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Rebuttal Testimony of

William M. Garfield, Joseph D. Harris,
Fredrick K. Schneider, and Joel M. Reiker

W-01445A-15-0277

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BEFORE THE ARIZONA CORPORATION COMMISSION

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AZ CORP COMMISSION
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COMMISSIONERS

DOUG LITTLE, Chairman
BOB STUMP
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TOM FORESE
ANDY TOBIN

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

Applicant, Arizona Water Company, hereby files the Rebuttal Testimony of William M. Garfield, Joseph D. Harris, Fredrick K. Schneider, Joel M. Reiker, Jamie R. Moe, and Pauline M. Ahern in the above-captioned docket.

RESPECTFULLY SUBMITTED this 13th day of April, 2016.

ARIZONA WATER COMPANY

By: _____

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ORIGINAL and thirteen (13) copies of the foregoing filed this 13th day of April, 2016, with:

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

I hereby certify that I have this day served the foregoing documents on all parties of record in this proceeding by delivering a copy thereof in person to:

Honorable Dwight D. Nodes
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Hearing Division
Arizona Corporation Commission
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Phoenix, Arizona 85007

Janice Alward
Legal Division Director
Arizona Corporation Commission
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Phoenix, Arizona 85007

Thomas M. Broderick
Utilities Division Director
Arizona Corporation Commission
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I hereby certify that I have this day served the foregoing documents on all parties of record in this proceeding by mailing a copy thereof, properly addressed with first class postage prepaid to:

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Dated at Phoenix, Arizona, this 13th day of April, 2016.

Garfield

ARIZONA WATER COMPANY

Docket No. W-01445A-15-0277

2015 WESTERN GROUP RATE HEARING

(For Test Year Ending 12/31/14)

Prepared

REBUTTAL TESTIMONY

of

WILLIAM M. GARFIELD

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ARIZONA WATER COMPANY

Rebuttal Testimony of

William M. Garfield

I. Introduction and Qualifications

Q. PLEASE STATE YOUR NAME, EMPLOYER AND OCCUPATION.

A. My name is William M. Garfield. I am employed by Arizona Water Company ("Arizona Water" or "Company") as its President and Chief Operating Officer ("COO"). As such, I am responsible for the management and operations of the Company. Each of Arizona Water's officers reports directly to me, and I report directly to Arizona Water's Chief Executive Officer.

Q. ARE YOU THE SAME WILLIAM M. GARFIELD THAT PREVIOUSLY PROVIDED DIRECT TESTIMONY IN THIS PROCEEDING?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to respond to the direct testimony of Staff witness Briton A. Baxter.

Q. HOW IS YOUR REBUTTAL TESTIMONY ORGANIZED?

A. My testimony is presented in two sections, including this introductory Section I. In Section II, I respond to Staff witness Briton A. Baxter's direct testimony regarding the Nitrate Cost Recovery Mechanism.

II. Response to Staff

A. Nitrate Cost Recovery Mechanism – Extraordinary Capital Expense

Q. DOES STAFF AGREE THAT ARIZONA WATER NEEDS TO CONSTRUCT FOUR ADDITIONAL WATER TREATMENT FACILITIES IN ORDER TO COMPLY WITH SAFE DRINKING WATER STANDARDS?

A. Yes. But Staff denies that Arizona Water would face an extreme financial hardship in expending $19[1] million to construct these four treatment facilities.[2]

Q. HOW DOES STAFF JUSTIFY ITS CONCLUSION THAT ARIZONA WATER WOULD NOT FACE AN EXTREME FINANCIAL HARDSHIP BY CONSTRUCTING $19 MILLION OF UTILITY PLANT?

A. They do not provide any analysis to support their conclusion, but simply reference Arizona Water's adjusted plant in service of $125 million and rate base of $57.8 million.

Q. DOES STAFF INFER ANYTHING BY THEIR TESTIMONY?

A. Yes. Staff infers that the $19 million needed to construct these four water treatment facilities is insignificant compared to Staff's adjusted plant in service and rate base calculations and any additional cost of service can be handled in the normal method of filing a general rate case after these facilities are constructed.

Q. IS STAFF CORRECT IN ITS INFERENCE THAT THESE CONSTRUCTION COSTS ARE NOT SIGNIFICANT?

A. No. The $19 million construction cost for nitrate treatment is nearly equal to the Company's total construction expenditures in the Pinal Valley service area during 2012, 2013, 2014 and 2015, <u>combined</u>.[3] Expending the equivalent of over four years' worth of capital expenditures to remove a single contaminant from drinking water is anything but insignificant.

In recommending denial of the Company's proposed nitrate cost recovery mechanism, Staff compares the $19 million construction cost for nitrate treatment to its recommended rate base in this proceeding of $57.8 million, and somehow

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[1] Actual cost is $19 million and not $26 million, *See* Schneider Direct Testimony, Page 107, lines 4-7.
[2] *See* Baxter Direct Testimony, Page 66, lines 18-22.
[3] *See* Schedule A-4 of the Company's Application.

concludes that a cost recovery mechanism is not warranted. However, this $19 million represents a 33% increase in the Pinal Valley service area's rate base. Staff provides no analysis or explanation of how a utility can fund a 33% increase in its rate base without taking extraordinary measures to maintain its financial integrity, or causing rate shock. It was the prospect of significant increases in rate base such as this that prompted the Commission to adopt the arsenic cost recovery mechanism.

Q. HOW DOES $19 MILLION IN UTILITY INVESTMENT IN NITRATE TREATMENT FACILITIES COMPARE TO THE LEVEL OF CAPITAL INVESTMENT IN ARSENIC TREATMENT FACILITIES FOR THE WESTERN GROUP WHEN THE ACRM WAS FIRST APPROVED FOR THIS GROUP?

A. The $19 million necessary to construct nitrate treatment facilities is nearly 40% larger than the amount of capital investment made in arsenic treatment facilities for the entire Western Group, which was estimated at $13.6 million.[4]

Q. DID THE COMMISSION FIND THAT THE ACRM WAS JUSTIFIED BASED ON $13.5 MILLION TO CONSTRUCT ARSENIC TREATMENT FACILITIES, AND DOES THE SAME SITUATION EXIST NOW FOR THE NITRATE TREATMENT FACILITIES?

A. As I testified in my direct testimony in this proceeding, in the Phase 2 proceeding for Arizona Water's Northern Group in Docket No. W-01445A-00-0962, the Commission concluded that:

- Arizona Water faces significant costs in the next several years to comply with the EPA's new arsenic MCL,

[4] *See* ACC Decision No. 68302, Page 46, lines 21-22.

- The impact on Arizona Water, as well as many other smaller water companies, will be significant,
- Absent the implementation of an ACRM mechanism, the only viable alternative would be a series of rate applications and the possibility that interim rate relief would be required to maintain the Company's financial integrity until rate relief could be granted, and
- Establishing an ACRM mechanism balances the need for Arizona Water to remain financially sound with the avoidance of significant rate shock to customers.

All of the Commission's conclusions about the need and justification for an ACRM, and benefits to customers, are even more applicable to the Nitrate Cost Recovery Mechanism, due to nitrate treatment facilities' higher capital cost and operating and maintenance expenses than similarly sized arsenic treatment facilities.[5]

Q. HOW DOES STAFF PROPOSE THAT ARIZONA WATER HANDLE THIS HIGH LEVEL OF UTILITY PLANT INVESTMENT?

A. Staff proposes that Arizona Water handle these facilities like it is being handled for the facilities already placed in service – by making the investments and seeking recovery in a general rate case.[6]

Q. IS THAT EVEN FEASIBLE?

A. No, not without significant financial risk to Arizona Water and rate shock to its customers.

Q. HOW DOES THIS LEVEL OF INVESTMENT IMPOSE SIGNIFICANT RISK ON ARIZONA WATER?

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[5] *See* Schneider Direct Testimony, Page 107, line10 through Page 108, line 14.
[6] *See* Baxter Direct Testimony, Page 67, lines 2-6.

A. The increased risk is demonstrated by comparing Arizona Water's capital structure before constructing arsenic treatment facilities in 2004, to Arizona Water's capital structure in 2008, in which the amount of equity in the Company's capital structure dropped from 75% to 46%. More importantly, the level of debt increased from $21.8 million to $75.0 million over this time period. The significant drop in Arizona Water's equity ratio and corresponding significant increase in debt ratio were due in large part to the cost of constructing arsenic treatment facilities. Significant declines in the equity ratio coupled with significant increases in debt increase Arizona Water's risk.

As experience shows, large capital projects completed over a short time period to comply with safe drinking water standards, such as arsenic and nitrate, can have a significant effect on the financial condition of a company such as Arizona Water. The Commission's conclusions about the need for an ACRM to maintain Arizona Water's financial integrity were exactly on point, and this practical real-life example shows why the NCRM is so badly needed.

Q. DO YOU STAND BY YOUR ORIGINAL RECOMMENDATION FOR THE NITRATE COST RECOVERY MECHANISM?

A. Yes, I do. My direct testimony and the Commission's own conclusions on the ACRM provide ample justification and need for an NCRM.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes.

Harris

ARIZONA WATER COMPANY

Docket No. W-01445A-15-0277

2015 WESTERN GROUP RATE HEARING

(For Test Year Ending 12/31/14)

Prepared

REBUTTAL TESTIMONY

of

JOSEPH D. HARRIS

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EXHIBITS

Chaparral City Water Company – CAP Surcharge Worksheet JDH-RB1

Calculation of Deferred Taxes on Post-Test Year Plant JDH-RB2

ARIZONA WATER COMPANY

Rebuttal Testimony of

Joseph D. Harris

I. **Introduction and Purpose of Testimony**

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

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

Q. **ARE YOU THE SAME JOSEPH D. HARRIS THAT PREVIOUSLY PROVIDED DIRECT TESTIMONY IN THIS MATTER?**

A. Yes.

Q. **HAVE YOU REVIEWED THE DIRECT TESTIMONY FILED BY THE OTHER PARTIES TO THIS PROCEEDING?**

A. Yes. I have reviewed the direct testimony of each of the witnesses of the Arizona Corporation Commission's ("Commission") Utilities Division Staff ("Staff"), the Residential Utility Consumer Office ("RUCO") and Abbott Laboratories.

Q. **WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

A. The purpose of my rebuttal testimony is to respond to the direct testimony of Staff witness Briton A. Baxter and RUCO witness John A. Cassidy.

Q. **HOW IS YOUR TESTIMONY ORGANIZED?**

A. My testimony is presented in six sections including this introductory Section I.

II. **RUCO's Recommended Imputed Cost of Debt**

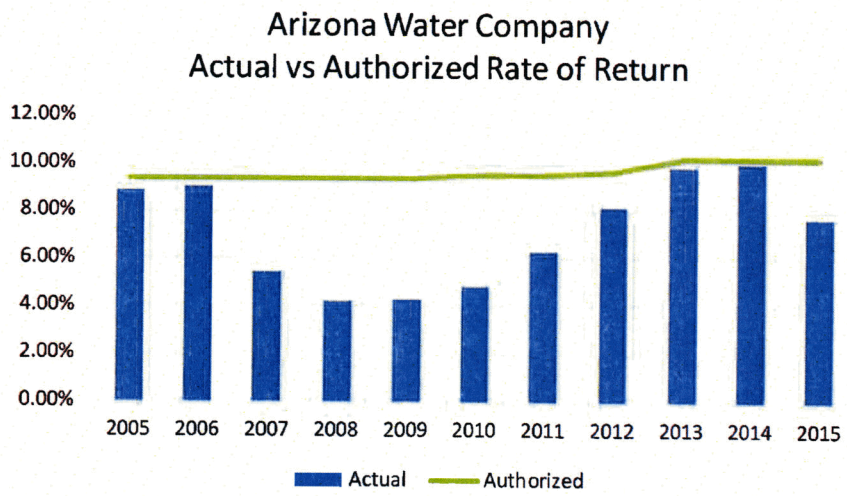
Q. **WHAT DO YOU ADDRESS IN THIS SECTION OF YOUR TESTIMONY?**

A. In this section of my rebuttal testimony I set the record straight regarding the Company's financial condition after December 2008, the period RUCO witness John A. Cassidy describes on page 6 (lines 8-9) of his testimony as "the worst financial crisis since the Great Depression." As explained by Company witness

Joel M. Reiker in Section II of his rebuttal testimony, RUCO witness John A. Cassidy rewrites history in an attempt to convince the Commission that the Company's management abused its discretion and made poor financing decisions during this period to the detriment of the Company's customers. Mr. Cassidy ultimately recommends that the Commission adopt a fictitious imputed cost of debt, and thereby disallow a significant portion of the fixed interest expense on the Company's outstanding bonds. Company witnesses Joel M. Reiker and Pauline M. Ahern both address Mr. Cassidy's testimony and fictitious cost of debt extensively in their rebuttal testimony.

Q. PLEASE DISCUSS THE COMPANY'S FINANCIAL CONDITION FOLLOWING ITS APPLICATION TO THE COMMISSION FOR AUTHORITY TO INCUR ADDITIONAL SHORT-TERM DEBT IN DECEMBER 2008.

A. 2008 marked a significant turning point in the Company's financial condition. As shown on the graph below, the Company's overall return on rate base fell 462 basis points from just a few years earlier. By the end of 2008, the Company had completed and placed in service more than $35 million in required utility infrastructure to comply with the U.S. Environmental Protection Agency's stringent new Safe Drinking Water Act standard for arsenic. Additional revenues from the Arsenic Cost Recovery Mechanism surcharge improved cash flow, but were not enough to halt the sharp downturn in the Company's financial condition.

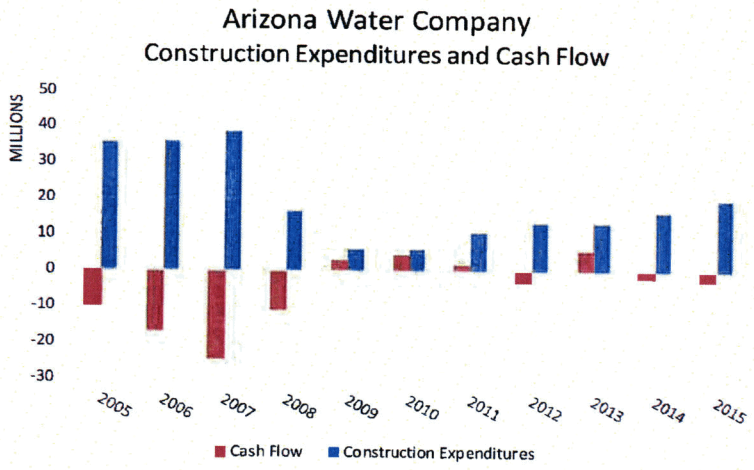


In addition to its investment in arsenic treatment facilities, the Company had nearly $159 million in utility plant placed in service at the time, benefitting customers, but not yet reflected in rates. Operating expenses, including depreciation, purchased power costs, and expenses associated with water treatment all rose significantly while sales and active customers declined. All of these factors contributed to a significant decline in available cash flow and worsening of the Company's financial condition after the end of 2008.

Customer growth, which averaged approximately 5% in previous years, suddenly reversed and for the first time in over twenty years, the Company lost customers as the effects of the housing market collapse adversely affected the areas that the Company served.

Q. HOW DID THE COMPANY RESPOND TO THE ECONOMIC CRISIS, REDUCED CASH FLOW, AND DECLINE IN EARNINGS?

A. As shown on the chart below, the government-mandated extraordinary investment in arsenic treatment facilities as well as other much needed utility plant additions drained the Company's cash flow for a number of years. In an effort to stabilize its earnings and cash flow, the Company took several steps, including sharply cutting its capital expenditures from nearly $30 million before the "Great Recession" to just $5.7 million in 2009. The Company also actively took steps to reduce certain operation and maintenance expenses.



In 2009 as the recession dragged on, for the first time in its history, the Company instituted staff reductions in an effort to reduce costs and weather the economic crisis. Other cost reduction efforts included wage and hiring freezes, and the suspension of dividend increases. This new "bare bones" level of capital expenditures and operating expenses continued for several years as the Company continued its efforts to control its expenses, debt, and stabilize its earnings.

Q. WERE THE STEPS THAT THE COMPANY TOOK TO CONTROL ITS EXPENSES, DEBT, AND STABILIZE ITS EARNINGS SUSTAINABLE?

A. No. Necessary capital investment and maintenance of utility infrastructure cannot be postponed indefinitely. As the Commission granted rate relief to the Company in 2010, 2012, and 2013, the deferred pent-up demand for investment in much needed water infrastructure had to be met. Understandably, the Company needed to take a cautious and conservative approach to ramping up its capital expenditures. To do so, the Company relied on internally generated funds to finance its capital expenditures thereby improving its ability to withstand another economic downturn, or worse, a reoccurrence of the recession. Building a stronger financial position by retaining and reinvesting earnings in utility plant additions and building equity enables the Company to better withstand worsening economic conditions, and is critical to attracting capital at rates and on terms that are favorable to the Company and to its customers to fund infrastructure improvements and replacements in the future. Having a strong financial position is critical as the Company also faces the need to invest nearly $200 million replacing aging infrastructure.[1]

Q. DID THE COMPANY INCUR ADDITIONAL LONG-TERM BOND DEBT DURING THE GREAT RECESSION?

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[1] *See* Decision No. 74081. Page 26, lines 4-6.

A. No. The Company had short-term debt outstanding during 2008, 2009, and 2010 but did not issue any additional long-term bond debt. This was because for a number of years the Company had insufficient earnings to meet the covenants of the Company's General Mortgage Bond Indenture.[2] In addition, during this time the Company took a cautious and austere approach to capital investment. While the Company gradually increased its capital expenditures in recent years, it has purposefully done so at a rate not to cause cash deficits that cannot be met with internally generated funds, reinvested earnings, and additional shareholder investment. By design, the Company did not need to finance its capital expenditures with additional long-term borrowing.

However, as Company witness Fredrick K. Schneider points out in his direct testimony, the Company must design and construct nitrate removal facilities to comply with safe drinking water standards. These facilities cost nearly forty percent more than the original estimates for arsenic treatment facilities for the entire Western Group. Add to those costs the nearly $200 million the Company has identified in much needed water distribution infrastructure replacement and it is clear that the Company will need to seek debt financing as it does not have the ability to generate the needed funding from its operations. The cost reduction efforts undertaken by the Company along with the rate relief granted by the Commission have improved the Company's operating results making it possible for the Company to meet the Times Interest Earned Ratio requirements of the Company's General Mortgage Bond Indenture. Additionally, because the Company took the cautious and conservative approach to its capital investment during the recession it did not need to seek additional long-term debt

[2] The Company's General Mortgage Bond Indenture includes a Times Interest Earned Ratio requirement that requires that the Net Earnings of the Company for a period of twelve consecutive calendar months within the immediately preceding fifteen calendar months be at least two times the sum of (i) the aggregate annual interest charges on all Funded Debt and (ii) the aggregate Annual Interest Factor on Long-Term Leases.

which helped it to improve its capital structure. The importance of improving its capital structure was pointed out by Staff when they said that the Company's "capital structure [was] no longer sufficiently strong to continue assuming that the [LOC] can be refinanced."[3] Company witness Joel M. Reiker discusses this point in more detail in his rebuttal testimony.

III. Central Arizona Project ("CAP") Surcharge

Q. DO YOU AGREE WITH STAFF'S RECOMMENDATION CONCERNING THE ESTIMATED PAYMENTS/EXPENSE ("COMPONENT 2") OF THE CAP SURCHARGE?

A. No. Staff recommends denial of Component 2 of the CAP surcharge because, according to Staff witness Briton A. Baxter, "... the actual amount of CAP water delivered may not be known until after the year is complete." Mr. Baxter is incorrect. Because of the way that CAP water is purchased, both the quantity delivered and its cost are known before the year in which it will take delivery of CAP water, and will also be known by the time the Company submits its annual CAP Surcharge filing (January 31).

Q. PLEASE EXPLAIN HOW THE AMOUNT DELIVERED AND THE COST WILL BE KNOWN BEFORE THE END OF EACH YEAR.

A. The terms and conditions for receiving deliveries of CAP water are set forth in a Subcontract between the United States Department of the Interior Bureau of Reclamation, the Central Arizona Water Conservation District ("CAWCD"), and the Company. The Subcontract states that on or before October 1 each year, the Company must submit in writing to CAWCD a water delivery schedule indicating the amounts of CAP water desired by the Company during each month of the following year, along with a preliminary estimate of CAP water desired for the succeeding two years. On or before November 15 of each year, CAWCD

[3] *See* Responsive Staff Report for Arizona Water Company's Application for Short-term Debt and the Delivery of a Promissory Note in Connection Therewith. Docket W-01445A-08-0607.

determines and furnishes to the Company a schedule showing water deliveries to the Company for each month of the following year.

After the Company places this order and CAWCD confirms the order, the Company is obligated to pay for the quantity of water ordered. In fact CAWCD immediately begins billing the Company in November for the water it has ordered for the following year.

In June of each year, CAWCD publishes its Final Rate Schedules for the upcoming year. CAWCD uses these prices to bill the Company for deliveries scheduled during the upcoming year. Therefore, the Company's cost of CAP deliveries is known and measurable before the year in which it actually takes delivery of its CAP water.

Q. DOES ANY OTHER WATER UTILITY IN ARIZONA HAVE A CAP SURCHARGE WITH A FEE SIMILAR TO COMPONENT 2?

A. Yes. In Docket No. W-02113A-13-0118, the Commission approved a CAP Water Surcharge Mechanism for Chaparral City Water Company. According to the Plan of Administration filed in that same docket, Section 2 of the CAP Surcharge Mechanism states: "This section estimates the payments and credits that will occur in the applicable year. It includes the cost of the CAP water associated with the expected delivery of the scheduled amount of CAP water in that year ..."

On January 29, 2016, Chaparral City Water Company filed its CAP Surcharge Mechanism tariff. The worksheets accompanying that filing show that the surcharge is based on scheduled deliveries during 2016, as well as projected deliveries and pricing for 2017. (*See* Exhibit JDH-RB1.)

Q. DID STAFF RECOMMEND INCLUDING AMORTIZATION OF ADDITIONAL DEFERRED CAP M&I CHARGES BE INCLUDED IN THE CAP SURCHARGE?

A. Yes. Staff recommends that the Company recover the increased portion of the used and useful deferred CAP M&I charges over a 20 year period, consistent with prior treatment.[4]

Q. DID COMPONENT 3 OF THE COMPANY'S PROPOSED CAP SURCHARGE INCLUDE AMORTIZATION OF THE USED AND USEFUL DEFERRED CAP M&I CHARGE AMORTIZED OVER 20 YEARS?

A. Yes. As shown on Schedule 2 of Exhibit JDH-11, the Company proposed that it be allowed to recover the additional amortization associated with the increased portion of used and useful CAP water. For example, on Schedule 2, the Company calculated the amount of deferred CAP M&I charges associated with 375 acre-feet of CAP water delivered in 2016 for White Tank as $207,221. Line 40 of that schedule then calculates the annual amortization by dividing $207,221 by 20 years to arrive at an annual amortization cost of $10,361.

Q. DOES THE COMPANY PROPOSE TO RECOVER THE FULL, INCREASED USED AND USEFUL PORTION IN THE YEAR THEY BECOME USED AND USEFUL?

A. No. As described above and as shown on Schedule 2 of Exhibit JDH-11, the Company intends to recover over a 20-year period any increase in the portion of deferred CAP M&I charges that become used and useful, as previously approved by the Commission.

Q. DID THE COMPANY INCLUDE A RETURN ON THE PORTION OF DEFERRED CAP M&I CHARGES IN ITS CALCULATION OF ITS CAP SURCHARGE?

A. Yes. Consistent with prevailing Commission practices, the Company calculated the return on the additional portion of deferred CAP M&I charges that becomes used and useful. This practice began with Decision No. 68302, and was also adopted by the Commission in Decision No. 71845, in which the Commission

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[4] *See* Direct Testimony of Briton Baxter, Page 60, lines 14-15.

approved adding the incremental used and useful portions of deferred CAP M&I charges to rate base, and included those charges in the Company's revenue requirement. Schedule 2 of JDH-11 shows the calculation of the revenue required for the additional deferred CAP M&I charges which become used and useful.

IV. Uniform System of Accounts

Q. BOTH STAFF AND RUCO HAVE RECOMMENDED THAT THE COMPANY CONVERT TO THE 1996 VERSION OF NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS UNIFORM SYSTEM OF ACCOUNTS ("1996 NARUC USoA"). WHAT IS THE COMPANY'S RESPONSE?

A. The Company is agreeable to making this conversion. But as Staff points out there will be costs associated with this conversion and the Company requests that it be allowed to defer these costs for recovery in its next rate filing for each of its operating groups.

Q. IS STAFF'S PROPOSED TIMELINE ACCEPTABLE?

A. No. The chart of accounts that a utility uses permeates every financial transaction that it undertakes from paying its employees and vendors to recording its sales and constructing infrastructure. As a result, converting to a new system of accounts is no simple task. The conversion to a new system of accounts will require that the Company change its software, forms, and reports, which will take significant time and resources to implement.

Based on my experience, the Company can make this conversion and begin recording costs using the new system of accounts at the earliest in January 2017. However, because the 1976 USoA and the 1996 USoA are so materially different, there is no practical way to modify the recorded historical transactions to the new system of accounts. As a result, all transactions recorded prior to

January 2017 will still reflect the 1976 USoA, and all transactions recorded after January 2017 will reflect the 1996 USoA.

Q. IS IT POSSIBLE FOR THE COMPANY TO FILE ITS NEXT RATE CASE USING THE 1996 USoA?

A. Not unless the Company's next group general rate case uses a 2017 test year, which is not possible. The Company is already preparing for its next general rate case, which it will file either in the third quarter of 2016, based on a 2015 test year, or possibly based on a 2015/2016 fiscal test year.

There is no practical way to convert historical transactions recorded from the 1976 USoA to the 1996 USoA. Ordering the Company to use the 1996 USoA in its next general rate case will effectively preclude the Company from seeking rate relief for any of its groups until at least 2018. By adopting Staff's recommendation in this proceeding, the Commission would impose an unreasonable delay on the Company's next group general rate case which would cause the Company to operate at a loss for an extended period of time, thereby harming the Company and its customers.

It is important to note in this regard that the Commission's rule on accounts and records states, in part, "each utility shall maintain its books and records in conformity with the NARUC Uniform System of Accounts (USOA) for Class A, B, C and D Water Utilities." (A.A.C. R14-2-411 D. 2) NARUC has modified and reissued its USoA for water utilities three times over the last 40 year period: 1976, 1984 and 1996. Each of these modifications in NARUC's USoA was issued with the following language:

> Pursuant to action by the National Association of Regulatory Utility Commissioners, this system of Accounts is <u>recommended</u> to the commissions represented in the membership of this Association for <u>consideration</u> and for <u>adoption</u> in their respective jurisdictions with such modifications only as they may deem necessary in the public interest." (emphasis added)

The Commission has never taken any action, whether by means of a decision or a rulemaking, to specifically adopt either the 1984 or 1996 NARUC USoA, much less arbitrarily imposed it in an unreasonable or unworkable way. For the Commission to prevent a utility from seeking rate relief simply because Staff and RUCO prefer a different USoA is wholly inappropriate and will only harm the utility and its customers.

Q. WHAT DOES THE COMPANY PROPOSE?

A. The Company proposes that it convert to the 1996 USoA beginning in January 2017, and that rate cases filed using a test year of 2017 or later would then utilize the 1996 USoA. In addition, the Company would use the 1996 USoA in filing its 2017 and later annual reports with the Commission.

V. Nitrate Cost Recovery Mechanism ("NCRM")

Q. DO YOU AGREE WITH STAFF'S ASSERTION THAT BUILDING THE NITRATE TREATMENT FACILITIES DESCRIBED IN YOUR TESTIMONY WOULD NOT BE A HARDSHIP FOR THE COMPANY?

A. No. The Company projects that it must spend nearly $19 million to design and construct nitrate removal facilities. Also, the cost of operating these nitrate removal facilities will significantly exceed the operating costs of arsenic treatment facilities. In fact, in the Company's 2004 rate application, it estimated an annual cost of operating all of its arsenic treatment plants at $2.1 million, while current estimates put the annual cost of operating just one nitrate removal facility at nearly $2 million.

In approving the original Arsenic Cost Recovery Mechanism, the Commission concluded that the level of investment required to build these federally mandated treatment plants was significant enough that special rate treatment was needed to ensure the Company's financial survival. The Construction Expenditures and Cash Flow table in Section II of my testimony shows the impact of constructing arsenic facilities. In comparison, the Company

has estimated that constructing the nitrate removal facilities at just four of its well sites will cost nearly forty percent more than the original estimate for all of the Company's arsenic treatment facilities in the Western Group.

Q. IF THE COMMISSION ULTIMATELY DECIDES NOT TO APPROVE THE NCRM ARE THERE OTHER STEPS THAT COULD BE TAKEN TO ALLEVIATE THE FINANCIAL HARDSHIP OF CONSTRUCTING THESE FACILITIES?

A. Yes. If the Commission ultimately decides not to allow the NCRM, the Company proposes that it be allowed to record post in service allowance for funds used during construction, that it be allowed to defer post in service depreciation expense, and that it be allowed to defer plant specific operating costs for these new facilities. These measures would help the Company mitigate a portion of the financial impacts of constructing these required treatment facilities between rate cases.

VI. Accumulated Depreciation

Q. BOTH STAFF AND RUCO HAVE RECOMMENDED THAT THE COMPANY BEGIN RECORDING ITS ACCUMULATED DEPRECIATION BALANCES BY ACCOUNT. DOES THE COMPANY AGREE?

A. Yes. However, an additional step is necessary to ensure that the accumulated depreciation accounts reflect correct balances.

Q. WHAT OTHER STEPS ARE NECESSARY?

A. In addition to recording on-going depreciation to accounts segregated by plant account, it is necessary to allocate the existing accumulated depreciation reserve to the individual plant accounts. Until this balance is allocated, it will not be possible to accurately evaluate the depreciation reserve, the useful lives of plant assets, or the depreciation rates.

For example, both Staff and RUCO recommend that the Company record depreciation expense by plant account going forward, but neither Staff witness

Briton A. Baxter nor RUCO witness John A. Cassidy make any recommendation about how retirements, cost of removal, or salvage should be recorded going forward. Without allocating the existing reserve, none of the benefits cited by Mr. Baxter on page 56 (lines 11-23) of his direct testimony can be realized.

Q. CAN THE DEPRECIATION RESERVE BE SIMPLY ALLOCATED BY PLANT BALANCE?

A. No. In addition to annual additions of depreciation expense, the reserve also includes retirement of assets, the cost of removing those assets, and salvage value. Based on the variety of entries recorded in the reserve, a simple allocation based on plant balances would be inaccurate and inappropriate.

Q. WHAT IS THE PREFERRED WAY TO ALLOCATE THE DEPRECIATION RESERVE?

A. In order to correctly allocate the existing reserve, it is necessary to calculate what is known a "theoretical reserve," which can only be done as part of a comprehensive depreciation study. The depreciation study would consist of data collection, asset life analysis and estimation, removal cost and salvage analysis, depreciation reserve analysis, and, if necessary, recommended changes to depreciation rates. Not only would a depreciation study provide an accurate way to allocate the depreciation reserve into its respective plant balances, it would also allow for careful analysis of the depreciation rates being used to ensure that they properly match asset lives and estimated removal and salvage costs.

Q. WHAT DOES THE COMPANY PROPOSE?

A. The Company proposes to have a comprehensive, companywide depreciation study completed prior to filing its next Western Group general rate case. Based on our experience, the cost of such a study will range from $50,000 to $70,000. The Company proposes that it defer the costs of the study for cost recovery consideration in its next rate cases for each of its operating groups.

VII. Deferred Income Taxes

Q. DOES THE COMPANY USE ACCELERATED DEPRECIATION WHEN COMPUTING ITS FEDERAL INCOME TAXES?

A. Yes, the Company computes depreciation for tax purposes using the Modified Accelerated Cost Recovery System, or MACRS. Depreciation rates are generally higher and the asset lives are shorter under MACRS. In compliance with Internal Revenue Code Section 168(f)(2), and Decision No. 53349[5], the Company must use the normalization method of accounting and record a deferred tax balance to account for the difference between accelerated tax depreciation and book depreciation.

Q. WAS BONUS DEPRECIATION IN EFFECT WHEN THE COMPANY FILED ITS WESTERN GROUP RATE CASE APPLICATION?

A. No. In 2008, Congress passed a number of stimulus provisions including bonus depreciation. However, the bonus depreciation provision was temporary and was not adopted on a permanent basis. As bonus depreciation expired in each year, Congress reenacted it. In August 2015, when the Company filed this rate application, bonus depreciation had expired and had not been reenacted. Then, in late December 2015 Congress passed the Protecting Americans from Tax Hikes Act of 2015, which among other things, restored bonus depreciation for 2015, and extended bonus depreciation at specified rates through 2019.

Q. WITH THE RENEWAL OF BONUS DEPRECIATION IS IT APPROPRIATE TO INCLUDE AN ADJUSTMENT TO THE COMPANY'S DEFERRED TAX BALANCES FOR APPROVED POST TEST YEAR PLANT?

A. Yes. Unlike the use of MACRS, bonus depreciation related to post-test year plant can result in a deferred tax liability that has a greater effect on rates. Therefore, to the extent that post test year plant is included in rate base, the

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[5] *See* Decision No. 53349. Page 8, lines 1-8.

appropriate amount of deferred tax resulting from bonus depreciation on post-test year plant should also be included in this particular case.

Q. HAVE YOU PREPARED AN EXHIBIT SHOWING THE AMOUNT OF DEFERRED TAX ASSOCIATED WITH POST TEST YEAR PLANT?

A. Yes, Exhibit JDH-RB2 shows a calculation of deferred taxes on the amount of post test year plant discussed in Mr. Schneider's rebuttal testimony.

Q. DOES THAT CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes.

EXHIBIT JDH-RB1

Chaparral City Water Company - CAP Surcharge
Schedule E - Projected Costs

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
Cost / Expense													
Municipal and Industrial Charges	$ 90,697	$ 90,697	$ 90,697	$ 90,697	$ 90,697	$ 90,697	$ 90,697	$ 90,697	$ 90,697	$ 90,697	$ 96,322	$ 96,322	$ 1,099,610
Capital Charges					102,454					106,908	-		209,362
MWD Storage (Credit)	-	-	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)	-	-	(8,000)
Other Storage Charges	-	-	-	-	-	-	-	-	-	-	-	-	-
CAP Power Credit for prior year	-	-	(39,450)	-	-	-	-	-	-	-	-	-	(39,450)
CAP Remarketing Credit for prior year			(90,697)	(90,697)	(22,707)								(204,101)
Total Projected Expense / Costs	$ 90,697	$ 90,697	$ (40,450)	$ (1,000)	$ 169,443	$ 89,697	$ 89,697	$ 89,697	$ 89,697	$ 196,605	$ 96,322	$ 96,322	$ 1,057,420
Water Loss Adjustment - Schedule C													$ (7,549)
Projected 2016 Annual Costs including water loss adjustment													$ 1,049,872

* Note - The surcharge will not be in effect in 2015, thus no revenues are shown. In future years this field will be populated with actual surcharge revenues.

	2015	2016	2017	
CAP M&I Rate	$ 157	$ 161	$ 166	per acre foot
CAP Capital Rate	$ 22	$ 23	$ 24	per acre foot
CAP Underground Storage Rate	$ 10	$ 10	$ 12	per acre foot
MWD Storage (Credit) Rate	$ (16)	$ (16)	$ (16)	per acre foot
Total CAP Allocation		8909	8909	acre feet
Water Ordered		6760	6963	acre feet
Water to be Stored at a CAP Facility		0	0	acre feet
Water to be Stored at MWD		500	600	acre feet

EXHIBIT JDH-RB2

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Calculation of Deferred Taxes on Post Test Year Plant
Bonus Depreciation

Line No.			Depreciation Rate	Pinal Valley	Book Depreciation	Tax Depreciation Rate	Bonus Depreciation	Depreciation for Tax Purposes	Tax Depreciation in Excess of Book Depreciation
1		Intangible Plant							
2	301	Organization	0.00%	0	0	0.00%	0.00%	0	
3	302	Franchises	n/a	0	0	0.00%	0.00%	0	
4	303	Other Intangibles	n/a	0	0	0.00%	0.00%	0	
5		Subtotal Intangible Plant		$ 0	$ 0			$ 0	
6		Source of Supply Plant							
7	310.1	Water Rights	0.00%	0	0	0.00%	0.00%	0	
8	310.3	Other Source of Supply Land	0.00%	0	0	0.00%	0.00%	0	
9	310.4	Wells - Other	n/a	0	0	0.00%	50.00%	0	
10	314	Wells	3.13%	403,946	12,644	3.75%	50.00%	209,547	
11		Subtotal Source of Supply Plant		$ 403,946	$ 12,644			$ 209,547	
12		Pumping Plant							
13	320	Pumping Plant Land	0.00%	0	0	0.00%	0.00%		
14	321	Pumping Plant Structures & Improvements	2.86%	80,966	2,316	3.75%	50.00%	42,001	
15	325	Electtric Pumping Equipment	5.88%	2,613,042	153,647	3.75%	50.00%	1,355,515	
16	328	Gas Engine Equipment	4.00%	0	0	3.75%	50.00%	0	
17		Subtotal Pumping Plant		$ 2,694,008	$ 155,962			$ 1,397,516	
18		Water Treatment Plant							
19	330	Water Treatment Plant Land	0.00%	0	0	0.00%	0.00%	0	
20	331	Water Treatment Structures & Improvements	2.50%	0	0	3.75%	50.00%	0	
21	332	Water Treatment Equipment	2.86%	1,542,660	44,120	3.75%	50.00%	800,255	
22		Subtotal Water Treatment Plant		$ 1,542,660	$ 44,120			$ 800,255	
23		Transmission & Distribution Plant							
24	340	Transmission and Distribution Land	0.00%	0	0	0.00%	0.00%	0	
25	341	Transmission and Distribution Structures	3.33%	0	0	3.75%	50.00%	0	
26	342	Storage Tanks	2.00%	90,656	1,813	3.75%	50.00%	47,028	
27	343	Transmission & Distribution Mains	1.79%	1,875,530	33,572	3.75%	50.00%	972,931	
28	344	Fire Sprinkler Taps	2.00%	430	9	3.75%	50.00%	223	
29	345	Services	2.38%	283,898	6,757	3.75%	50.00%	147,272	
30	346	Meters	4.55%	351,901	16,012	3.75%	50.00%	182,549	
31	348	Hydrants	1.82%	12,171	222	3.75%	50.00%	6,314	
32		Subtotal Transmission & Distribution Plant		$ 2,614,586	$ 58,383			$ 1,356,317	
33		General Plant							
34	389	General Plant Land	0.00%	0	0	0.00%	0.00%	0	
35	390	General Plant Structures	2.50%	13,266	332	1.72%	50.00%	6,747	
36	390.1	Leasehold Improvements	n/a	0	0	1.72%	50.00%	0	
37	391	Office Furniture & Equipment	6.67%	14,392	960	14.29%	50.00%	8,225	
38	393	Warehouse Equipment	5.00%	0	0	14.29%	50.00%	0	
39	394	Tools, Shop & Garage Equipment	4.00%	9,705	388	14.29%	50.00%	5,546	
40	395	Laboratory Equipment	5.00%	1,671	84	14.29%	50.00%	955	
41	396	Power Operated Equipment	6.67%	4,042	270	14.29%	50.00%	2,310	
42	397	Communication Equipment	6.67%	28,305	1,888	14.29%	50.00%	16,175	
43	398	Miscellaneous Equipment	3.33%	22,766	758	14.29%	50.00%	13,010	
44		Subtotal General Plant		$ 94,147	$ 4,679			$ 52,968	
45									
46		Total Utility Plant		$ 7,349,346	$ 275,789			$ 3,816,603	$ 3,540,814
47									
48		Federal Tax Rate							35%
49									
50		Deferred Income Taxes							$ 1,239,285
51									
52									
53									
54									
55									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Calculation of Deferred Taxes on Post Test Year Plant
Bonus Depreciation

Line No.			Depreciation Rate	White Tank	Book Depreciation	Tax Depreciation Rate	Bonus Depreciation	Depreciation for Tax Purposes	Tax Depreciation in Excess of Book Depreciation
1		Intangible Plant							
2	301	Organization	0.00%	0	0	0.00%	0.00%	0	
3	302	Franchises	n/a	0	0	0.00%	0.00%	0	
4	303	Other Intangibles	n/a	0	0	0.00%	0.00%	0	
5		Subtotal Intangible Plant		$ 0	$ 0			$ 0	
6		Source of Supply Plant							
7	310.1	Water Rights	0.00%	0	0	0.00%	0.00%	0	
8	310.3	Other Source of Supply Land	0.00%	0	0	0.00%	0.00%	0	
9	310.4	Wells - Other	n/a	0	0	0.00%	50.00%	0	
10	314	Wells	3.13%	0	0	3.75%	50.00%	0	
11		**Subtotal Source of Supply Plant**		$ 0	$ 0			$ 0	
12		Pumping Plant							
13	320	Pumping Plant Land	0.00%	0	0	0.00%	0.00%	0	
14	321	Pumping Plant Structures & Improvements	2.86%	0	0	3.75%	50.00%	0	
15	325	Electtric Pumping Equipment	5.88%	33,612	1,976	3.75%	50.00%	17,436	
16	328	Gas Engine Equipment	4.00%	0	0	3.75%	50.00%	0	
17		Subtotal Pumping Plant		$ 33,612	$ 1,976			$ 17,436	
18		Water Treatment Plant							
19	330	Water Treatment Plant Land	0.00%	0	0	0.00%	0.00%	0	
20	331	Water Treatment Structures & Improvements	2.50%	0	0	3.75%	50.00%	0	
21	332	Water Treatment Equipment	2.86%	68,859	1,969	3.75%	50.00%	35,721	
22		Subtotal Water Treatment Plant		$ 68,859	$ 1,969			$ 35,721	
23		Transmission & Distribution Plant							
24	340	Transmission and Distribution Land	0.00%	0	0	0.00%	0.00%	0	
25	341	Transmission and Distribution Structures	3.33%	0	0	3.75%	50.00%	0	
26	342	Storage Tanks	2.00%	18,004	360	3.75%	50.00%	9,340	
27	343	Transmission & Distribution Mains	1.79%	68,746	1,231	3.75%	50.00%	35,662	
28	344	Fire Sprinkler Taps	2.00%	0	0	3.75%	50.00%	0	
29	345	Services	2.38%	31,072	740	3.75%	50.00%	16,119	
30	346	Meters	4.55%	105	5	3.75%	50.00%	55	
31	348	Hydrants	1.82%	3,867	70	3.75%	50.00%	2,006	
32		Subtotal Transmission & Distribution Plant		$ 121,795	$ 2,405			$ 63,182	
33		General Plant							
34	389	General Plant Land	0.00%	0	0	0.00%	0.00%	0	
35	390	General Plant Structures	2.50%	0	0	1.72%	50.00%	0	
36	390.1	Leasehold Improvements	n/a	0	0	1.72%	50.00%	0	
37	391	Office Furniture & Equipment	6.67%	0	0	14.29%	50.00%	0	
38	393	Warehouse Equipment	5.00%	0	0	14.29%	50.00%	0	
39	394	Tools, Shop & Garage Equipment	4.00%	239	10	14.29%	50.00%	136	
40	395	Laboratory Equipment	5.00%	0	0	14.29%	50.00%	0	
41	396	Power Operated Equipment	6.67%	0	0	14.29%	50.00%	0	
42	397	Communication Equipment	6.67%	336,357	22,435	14.29%	50.00%	192,211	
43	398	Miscellaneous Equipment	3.33%	3,974	132	14.29%	50.00%	2,271	
44		Subtotal General Plant		$ 340,569	$ 22,577			$ 194,618	
45									
46		Total Utility Plant		$ 564,837	$ 28,928			$ 310,957	$ 282,029
47									
48		Federal Tax Rate							35%
49									
50		Deferred Income Taxes							$ 98,710
51									
52									
53									
54									
55									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Calculation of Deferred Taxes on Post Test Year Plant
Bonus Depreciation

Line No.			Depreciation Rate	Ajo	Book Depreciation	Tax Depreciation Rate	Bonus Depreciation	Depreciation for Tax Purposes	Tax Depreciation in Excess of Book Depreciation
1		Intangible Plant							
2	301	Organization	0.00%	0	0	0.00%	0.00%	0	
3	302	Franchises	n/a	0	0	0.00%	0.00%	0	
4	303	Other Intangibles	n/a	0	0	0.00%	0.00%	0	
5		Subtotal Intangible Plant		$ 0	$ 0			$ 0	
6		Source of Supply Plant							
7	310.1	Water Rights	0.00%	0	0	0.00%	0.00%	0	
8	310.3	Other Source of Supply Land	0.00%	0	0	0.00%	0.00%	0	
9	310.4	Wells - Other	n/a	0	0	0.00%	50.00%	0	
10	314	Wells	3.13%	0	0	3.75%	50.00%	0	
11		Subtotal Source of Supply Plant		$ 0	$ 0			$ 0	
12		Pumping Plant							
13	320	Pumping Plant Land	0.00%	0	0	0.00%	0.00%	0	
14	321	Pumping Plant Structures & Improvements	2.86%	0	0	3.75%	50.00%	0	
15	325	Electric Pumping Equipment	5.88%	0	0	3.75%	50.00%	0	
16	328	Gas Engine Equipment	4.00%	0	0	3.75%	50.00%	0	
17		Subtotal Pumping Plant		$ 0	$ 0			$ 0	
18		Water Treatment Plant							
19	330	Water Treatment Plant Land	0.00%	0	0	0.00%	0.00%	0	
20	331	Water Treatment Structures & Improvements	2.50%	0	0	3.75%	50.00%	0	
21	332	Water Treatment Equipment	2.86%	0	0	3.75%	50.00%	0	
22		Subtotal Water Treatment Plant		$ 0	$ 0			$ 0	
23		Transmission & Distribution Plant							
24	340	Transmission and Distribution Land	0.00%	0	0	0.00%	0.00%	0	
25	341	Transmission and Distribution Structures	3.33%	0	0	3.75%	50.00%	0	
26	342	Storage Tanks	2.00%	0	0	3.75%	50.00%	0	
27	343	Transmission & Distribution Mains	1.79%	1,409	25	3.75%	50.00%	731	
28	344	Fire Sprinkler Taps	2.00%	0	0	3.75%	50.00%	0	
29	345	Services	2.38%	9,019	215	3.75%	50.00%	4,679	
30	346	Meters	4.55%	0	0	3.75%	50.00%	0	
31	348	Hydrants	1.82%	0	0	3.75%	50.00%	0	
32		Subtotal Transmission & Distribution Plant		$ 10,428	$ 240			$ 5,410	
33		General Plant							
34	389	General Plant Land	0.00%	0	0	0.00%	0.00%	0	
35	390	General Plant Structures	2.50%	0	0	1.72%	50.00%	0	
36	390.1	Leasehold Improvements	n/a	0	0	1.72%	50.00%	0	
37	391	Office Furniture & Equipment	6.67%	481	32	14.29%	50.00%	275	
38	393	Warehouse Equipment	5.00%	0	0	14.29%	50.00%	0	
39	394	Tools, Shop & Garage Equipment	4.00%	3,974	159	14.29%	50.00%	2,271	
40	395	Laboratory Equipment	5.00%	0	0	14.29%	50.00%	0	
41	396	Power Operated Equipment	6.67%	0	0	14.29%	50.00%	0	
42	397	Communication Equipment	6.67%	16	1	14.29%	50.00%	9	
43	398	Miscellaneous Equipment	3.33%	1,053	35	14.29%	50.00%	602	
44		Subtotal General Plant		$ 5,523	$ 227			$ 3,157	
45									
46		Total Utility Plant		$ 15,951	$ 467			$ 8,567	$ 8,100
47									
48		Federal Tax Rate							35%
49									
50		Deferred Income Taxes							$ 2,835
51									
52									
53									
54									
55									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Calculation of Deferred Taxes on Post Test Year Plant
Bonus Depreciation

Line No.			Depreciation Rate	Phoenix	Book Depreciation	Tax Depreciation Rate	Bonus Depreciation	Depreciation for Tax Purposes	Tax Depreciation in Excess of Book Depreciation
1		Intangible Plant							
2	301	Organization	0.00%	0	0	0.00%	0.00%	0	
3	302	Franchises	n/a	0	0	0.00%	0.00%	0	
4	303	Other Intangibles	n/a	0	0	0.00%	0.00%	0	
5		Subtotal Intangible Plant		$ 0	$ 0			$ 0	
6		Source of Supply Plant							
7	310.1	Water Rights	0.00%	0	0	0.00%	0.00%	0	
8	310.3	Other Source of Supply Land	0.00%	0	0	0.00%	0.00%	0	
9	310.4	Wells - Other	n/a	0	0	0.00%	50.00%	0	
10	314	Wells	3.13%	0	0	3.75%	50.00%	0	
11		Subtotal Source of Supply Plant		$ 0	$ 0			$ 0	
12		Pumping Plant							
13	320	Pumping Plant Land	0.00%	0	0	0.00%	0.00%	0	
14	321	Pumping Plant Structures & Improvements	2.86%	0	0	3.75%	50.00%	0	
15	325	Electtric Pumping Equipment	5.88%	0	0	3.75%	50.00%	0	
16	328	Gas Engine Equipment	4.00%	0	0	3.75%	50.00%	0	
17		Subtotal Pumping Plant		$ 0	$ 0			$ 0	
18		Water Treatment Plant							
19	330	Water Treatment Plant Land	0.00%	0	0	0.00%	0.00%	0	
20	331	Water Treatment Structures & Improvements	2.50%	0	0	3.75%	50.00%	0	
21	332	Water Treatment Equipment	2.86%	0	0	3.75%	50.00%	0	
22		Subtotal Water Treatment Plant		$ 0	$ 0			$ 0	
23		Transmission & Distribution Plant							
24	340	Transmission and Distribution Land	0.00%	0	0	0.00%	0.00%	0	
25	341	Transmission and Distribution Structures	3.33%	0	0	3.75%	50.00%	0	
26	342	Storage Tanks	2.00%	0	0	3.75%	50.00%	0	
27	343	Transmission & Distribution Mains	1.79%	0	0	3.75%	50.00%	0	
28	344	Fire Sprinkler Taps	2.00%	0	0	3.75%	50.00%	0	
29	345	Services	2.38%	0	0	3.75%	50.00%	0	
30	346	Meters	4.55%	0	0	3.75%	50.00%	0	
31	348	Hydrants	1.82%	0	0	3.75%	50.00%	0	
32		Subtotal Transmission & Distribution Plant		$ 0	$ 0			$ 0	
33		General Plant							
34	389	General Plant Land	0.00%	0	0	0.00%	0.00%	0	
35	390	General Plant Structures	2.50%	0	0	1.72%	50.00%	0	
36	390.1	Leasehold Improvements	n/a	0	0	1.72%	50.00%	0	
37	391	Office Furniture & Equipment	6.67%	64,181	4,281	14.29%	50.00%	36,676	
38	393	Warehouse Equipment	5.00%	0	0	14.29%	50.00%	0	
39	394	Tools, Shop & Garage Equipment	4.00%	0	0	14.29%	50.00%	0	
40	395	Laboratory Equipment	5.00%	0	0	14.29%	50.00%	0	
41	396	Power Operated Equipment	6.67%	0	0	14.29%	50.00%	0	
42	397	Communication Equipment	6.67%	3,660	244	14.29%	50.00%	2,091	
43	398	Miscellaneous Equipment	3.33%	0	0	14.29%	50.00%	0	
44		Subtotal General Plant		$ 67,841	$ 4,525			$ 38,767	
45									
46		Total Utility Plant		$ 67,841	$ 4,525			$ 38,767	$ 34,242
47									
48		Federal Tax Rate							35%
49									
50		Deferred Income Taxes							$ 11,985
51									
52									
53									
54									
55									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Calculation of Deferred Taxes on Post Test Year Plant
Bonus Depreciation

Line No.			Depreciation Rate	Meter Shop	Book Depreciation	Tax Depreciation Rate	Bonus Depreciation	Depreciation for Tax Purposes	Tax Depreciation in Excess of Book Depreciation
1		Intangible Plant							
2	301	Organization	0.00%	0	0	0.00%	0.00%	0	
3	302	Franchises	n/a	0	0	0.00%	0.00%	0	
4	303	Other Intangibles	n/a	0	0	0.00%	0.00%	0	
5		Subtotal Intangible Plant		$ 0	$ 0			$ 0	
6		Source of Supply Plant							
7	310.1	Water Rights	0.00%	0	0	0.00%	0.00%	0	
8	310.3	Other Source of Supply Land	0.00%	0	0	0.00%	0.00%	0	
9	310.4	Wells - Other	n/a	0	0	0.00%	50.00%	0	
10	314	Wells	3.13%	0	0	3.75%	50.00%	0	
11		Subtotal Source of Supply Plant		$ 0	$ 0			$ 0	
12		Pumping Plant							
13	320	Pumping Plant Land	0.00%	0	0	0.00%	0.00%	0	
14	321	Pumping Plant Structures & Improvements	2.86%	0	0	3.75%	50.00%	0	
15	325	Electtric Pumping Equipment	5.88%	0	0	3.75%	50.00%	0	
16	328	Gas Engine Equipment	4.00%	0	0	3.75%	50.00%	0	
17		Subtotal Pumping Plant		$ 0	$ 0			$ 0	
18		**Water Treatment Plant**							
19	330	Water Treatment Plant Land	0.00%	0	0	0.00%	0.00%	0	
20	331	Water Treatment Structures & Improvements	2.50%	0	0	3.75%	50.00%	0	
21	332	Water Treatment Equipment	2.86%	0	0	3.75%	50.00%	0	
22		**Subtotal Water Treatment Plant**		$ 0	$ 0			$ 0	
23		Transmission & Distribution Plant							
24	340	Transmission and Distribution Land	0.00%	0	0	0.00%	0.00%	0	
25	341	Transmission and Distribution Structures	3.33%	0	0	3.75%	50.00%	0	
26	342	Storage Tanks	2.00%	0	0	3.75%	50.00%	0	
27	343	Transmission & Distribution Mains	1.79%	0	0	3.75%	50.00%	0	
28	344	Fire Sprinkler Taps	2.00%	0	0	3.75%	50.00%	0	
29	345	Services	2.38%	0	0	3.75%	50.00%	0	
30	346	Meters	4.55%	0	0	3.75%	50.00%	0	
31	348	Hydrants	1.82%	0	0	3.75%	50.00%	0	
32		Subtotal Transmission & Distribution Plant		$ 0	$ 0			$ 0	
33		General Plant							
34	389	General Plant Land	0.00%	0	0	0.00%	0.00%	0	
35	390	General Plant Structures	2.50%	281	7	1.72%	50.00%	143	
36	390.1	Leasehold Improvements	n/a	0	0	1.72%	50.00%	0	
37	391	Office Furniture & Equipment	6.67%	1,818	121	14.29%	50.00%	1,039	
38	393	Warehouse Equipment	5.00%	0	0	14.29%	50.00%	0	
39	394	Tools, Shop & Garage Equipment	4.00%	0	0	14.29%	50.00%	0	
40	395	Laboratory Equipment	5.00%	0	0	14.29%	50.00%	0	
41	396	Power Operated Equipment	6.67%	0	0	14.29%	50.00%	0	
42	397	Communication Equipment	6.67%	0	0	14.29%	50.00%	0	
43	398	**Miscellaneous Equipment**	3.33%	0	0	14.29%	50.00%	0	
44		Subtotal General Plant		$ 2,099	$ 128			$ 1,182	
45									
46		Total Utility Plant		$ 2,099	$ 128			$ 1,182	$ 1,054
47									
48		Federal Tax Rate							35%
49									
50		Deferred Income Taxes							$ 369
51									
52									
53									
54									
55									

Schneider

ARIZONA WATER COMPANY

Docket No. W-01445A-15-0277

2015 WESTERN GROUP RATE HEARING

(For Test Year Ending 12/31/14)

Prepared

REBUTTAL TESTIMONY

of

FREDRICK K. SCHNEIDER

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EXHIBITS

National Association of Corrosion Engineers Paper No. 08279 ..... FKS-RB1
Pinal Valley System Improvement Benefit Mechanism Project Prioritization and Cost Schedule FKS-RB2

ARIZONA WATER COMPANY

Rebuttal Testimony of

Fredrick K. Schneider

I. Introduction

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

A. My name is Fredrick K. Schneider. I am employed by Arizona Water Company ("Arizona Water" or "Company") as Vice President – Engineering.

Q. ARE YOU THE SAME FREDRICK K. SCHNEIDER THAT PREVIOUSLY PROVIDED DIRECT TESTIMONY IN THIS PROCEEDING?

A. Yes.

Q. HAVE YOU REVIEWED THE DIRECT TESTIMONY FILED BY THE OTHER PARTIES TO THIS PROCEEDING?

A. Yes, I have reviewed the testimony of each of the witnesses for the Residential Utility Consumer Office ("RUCO"), the Arizona Corporation Commission's ("Commission") Utilities Division Staff ("Staff"), and Abbott Laboratories, Inc. ("Abbott").

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to respond to the direct testimony of RUCO witness John A. Cassidy and Staff witnesses Briton A. Baxter and Frank M. Smaila.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. My testimony is presented in three sections, including this introductory Section I. In Section II, I respond to RUCO witness John A. Cassidy's testimony regarding RUCO's adjustments to post-test year plant additions, the Company's Tank Maintenance plan, RUCO's recommendations to the System Improvement Benefits ("SIB") mechanism,

and the proposed Nitrate Cost Recovery Mechanism ("NCRM"). In Section III, I respond to Staff witnesses Briton A. Baxter and Frank M. Smaila's testimony regarding Staff's adjustments to post-test year plant additions, System Improvement Benefits ("SIB") mechanism, Arsenic Cost Recovery Mechanism ("ACRM"), and the proposed Nitrate Cost Recovery Mechanism ("NCRM").

Q. ARE YOU SPONSORING ANY EXHIBITS WITH YOUR REBUTTAL TESTIMONY?

A. Yes. I am sponsoring the following exhibits:

FKS-RB1 – National Association of Corrosion Engineers ("NACE") Paper No. 08279.

FKS-RB2 – Pinal Valley System Improvement Benefits Mechanism Project Prioritization and Cost Schedule.

II. Response to RUCO

A. Post-Test Year Utility Plant Additions

Q. WHAT DO YOU ADDRESS IN THIS SECTION OF YOUR REBUTTAL?

A. In this section I address RUCO's rate base adjustment No. 1 regarding post-test year plant. Company witness Jamie R. Moe also addresses RUCO's rate base adjustment No. 1 in his rebuttal testimony.

Q. HAVE YOU REVIEWED RUCO'S RECOMMENDED ADJUSTMENTS TO POST-TEST YEAR PLANT?

A. Yes.

Q. WHAT ADJUSTMENTS TO POST-TEST YEAR PLANT IS RUCO RECOMMENDING?

A. RUCO is recommending that the Commission disallow cost recovery for forty specific post-test year utility plant projects and five "Blanket" capital improvements totaling nearly $6.2 million.

Q. WHAT JUSTIFICATION HAS RUCO PROVIDED FOR REMOVING THE COMPANY'S POST-TEST YEAR UTILITY PLANT INVESTMENTS?

A. According to John A. Cassidy's testimony, RUCO supports post-test year plant only if the projects were completed within an arbitrary six months of the test year end and for projects considered as "major projects". Company witness Jamie R. Moe addresses RUCO's arbitrary six month cut-off in his testimony.

Q. DID RUCO PERFORM ANY SITE VISITS OR SITE INSPECTIONS TO DETERMINE IF THE COMPANY'S PROPOSED POST-TEST YEAR PLANT ADDITIONS ARE USED OR USEFUL?

A. No.

Q. DID STAFF PERFORM ANY SITE VISITS OR SITE INSPECTIONS TO DETERMINE IF THE COMPANY'S PROPOSED POST-TEST YEAR PLANT ADDITIONS ARE USED OR USEFUL?

A. Yes. Staff engineer, Frank M. Smaila performed a detailed and thorough review of the Company's proposed post-test year plant additions by performing site inspections of the Company's Western Group offices and plant sites which took several days to complete. In fact, Staff witness Briton A. Baxter attended some of the site inspections with Mr. Smaila.

Q. ARE THE COMPANY'S POST-TEST YEAR PLANT ADDITIONS INTENDED TO FACILITATE THE ADDITION OF CUSTOMERS AFTER THE END OF THE TEST YEAR?

A. No.

Q. DID RUCO DETERMINE THAT ANY OF THE COMPANY'S PROPOSED POST-TEST YEAR PLANT ADDITIONS WERE NOT PRUDENT OR NECESSARY FOR THE PROVISION OF SERVICE?

A. No. In fact, some of the proposed additions that RUCO recommends removing are required by Arizona Department of Environmental Quality and U.S. Environmental Protection Agency in order for the Company to comply with State and Federal Safe Drinking Water regulations. Other utility plant additions are necessary for public safety and fire fighting purposes, and to provide safe and adequate water service to the Company's customers. For example, RUCO recommends removing the Company's Valley Farms Well No. 2 Arsenic Removal Facility which was placed in service on July 8, 2015, eight days after RUCO's arbitrary cut-off date of six months after the end of the test year.

Q. HAS THE COMMISSION DETERMINED WHETHER THE COMPANY'S VALLEY FARMS WELL NO. 2 ARSENIC REMOVAL FACILITY IS USED AND USEFUL AND DID THE COMMISSION AUTHORIZE AN ACRM SURCHARGE FOR THIS FEDERALLY MANDATED UTILITY PLANT INVESTMENT?

A. Yes. After completing construction, receiving the necessary regulatory approvals, and placing the facility in service the Company submitted an application to the Commission to implement an ACRM surcharge. Staff visited the site, determined the arsenic removal facility was used and useful, and recommended the Commission approve the ACRM surcharge. On January 19, 2016, the Commission approved the Company's ACRM application. The ACRM surcharge went into effect on January 22, 2016.

Q. DOES RUCO RECOMMEND DISALLOWING UTILITY PLANT AFTER STAFF AND THE COMMISSION APPROVED SUCH INVESTMENTS?

A. Yes. RUCO recommends that the Commission arbitrarily disallow federally mandated utility plant additions that the Commission has already deemed necessary and prudent.

Q. DOES RUCO PROVIDE AN EXPLANATION FOR ITS RECOMMENDATION TO DISALLOW THE COMPANY'S INVESTMENT IN NECESSARY UTILITY PLANT?

A. Yes. According to John A. Cassidy, the plant was placed in service after RUCO's arbitrary June 30, 2015 cut-off date.

Q. CAN YOU PROVIDE AN EXAMPLE OF RUCO PICKING AND CHOOSING WHEN TO APPLY THEIR ARBITRARY CUT-OFF DATE FOR POST-TEST YEAR PLANT OF JUNE 30, 2015?

A. Yes. In 2015, the Company experienced failure of the 36-inch water transmission main connecting its 5 million gallon storage tank to the Pinal Valley water system. The storage tank is critical and necessary to provide water service during peak demands and water for firefighting purposes. The Company was required to replace, on an emergency basis, 130 linear feet of the failed 36-inch water main with 36-inch DIP at a cost of $300,000. This replacement water main was placed in service on May 5, 2015, within RUCO's six month cut-off date and is considered a "major" project.

Q. **WHY DOES RUCO RECOMMEND THAT THE COMPANY'S 36-INCH WATER TRANSMISSION MAIN REPLACEMENT BE DISALLOWED IF IT WAS COMPLETED AND PLACED IN SERVICE BEFORE RUCO'S ARBITRARY CUT-OFF DATE OF JUNE 30, 2015?**

A. Mr. Cassidy provides no explanation for RUCO's disallowance. RUCO is not following their own criteria for the inclusion of post-test year plant, even though such criteria is arbitrary.

Q. DOES THE COMPANY AGREE WITH RUCO'S ADJUSTMENTS?

A. Absolutely not. RUCO's recommended adjustments are arbitrary, capricious, unsupported by any facts, and not consistent with recent Staff and Commission practice. Such recommendations to arbitrarily disallow utility plant are not in the best interest of the customers or the Company.

Q. WHAT IS THE COMPANY'S RECOMMENDATION TO THE COMMISSION?

A. The Commission should disregard RUCO's adjustments to post-test year plant because their position is inconsistent, arbitrary, and not supported by fact. In fact, as I discuss later in my rebuttal testimony, the Commission should adopt Staff's recommendation, with the minor adjustments the Company recommends.

B. <u>Tank Maintenance</u>

Q. WHAT DO YOU ADDRESS IN THIS SECTION OF YOUR REBUTTAL?

A. In this section I address RUCO's operating income adjustment No. 3 regarding tank maintenance. Company witness Jamie R. Moe also addresses RUCO's operating income adjustment No. 3 in his rebuttal testimony.

Q. HAS THE COMPANY DEVELOPED A DETAILED TANK MAINTENANCE PLAN AND SCHEDULE FOR COMPLETING PRUDENT AND NECESSARY MAINTENANCE OF ITS WESTERN GROUP STORAGE TANKS?

A. Yes.

Q. WAS THE COMPANY'S PLAN AND SCHEDULE ACCEPTED BY STAFF?

A. Yes.

Q. DOES THE COMPANY AGREE WITH RUCO'S ADJUSTMENTS TO TANK MAINTENANCE EXPENSE?

A. No.

Q. DID RUCO PROVIDE JUSTIFICATION FOR THEIR ADJUSTMENT TO THE COMPANY'S PLAN AND SCHEDULE?

A. According to John A. Cassidy's direct testimony, RUCO does not agree with the Company's tank maintenance plan because: (a) The Company normalized the tank maintenance costs over a 14-year period; (b) A longer time period creates imbalances; and (c) The company does not have costs in each year of the 14 year normalization period for the Company's smaller water systems.

I address each of the above reasons RUCO uses to deny the Company's recommendation.

Q. WHY DID THE COMPANY DEVELOP A 14-YEAR TANK MAINTENANCE PLAN AND SCHEDULE?

A. The generally accepted interval for interior tank coating is 10-15 years, depending on tank material and exposure to environmental conditions, such as water quality, weather, and soil conditions. Many years ago, the Company adopted 14-year and 7-year coating intervals for interior and exterior coating, respectively. The Company's adopted coating interval is in accordance with industry standards. I have included as Exhibit FKS-RB1 a paper prepared by the NACE for recommended coating system replacement. Their paper supports the Company's tank maintenance plan and schedule.

Q. WHY DOES THE COMPANY USE 14-YEAR AND 7-YEAR COATING INTERVALS?

A. Based on the Company's experience, interior coating shows deterioration after 14 years. It has been the Company's experience that postponing interior recoating beyond 14 years results in premature metal damage, which increases repair and replacement costs. Similarly, after 7 years exterior coating shows signs of chalking and cracking because of exposure to ultraviolet rays from sunlight. Recoating is required to protect the exterior metal surface to prevent surface corrosion and to maintain a suitable exterior appearance. The Company's 14-year and 7-year schedules work well to extend the life of storage tanks, provide adequate corrosion protection, and maintain a suitable exterior appearance.

Q. DOES THE COMPANY'S TANK MAINTENANCE PLAN AND SCHEDULE FOLLOW GENERAL INDUSTRY PRACTICES?

A. Yes, they do.

Q. DID THE COMPANY ADJUST THE COST OF TANK MAINTENANCE FOR ANNUAL INCREASES IN COSTS?

A. No. To be conservative, the Company did not adjust tank maintenance costs to reflect annual increases in materials or labor, although such cost pressures are clearly present. As a result, the Company's tank maintenance expense normalization is conservative.

Q. WILL THE COMPANY UPDATE ITS TANK MAINTENANCE PLAN AND SCHEDULE BEFORE 14 YEARS?

A. Yes. Typically, the Company has filed a rate case for each of its rate groups every three years. The Company intends to normalize tank maintenance expense and update its tank maintenance plan and schedule in each of its future rate cases as necessary. The update will reflect the increase in cost of materials, labor, and the addition of new storage tanks in the Company's water systems.

Q. WHY IS STORAGE TANK MAINTENANCE IMPORTANT?

A. In accordance with American Water Works Association ("AWWA") Manual M42 for Steel Water Storage Tanks, standard AWWA practice calls for tanks to be inspected by industry professionals on a regular basis to ensure structural and sanitary integrity and to extend the useful life of the storage tank. Regular storage tank inspection also helps the Company identify problems in the storage tank which may develop into major problems if left undetected or repaired. Lack of proper maintenance and repairs leads to costly repairs and premature tank failure. These inspections should also include routine cleaning as necessary. Water storage tanks that are not routinely cleaned can affect water quality such as water quality degradation, turbidity, reduced chlorine residual, and taste and odor, which can lead to customer complaints. In addition to routine inspections and cleaning, AWWA standard practice calls for every tank

inspection to include a detailed inspection of the structure and foundation. A report performed by a qualified inspector documents the inspection results.

Q. FOR THE COMPANY'S SMALLER WATER SYSTEMS, WHY DID THE COMPANY NOT INCLUDE TANK MAINTENANCE IN EACH OF THE 14 YEARS?

A. In the Company's smaller water systems such as Ajo and White Tank, the water system only has two and five storage tanks, respectively. Therefore, it is not necessary to perform tank maintenance each and every year. That is why the Company normalized the tank maintenance cost over the entire 14-year planning schedule. It is the prudent thing to do. Mr. Cassidy does not understand that the infrequent nature of tank maintenance lends itself to normalizing this expense.

Q. SHOULD THE COMMISSION REJECT RUCO'S TANK MAINTENANCE ADJUSTMENT AND ACCEPT STAFF'S RECOMMENDATION?

A. Yes. RUCO's recommendation is misplaced and fails to recognize the purpose of normalizing adjustments.

C. <u>SIB MECHANISM</u>

Q. HAS THE COMPANY DEVELOPED A DETAILED PLAN TO REPLACE AGING AND FAILING INFRASTRUCTURE IN ITS WESTERN GROUP OF WATER SYSTEMS?

A. Yes. The Company's detailed plan was included in my direct testimony as Exhibit FKS-12 titled "Aging Infrastructure Replacement Plan".

Q. IS THE COMPANY'S AGING INFRASTRUCTURE REPLACEMENT PLAN A COMPREHENSIVE PLAN SIMILAR TO THOSE THE COMPANY PREPARED AND SUBMITTED IN PREVIOUS RATE PROCEEDINGS WHERE THE COMMISSION APPROVED A SIB MECHANISM?

A. Yes.

Q. WHY IS A SIB MECHANISM NECESSARY FOR THE WESTERN GROUP OF WATER SYSTEMS WHERE WATER LOSS IS LESS THEN TEN PERCENT?

A. Water loss in those water systems is trending upward. Specifically for Pinal Valley, water loss is 9.17 percent for calendar year 2015. This represents approximately 480,000,000 gallons of water. It is less wasteful and more cost effective to keep water loss below ten percent by replacing aging infrastructure in a timely fashion rather than to allow water loss to increase above ten percent before beginning to replace failing infrastructure. The Company's plan identifies the need to increase the rate of replacing aging infrastructure, which the SIB mechanism will facilitate by providing for more timely cost recovery.

Q. WHAT DOES THE PLAN SHOW?

A. The plan shows that 318,300 linear feet of water main, or approximately 7.3 percent of the mains in the Western Group of water systems are in immediate need of replacement. 4,110 service lines also need immediate replacement. This analysis is based on a complete review of the documented water main and service line leak, break, and repair history, which is summarized in Appendix 6.2 of Exhibit FKS-12. The specific replacement projects are identified in Appendix 6.3 of Exhibit FKS-12. The Company estimates that replacing these failing water mains and service lines will cost <u>$55.8 million</u>. Each year, as the number of water mains and service lines that need to be replaced increases, so will the associated costs of replacing the water mains and service lines, making it more difficult for the Company to keep up with replacements.

Q. ARE THERE ANY WESTERN GROUP WATER SYSTEMS WITH WATER LOSS GREATER THAN TEN PERCENT?

A. Yes. The Company's Ajo water system had water loss of 16.1 percent for calendar year 2015.

Q. DID THE COMMISSION PREVIOUSLY APPROVE A SIB MECHANISM FOR THE COMPANY AND OTHER WATER UTILITIES?

A. Yes.

Q. WHAT UTLIMATELY BECAME OF THE SIB MECHANISM?

A. RUCO challenged the constitutionality of the SIB mechanism, a position which the Court of Appeals agreed with.

Q. HAS THE ARIZONA SUPREME COURT TAKEN UP THE MATTER?

A. Yes. The Commission petitioned the Arizona Supreme Court to review the Court of Appeals opinion and the Arizona Supreme Court heard oral arguments from the Commission, the Company, and RUCO on March 22, 2016.

Q. WHY IS THE COMPANY ASKING FOR A SIB MECHANISM IN THIS CASE?

A. Both Staff and the Company believe that the SIB mechanism is legal. The need to fund and replace infrastructure still exists and the Company is requesting the Commission approve the SIB mechanism pending review and approval by the Arizona Supreme Court. Once the Arizona Supreme Court rules, the Commission may retain the SIB mechanism or, in the alternative, the Commission may determine another path forward for the SIB or a SIB-like mechanism in this rate proceeding.

D. <u>NCRM</u>

Q. WHY DOES RUCO OPPOSE THE COMPANY'S PROPOSED NCRM?

A. According to John A. Cassidy, RUCO opposes the NCRM for the same reason RUCO opposes the SIB Mechanism.

Q. DOES RUCO DISAGREE WITH THE COMPANY'S NEED TO CONSTRUCT NITRATE REMOVAL FACILITIES TO PROVIDE SAFE AND RELIABLE WATER SERVICE?

A. No.

Q. DOES RUCO DISAGREE WITH THE COMPANY'S ESTIMATED COSTS TO CONSTRUCT THE NITRATE REMOVAL FACILITIES?

A. No.

Q. IF APPROVED, WOULD THE NCRM WORK THE SAME AS THE COMMISSION APPROVED ACRM?

A. Yes, exactly the same way.

Q. HAS RUCO DISAGREED WITH THE COMPANY'S REQUEST FOR CONTINUANCE OF THE ACRM IN PREVIOUS RATE PROCEEDINGS?

A. No.

Q. IS RUCO DISAGREEING WITH THE COMPANY'S REQUEST FOR CONTINUANCE OF AN ACRM IN THIS RATE PROCEEDING?

A. No.

Q. DID RUCO SUPPORT THE COMPANY'S ACRM FILINGS SINCE 2006?

A. Yes.

Q. RUCO'S SOLE OPPOSITION TO THE COMPANY'S REQUEST FOR AN NCRM IS THEIR OPPOSITION TO THE SIB MECHANISM, BUT THEY DO NOT OPPOSE THE CONTINUANCE OF THE COMPANY'S ACRM?

A. Correct. RUCO's position on nitrate, which is an acute contaminant, is inconsistent with its position on regulated contaminants such as arsenic, which have a less immediate effect on the public health.

III. Response to Staff

A. Post-Test Year Utility Plant Additions

Q. WHAT DO YOU ADDRESS IN THIS SECTION OF YOUR REBUTTAL?

A. In this section I address Staff's rate base adjustment No. 1 regarding post-test year plant. Company witness Jamie R. Moe also addresses Staff's rate base adjustment No. 1 in his rebuttal testimony.

Q. HAVE YOU REVIEWED STAFF'S RECOMMENDED ADJUSTMENTS TO POST-TEST YEAR PLANT?

A. Yes.

Q. DO YOU AGREE WITH STAFF'S POST-TEST YEAR PLANT ADJUSTMENTS?

A. In general, yes. However, the Company disagrees with Staff's adjustment to post-test year plant projects which the Company described as blanket capital investments.

Q. WHY DID STAFF MAKE THIS ADJUSTMENT TO BLANKET POST-TEST YEAR PLANT ADDITIONS?

A. According to Mr. Baxter, these post-test year plant items were determined to be not used or useful because Staff did not verify their installations by physically inspecting these plant additions.

Q. ARE THE COMPANY'S BLANKET POST-TEST YEAR PLANT ADJUSTMENTS USED AND USEFUL?

A. Yes. Each and every blanket project was completed and all are used and useful. Each project was placed in service during the post-test year period ending December 31, 2015.

Q. WHAT ARE BLANKET PROJECTS?

A. Blanket projects are smaller projects with short lead times that are managed by division management and reviewed on an aggregate basis by the Company's engineering department and Company management. These projects are replacement projects with a cost less than $10,000, which are necessary to provide safe and reliable water service. Blanket projects include small water main replacements, service line

replacements, water treatment equipment replacements, meter replacements, communication equipment replacements, office equipment, and small tools. A typical blanket project could include replacing a failed water treatment chemical pump. These types of small projects are accounted for using the NARUC chart of accounts to signify the type of addition or replacement in the same manner as larger utility plant additions. These types of small replacement and additions are common in the utility industry. Budgeting for these smaller capital investments the way the Company has done is a common industry practice critical to maintaining water service.

Q. IS THE COMPANY WILLING TO ACCOMPANY STAFF TO INSPECT THESE BLANKET POST-TEST YEAR PLANT ADDITIONS?

A. Yes. These utility plant additions are in service and available for inspection at Staff's convenience.

Q. HAS THE COMPANY PROVIDED STAFF THE NECESSARY SUPPORTING DOCUMENTATION FOR THESE BLANKET PROJECTS?

A. Yes. As Staff requested of the Company in its data request BAB 8.1, the Company provided Staff with copies of all invoices with a cost more than $1,000. We are hopeful that this information will allow staff to satisfy itself that the Company has indeed completed these blanket post-test year plant additions.

Q. WHAT PROJECTS AND AMOUNTS DOES THE COMPANY AGREE WITH STAFF TO REMOVE FROM POST-TEST YEAR PLANT?

A. The Company agrees with removing the following post-test year plant items:

Location	WA No.	Filing Amount	Required Adjustment
Pinal Valley	4806	$1,500,000	($1,500,000)
Pinal Valley	5166	$80,000	($80,000)
Phoenix Office	5324	$85,000	(85,000)
Phoenix Office	5325	$31,000	($31,000)
Phoenix Office	5327	$20,000	($20,000)

These items are reflected in the Company's revised schedule B2.1.

B. SIB MECHANISM

Q. HAS THE COMPANY DEVELOPED A DETAILED PLAN TO REPLACE FAILING INFRASTRUCTURE IN ITS WESTERN GROUP WATER SYSTEMS?

A. Yes. The Company's detailed plan was included in my direct testimony as Exhibit FKS-12 titled "Aging Infrastructure Replacement Plan".

Q. IS THE COMPANY'S AGING INFRASTRUCTURE REPLACEMENT PLAN A COMPREHENSIVE PLAN SIMILAR TO THOSE THE COMPANY PREPARED AND SUBMITTED IN PREVIOUS RATE PROCEEDINGS WHERE THE COMMISSION APPROVED A SIB MECHANISM?

A. Yes.

Q. OTHER THAN THE RUCO CHALLENGE AND ULTIMATE APPEAL OF THE SIB MECHANISM TO THE ARIZONA SUPREME COURT, DID STAFF HAVE ANY OTHER CONCERNS WITH THE COMPANY'S SIB MECHANISM?

A. Yes. Staff stated: (1) the Company's SIB tables lacked prioritization and cost schedules; (2) The Company was unable to complete the proposed projects within a reasonable time frame; and (3) water loss was less than ten percent. I will address each of these items.

Q. HAS THE COMPANY PRIORITIZED THE SIB PROJECTS?

A. Yes. The updated SIB tables are included as Exhibit FKS-RB2. The updated SIB tables include scheduled completion dates and prioritizations. The Company provided some of this pertinent information in the Company's response to Staff's data request BAB 7.2, which is incorporated into my rebuttal testimony.

Q. DID THE SIB TABLES AND REPORT INCLUDED IN YOUR DIRECT TESTIMONY AS EXHIBIT FKS-12 INCLUDE COST SCHEDULES?

A. Yes.

Q. CAN THE COMPANY COMPLETE THE PLANNED AND SCHEDULED PROJECTS WITHIN A REASONABLE TIMEFRAME AS IT HAS PROPOSED IN EXHIBIT FKS-RB1?

A. Yes, and it intends to do so if a SIB or SIB-like mechanism is approved.

Q. SHOULD A SIB MECHANISM BE APPROVED FOR WATER SYSTEMS WITH WATER LOSS LESS THAN TEN PERCENT?

A. Yes, as long as there are compelling reasons, which the Company has provided in its report. Staff has not disputed the need for the replacements or the cost of those replacements. However, waiting until a system has ten percent water loss should not be the only criteria used to approve a SIB or SIB-like mechanism. It is prudent to begin replacing aging infrastructure before water loss reaches ten percent. If replacement of aging infrastructure can reduce water loss by one percent in the Company's Pinal Valley water system that would result in saving 48 million gallons of water annually.

Q. WHAT IS THE COMPANY REQUESTING IN THIS RATE PROCEEDING?

A. As previously stated, both Staff and the Company believe that the SIB mechanism is legal. The Company respectfully requests the Commission approve a SIB mechanism for its Western Group of water systems, or, in the alternative, that the Commission determine another path forward for the SIB or a SIB-like mechanism in this rate proceeding.

C. <u>ACRM</u>

Q. DID STAFF REVIEW THE COMPANY'S ARSENIC REMOVAL FACILITIES PLANNED FOR CONSTRUCTION AND RECOVERY THROUGH AN ACRM?

A. Yes.

Q. DID STAFF AGREE WITH THE COMPANY'S PLANNED ARSENIC REMOVAL FACILITIES?

A. Yes. Staff engineer Frank M. Smaila agreed with the Company's planned construction of three arsenic removal facilities, Pinal Valley Well No. 13, Pinal Valley Well No. 34, and the Coolidge airport point-of-use devices. However, Staff witness Briton A. Baxter only recommended ACRM approval for Well Nos. 13 and 34.

Q. DID THE COMPANY DISCUSS THIS OVERSIGHT WITH MR. BAXTER?

A. Yes. Company witness Jamie R. Moe discussed this with Briton A. Baxter and Mr. Moe informed me that it was a Staff oversight. Mr. Baxter now recommends including the Coolidge airport point-of-use devices in the Company's ACRM.

Q. DOES THE COMPANY HAVE ANY OTHER CONCERNS WITH STAFF'S ACRM TESTIMONY?

A. No.

D. <u>NCRM</u>

Q. WHAT ARE THE COMPANY'S ESTIMATED COST TO CONSTRUCT EACH OF THE FOUR NITRATE REMOVAL FACILITIES?

A. The cost to construct the four nitrate removal facilities is nearly $19 million. The detailed cost estimates are included in my direct testimony as Exhibit FKS-24 and are summarized below:

Facility Name	Estimated Construction Cost	Anticipated Start of Construction	Anticipated Placed in Service Date
Well No. 33	$6,529,000	2016	2017
Well No. 32	$6,529,000	2017	2018
Well No. 27	$2,380,000	2018	2019
Well No. 7	$3,470,000	2019	2020

Q. ARE THESE CONSTRUCTION COSTS SIGNIFICANT?

A. Yes. The cost to construct the four nitrate removal facilities is approximately 150 % the amount Company invested to construct the initial Pinal Valley arsenic removal facilities the Company completed in 2005-2007 which cost $13.6 million. In comparison, the Company invested approximately $35 million to construct all of the initial arsenic removal facilities the Company made between 2005-2007. The comparison of costs is discussed in more detail in Company witness William M. Garfield's rebuttal testimony. The financial impact of constructing these four nitrate removal facilities without an approved NCRM is discussed in more detail by Company witness Joseph D. Harris in his rebuttal testimony.

Q. ARE THE OPERATIONAL AND MAINTENANCE COSTS FOR A NITRATE REMOVAL FACILITY GREATER THAN THE COST TO OPERATE AND MAINTAIN AN ARSENIC REMOVAL FACILITY?

A. Yes, significantly. The cost to operate and maintain a nitrate removal facility is approximately ten times the cost to operate and maintain a similarly-sized arsenic removal facility. The operation and maintenance of an arsenic removal facility costs approximately $100-$125 per acre-foot while a nitrate removal facility can cost $1,000 per acre-foot or more.

Q. WHY IS THAT?

A. It is partly because the amount of nitrate removed is 1,000 times the amount of arsenic removed and partly because ion-exchange is much more expensive to operate than C/F or adsorptive technologies. These other technologies will not effectively remove nitrates.

Q. WHY DOES THE COMPANY NEED TO CONSTRUCT FOUR NITRATE REMOVAL FACILITIES IN THE PINAL VALLEY WATER SYSTEM?

A. Nitrate removal facilities are required for the Company to comply with federally mandated Safe Drinking Water Act regulations.

Q. BASED ON THESE FACTS DOES THE COMPANY CONTINUE TO REQUEST COMMISSION APPROVAL OF AN NCRM?

A. Yes. Based on the facts the Company has presented in this rate proceeding and similar to the Commission's decision to approve an ACRM to address the significant cost to construct and operate a federally mandated arsenic removal facility, the Company recommends and respectfully requests that the Commission approve and allow the Company to implement a NCRM.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes.

Paper No.
08279

NACE INTERNATIONAL CORROSION 2008 CONFERENCE & EXPO

EXPECTED SERVICE LIFE AND COST CONSIDERATIONS FOR MAINTENANCE AND NEW CONSTRUCTION PROTECTIVE COATING WORK

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ABSTRACT

This paper is an update to "Expected Service Life and Cost Considerations for Maintenance and New Construction Protective Coating Work" co-authored by J. L. Helsel, M. F. Melampy, K. Wissmar for NACE Corrosion 2006.

Designed to assist the coatings engineer or specifier in identifying candidate protective coating systems for specific industrial environments, this paper provides: 1) commonly used generic coating systems in typical service environments, 2) service life for each, 3) current material costs, 4) current field and shop painting costs, and 5) guidelines for calculating approximate installed costs of the systems. Guidelines for developing long-term life-cycle costs and number of paintings for the expected life of the structure are included. The basic elements of economic analysis and justification are addressed together with guidance on the preparation of a Present Value Analysis. Worksheets and examples are provided to aid the reader in the proper use of the information.

Updates to the paper also include additional information related to metallizing, updated cost data, and the inclusion of new coating systems.

Keywords: protective coatings, life-cycle costs, coating selection, coating system life, containment costs, industrial maintenance, maintenance painting costs, industrial environments, corrosive, solvent-free, metallizing, galvanizing, Present Value Analysis, installed coating costs.

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INTRODUCTION

Major manufacturers of protective coatings, steel fabricators, painting contractors, galvanizers, and end users, were surveyed to identify surface preparation and coating application costs, coating material costs, typical industrial environments and available generic coatings for use within those environments, and expected coating service lives.

The approach to this cost data is meant to be practical. Instead of burdening the coating engineer with complicated cost formulas based on hourly wages, supervision, equipment rates, overhead, profit, and other cost elements, this guide supplies total costs, which include all of these elements. The costs are intended to reflect current, competitive/commercial prices charged in today's market.

Surface preparation and application costs are primarily based on major steel fabricators and painting contractors. Material costs are secured from major suppliers who furnish approximate prices at which coatings are being sold on commercial-sized jobs. The current cost data presented is a number developed from the collected data along with leading industry cost references.

This guide produces a base cost of painting steel on the ground at the site that is then adjusted to an installed cost, using multipliers based on input from painting contractors. Most elements used in the guide have come from these contractors, and have proven to be practical over the guide's long history.

Limitations

The costs in the guide are not intended to be absolute, nor are they intended for use in estimating or negotiating. Specific job costs will vary depending on the job size, geographic location, logistics, competitive climate, and other factors including available working hours, allowable time to completion, traffic restrictions and level of inspection required. The purpose of the guide is to provide an easy-to-use, practical means to identify, compare, select, and justify suitable, cost-effective protective coating systems for specific environments, and to answer fundamental questions such as: What will work? How much will it cost installed? How long will it last? What is the cost per year per square foot?

DISCUSSION

Product Trends, System Changes, Service Environment and Updates

1. Coating System Update: The information detailed for designated "coating systems" include the level of surface preparation, generic coating type(s), and a minimum coating dry film thickness. The categories for surface preparation include either hand/power tool cleaning or abrasive blast cleaning. A distinction is not made between grades of blast cleaning (e.g. Near-White versus Commercial Blast). The coating systems are divided into two categories: those for atmospheric exposure listed in Table 1A, and those for immersion (water) service listed in Table 1B. Tables 1A and 1B list the expected service life (as subsequently defined) for each "coating system" corresponding to particular service environments as described below.

2. Service Environment: The "service environment" defines the anticipated environmental exposure conditions for a coating system. For atmospheric exposure, there are four service environments that correspond to ISO 12944-2, "Classification of Environments." These categories are defined as follows:

   C2: Low - Atmospheres with low levels of pollution; mostly rural areas

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C3: Medium - Urban and industrial atmospheres, moderate sulfur dioxide pollution; coastal areas with low salinity

C5-I: Very High, Industry - Industrial areas with high humidity and aggressive atmosphere

C5-M: Very High, Marine - Coastal and offshore areas with high salinity

For water immersion service, there are three service environments corresponding to exposure to potable water, fresh water, and salt water.

3. Hot Dip Galvanizing: Hot dip galvanizing is a shop applied coating (installed by dipping the parts in special cleaning and molten zinc baths) which provides a combination of physical properties that can be superior to many other coating systems. A galvanized coating consists of a progression of zinc-iron alloy layers metallurgically bonded to steel substrates. The resulting coating is anodic to steel, resists underfilm corrosion, has excellent abrasion resistance, and provides excellent film build at sharp corners, edges and projections. The service life, material costs, and all labor and equipment costs associated with surface preparation, fluxing, dipping, and cooling for hot dip galvanizing are included in Tables 1A and 3.

4. Metallizing Systems: Metallizing is the application of zinc and/or aluminum directly to a steel surface. For atmospheric exposure, a typical composition of the metal is 85% zinc and 15% aluminum. The metal is applied by "thermal spray" where the metal, in wire or powder form, is heated, liquefied, and sprayed onto the substrate. A sealer coat is often applied to the metal coating since metallizing results in a somewhat porous coating layer. Metallizing provides galvanic protection to the steel and is a very durable and abrasion resistant coating. This system's performance (life) is provided in Tables 1A and 1B. The costs for metallizing are estimates based on information published by the Federal Highway Administration.[7,8]

5. Paint Removal: The Containment Multiplier Guidelines in Table 5 are included to aid in developing approximate costs for paint removal depending upon the containment type. These are to be used in conjunction with surface preparation costs developed in Table 4. The containment type (class) is based on SSPC Guide No. 6, "Guide for Containing Debris Generated During Paint Removal Operations."

6. Maintenance Painting Sequences: This guide presents a sequence for typical maintenance painting. This sequence includes: Original Painting, Spot Touch-up and Repair, Maintenance Repaint (spot prime and full coat), and Full Repaint. Examples of maintenance painting following this convention for various coating systems are presented in the guide. It is important to note, however, that this sequence does not always represent the most economical approach to maintenance painting. Often, several cycles of touch-up and maintenance repainting can be performed prior to the need for full repainting. The determining factors involved with this type of extended maintenance painting sequence are the amount of corrosion present and the physical characteristics of the existing coatings. These factors should be investigated prior to the next scheduled painting operation.

   Decisions involving whether or not a full repaint is required, as opposed to a maintenance repaint or touch-up, should be based on the results of a field investigation. Generally, touch-up procedures are used when the amount of corrosion is limited or found in discrete areas. The success of maintenance repainting depends on the coating type, thickness, and adhesion of the existing coating system, as well as the substrate condition. The general procedures outlined in this guide may be used to determine installed costs and life-cycle costs for any combination of maintenance painting sequences.

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Table 6 can be used as a guide to determine maintenance repainting risk (i.e. whether the existing coating might be a candidate for repair)[2].

7. Worksheets (Shop and Field Application): These worksheets were developed to aid in preparing initial installation costs (see Figures 1 and 2). The step by step, fill-in worksheets are designed to minimize the omission of important information. It must also be recognized that every job may have unique conditions that will prevent the development, or use, of general overall multipliers.

PRACTICAL SERVICE LIFE

How long will the coating system last? The answer depends on the user's approach to, and philosophy of, maintenance painting. Is protection alone important, or is appearance also a primary consideration? Is painting viewed as an unfortunate necessity, or is cost-effective corrosion protection the objective?

This guide supplies system life estimates for a "Practical" maintenance approach. Practical life is considered to be the time until 5 to 10% coating breakdown occurs (SSPC-Vis 2 Rust Grade 4[3]), and active rusting of the substrate is present. It should be noted, however, that the distribution of the breakdown must also be considered when making judgments regarding the feasibility and costs of maintenance painting. For example, 5% breakdown that occurs in well-defined areas can be practically repaired through localized touch up, whereas 5% breakdown uniformly scattered across 100% of the surface is beyond spot repair. At a minimum, a full coat is required, if the coating is even salvageable. The guide does not address these differences, but the user must take them into consideration when making painting decisions and determining the costs of painting.

Note that this "Practical" maintenance sequence is based on one approach, but it may not always represent the most economical approach to maintenance painting. The determining factors are the amount of corrosion present and the physical characteristics of the existing coatings. These factors should be assessed prior to the next scheduled painting operation. In some cases, multiple cycles of touch-up and maintenance repainting can be performed, pushing the need for full repainting further into the future. Decisions involving whether or not a full repaint is required, as opposed to another maintenance repaint or touch-up, should be based on the results of an investigation of coating thickness, adhesion, substrate condition, and extent and distribution of corrosion.

TYPICAL MAINTENANCE PAINTING PRACTICES

The sequences followed by users in maintenance painting vary widely. For some, the only criterion is, "Does it need to be painted?" However, when reviewing the subject with quality painting contractors, the consensus is that most users generally follow this sequence:

- Original Painting
- Spot Touch-Up and Repair
- Maintenance Repaint (spot prime and full coat)
- Full Repaint (total coating removal and replacement)

"Spot Touch-Up and Repair," which is the first time coating repairs are made, are intended to be completed at the "Practical Life" ("P") of the coating system as listed in Tables 1A or 1B. The time until "Maintenance Repaint" is estimated to be the "Practical Life" plus 33% (i.e. "P" x 1.33). A "Full Repaint," involving total coating removal and replacement, is expected to occur at the year of "Maintenance Repaint" plus 50% of the "Practical Life" (i.e. Maintenance Repaint year + ["P" x 0.5]).

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For example, if the practical life of a system is 21 years, the spot touch up would occur at year 21, with an overcoat at year 28, and full replacement of the system at year 39. Even though complete removal and replacement of a system is no longer a "maintenance" operation, it may be included in the life cycle analysis (as subsequently discussed) to allow for a comparison of different coating systems that have varying lengths of practical service life. The continuing cycle of maintenance painting also is necessary when the design life of the structure exceeds the design life of the coating system. In this case, the cost of complete coating replacement and additional maintenance cycles must be calculated to determine the total cost of the corrosion protective system over the entire life of the structure. Note that the coating replacement and continued maintenance painting assumes the same type(s) of coatings for the particular protective coating system are used over time.

COST COMPARISONS

Shop versus Field Painting – New Construction

Shop blasting and priming are about half the cost of doing work in the field when a minimum of 250 tons of steel are involved and the steel fabricator has rotary wheel-blasting equipment (see Tables 3 and 4). Field touch-up is necessary to repair in-transit damage, but cost savings are often enough to justify shop preparation and painting. Application is easier on the ground, spray loss is reduced, and safety enhanced. Job-site conflicts, scheduling difficulties, and compromised applications that can be common on new projects are greatly reduced or eliminated. Field touch-up however, may lead to a spotty appearance, and special handling procedures are necessary to protect the finish during shipping and erection.

Costs for Typical Maintenance Painting Practices

The life and cost of the repainting steps following typical maintenance painting practices will vary according to whether the original work was shop or field applied. Table 7 provides an example of costs for a typical maintenance painting sequence, based on both shop and field application for the original work. This table includes multipliers for determining the approximate cost for each field repainting step based on whether the original work was done in the shop or field.

Painting Costs Compared to Hot Dipped Galvanizing Costs

The initial and life-cycle costs of shop prepared and applied inorganic zinc coating can compared to the initial and life-cycle costs of hot dipped galvanizing, as shown in Figure 4. The initial costs were based on a job size of 75,000 to 125,000 square feet of steel surface area, and steel member sizes ranging from 126 to 200 pounds per linear foot. The environment chosen for this example was moderate (industrial, C3: medium). Life-costs for each system were determined over a 35 year structure life using 4% for inflation and 7% for interest, and the practical "P" service life of each coating system. The results of this specific example show that the initial cost of galvanizing is 43% higher than a single coat of shop applied inorganic zinc. However, the life-cycle cost of galvanizing was 15% less than painting with inorganic zinc, which represents a reduction in corrosion maintenance costs over 35 years. If the budget for this project is large enough to bear the initial cost, galvanizing would be the most cost effective alternative. It is important to note that galvanizing is typically used only for new construction and limitations on the size of the steel members exist. Additional costs may be incurred when using galvanizing due to fabrication design alterations and the need for additional machining or cutting. These additional procedures are sometimes necessary to provide proper venting and drainage as the members are submerged and removed from the bath of molten zinc.[4] It should be noted that if color is of concern, it can be difficult to paint galvanizing. Special pretreatments or surface preparation procedures may be required in order to assure that the coating system achieves the desired level of adhesion and performance.

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ECONOMIC ANALYSIS AND JUSTIFICATION

This subject is sometimes misunderstood and overly complicated for paint and coating systems. Capital items require intricate analyses to identify the full financial impact. Paint and coating systems are basically expense items without salvage value or depreciation considerations. However, they are tax deductible, in most instances. Only a few calculations are needed to compare one system with another and to measure each system's true cost in comparable dollars.

For each system used or considered, simply list the timing, number, and cost of painting operations required to protect the structure for its projected life. This should include such items as original painting, touch-up, touch-up and full coats, and full repaintings. The cost of each painting operation should be calculated in three categories:

1. At Current Cost levels

2. At Net Future Value (*NFV*) levels – the current cost with inflation included. How much will it cost, in inflated dollars in the year scheduled.

3. At Net Present Value (*NPV*) levels – the present worth of the inflated cost (*NFV*) in monies today invested at current interest rates.

For example, assuming 5% inflation, a current cost of $10 today inflates to $12.76 in five years. $12.76 is the Net Future Value (*NFV*). The formula[5,6] for calculating this is (i = inflation; n = number of years):

$$NFV = Current\ Cost[(1 + i)^n] \tag{1}$$

To calculate the Net Present Value (*NPV*), or what $12.76 (*NFV*) is worth today if invested at current interest rates (10%) for five years, use the following formula[5,6]: (i = interest rate; n = number of years):

$$NPV = NFV\left[\frac{1}{(1+i)^n}\right] \tag{2}$$

Invested today at 10% for five years, $7.92 will yield $12.76.

By making these calculations for each of the system's painting operations, the true cost and number of painting operations can be compared, and the coating selection made on a comparable basis. One system may be less costly to install initially, but if it has a shorter life and requires frequent repaintings, the financial cost and impact of the additional repaintings, and the disruption of the structure's intended service must be recognized.

An additional calculation called the Average Equivalent Annual Cost (*AEAC*) is popular with many engineers. This simply converts the entire stream of present and future costs to a present worth (*NPV*) and then distributes that sum in equal annual amounts over the structure's life. The formula[5,6] to calculate this is (i = interest; n = structure life):

$$AEAC = NPV\left[\frac{i(1+i)^n}{(1+i)^n - 1}\right] \tag{3}$$

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An example using the *AEAC* is presented in Figure 4, which compares the life-cycle costs of painting to galvanizing.

To summarize, the steps for calculating an economic analysis of a paint and coating system are:

1. For each candidate system (using a separate sheet for each), develop a time table for the design or projected life of the coating on the structure. See example in Figure 3.

2. For each system, indicate in the time table when all painting operations will take place: Original painting, Touch-Up, Maintenance Repainting, and Full Repainting. If the analysis is based on the design life of the structure, repeat the painting cycle(s) as necessary to achieve the desired life. Insert the Current Costs for these operations (i.e., the costs if they were performed today).

3. Using the current inflation rate, calculate and record the Net Future Value (*NFV*) for each of the painting operations.

4. Using the current interest rate, calculate and record the Net Present Value (*NPV*) {of the *NFV*} for all of the painting operations.

5. For each system, total the sum of the three categories (*Current Cost*, *NFV*, and *NPV*).

6. Compare these values, particularly Net Present Value, for a direct comparison of number of painting operations and each system's true cost in monies today. See Figure 3 for an example of a Present Value Analysis.

7. To compare the life-cycle costs for each system, calculate the Average Equivalent Annual Cost (*AEAC*). See Figure 4 for an example.

On new capital projects, coating costs may be capitalized, which will require considerations for depreciation. However, most maintenance costs are tax deductible and when deducted, reduce the taxable income of the owner. The same Present Value Analysis outlined above should be followed for making the coating selection and the analyses turned over to Project Management for further financial treatment, and tax considerations.

SUMMARY

1. This guide defines a wide variety of coating systems in terms of required surface preparation and generic coating product(s). The practical service life of coating systems in atmospheric exposure are defined for four different standard service environments. The service life for coating systems in water immersion service are defined for three categories of water exposure.

2. Hot dip galvanizing and metallizing provide excellent corrosion protection in many environments at relatively low life-cycle costs.

3. Regulations on containment, capture, and disposal of removed coatings (especially coatings containing hazardous metals) continue to impact the cost of painting projects.

4. Surface preparation techniques which use water or non-traditional abrasives may adequately remove coatings and may reduce potential risks to the environment and the workers involved in coating removal.

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5. Steps for selecting suitable, cost-effective systems for specific environments, and the calculation of a Present Value Analysis to define long-term protection costs over the structure's life are reviewed and outlined.

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TABLE 1A
Estimated Service Life for Practical Maintenance
Coating Systems for Atmospheric Exposure
(in years before first maintenance painting)[4]

Type	Coating Systems for Atmospheric Exposure (primer/midcoat/topcoat)	Surface Preparation[2]	Number of Coats	DFT Minimum (mils)	Service Life[1,3]			
					Mild (rural)/C2	Moderate (industrial)/C3	Severe (heavy industrial)/C5-I	Seacoast Heavy Industrial/C5-M
Acrylic	Acrylic Waterborne/Acrylic WB/ Acrylic WB	Hand/Power	3	6	12	8	5	5
Acrylic	Acrylic Waterborne/Acrylic WB/ Acrylic WB	Blast	3	6	17	12	9	9
Alkyd	Alkyd/Alkyd	Hand/Power	2	4	6	3	2	2
Alkyd	Alkyd/Alkyd/Alkyd	Blast	3	6	14	9	5	5
Alkyd	Alkyd/Alkyd/Silicone alkyd	Blast	3	4	11	6	3	3
Epoxy	Surface Tolerant Epoxy (STE)	Hand/Power	1	5	12	8	5	5
Epoxy	Surface Tolerant Epoxy/STE	Hand/Power	2	10	17	12	9	9
Epoxy	Surface Tolerant Epoxy/STE	Blast	2	10	21	15	12	12
Epoxy	Surface Tolerant Epoxy/Polyurethane	Hand/Power	2	7	17	11	6	6
Epoxy	Surface Tolerant Epoxy/Polyurethane	Blast	2	7	20	14	9	9
Epoxy	Surf-Tolerant Epoxy/STE/Polyurethane	Hand/Power	3	12	23	17	12	12
Epoxy	Surf-Tolerant Epoxy/STE/Polyurethane	Blast	3	12	26	20	15	15
Epoxy	Epoxy 100% Sol Pent Sealer/Epoxy	Hand/Power	2	6	13	8	5	5
Epoxy	Epoxy 100% Solids Penetrating Sealer/Polyurethane	Hand/Power	2	6	13	8	5	5
Epoxy	Epoxy/Epoxy	Blast	2	6	18	12	9	9
Epoxy	Epoxy/Epoxy	Blast	2	8	20	14	11	11
Epoxy	Epoxy/Epoxy/Epoxy	Blast	3	10	23	17	14	14
Epoxy	Epoxy/Polyurethane	Blast	2	6	17	11	8	8
Epoxy	Epoxy/Epoxy/Polyurethane	Blast	3	8	20	14	11	11
Epoxy	Epoxy waterborne	Blast	3	9	18	12	9	9
Epoxy	Coal Tar Epoxy	Blast	2	16	21	17	14	14
Epoxy Zinc	Epoxy Zinc/Epoxy	Blast	2	7	26	18	12	12
Epoxy Zinc	Epoxy Zinc/Epoxy/Epoxy	Blast	3	11	30	21	15	15
Epoxy Zinc	Epoxy Zinc/Polyurethane	Blast	2	7	24	17	12	12
Epoxy Zinc	Epoxy Zinc/Polyurethane/Polyurethane	Blast	3	11	32	23	15	15
Epoxy Zinc	Epoxy Zinc/Epoxy/Polyurethane	Blast	3	9	29	20	14	14
Inorganic Zinc	Inorganic Zinc (IOZ)	Blast	1	3	27	17	12	12
Inorganic Zinc	IOZ/Epoxy	Blast	2	7	26	18	14	14
Inorganic Zinc	IOZ/Epoxy/Epoxy	Blast	3	11	32	23	17	17
Inorganic Zinc	IOZ/Polyurethane/Polyurethane	Blast	3	11	32	23	17	17
Inorganic Zinc	IOZ/Epoxy/Polyurethane	Blast	3	9	30	21	15	15

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Type	Coating Systems for Atmospheric Exposure (primer/midcoat/topcoat)	Surface Preparation[2]	Number of Coats	DFT Minimum (mils)	Service Life[1,3]			
					Mild (rural)/C2	Moderate (industrial)/C3	Severe (heavy industrial)/C5-I	Seacoast Heavy Industrial/C5-M
Inorganic Zinc	IOZ/Waterborne Acrylic	Blast	3	6	24	17	12	12
Metalizing	Zinc Metalizing (minimum 90% zinc)	Blast	1	5	33	22	16	16
Metalizing	Zinc Metalizing/Sealer	Blast	2	9	34	24	17	18
Metalizing	Zinc Metalizing/Sealer/Polyurethane	Blast	3	13	39	27	22	22
Moisture Curing Polyurethane	MCU Pent Sealer/MCU/MCU	Hand/Power	3	7	15	14	7	9
Moisture Curing Polyurethane	Zinc Rich MCU/Polyaspartic	Blast	2	11	25	20	14	14
Moisture Curing Polyurethane	Zinc Rich MCU/Polyurethane/ Polyurethane	Blast	3	9	30	21	15	15
Moisture Curing Polyurethane	Zinc Rich MCU/MCU/MCU	Blast	3	9	29	21	14	15
Misc	Universal primer/Epoxy	Hand/Power	2	6	12	8	5	5
Misc	Universal primer/Epoxy/Polyurethane	Hand/Power	3	8	14	9	6	6
Misc	Epoxy/Epoxy Siloxane	Blast	2	7	23	17	14	14
Misc	Epoxy/Acrylic Siloxane	Blast	2	6	23	17	14	14
Misc	Polyurethane 100% Solids Elastomeric	Blast	1	20	24	18	14	14
Misc	Epoxy Zinc/Epoxy/Fluorinated Polyurethane	Blast	3	10	27	22	17	17
Misc	Polyurea (aliphatic)	Blast	1	20	20	18	16	16

NOTES:

1. Service Life Estimates:
   All estimates (in years) are for the "Practical" life of the system. Practical life is considered to be the time until 5 to 10% coating breakdown occurs (SSPC-Vis 2 Grade 4), and active rusting of the substrate is present.

2. Surface preparation definitions:
   Hand/Power - Requires SSPC-SP 3 "Power Tool Cleaning" or SP 2 "Hand Tool Cleaning"
   Blast - Requires SSPC-SP 6 "Commercial Blast" or SP 10 "Near White Blast"

3. Service Life Environments per ISO 12944-2, "Classification of Environments"
   C2: Low - Atmospheres with low levels of pollution; mostly rural areas
   C3: Medium - Urban and industrial atmospheres, moderate sulfur dioxide pollution; coastal areas with low salinity
   C5-I: Very High, Industry - Industrial areas with high humidity and aggressive atmosphere
   C5-M: Very High, Marine - Coastal and offshore areas with high salinity

4. Typical Maintenance Painting Sequence:
   Touch-Up painting occurs at Practical or "P" service life as listed in this Table
   Maintenance Repaint occurs at "P" Life + 33% ("P" x 1.33)
   Full Repaint occurs at Year of Maintenance Repaint + 50% of "P" Life (Maint. Repaint Year + ["P" x 0.50]

5. Service Life for Hot Dip Galvanizing (4 mils minimum) as reported by American Galvanizers Association:
   Mild (rural) = 68 Years; Moderate (industrial) = 33 Years; Severe (heavy industrial) = 21 Years

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TABLE 1B
Estimated Service Life for Practical Maintenance
Coating Systems for Immersion Service
(in years before first maintenance painting)[4]

Type	Coating Systems for Immersion Service (primer/midcoat/topcoat)	Surface Preparation[2]	Number of Coats	DFT Minimum (mils)	Service Life[1,3]		
					Potable Water	Fresh Water Immersion	Salt Water Immersion
Epoxy	Coal Tar Epoxy	Blast	2	16	--	17	14
Epoxy	Epoxy/Epoxy	Blast	2	8	12	9	8
Epoxy	Epoxy/Epoxy	Blast	2	6	10	8	6
Epoxy	Epoxy/Epoxy/Epoxy	Blast	3	10	15	12	11
Epoxy	Epoxy 100% Solids	Blast	1	40	15	12	11
Epoxy Phenolic	Epoxy Phenolic/Epoxy Phenolic	Blast	2	12	--	14	12
Metallizing	Zinc Metallizing/Epoxy	Blast	2	9	20	17	15
Metallizing	Zinc Metallizing/Epoxy/Epoxy	Blast	3	13	24	20	18
Misc	Polyurethane 100% Solids	Blast	1	20	16	14	12
Misc	Vinyl Ester/Vinyl Ester	Blast	2	20	--	14	12
Misc	Polyester (composite filled)	Blast	2	25	--	14	12
Misc	Polyurea	Blast	1	20	--	14	12

NOTES:

1. Service Life Estimates:
   All estimates (in years) are for the "Practical" life of the system. Practical life is considered to be the time until 5 to 10% coating breakdown occurs (SSPC-Vis 2 Grade 4), and active rusting of the substrate is present.

2. Surface preparation definitions:
   Blast - Requires SP-10 "Near White Blast" for immersion service

3. Service Life Environment definitions:
   Potable Water - Immersion at an ambient temperature and pressure, coating requires NSF approval
   Fresh Water - Immersion at an ambient temperature and pressure
   Salt Water - Immersion at an ambient temperature and pressure

4. Typical Maintenance Painting Sequence:
   Touch-Up painting occurs at Practical or "P" service life as listed in this Table
   Maintenance Repaint occurs at "P" Life + 33% ("P" x 1.33)
   Full Repaint occurs at Year of Maintenance Repaint + 50% of "P" Life (Maint. Repaint Year + ["P" x 0.50]

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TABLE 2
Typical Material Costs of Paints and Protective Coatings
Approximate Cost Per Square Foot @ Typical DFT

Coating	DFT	Theoretical	Practical Spray	Practical Brush/Roll
Acrylic, Waterborne Primer	3.0	$0.201	$0.287	$0.223
Acrylic, Waterborne Topcoat	3.0	$0.212	$0.303	$0.236
Acrylic, Elastomeric Waterborne	6.0	$0.257	$0.367	$0.285
Alkyd Primer	2.0	$0.081	$0.116	$0.090
Alkyd Gloss Topcoat	2.0	$0.091	$0.131	$0.102
Alkyd Silicone	2.0	$0.132	$0.188	$0.147
Coal Tar Epoxy	8.0	$0.205	$0.293	$0.228
Epoxy Primer	2.0	$0.097	$0.139	$0.108
Epoxy Intermediate/Topcoat	4.0	$0.176	$0.252	$0.196
Epoxy, Waterborne	3.0	$0.211	$0.301	$0.234
Epoxy, Phenolic Primer	5.0	$0.280	$0.400	$0.311*
Epoxy, Phenolic Finish	5.0	$0.286	$0.409	$0.318*
Epoxy, Surface Tolerant	5.0	$0.218	$0.312	$0.242
Epoxy, 100% solids	20.0	$1.078	$1.540	$1.198*
Epoxy, Ester, Primer	1.5	$0.051	$0.073	$0.056
Epoxy, Ester, Topcoat	2.0	$0.105	$0.149	$0.116
Polyaspartic	8.0	$0.581	$0.830	$0.646*
Polyester (glass flake)	10.0	$0.355	$0.508	$0.395*
Polyurea, 100% solids	20.0	$0.740	$1.057	$0.822*
Polyurethane, Elastomeric Solvented	20.0	$1.321	$1.887	$1.468*
Polyurethane, Aromatic HB Primer	5.0	$0.238	$0.340	$0.265
Polyurethane, Aliphatic Acrylic	2.0	$0.160	$0.229	$0.178
Polyurethane, Aliphatic HB Acrylic Inter/Top	4.0	$0.288	$0.411	$0.320
Polyurethane, Aliphatic Polyester	2.0	$0.183	$0.262	$0.203
Polyurethane, Fluorinated	2.5	$1.089	$1.556	$1.210*
Polyurethane, Moisture-Cured Aluminum	2.5	$0.161	$0.229	$0.178
Polyurethane, Moisture-Cured Clear Sealer	2.0	$0.136	$0.194	$0.151*
Siloxane, Acrylic	5.0	$0.637	$0.909	$0.707
Siloxane, Epoxy	4.0	$0.580	$0.828	$0.644
Universal Primer, 1-pack	2.0	$0.104	$0.149	$0.116
Vinyl Ester	20.0	$1.327	$1.896	$1.474*
Zinc Rich, Inorganic	3.0	$0.227	$0.324	$0.252*
Zinc Rich, Organic	3.0	$0.284	$0.406	$0.315*
Zinc Rich, Moisture-Cured Urethane	3.0	$0.269	$0.384	$0.299*

NOTES:

* = Brush/roller application is not recommended by some manufacturers
--Costs are approximate based on data secured from representative US paint and coating suppliers
--DFT = Dry Film Thickness in mils (1mil = 25.4 microns)
--Spray Practical = 30% loss
--Roll/Brush Practical = 10% loss

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TABLE 3
Shop Painting Costs per Sq. Ft. Including Labor, Equipment, and Related Costs[1]
(No Material Costs Included)

Cleaning Grade	Cost[2]
SP-2	$0.50
SP-3	$0.34
SP-6 Automated	$0.40
SP-10 Automated	$0.40
SP-5 Automated	$0.49
SP-6 Conventional with Recyclable Abrasives	$0.85
SP-10 Conventional with Recyclable Abrasives	$1.40
SP-5 Conventional with Recyclable Abrasives	$1.53
SP-6 Conventional with Expendable Abrasives	$0.94
SP-10 Conventional with Expendable Abrasives	$1.77
SP-5 Conventional with Expendable Abrasives	$2.01

Shop Paint Application	Cost
One-Pack Products	$0.37
Two-Pack Epoxies	$0.51
Two-Pack Urethanes	$0.54
Zinc Rich Primers	$0.53

Hot Dip Galvanizing	Cost[3]
Labor, Equipment, Surface Preparation and Related Costs	$1.76

Metallizing (Including Surface Preparation)	Cost[4]
Zinc Metallizing	$5.64
Zinc Metallizing w/sealer	$6.19

Size of Job Multipliers (per square foot)

10,000-25,000	120%
25,000-75,000	110%
75,000-125,000	100%
125,000-300,000	95%
300,000-1,000,000	90%
1,000,000+	80%

Member Size Multipliers For Hot Dip Galvanizing[3]
Member Weight Per Foot (Lbs/Ft)

0 – 20	80%
21 – 50	100%
50 – 125	115%
126 – 200	125%
200+	180%

Conversion of Tons of Steel to Square Feet

Member Type	Sq Ft/Ton
Typical mix size/shapes	250
Large Structural	100
Medium Structural	200
Light Structural	400
Light Trusses	500

Notes

1. Costs shown are approximate composite values, based on data secured from representative US steel fabricators; RS Means – Heavy Construction Cost Data; and Craftsman National Painting Cost Estimator. Steel plate cleaning costs are about 20% less than prices listed above for structural steel.

2. Costs labeled automated are for steel fabricators having centrifugal wheel blasting equipment.

3. Costs based on American Galvanizers Association, 2006 Survey. Note there are member size limitations for hot dip galvanizing. The maximum depth is approximately 3 feet and maximum length is approximately 80 feet when double dipped in standard galvanizing kettles.

4. Costs based on information published by the Federal Highway Administration.

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TABLE 4
Field Painting Costs per Sq. Ft. Including Labor, Equipment, and Related Costs[1]
(No Material Costs Included)

Cleaning Grade	Cost
SP-2 Hand Tool Cleaning	$0.59
SP-3 Power Tool Cleaning	$0.93
SP-11 Power Tool-Bare Steel	$4.74
SP-7 Brush-Off Blast	$0.67
SP-6 Commercial Blast	$1.08
SP-10 Near White Blast	$1.72
SP-5 White Metal Blast	$2.05
Water Wash Prior to Surface Prep.	$0.20
Hi Pres. Water/Steam Clean prior to Surface Prep.	$0.30
Water Slurry Blast	$1.57
Low Pressure wo/abrasive SP-1	$0.41
Low Pressure w/abrasive SP-10	$1.80
High Pressure w/abrasive SP-10	$3.93
Sponge Media Blast	$4.92
Bicarbonate	$2.11

NOTE: Multiplier for using recyclable grit for: SP-6, SP-10, SP-5 above is 1.5 – 1.9

Field Application	Cost
One-Pack by Brush/Roller	$0.45
One-Pack by Spray	$0.36
Two-Pack Epoxies, by Spray	$0.38
Two-Pack Urethanes, by Spray	$0.42
Zinc Rich Primers, by Spray	$0.49

Metallizing (Including Surface Prep.)	Cost[2]
Zinc Metallizing	$9.48
Zinc Metallizing w/sealer	$10.00

Structure Multiplier[3]	Field labor x's
Simple Structures < 50' high	120%
Simple Structures 50'-100' high	130%
Simple Structures > 100' high	145%
Complex Structures < 50' high	135%
Complex Structures 50'-100' high	145%
Complex Structures > 100' high	150%
Elevated tanks, intricate structures, structures greater than 50' high	150%
Ground Tanks	80%
Piping: 1"-2"	140%
4"-6"	100%
12" and 24"	95%
48"	90%

Existing Coating Conditions	Total $/sq ft x's
Light rusting, pitting/paint breakdown (SNAME T&R 21, Fig 5)[5] (Europe Std. Re 5-6)[6] (SSPC Vis. 1-C)[7]	100%
Heavy paint breakdown, severe rusting and pitting (SNAME T&R 21, Fig 3, 6)[5] (Europe Std. Re 8)[6] (SSPC Vis. 1-D)[7]	130%
Extremely heavy paint films >20 mils with extreme breakdown and substantial pitting and rusting (SNAME T&R 21, Fig 7)[5]	160%
Adherent Mill Scale (SSPC Vis. 1-A)[7]	125%

Size of Job Multiplier[4]	Total $/sq ft x's
10,000-25,000	115%
25,000-75,000	105%
75,000-125,000	100%
125,000-300,000	95%
300,000-1,000,000	90%
1,000,000+	85%

Notes

1. Costs shown are approximate composite values, based on data secured from representative US painting contractors; RS Means – Heavy Construction Cost Data; and Craftsman National Painting Cost Estimator. The costs are for calculating the base price of new steel cleaned and painted on the ground at the job site.
2. Costs based on information published by the Federal Highway Administration.
3. The Structure Multiplier is applied to the field labor costs per square foot.
4. The Size of Job and Existing Coating Condition Multipliers are applied to the total costs per square foot.
5. "Abrasive Blasting Guide for Aged or Coated Steel Surfaces," T & R Bulleting 4-21, The Society of Naval and Marine Engineers
6. "European Scale of Degree of Rusting for Anti-Corrosive Paints," Royal Swedish Academy of Engineering, Stockholm, 1961
7. SSPC: The Society for Protective Coatings, Pittsburgh, PA, "Good Painting Practices," Volume 1

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TABLE 5
Paint Removal
Containment Multipliers Guidelines

Containment Designation is in accordance with
SSPC: The Society for Protective Coatings
Technology Guide No. 6
Guide for Containing Surface Preparation Debris Generated During Paint Removal Operations

Containment Designation	Simple Structure			Complex Structure		
	<50' high	50' < x <100'	>100'	<50' high	50' < x <100'	>100'
Class 1-A	3.00	3.25	3.50	3.50	3.75	4.00
Class 2-A	2.50	2.75	3.00	3.00	3.25	3.50
Class 3-A	2.25	2.50	2.75	2.75	3.00	3.25
Class 4-A	1.50	1.75	1.75	1.75	2.00	2.25
Class 1-C	2.25	2.50	3.00	3.00	3.25	3.50
Class 2-C	2.00	2.25	2.25	2.25	2.50	3.00
Class 3-C	1.75	1.75	2.00	2.00	2.25	2.50
Class 1-W	2.75	3.00	3.00	3.00	3.25	3.50
Class 2-W	2.25	2.50	2.50	2.50	2.50	2.75
Class 3-W	2.00	2.25	2.25	2.25	2.50	2.75
Class 1-P	2.25	2.75	3.25	3.25	3.50	3.75
Class 2-P	1.75	1.75	2.00	2.00	2.25	2.50
Class 3-P	1.25	1.50	1.75	1.75	2.00	2.25

Legend:

Class 1: This system provides the highest level of emissions control
Class 2: This system provides a high level of emissions control
Class 3: This system provides a moderate level of emissions control
Class 4: This system provides a minimal level of emissions control
-A: This is used for abrasive blast cleaning
-W This is used for water blasting/water jetting
-C This is used for chemical stripping
-P This is used for hand or power tool cleaning

Notes:
1. Multipliers are applied to the total cost per square foot.

2. Multipliers for chemical stripping are provided for information only.

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TABLE 6
Determination of Maintenance Repainting Risk for Alkyd Coatings[1]

Coating Attribute	Test Method	Repair Likely	Repair Possible	Repair Unlikely
Corrosion / Coating Deterioration	SSPC-Vis 2	<10%	10 – 20%	>20%
Knife Adhesion	ASTM D3359	>2A or 2B	1A or 1B	0A or 0B
Film Thickness	SSPC-PA 2	<20 mils	20 – 30 mils	>30 mils
Mill Scale / Rust	Visual	Not Present or Inactive	Not Present or Inactive	Active

NOTE:
1. Table based on article by Kline, E. S.; Corbett, W. D., "Beneficial Procrastination: Delaying Lead Paint Removal Projects by Upgrading the Coating System," Journal of Protective Coatings and Linings, March 1992.

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TABLE 7
Practical Maintenance Painting Sequence

Operation	Painting Occurs in Year	Cost if Original in Field	Cost if Original in Shop
Initial Painting	0	Original	Original
Touch-Up	Practical Life or "P"	Original x 40%	Original x 60%
Maintenance Repaint	"P" Life + 33% (i.e. "P" x 1.33)	Original x 70%	Original x 105%
Full Repaint	Year of Maint. Repaint + 50% of "P" Life (i.e. Maint. Repaint Year + ["P" x 0.50])	Original x 135%	Original x 205%

Examples Using Practical Maintenance Sequence

System With 12 Year Practical Life and Original Shop Installed Cost of $1.05 per Square Foot
System With 12 Year Practical Life and Original Field Installed Cost of $1.60 per Square Foot

Operation	Painting Occurs in Year	Cost if Original in Field	Cost if Original in Shop
Initial Painting	0	$1.60	$1.05
Touch-Up	12	$0.64	$0.63
Maintenance Repaint	16	$1.12	$1.10
Full Repaint	22	$2.16	$2.15

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Figure 1
WORKSHEET A – SHOP COATING APPLICATION

Project Name: Structural Steel for Bridge Overpass
Project Location: Pittsburgh, PA

(A) Project Size (Sq. Ft. or Tons): 60,000 Sq Ft

Coating System: IOZ/epoxy/polyurethane
Intended Environment: Severe Industrial (C5-I)
Service Life: 15

I. Surface Preparation: SP 10 automated — Cost ($): 0.40 Per Sq. Ft.
(Includes labor, equipment and related costs, no materials) (Note: Automated or Conventional Method)
I. Sub-Total ($ Per Sq. Ft.) = 0.40

II. Application:
a) Paint Material

Spray	1st Coat	Cost ($): 0.53	Per Sq. Ft.
Spray	2nd Coat	Cost ($): 0.51	Per Sq. Ft.
Spray	3rd Coat	Cost ($): 0.54	Per Sq. Ft.

II. Sub-Total ($ Per Sq. Ft.) = 1.58 (a)

OR

b) Hot Dip Galvanizing
(Includes labor, surface preparation and related costs)
II. Sub-Total ($ Per Sq. Ft.) = _____ (b)

Labor Sub-Total ($ Per Sq. Ft.) = 1.98
I + II (a or b)

III. Job Multiplier:
a) Job Size: 60,000 sq ft %: 110
b) Member Size: _____ %: _____
III. Adjusted Labor Cost ($ Per Sq. Ft.) = 2.178
(Labor x III.a x III.b.)

IV. Material Costs

Inorganic zinc	1st Coat	Cost ($): 0.324	Per Sq. Ft.
Epoxy	2nd Coat	Cost ($): 0.252	Per Sq. Ft.
Polyurethane	3rd Coat	Cost ($): 0.229	Per Sq. Ft.

Total DFT = _____
IV. Sub-Total ($ Per Sq. Ft.) = 0.805
(B) Preliminary Project Cost ($ Per Sq. Ft.) = 2.98
(III + IV)

(C) TOTAL PROJECT COST ($) = 178,800
(A x B)

Conversion of Tons of Steel into Square Feet:

	Tons	Mult. by	= Square Feet
Typical mix		250	
Large Structural		100	
Medium Structural		200	
Light Structural		400	
Light Trusses		500	

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Figure 2
WORKSHEET B – FIELD COATING APPLICATION

Project Name: Elevated Water Storage Tank
Project Location: St. Louis, MO

(A) Project Size (Square Feet): 30,000

Coating System: 2-coat alkyd
Intended Environment: Mild (C2)
Service Life: 6

I. Surface Preparation: Power tool, SP3 Cost ($): 0.93 Per Sq. Ft.
(Includes labor, equipment and related costs, no materials)

Additional Cleaning: _____ Cost ($): _____ Per Sq. Ft.
_____ Cost ($): _____ Per Sq. Ft.
_____ Cost ($): _____ Per Sq. Ft.
I. Sub-Total ($ Per Sq. Ft.) = 0.93

II. Application:
Method: Spray 1st Coat Cost ($): 0.36 Per Sq. Ft.
Spray 2nd Coat Cost ($): 0.36 Per Sq. Ft.
_____ 3rd Coat Cost ($): _____ Per Sq. Ft.
II. Sub-Total ($ Per Sq. Ft.) = 0.72

Labor Sub-Total ($ Per Sq. Ft.) = 1.65
(I + II)

III. Structure Multiplier:
General Configuration: Elevated (Simple/Complex) Height: 100 %: 150
OR
_____ (Unique) (Size): _____ (If pipe) %: _____
III. Adjusted Labor Cost ($ Per Sq. Ft.) = 2.475
(I + II) x (%)

IV. Material Costs
Alkyd prime 1st Coat Cost ($): 0.116 Per Sq. Ft.
Alkyd top 2nd Coat Cost ($): 0.131 Per Sq. Ft.
_____ 3rd Coat Cost ($): _____ Per Sq. Ft.
Total DFT = 6 IV. Sub-Total ($ Per Sq. Ft.) = 0.247
(B) Preliminary Project Cost ($ Per Sq. Ft.) = 2.722
(III + IV)

V. Project Multipliers
(C) Existing Conditions %: 130
(D) Project Size %: 105

(E) Adjusted Project Cost ($ Per Sq. Ft.) = 3.72
(B x C x D)

(C) TOTAL PROJECT COST ($) = 111,600
(A x E)

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Figure 3
Example of Present Value Analysis

Economic Analysis Worksheet
Total Painting Cost Per Sq. Ft. for 45-Year Plant Life, Field Application
Three-Coat Inorganic Zinc/Epoxy/Polyurethane, SP6, 15 Year System Life (Severe/C5-I)

Painting Operation →	Original Painting	Touch-Up Year 15	Maintenance Repaint Year 20	Full Repaint Year 28	Touch-Up Year 43	Totals
Cost in Current $'s	$3.18	$1.27	$2.23	$4.29	$1.27	$12.24
NFV costs Future value @ 3% inflation	$3.18	$2.29	$4.88	$12.87	$6.87	$30.09
NPV costs Present value @ 7% interest	$3.18	$0.83	$1.26	$1.94	$0.37	$7.58

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Figure 4
Comparing Painting Costs and Galvanizing Costs

Economic Analysis Worksheet
Total Painting Cost Per Sq. Ft. for 35-Year Structure Life, Moderate (C3) Environment
1 Coat Inorganic Zinc System, Shop SSPC-SP 10 Automated
17 Year "P" Life, Inflation = 4%, Interest = 7%

Painting Operation →	Original Painting Year 0	Touch-Up Year 17	Maintenance Repaint Year 23	Full Repaint Year 32	Totals
Cost in Current $'s	$1.25	$0.75	$1.31	$2.56	$5.88
NFV costs Future value @ 4% inflation	$1.25	$1.46	$3.23	$8.99	$14.97
NPV costs Present value @ 7% interest	$1.25	$0.46	$0.68	$1.03	$3.42

$$\text{Average Equivalent Annual Cost} = \$0.27 = \$3.42 \times \frac{(0.07)(1.07)^{35}}{(1.07)^{35} - 1}$$

Economic Analysis Worksheet
TotalGalvanizing Cost Per Sq. Ft. for 35-Year Structure Life, Moderate (C3) Environment
Galvanized to Achieve 4 mils of Zinc Coating
Touch-Up Cost Based on 1 Coat Field Applied Organic Zinc Primer, SSPC-SP 3
33 Year "P" Life, Inflation = 4%, Interest = 7%

Painting Operation →	Original Painting Year 0	Touch-Up Year 33	Totals
Cost in Current $'s	$2.20	$1.83	$4.03
NFV costs Future value @ 4% inflation	$2.20	$6.68	$8.88
NPV costs Present value @ 7% interest	$2.20	$0.72	$2.92

$$\text{Average Equivalent Annual Cost} = \$0.23 = \$2.92 \times \frac{(0.07)(1.07)^{35}}{(1.07)^{35} - 1}$$

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SIB TABLE I
PINAL VALLEY

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 309 Supply Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
1	NA										
2	NA										
3	NA										
4	NA										
5	NA										
6	NA										
7	NA										
8	NA										
9	NA										
10	NA										
11	NA										
12	NA										
13	NA										
14	NA										
15	NA										
16	NA										
17	NA										
18	NA										
19	NA										
20	NA										
21	NA										
22	NA										
23	NA										
24	NA										
25	NA										
26	NA										
27	NA										
28	NA										
29	NA										

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 309 Supply Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
30	NA										
31	NA										
32	NA										
33	NA										
34	NA										
35	NA										
36	NA										
37	NA										
38	NA										
39	NA										
40	NA										
41	NA										
42	NA										
43	NA										
44	NA										
45	NA										
46	NA										
47	NA										
50	NA										
51	NA										
52	NA										
53	NA										
54	NA										
55	NA										
56	NA										
57	NA										
58	NA										
59	NA										
60	NA										

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 309 Supply Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
61	NA										
62	NA										
63	NA										
						Estimated Total Cost	0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
1	343	3,000 1,700 500	6 8 12	DI	$89.5460 $115.1312 $147.1120		$537,917	FLORENCE STREET & BEECH AVENUE	2018	Start design in 2017 and construction in 2018	CONSTRUCT 3,000 LF OF 6-INCH DI, 1,700 LF OF 8-INCH DI AND 500 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,900 LF OF 3-INCH CA AND 4-INCH CA WATER MAIN, REPLACE 77 SERVICE CONNECTIONS, REPLACE 77 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE STREET, ASH AVENUE, BEECH AVE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.
2	343	3,900 700	6 12	DI	$89.6369 $147.2600		$452,666	FLORENCE STREET & CEDAR AVENUE	2019	Start design in 2018 and construction in 2019	CONSTRUCT 3,900 LF OF 6-INCH DI AND 700 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,800 LF OF 2-INCH CA, 3-INCH CA, AND 4-INCH CA WATER MAIN, REPLACE 52 SERVICE CONNECTIONS, REPLACE 52 METERS AND REPLACE 3 FIRE HYDRANTS ON FLORENCE STREET, CEDAR AVENUE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.
3	343	4,000 200	6 12	DI	$89.6625 $147.3000		$388,110	FLORENCE STREET & ELM AVENUE	2020	Start design in 2019 and construction in 2020	CONSTRUCT 4,000 LF OF 6-INCH DI AND 200 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,000 LF OF 2-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS AND REPLACE 51 METERS ON FLORENCE STREET, DATE AVENUE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.
4	343	3,800 1,300 400	6 8 12	DI	$89.6676 $115.2869 $147.3100		$549,534	FIRST STREET & PINAL AVENUE	2022 or later		CONSTRUCT 3,800 LF OF 6-INCH DI, 1,300 LF OF 8-INCH DI AND 400 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,900 LF OF 2-INCH STL, 4-INCH CI, 6-INCH CA AND 8-INCH CI WATER MAIN, REPLACE 77 SERVICE CONNECTIONS, REPLACE 77 METERS AND REPLACE 6 FIRE HYDRANTS ON FIRST STREET, SECOND STREET, THIRD STREET AND PINAL AVENUE.
5	343	3,700 400 900	6 8 12	DI	$89.6684 $115.2875 $147.3122		$510,469	FOURTH STREET & CASA GRANDE AVENUE	2022 or later		CONSTRUCT 3,700 LF OF 6-INCH DI, 400 LF OF 8-INCH DI AND 900 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,700 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 72 SERVICE CONNECTIONS, REPLACE 72 METERS AND REPLACE 3 FIRE HYDRANTS ON THIRD STREET, FOURTH STREET AND FIFTH STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
6	343	2,100 2,900	6 8	DI	$89.5171 $115.0938		$521,758	FIRST STREET & CASA GRANDE AVENUE	2022 or later		CONSTRUCT 2,100 LF OF 6-INCH DI AND 2,900 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,100 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CI WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 6 FIRE HYDRANTS ON FIRST STREET, SECOND STREET AND CASA GRANDE AVENUE.
7	343	3,900 300 2,900	6 8 12	DI	$89.6421 $115.2533 $147.2690		$811,260	SIXTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI, 300 LF OF 8-INCH DI AND 2,900 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,700 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 3 FIRE HYDRANTS ON FLORENCE BOULEVARD AND SIXTH STREET.
8	343	5,100 1,300	6 8	DI	$89.6625 $115.2800		$607,143	FOURTH STREET & BROWN AVENUE	2022 or later		CONSTRUCT 5,100 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,200 LF OF 2-INCH CA, 2-INCH PVC, 3-INCH CA, 4-INCH CI, 4-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 127 SERVICE CONNECTIONS, REPLACE 127 METERS AND REPACE 2 FIRE HYDRANTS ON CAMERON AVENUE, MORRISON AVENUE, LINCOLN AVENUE AND FOURTH STREET.
9	343	4,900 1,400	6 12	DI	$89.5449 $147.1100		$644,724	SECOND STREET & TREKELL ROAD	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH DI AND 1,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 6,900 LF OF 2-INCH CA, 4-INCH CA, 6-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 104 SERVICE CONNECTIONS, REPLACE 104 METERS AND REPLACE 5 FIRE
10	343	3,900 1,300	6 8	DI	$89.6149 $115.2192		$499,283	SECOND STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI TO REPLACE 5,100 LF OF 2-INCH CA, 3-INCH CA, 4-INCH CI, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 2 FIRE HYDRANTS ON FIRST STREET, SECOND STREET, THIRD STREET, CAMERON AVENUE, MORRISON AVENUE AND BROWN AVENUE.
11	343	3,300	6	DI	$ 89.5082		$295,377	SECOND STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 3,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 4,200 LF OF 2-INCH CI, 4-INCH CI, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 58 SERVICE CONNECTIONS, REPLACE 58 METERS AND REPLACE 3 FIRE HYDRANTS ON CAMERON AVENUE, MORRISON AVENUE, BROWN AVENUE AND FIRST STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
12	343	3,100 1,800	6 12	DI	$89.5584 $147.1317		$542,468	SIXTH STREET & AMARILLO AVENUE	2022 or later		CONSTRUCT 3,100 LF OF 6-INCH DI AND 1,800 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,400 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 10-INCH CA WATER MAIN, REPLACE 81 SERVICE CONNECTIONS, REPLACE 81 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE BOULEVARD, PUEBLO DRIVE, TREKELL ROAD, LOVE STREET, SIXTH STREET AND AMARILLO STREET.
13	343	4,300 800	6 12	DI	$89.6384 $147.2625		$503,255	TREKELL ROAD & FOURTH STREET	2022 or later		CONSTRUCT 4,300 LF OF 6-INCH DI AND 800 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,400 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 10-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 104 SERVICE CONNECTIONS, REPLACE 104 METERS AND REPLACE 4 FIRE HYDRANTS ON FOURTH STREET, FIFTH STREET, AMARILLO STREET, TREKELL ROAD AND PUEBLO DRIVE.
14	343	4,100 700	6 12	DI	$89.4841 $147.0100		$469,792	TREKELL ROAD & SECOND STREET	2022 or later		CONSTRUCT 4,100 LF OF 6-INCH DI AND 700 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,100 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 85 SERVICE CONNECTIONS, REPLACE 85 METERS AND REPLACE 3 FIRE HYDRANTS ON SECOND STREET, THIRD STREET, AMARILLO STREET, PUEBLO DRIVE AND TREKELL ROAD.
15	343	2,200 300 1,500	6 8 12	DI	$89.6482 $115.2600 $147.2787		$452,722	PINAL AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 2,200 LF OF 6-INCH DI, 300 LF OF 8-INCH DI AND 1,500 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,000 LF OF 2-INCH CA, 3-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 75 SERVICE CONNECTIONS, REPLACE 75 METERS AND REPLACE 3 FIRE HYDRANTS ON PINAL AVENUE, ARBOR AVENUE, ELEVENTH STREET, THIRTEEN STREET AND McMURRAY BOULEVARD.
16	343	4,700 800	6 8	DI	$89.5951 $115.1938		$513,252	PARK AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 4,700 LF OF 6-INCH DI AND 800 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,600 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 2 FIRE HYDRANTS ON ELEVENTH STREET, THIRTEEN STREET, McMURRAY BOULEVARD, PARK AVENUE AND CENTER AVENUE.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
17	343	3,600 2,300	6 8	DI	$89.5369 $115.1187		$587,106	OLIVE AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 3,600 LF 6-INCH DI AND 2,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,500 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 50 SERVICE CONNECTIONS, REPLACE 50 METERS AND REPLACE 3 FIRE HYDRANTS ON TENTH STREET, ORANGE DRIVE, WALNUT DRIVE , DATE DRIVE AND OLIVE AVENUE.
18	343	2,100 1,400	6 12	DI	$89.6381 $147.2629		$394,408	PINAL AVENUE & FLORENCE. BOULEVARD	2022 or later		CONSTRUCT 2,100 LF OF 6-INCH DI AND 1,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 35 SERVICE CONNECTIONS, REPLACE 35 METERS AND REPLACE 2 FIRE HYDRANTS ON EIGHT STREET, NINTH STREET, TENTH STREET, FLORENCE BOULEVARD, ARBOR AVENUE AND PINAL AVENUE.
19	343	5,400	6	DI	$89.7406		$484,599	NINTH STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 5,400 LF OF 6-INCH DI WATER MAIN TO REPLACE 5,100 LF OF 2-INCH CA, 3-INCH CA, 4-INCH CA, 4-INCH CI, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 60 SERVICE CONNECTIONS, REPLACE 60 METERS AND REPLACE 5 FIRE HYDRANTS ON NINTH STREET, TENTH STREET, CAMERON AVENUE, MORRISON AVENUE, BROWN AVENUE AND KADOTA AVENUE.
20	343	4,300 1,000	6 12	DI	$89.4914 $147.0210		$531,834	NINTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 4,300 LF OF 6-INCH DI AND 1,000 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 69 SERVICE CONNECTIONS, REPLACE 69 METERS AND REPLACE 3 FIRE HYDRANTS ON TREKELL ROAD, COOLIDGE AVENUE, GILBERT AVENUE, LEHMBERG AVENUE, EIGHTH STREET AND NINTH STREET.
21	343	3,200 600 1,300	6 8 12	DI	$89.6038 $115.2050 $147.2062		$547,223	ELEVENTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 3,200 LF OF 6-INCH DI, 600 LF OF 8-INCH DI AND 1,300 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 2 FIRE HYDRANTS ON TREKELL ROAD, COOLIDGE AVENUE, GILBERT AVENUE, MCMURRAY BOULEVARD AND ELEVENTH STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
22	343	1,300	6	DI	$89.5300		$116,389	SAGUARO STREET	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 2-INCH PVC WATER MAIN, REPLACE 31 SERVICE CONNECTIONS AND REPLACE 31 METERS IN CUL-DE-SACS ON SAGUARO STREET.
23	343	3,200	6	DI	$89.6963		$287,028	MORRISON AVENUE & MANOR DRIVE	2022 or later		CONSTRUCT 3,200 LF OF 6-INCH DI WATER MAIN TO REPLACE 5,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 94 SERVICE CONNECTIONS, REPLACE 94 METERS AND REPLACE 3 FIRE HYDRANTS ON MORRISON AVENUE AND MANOR DRIVE.
24	343	3,900 1,300	6 8	DI	$89.6959 $115.3231		$499,734	LAUREL DRIVE & KADOTA AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 3,400 LF OF 3-INCH CA, 4-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 55 SERVICE CONNECTIONS, REPLACE 55 METERS AND REPLACE 4 FIRE HYDRANTS ON LAUREL DRIVE, MCMURRAY BOULEVARD, CAMERON AVENUE, BROWN AVENUE, MORRISON AVENUE AND KADOTA AVENUE.
25	343	5,000	6	DI	$89.5194		$447,597	FRENCH STREET & OCOTILLA STREET	2022 or later		CONSTRUCT 5,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 4,700 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 136 SERVICE CONNECTIONS, REPLACE 136 METERS AND REPLACE 4 FIRE HYDRANTS ON OCOTILLA STREET, MELROSE DRIVE AND FRENCH STREET.
26	343	3,700 1,400 600	6 8 12	DI	$89.6319 $115.2407 $147.2517		$581,326	FIRST STREET & ALTA AVENUE	2022 or later		CONSTRUCT 3,700 LF OF 6-INCH DI, 1,400 LF OF 8-INCH DI AND 600 LF OF 12-INCH DI WATER MAIN TO REPLACE 5,600 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA AND 8-INCH DI WATER MAIN, REPLACE 94 SERVICE CONNECTIONS, REPLACE 94 METERS AND REPLACE 4 FIRE HYDRANTS ON FIRST STREET, DOAN STREET, TREKELL ROAD, ALTA AVENUE, AMARILLO STREET, VISTA AVENUE AND PUEBLO DRIVE.
27	343	2,500 600	6 8	DI	$89.7368 $115.3750		$293,567	COLORADO STREET & AVILA AVENUE	2022 or later		CONSTRUCT 2,500 LF OF 6-INCH DI AND 600 LF OF 8-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 88 SERVICE CONNECTIONS, REPLACE 88 METERS AND REPLACE 5 FIRE HYDRANTS ON RODEO ROAD, AVILA AVENUE, BARCELONA AVENUE AND COLORADO STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
28	343	3,200	6	DI	$89.8534		$287,531	SCOTT DRIVE & HAVASUPAI DRIVE	2022 or later		CONSTRUCT 3,200 LF OF 6-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 2-INCH PVC WATER MAIN, REPLACE 35 SERVICE CONNECTIONS AND REPLACE 35 METERS ON HAVASUPAI DRIVE, MASCALERO DRIVE AND CALGARY DRIVE.
29	343	2,300	6	DI	$89.8448		$206,643	MCCARTNEY ROAD & EVANS ROAD	2022 or later		CONSTRUCT 2,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 2,300 LF OF 1-INCH PVC AND 2-INCH PVC WATER MAIN, REPLACE 12 SERVICE CONNECTIONS AND REPLACE 12 METERS ALONG EVANS ROAD SOUTH OF MCCARTNEY ROAD.
30	343	4,000 500	6 8	DI	$89.6608 $115.2780		$416,282	COLORADO STREET & CORDOVA AVENUE	2022 or later		CONSTRUCT 4,000 LF OF 6-INCH DI AND 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,900 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 92 SERVICE CONNECTIONS AND REPLACE 92 METERS ON CORDOVA AVENUE, DELANO DRIVE, BLANCO DRIVE, AVENIDA ELLENA AND COLORADO STREET.
31	343	2,800 800 1,200	6 8 12	C-900	$83.2161 $108.8200 $140.8267		$489,053	CARMICHAEL STREET & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 2,800 LF OF 6-INCH C-900, 800 LF OF 8-INCH C-900 AND 1,200 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 550 LF OF 2-INCH PVC, 2-INCH GS, 6-INCH PVC AND 6-INCH CA WATER MAIN, REPLACE 38 SERVICE CONNECTIONS AND REPLACE 38 METERS ON CARMICHAEL STREET, BATEMAN STREET, ARIZONA BOULEVARD AND HUDSON ROAD.
32	343	3,300 2,500	6 12	C-900	$83.2970 $140.9640		$627,290	ARIZONA BOULEVARD & VAH KI INN	2017	Start design in 2017 and construction in 2017	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 2,500 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 7,200 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA, 12-INCH CA, 4-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 97 SERVICE CONNECTIONS, REPLACE 97 METERS AND REPLACE 7 FIRE HYDRANTS ON VAH KI INN, HESS AVENUE, ARIZONA BOULEVARD, 4TH STREET AND 3RD STREET.
33	343	5,100 800	6 12	C-900	$83.2625 $140.9063		$537,364	ARIZONA BOULEVARD & WALTON AVENUE	2019	Start design in 2018 and construction in 2019	CONSTRUCT 5,100 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 7,000 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 102 SERVICE CONNECTIONS, REPLACE 102 METERS AND REPLACE 5 FIRE HYDRANTS ON WALTON AVENUE, BEALY AVENUE, ARIZONA BOULEVARD, 4TH STREET AND 3RD STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
34	343	2,600 400	6 12	C-900	$83.1823 $140.7700		$272,582	ARIZONA BOULEVARD & KENNEDY AVENUE	2020	Start design in 2019 and construction in 2020	CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,400 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 59 SERVICE CONNECTIONS, REPLACE 59 METERS AND REPLACE 3 FIRE HYDRANTS ON KENNEDY AVENUE, ARIZONA BOULEVARD,4TH STREET, 3RD STREET AND MAIN STREET.
35	343	3,300 400	6 12	C-900	$83.1906 $140.7850		$330,843	ARIZONA BOULEVARD & BYRD AVENUE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,900 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 8-INCH PVC WATER MAIN, REPLACE 66 SERVICE CONNECTIONS, REPLACE 66 METERS AND REPLACE 3 FIRE HYDRANTS ON BYRD AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
36	343	3,300 400	6 12	C-900	$83.2021 $140.2025		$330,888	ARIZONA BOULEVARD & LINDBERGH AVENUE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 70 SERVICE CONNECTIONS, REPLACE 70 METERS AND REPLACE 3 FIRE HYDRANTS ON LINDBERGH AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
37	343	900 2,600	6 12	C-900	$83.3189 $141.0015		$441,591	ARIZONA BOULEVARD & NORTHERN AVENUE	2022 or later		CONSTRUCT 900 LF OF 6-INCH C-900 AND 2,600 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,700 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 46 SERVICE CONNECTIONS, REPLACE 46 METERS AND REPLACE 3 FIRE HYDRANTS ON NORTHERN AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
38	343	5,500 400	6 12	C-900	$83.1995 $140.7950		$513,915	ARIZONA BOULEVARD & PIMA AVENUE	2022 or later		CONSTRUCT 5,500 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,800 LF OF 4-INCH CA, 6-INCH CA, 4-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 90 SERVICE CONNECTIONS, REPLACE 90 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, PIMA AVENUE, PINKLEY AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
39	343	6,300 800	6 12	C-900	$83.2346 $140.8588		$637,065	ARIZONA BOULEVARD & CENTRAL AVENUE	2022 or later		CONSTRUCT 6,300 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,500 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 111 SERVICE CONNECTIONS, REPLACE 111 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, CENTRAL AVENUE, ROOSEVELT AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
40	343	4,700 800	6 12	C-900	$83.1694 $140.7475		$503,494	ARIZONA BOULEVARD & WILSON AVENUE	2022 or later		CONSTRUCT 4,700 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 5,900 LF OF 4-INCH CA, 6-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 66 SERVICE CONNECTIONS, REPLACE 66 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, WILSON AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
41	343	1,900 1,700	6 12	C-900	$83.1937 $140.7888		$397,409	ARIZONA BOULEVARD & HARDING AVENUE	2022 or later		CONSTRUCT 1,900 LF OF 6-INCH C-900 AND 1,700 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 1,700 LF OF 4-INCH CA WATER MAIN, REPLACE 75 SERVICE CONNECTIONS, REPLACE 75 METERS AND REPLACE 3 FIRE HYDRANTS ON ARIZONA BOULEVARD, HARDING AVENUE, COOLIDGE AVENUE, 4TH STREET AND 3RD STREET.
42	343	500	36	DI	$898.0000		$449,000	INTERSTATE 8 & PEART ROAD	2022 or later		CONSTRUCT 500 LF OF 36-INCH DI WATER MAIN TO REPLACE 500 LF OF 36-INCH AMERON WATER MAIN ON INTERSTATE 8 EAST TO PEART ROAD.
43	343	5,400	24	DI	$320.1852		$1,729,000	PEART ROAD & JIMMIE KERR BOULEVARD	2022 or later		CONSTRUCT 5,400 LF OF 24-INCH DI WATER MAIN TO REPLACE 5,400 LF OF 24-INCH AMERON WATER MAIN ON PEART ROAD FROM SELMA HIGHWAY NORTH TO EARLY ROAD.
44	343	5,200	24	DI	$319.9804		$1,663,898	PEART ROAD & DOAN STREET	2022 or later		CONSTRUCT 5,200 LF OF 24-INCH DI WATER MAIN TO REPLACE 5,200 LF OF 24-INCH AMERON WATER MAIN, REPLACE 11 SERVICE CONNECTIONS, AND REPLACE 11 METERS ON PEART ROAD FROM EARLY ROAD NORTH TO FLORENCE BOULEVARD.
45	343	2,800	24	DI	$319.7643		$895,340	FLORENCE BOULEVARD & ARIZOLA ROAD	2022 or later		CONSTRUCT 2,800 LF OF 24-INCH DI WATER MAIN TO REPLACE 2,800 LF OF 24-INCH AMERON WATER MAIN, REPLACE 7 SERVICE CONNECTIONS AND REPLACE 7 METERS ON FLORENCE BOULEVARD FROM ARIZOLA ROAD TO HENNESS ROAD.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
46	343	500	8	DI	$117.3220		$58,661	CASA GRANDE AVENUE & RODEO ROAD	2022 or later		CONSTRUCT 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 500 LF OF 6-INCH CA WATER MAIN, REPLACE 2 SERVICE CONNECTIONS AND REPLACE 2 METERS ON CASA GRANDE AVENUE BETWEEN RODEO ROAD AND HORSESHOE CIRCLE.
47	343	4,900 700	6 8	DI	$89.6090 $115.2114		$519,732	ELEVENTH STREET & BROWN AVENUE	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH DI AND 700 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,800 LF OF 2-INCH CA, 4-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 81 SERVICE CONNECTIONS, REPLACE 81 METERS AND REPLACE 3 FIRE HYDRANTS ON BROWN AVENUE, KADOTA AVENUE, LEHMBERG AVENUE, ELEVENTH STREET AND MCMURRAY BOULEVARD.
50	343	3,600 900	6 12	DI	$89.6547 $147.2911		$455,319	PARK AVENUE & FLORENCE BOULEVARD	2022 or later		CONSTRUCT 3,600 LF OF 6-INCH DI AND 900 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,700 LF OF 1-INCH PVC, 4-INCH CA, 6-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 65 SERVICE CONNECTIONS, REPLACE 65 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE BOULEVARD, EIGHTH STREET, NINTH STREET, TENTH STREET AND PARK AVENUE.
51	343	3,100 300	6 12	DI	$89.6629 $147.3033		$322,146	FLORENCE BOULEVARD & CENTER AVENUE	2022 or later		CONSTRUCT 3,100 LF OF 6-INCH DI AND 300 LF OF 12-INCH WATER MAIN TO REPLACE 3,400 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 56 SERVICE CONNECTIONS, REPLACE 56 METERS AND REPLACE 2 FIRE HYDRANTS ON EIGHTH STREET, NINTH STREET, TENTH STREET, FLORENCE BOULEVARD, CENTER AVENUE AND WALNUT AVENUE.
52	343	3,900 800	6 12	DI	$89.7564 $147.4563		$468,015	FLORENCE BOULEVARD & OLIVE AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 800 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,300 LF OF 2-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 4 FIRE HYDRANTS ON EIGHTH STREET, NINTH STREET, TENTH STREET, PICACHO AVENUE, OLIVE AVENUE AND FLORENCE BOULEVARD.
53	343	1,800 1,100	6 12	C-900	$83.0206 $140.4982		$303,985	3RD STREET & HARDING AVENUE	2022 or later		CONSTRUCT 1,800 LF OF 6-INCH C-900 AND 1,100 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,200 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 59 SERVICE CONNECTIONS, REPLACE 59 METERS AND REPLACE 2 FIRE HYDRANTS ON HARDING AVENUE, COOLIDGE AVENUE, 3RD STREET, 1ST STREET AND MAIN STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
54	343	4,900 500	6 12	C-900	$83.3308 $141.0220		$478,832	ARIZONA BOULEVARD & RAYMOND STREET	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH C-900 AND 500 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,300 LF OF 4-INCH CA, 6-INCH CA, 2-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 5 FIRE HYDRANTS ON 8TH PLACE, 7TH PLACE, 6TH PLACE, ARIZONA BOULEVARD, RAYMOND STREET AND KENWORTHY PLACE.
55	343	2,000 2,000	6 12	C-900	$83.1450 $140.7065		$447,703	NORTHERN AVENUE & 8TH STREET	2022 or later		CONSTRUCT 2,000 LF OF 6-INCH C-900 AND 2,000 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 5,300 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 44 SERVICE CONNECTIONS, REPLACE 44 METERS AND REPLACE 3 FIRE HYDRANTS ON NORTHERN AVENUE, PIMA AVENUE, 8TH STREET AND 7TH STREET.
56	343	1,300 2,000	6 12	C-900	$83.2385 $140.8640		$389,938	ARIZONA BOULEVARD & NORTHERN AVENUE	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH C-900 AND 2,000 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,200 LF OF 4-INCH CA, 6-INCH CA,8-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 50 SERVICE CONNECTIONS, REPLACE 50 METERS AND REPLACE 5 FIRE HYDRANTS ON NORTHERN AVENUE, PIMA AVENUE, 8TH STREET, 6TH STREET AND ARIZONA BOULEVARD.
57	343	4,200 800	6 12	C-900	$83.2288 $140.8488		$462,240	PINKLEY AVENUE & 7TH STREET	2022 or later		CONSTRUCT 4,200 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,700 LF OF 4-INCH CA, 6-INCH CA, 12-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON PINKLEY AVENUE, CENTRAL AVENUE, 8TH STREET AND 7TH STREET.
58	343	2,600 800	6 12	C-900	$83.1427 $140.7038		$328,734	PINKLEY AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,000 LF OF 4-INCH CA WATER MAIN, REPLACE 69 SERVICE CONNECTIONS, REPLACE 69 METERS AND REPLACE 4 FIRE HYDRANTS ON PINKLEY AVENUE, CENTRAL AVENUE AND ARIZONA BOULEVARD.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
59	343	4,100 400	6 12	C-900	$83.0637 $140.5675		$396,788	ROOSEVELT AVENUE & 7TH STREET	2022 or later		CONSTRUCT 4,100 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,400 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 4 FIRE HYDRANTS ON ROOSEVELT AVENUE, WILSON AVENUE, 8TH STREET AND 7TH STREET.
60	343	2,600 400	6 12	C-900	$83.1492 $140.7150		$272,474	ROOSEVELT AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 1,900 LF OF 4-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON ROOSEVELT AVENUE, WILSON AVENUE, 6TH STREET AND ARIZONA BOULEVARD.
61	343	1,900 1,400	6 12	C-900	$83.2174 $140.8293		$355,274	HARDING AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 1,900 LF OF 6-INCH C-900 AND 1,400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON WILSON PLACE, COOLIDGE PLACE, HARDING AVENUE, COOLIDGE AVENUE AND ARIZONA BOULEVARD.
62	343	2,300 400	24 36	DI	$320.1757 $896.4900		$1,095,000	INTERSTATE 8 & PEART ROAD	2022 or later		CONSTRUCT 2,300 LF OF 24-INCH DI AND 400 LF OF 36-INCH DI WATER MAIN TO REPLACE 2,700 LF OF 24-INCH AND 36-INCH AMERON WATER MAIN FROM INTERSTATE 8 NORTH ON PEART ROAD.
63	343	3,100	24	DI	$320.0000		$992,000	PEART ROAD & SELMA HIGHWAY	2022 or later		CONSTRUCT 3,100 LF OF 24-INCH DI WATER MAIN TO REPLACE 3,100 LF OF 24-INCH AMERON WATER MAIN ON PEART ROAD NORTH TO SELMA HIGHWAY.
						Estimated Total Cost	$31,146,570				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
1	345	75 2	1-inch 2-inch	Copper	$3,198.0800 $7,675.5000		$255,207	FLORENCE STREET & BEECH AVENUE	2018	Start design in 2017 and construction in 2018	CONSTRUCT 3,000 LF OF 6-INCH DI, 1,700 LF OF 8-INCH DI AND 500 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,900 LF OF 3-INCH CA AND 4-INCH CA WATER MAIN, REPLACE 77 SERVICE CONNECTIONS, REPLACE 77 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE STREET, ASH AVENUE, BEECH AVE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.
2	345	52	1-inch	Copper	$3,201.3077		$166,468	FLORENCE STREET & CEDAR AVENUE	2019	Start design in 2018 and construction in 2019	CONSTRUCT 3,900 LF OF 6-INCH DI AND 700 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,800 LF OF 2-INCH CA, 3-INCH CA, AND 4-INCH CA WATER MAIN, REPLACE 52 SERVICE CONNECTIONS, REPLACE 52 METERS AND REPLACE 3 FIRE HYDRANTS ON FLORENCE STREET, CEDAR AVENUE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.
3	345	51	1-inch	Copper	$3,202.2157		$163,313	FLORENCE STREET & ELM AVENUE	2020	Start design in 2019 and construction in 2020	CONSTRUCT 4,000 LF OF 6-INCH DI AND 200 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,000 LF OF 2-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS AND REPLACE 51 METERS ON FLORENCE STREET, DATE AVENUE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.
4	345	67 10	1-inch 2-inch	Copper	$3,202.4179 $7,685.8000		$291,420	FIRST STREET & PINAL AVENUE	2022 or later		CONSTRUCT 3,800 LF OF 6-INCH DI, 1,300 LF OF 8-INCH DI AND 400 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,900 LF OF 2-INCH STL, 4-INCH CI, 6-INCH CA AND 8-INCH CI WATER MAIN, REPLACE 77 SERVICE CONNECTIONS, REPLACE 77 METERS AND REPLACE 6 FIRE HYDRANTS ON FIRST STREET, SECOND STREET, THIRD STREET AND PINAL AVENUE.
5	345	68 4	1-inch 2-inch	Copper	$3,202.4412 $7,685.7500		$248,509	FOURTH STREET & CASA GRANDE AVENUE	2022 or later		CONSTRUCT 3,700 LF OF 6-INCH DI, 400 LF OF 8-INCH DI AND 900 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,700 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 72 SERVICE CONNECTIONS, REPLACE 72 METERS AND REPLACE 3 FIRE HYDRANTS ON THIRD STREET, FOURTH STREET AND FIFTH STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
6	345	70 6	1-inch 2-inch	Copper	$3,197.0571 $7,673.0000		$269,832	FIRST STREET & CASA GRANDE AVENUE	2022 or later		CONSTRUCT 2,100 LF OF 6-INCH DI AND 2,900 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,100 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CI WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 6 FIRE HYDRANTS ON FIRST STREET, SECOND STREET AND CASA GRANDE AVENUE.
7	345	49 2	1-inch 2-inch	Copper	$3,201.4898 $7,683.5000		$172,240	SIXTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI, 300 LF OF 8-INCH DI AND 2,900 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,700 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 3 FIRE HYDRANTS ON FLORENCE BOULEVARD AND SIXTH STREET.
8	345	127	1-inch	Copper	$3,202.2283		$406,683	FOURTH STREET & BROWN AVENUE	2022 or later		CONSTRUCT 5,100 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,200 LF OF 2-INCH CA, 2-INCH PVC, 3-INCH CA, 4-INCH CI, 4-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 127 SERVICE CONNECTIONS, REPLACE 127 METERS AND REPACE 2 FIRE HYDRANTS ON CAMERON AVENUE, MORRISON AVENUE, LINCOLN AVENUE AND FOURTH STREET.
9	345	104	1-inch	Copper	$3,198.0385		$332,596	SECOND STREET & TREKELL ROAD	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH DI AND 1,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 6,900 LF OF 2-INCH CA, 4-INCH CA, 6-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 104 SERVICE CONNECTIONS, REPLACE 104 METERS AND REPLACE 5 FIRE HYDRANTS ON ROOSEVELT AVENUE, COOLIDGE AVENUE, SECOND STREET AND TREKELL ROAD.
10	345	51	1-inch	Copper	$3,200.5294		$163,227	SECOND STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI TO REPLACE 5,100 LF OF 2-INCH CA, 3-INCH CA, 4-INCH CI, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 2 FIRE HYDRANTS ON FIRST STREET, SECOND STREET, THIRD STREET, CAMERON AVENUE, MORRISON AVENUE AND BROWN AVENUE.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
11	345	58	1-inch	Copper	$3,196.7069		$185,409	SECOND STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 3,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 4,200 LF OF 2-INCH CI, 4-INCH CI, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 58 SERVICE CONNECTIONS, REPLACE 58 METERS AND REPLACE 3 FIRE HYDRANTS ON CAMERON AVENUE, MORRISON AVENUE, BROWN AVENUE AND FIRST STREET.
12	345	79 2	1-inch 2-inch	Copper	$3,198.5063 $7,676.5000		$268,035	SIXTH STREET & AMARILLO AVENUE	2022 or later		CONSTRUCT 3,100 LF OF 6-INCH DI AND 1,800 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,400 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 10-INCH CA WATER MAIN, REPLACE 81 SERVICE CONNECTIONS, REPLACE 81 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE BOULEVARD, PUEBLO DRIVE, TREKELL ROAD, LOVE STREET, SIXTH STREET AND AMARILLO STREET.
13	345	102 2	1-inch 2-inch	Copper	$3,201.3627 $7,683.5000		$341,906	TREKELL ROAD & FOURTH STREET	2022 or later		CONSTRUCT 4,300 LF OF 6-INCH DI AND 800 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,400 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 10-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 104 SERVICE CONNECTIONS, REPLACE 104 METERS AND REPLACE 4 FIRE HYDRANTS ON FOURTH STREET, FIFTH STREET, AMARILLO STREET, TREKELL ROAD AND PUEBLO DRIVE.
14	345	84 1	1-inch 2-inch	Copper	$3,195.8571 $7,670.0000		$276,122	TREKELL ROAD & SECOND STREET	2022 or later		CONSTRUCT 4,100 LF OF 6-INCH DI AND 700 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,100 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 85 SERVICE CONNECTIONS, REPLACE 85 METERS AND REPLACE 3 FIRE HYDRANTS ON SECOND STREET, THIRD STREET, AMARILLO STREET, PUEBLO DRIVE AND TREKELL ROAD.
15	345	75	1-inch	Copper	$3,201.7067		$240,128	PINAL AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 2,200 LF OF 6-INCH DI, 300 LF OF 8-INCH DI AND 1,500 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,000 LF OF 2-INCH CA, 3-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 75 SERVICE CONNECTIONS, REPLACE 75 METERS AND REPLACE 3 FIRE HYDRANTS ON PINAL AVENUE, ARBOR AVENUE, ELEVENTH STREET, THIRTEEN STREET AND McMURRAY BOULEVARD.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
16	345	76	1-inch	Copper	$3,199.8289		$243,187	PARK AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 4,700 LF OF 6-INCH DI AND 800 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,600 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 2 FIRE HYDRANTS ON ELEVENTH STREET, THIRTEEN STREET, McMURRAY BOULEVARD, PARK AVENUE AND CENTER AVENUE.
17	345	50	1-inch	Copper	$3,197.7400		$159,887	OLIVE AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 3,600 LF 6-INCH DI AND 2,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,500 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 50 SERVICE CONNECTIONS, REPLACE 50 METERS AND REPLACE 3 FIRE HYDRANTS ON TENTH STREET, ORANGE DRIVE, WALNUT DRIVE , DATE DRIVE AND OLIVE AVENUE.
18	345	34 1	1-inch 2-inch	Copper	$3,201.3529 $7,683.0000		$116,529	PINAL AVENUE & FLORENCE BOULEVARD	2022 or later		CONSTRUCT 2,100 LF OF 6-INCH DI AND 1,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 35 SERVICE CONNECTIONS, REPLACE 35 METERS AND REPLACE 2 FIRE HYDRANTS ON EIGHT STREET, NINTH STREET, TENTH STREET, FLORENCE BOULEVARD, ARBOR AVENUE AND PINAL AVENUE.
19	345	60	1-inch	Copper	$3,205.0167		$192,301	NINTH STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 5,400 LF OF 6-INCH DI WATER MAIN TO REPLACE 5,100 LF OF 2-INCH CA, 3-INCH CA, 4-INCH CA, 4-INCH CI, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 60 SERVICE CONNECTIONS, REPLACE 60 METERS AND REPLACE 5 FIRE HYDRANTS ON NINTH STREET, TENTH STREET, CAMERON AVENUE, MORRISON AVENUE, BROWN AVENUE AND KADOTA AVENUE.
20	345	69	1-inch	Copper	$3,196.1159		$220,532	NINTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 4,300 LF OF 6-INCH DI AND 1,000 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 69 SERVICE CONNECTIONS, REPLACE 69 METERS AND REPLACE 3 FIRE HYDRANTS ON TREKELL ROAD, COOLIDGE AVENUE, GILBERT AVENUE, LEHMBERG AVENUE, EIGHTH STREET AND NINTH STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
21	345	76	1-inch	Copper	$3,200.1447		$243,211	ELEVENTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 3,200 LF OF 6-INCH DI, 600 LF OF 8-INCH DI AND 1,300 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 2 FIRE HYDRANTS ON TREKELL ROAD, COOLIDGE AVENUE, GILBERT AVENUE, MCMURRAY BOULEVARD AND ELEVENTH STREET.
22	345	31	1-inch	Copper	$3,197.4839		$99,122	SAGUARO STREET	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 2-INCH PVC WATER MAIN, REPLACE 31 SERVICE CONNECTIONS AND REPLACE 31 METERS IN CUL-DE-SACS ON SAGUARO STREET.
23	345	94	1-inch	Copper	$3,203.4255		$301,122	MORRISON AVENUE & MANOR DRIVE	2022 or later		CONSTRUCT 3,200 LF OF 6-INCH DI WATER MAIN TO REPLACE 5,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 94 SERVICE CONNECTIONS, REPLACE 94 METERS AND REPLACE 3 FIRE HYDRANTS ON MORRISON AVENUE AND MANOR DRIVE.
24	345	55	1-inch	Copper	$3,203.4182		$176,188	LAUREL DRIVE & KADOTA AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 3,400 LF OF 3-INCH CA, 4-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 55 SERVICE CONNECTIONS, REPLACE 55 METERS AND REPLACE 4 FIRE HYDRANTS ON LAUREL DRIVE, MCMURRAY BOULEVARD, CAMERON AVENUE, BROWN AVENUE, MORRISON AVENUE AND KADOTA AVENUE.
25	345	136	1-inch	Copper	$3,197.1250		$434,809	FRENCH STREET & OCOTILLA STREET	2022 or later		CONSTRUCT 5,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 4,700 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 136 SERVICE CONNECTIONS, REPLACE 136 METERS AND REPLACE 4 FIRE HYDRANTS ON OCOTILLA STREET, MELROSE DRIVE AND FRENCH STREET.
26	345	94	1-inch	Copper	$3,201.1383		$300,907	FIRST STREET & ALTA AVENUE	2022 or later		CONSTRUCT 3,700 LF OF 6-INCH DI, 1,400 LF OF 8-INCH DI AND 600 LF OF 12-INCH DI WATER MAIN TO REPLACE 5,600 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA AND 8-INCH DI WATER MAIN, REPLACE 94 SERVICE CONNECTIONS, REPLACE 94 METERS AND REPLACE 4 FIRE HYDRANTS ON FIRST STREET, DOAN STREET, TREKELL ROAD, ALTA AVENUE, AMARILLO STREET, VISTA AVENUE AND PUEBLO DRIVE.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	
27	345	88	1-inch	Copper	$3,204.8750		$282,029	COLORADO STREET & AVILA AVENUE	2022 or later		CONSTRUCT 2,500 LF OF 6-INCH DI AND 600 LF OF 8-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 88 SERVICE CONNECTIONS, REPLACE 88 METERS AND REPLACE 5 FIRE HYDRANTS ON RODEO ROAD, AVILA AVENUE, BARCELONA AVENUE AND COLORADO STREET.
28	345	35	1-inch	Copper	$3,209.0517		$112,317	SCOTT DRIVE & HAVASUPAI DRIVE	2022 or later		CONSTRUCT 3,200 LF OF 6-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 2-INCH PVC WATER MAIN, REPLACE 35 SERVICE CONNECTIONS AND REPLACE 35 METERS ON HAVASUPAI DRIVE, MASCALERO DRIVE AND CALGARY DRIVE.
29	345	12	1-inch	Copper	$3,208.7500		$38,505	MCCARTNEY ROAD & EVANS ROAD	2022 or later		CONSTRUCT 2,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 2,300 LF OF 1-INCH PVC AND 2-INCH PVC WATER MAIN, REPLACE 12 SERVICE CONNECTIONS AND REPLACE 12 METERS ALONG EVANS ROAD SOUTH OF MCCARTNEY ROAD.
30	345	92	1-inch	Copper	$3,202.1630		$294,599	COLORADO STREET & CORDOVA AVENUE	2022 or later		CONSTRUCT 4,000 LF OF 6-INCH DI AND 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,900 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 92 SERVICE CONNECTIONS AND REPLACE 92 METERS ON CORDOVA AVENUE, DELANO DRIVE, BLANCO DRIVE, AVENIDA ELLENA AND COLORADO STREET.
31	345	38	1-inch	Copper	$3,200.6053		$121,623	CARMICHAEL STREET & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 2,800 LF OF 6-INCH C-900, 800 LF OF 8-INCH C-900 AND 1,200 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 550 LF OF 2-INCH PVC, 2-INCH GS, 6-INCH PVC AND 6-INCH CA WATER MAIN, REPLACE 38 SERVICE CONNECTIONS AND REPLACE 38 METERS ON CARMICHAEL STREET, BATEMAN STREET, ARIZONA BOULEVARD AND HUDSON ROAD.
32	345	97	1-inch	Copper	$3,203.7216		$310,761	ARIZONA BOULEVARD & VAH KI INN	2017	Start design in 2017 and construction in 2017	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 2,500 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 7,200 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA, 12-INCH CA, 4-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 97 SERVICE CONNECTIONS, REPLACE 97 METERS AND REPLACE 7 FIRE HYDRANTS ON VAH KI INN, HESS AVENUE, ARIZONA BOULEVARD, 4TH STREET AND 3RD STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
33	345	102	1-inch	Copper	$3,202.4020		$326,645	ARIZONA BOULEVARD & WALTON AVENUE	2019	Start design in 2018 and construction in 2019	CONSTRUCT 5,100 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 7,000 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 102 SERVICE CONNECTIONS, REPLACE 102 METERS AND REPLACE 5 FIRE HYDRANTS ON WALTON AVENUE, BEALY AVENUE, ARIZONA BOULEVARD, 4TH STREET AND 3RD STREET.
34	345	59	1-inch	Copper	$3,199.3220		$188,760	ARIZONA BOULEVARD & KENNEDY AVENUE	2020	Start design in 2019 and construction in 2020	CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,400 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 59 SERVICE CONNECTIONS, REPLACE 59 METERS AND REPLACE 3 FIRE HYDRANTS ON KENNEDY AVENUE, ARIZONA BOULEVARD,4TH STREET, 3RD STREET AND MAIN STREET.
35	345	65 1	1-inch 2-inch	Copper	$3,199.6462 $7,679.0000		$215,656	ARIZONA BOULEVARD & BYRD AVENUE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,900 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 8-INCH PVC WATER MAIN, REPLACE 66 SERVICE CONNECTIONS, REPLACE 66 METERS AND REPLACE 3 FIRE HYDRANTS ON BYRD AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
36	345	70	1-inch	Copper	$3,200.0857		$224,006	ARIZONA BOULEVARD & LINDBERGH AVENUE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 70 SERVICE CONNECTIONS, REPLACE 70 METERS AND REPLACE 3 FIRE HYDRANTS ON LINDBERGH AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
37	345	45 1	1-inch 2-inch	Copper	$3,204.5778 $7,691.00		$151,897	ARIZONA BOULEVARD & NORTHERN AVENUE	2022 or later		CONSTRUCT 900 LF OF 6-INCH C-900 AND 2,600 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,700 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 46 SERVICE CONNECTIONS, REPLACE 46 METERS AND REPLACE 3 FIRE HYDRANTS ON NORTHERN AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
38	345	90	1-inch	Copper	$3,199.9667		$287,997	ARIZONA BOULEVARD & PIMA AVENUE	2022 or later		CONSTRUCT 5,500 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,800 LF OF 4-INCH CA, 6-INCH CA, 4-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 90 SERVICE CONNECTIONS, REPLACE 90 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, PIMA AVENUE, PINKLEY AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
39	345	107 4	1-inch 2-inch	Copper	$3,201.3271 $7,683.2500		$373,275	ARIZONA BOULEVARD & CENTRAL AVENUE	2022 or later		CONSTRUCT 6,300 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,500 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 111 SERVICE CONNECTIONS, REPLACE 111 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, CENTRAL AVENUE, ROOSEVELT AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
40	345	66	1-inch	Copper	$3,198.8182		$211,122	ARIZONA BOULEVARD & WILSON AVENUE	2022 or later		CONSTRUCT 4,700 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 5,900 LF OF 4-INCH CA, 6-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 66 SERVICE CONNECTIONS, REPLACE 66 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, WILSON AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
41	345	74 1	1-inch 2-inch	Copper	$3,199.7432 $7,679.0000		$244,460	ARIZONA BOULEVARD & HARDING AVENUE	2022 or later		CONSTRUCT 1,900 LF OF 6-INCH C-900 AND 1,700 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 1,700 LF OF 4-INCH CA WATER MAIN, REPLACE 75 SERVICE CONNECTIONS, REPLACE 75 METERS AND REPLACE 3 FIRE HYDRANTS ON ARIZONA BOULEVARD, HARDING AVENUE, COOLIDGE AVENUE, 4TH STREET AND 3RD STREET.
42	345	NA									
43	345	NA									
44	345	4 7	1-inch 2-inch	Copper	$3,199.7500 $7,679.5714		$66,556	PEART ROAD & DOAN STREET	2022 or later		CONSTRUCT 5,200 LF OF 24-INCH DI WATER MAIN TO REPLACE 5,200 LF OF 24-INCH AMERON WATER MAIN, REPLACE 11 SERVICE CONNECTIONS, AND REPLACE 11 METERS ON PEART ROAD FROM EARLY ROAD NORTH TO FLORENCE BOULEVARD.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
45	345	2 5	1-inch 2-inch	Copper	$3,197.5000 $7,674.4000		$44,767	FLORENCE BOULEVARD & ARIZOLA ROAD	2022 or later		CONSTRUCT 2,800 LF OF 24-INCH DI WATER MAIN TO REPLACE 2,800 LF OF 24-INCH AMERON WATER MAIN, REPLACE 7 SERVICE CONNECTIONS AND REPLACE 7 METERS ON FLORENCE BOULEVARD FROM ARIZOLA ROAD TO HENNESS ROAD.
46	345	2	1-inch	Copper	$3,259.0000		$6,518	CASA GRANDE AVENUE & RODEO ROAD	2022 or later		CONSTRUCT 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 500 LF OF 6-INCH CA WATER MAIN, REPLACE 2 SERVICE CONNECTIONS AND REPLACE 2 METERS ON CASA GRANDE AVENUE BETWEEN RODEO ROAD AND HORSESHOE CIRCLE.
47	345	80 1	1-inch 2-inch	Copper	$3,200.3250 $7,681.0000		$263,707	ELEVENTH STREET & BROWN AVENUE	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH DI AND 700 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,800 LF OF 2-INCH CA, 4-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 81 SERVICE CONNECTIONS, REPLACE 81 METERS AND REPLACE 3 FIRE HYDRANTS ON BROWN AVENUE, KADOTA AVENUE, LEHMBERG AVENUE, ELEVENTH STREET AND MCMURRAY BOULEVARD.
50	345	64 1	1-inch 2-inch	Copper	$3,201.9688 $7,685.0000		$212,611	PARK AVENUE & FLORENCE BOULEVARD	2022 or later		CONSTRUCT 3,600 LF OF 6-INCH DI AND 900 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,700 LF OF 1-INCH PVC, 4-INCH CA, 6-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 65 SERVICE CONNECTIONS, REPLACE 65 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE BOULEVARD, EIGHTH STREET, NINTH STREET, TENTH STREET AND PARK AVENUE.
51	345	56	1-inch	Copper	$3,202.2500		$179,326	FLORENCE BOULEVARD & CENTER AVENUE	2022 or later		CONSTRUCT 3,100 LF OF 6-INCH DI AND 300 LF OF 12-INCH WATER MAIN TO REPLACE 3,400 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 56 SERVICE CONNECTIONS, REPLACE 56 METERS AND REPLACE 2 FIRE HYDRANTS ON EIGHTH STREET, NINTH STREET, TENTH STREET, FLORENCE BOULEVARD, CENTER AVENUE AND WALNUT AVENUE.
52	345	51	1-inch	Copper	$3,205.5686		$163,484	FLORENCE BOULEVARD & OLIVE AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 800 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,300 LF OF 2-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 4 FIRE HYDRANTS ON EIGHTH STREET, NINTH STREET, TENTH STREET, PICACHO AVENUE, OLIVE AVENUE AND FLORENCE BOULEVARD.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
53	345	59	1-inch	Copper	$3,193.1356		$188,395	3RD STREET & HARDING AVENUE	2022 or later		CONSTRUCT 1,800 LF OF 6-INCH C-900 AND 1,100 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,200 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 59 SERVICE CONNECTIONS, REPLACE 59 METERS AND REPLACE 2 FIRE HYDRANTS ON HARDING AVENUE, COOLIDGE AVENUE, 3RD STREET, 1ST STREET AND MAIN STREET.
54	345	72 4	1-inch 2-inch	Copper	$3,205.0278 $7,692.0000		$261,530	ARIZONA BOULEVARD & RAYMOND STREET	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH C-900 AND 500 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,300 LF OF 4-INCH CA, 6-INCH CA, 2-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 5 FIRE HYDRANTS ON 8TH PLACE, 7TH PLACE, 6TH PLACE, ARIZONA BOULEVARD, RAYMOND STREET AND KENWORTHY PLACE.
55	345	44	1-inch	Copper	$3,197.8636		$140,706	NORTHERN AVENUE & 8TH STREET	2022 or later		CONSTRUCT 2,000 LF OF 6-INCH C-900 AND 2,000 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 5,300 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 44 SERVICE CONNECTIONS, REPLACE 44 METERS AND REPLACE 3 FIRE HYDRANTS ON NORTHERN AVENUE, PIMA AVENUE, 8TH STREET AND 7TH STREET.
56	345	50	1-inch	Copper	$3,201.4600		$160,073	ARIZONA BOULEVARD & NORTHERN AVENUE	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH C-900 AND 2,000 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,200 LF OF 4-INCH CA, 6-INCH CA,8-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 50 SERVICE CONNECTIONS, REPLACE 50 METERS AND REPLACE 5 FIRE HYDRANTS ON NORTHERN AVENUE, PIMA AVENUE, 8TH STREET, 6TH STREET AND ARIZONA BOULEVARD.
57	345	61	1-inch	Copper	$3,201.0984		$195,267	PINKLEY AVENUE & 7TH STREET	2022 or later		CONSTRUCT 4,200 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,700 LF OF 4-INCH CA, 6-INCH CA, 12-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON PINKLEY AVENUE, CENTRAL AVENUE, 8TH STREET AND 7TH STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
58	345	69	1-inch	Copper	$3,197.8116		$220,649	PINKLEY AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,000 LF OF 4-INCH CA WATER MAIN, REPLACE 69 SERVICE CONNECTIONS, REPLACE 69 METERS AND REPLACE 4 FIRE HYDRANTS ON PINKLEY AVENUE, CENTRAL AVENUE AND ARIZONA BOULEVARD.
59	345	49 2	1-inch 2-inch	Copper	$3,194.7347 $7,665.5000		$171,877	ROOSEVELT AVENUE & 7TH STREET	2022 or later		CONSTRUCT 4,100 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,400 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 4 FIRE HYDRANTS ON ROOSEVELT AVENUE, WILSON AVENUE, 8TH STREET AND 7TH STREET.
60	345	61	1-inch	Copper	$3,198.0656		$195,082	ROOSEVELT AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 1,900 LF OF 4-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON ROOSEVELT AVENUE, WILSON AVENUE, 6TH STREET AND ARIZONA BOULEVARD.
61	345	61	1-inch	Copper	$3,200.6557		$195,240	HARDING AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 1,900 LF OF 6-INCH C-900 AND 1,400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON WILSON PLACE, COOLIDGE PLACE, HARDING AVENUE, COOLIDGE AVENUE AND ARIZONA BOULEVARD.
62	345	NA									
63	345	NA									
						Estimated Total Cost	$12,318,330				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
1	346	75 2	1-inch and smaller 2-inch	$402.9600 $2,417.5000		$35,057	FLORENCE STREET & BEECH AVENUE	2018	Start design in 2017 and construction in 2018	CONSTRUCT 3,000 LF OF 6-INCH DI, 1,700 LF OF 8-INCH DI AND 500 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,900 LF OF 3-INCH CA AND 4-INCH CA WATER MAIN, REPLACE 77 SERVICE CONNECTIONS, REPLACE 77 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE STREET, ASH AVENUE, BEECH AVE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.
2	346	52	1-inch and smaller	$403.3654		$20,975	FLORENCE STREET & CEDAR AVENUE	2019	Start design in 2018 and construction in 2019	CONSTRUCT 3,900 LF OF 6-INCH DI AND 700 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,800 LF OF 2-INCH CA, 3-INCH CA, AND 4-INCH CA WATER MAIN, REPLACE 52 SERVICE CONNECTIONS, REPLACE 52 METERS AND REPLACE 3 FIRE HYDRANTS ON FLORENCE STREET, CEDAR AVENUE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.
3	346	51	1-inch and smaller	$403.4706		$20,577	FLORENCE STREET & ELM AVENUE	2020	Start design in 2019 and construction in 2020	CONSTRUCT 4,000 LF OF 6-INCH DI AND 200 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,000 LF OF 2-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS AND REPLACE 51 METERS ON FLORENCE STREET, DATE AVENUE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.
4	346	67 10	1-inch and smaller 2-inch	$403.5075 $2,421.0000		$51,245	FIRST STREET & PINAL AVENUE	2022 or later		CONSTRUCT 3,800 LF OF 6-INCH DI, 1,300 LF OF 8-INCH DI AND 400 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,900 LF OF 2-INCH STL, 4-INCH CI, 6-INCH CA AND 8-INCH CI WATER MAIN, REPLACE 77 SERVICE CONNECTIONS, REPLACE 77 METERS AND REPLACE 6 FIRE HYDRANTS ON FIRST STREET, SECOND STREET, THIRD STREET AND PINAL AVENUE.
5	346	68 4	1-inch and smaller 2-inch	$403.5000 $2,421.0000		$37,122	FOURTH STREET & CASA GRANDE AVENUE	2022 or later		CONSTRUCT 3,700 LF OF 6-INCH DI, 400 LF OF 8-INCH DI AND 900 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,700 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 72 SERVICE CONNECTIONS, REPLACE 72 METERS AND REPLACE 3 FIRE HYDRANTS ON THIRD STREET, FOURTH STREET AND FIFTH STREET.
6	346	70 6	1-inch and smaller 2-inch	$402.8286 $2,417.0000		$42,700	FIRST STREET & CASA GRANDE AVENUE	2022 or later		CONSTRUCT 2,100 LF OF 6-INCH DI AND 2,900 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,100 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CI WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 6 FIRE HYDRANTS ON FIRST STREET, SECOND STREET AND CASA GRANDE AVENUE.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
7	346	49 2	1-inch and smaller 2-inch	$403.3878 $2,420.5000		$24,607	SIXTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI, 300 LF OF 8-INCH DI AND 2,900 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,700 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 3 FIRE HYDRANTS ON FLORENCE BOULEVARD AND SIXTH STREET.
8	346	127	1-inch and smaller	$403.4803		$51,242	FOURTH STREET & BROWN AVENUE	2022 or later		CONSTRUCT 5,100 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,200 LF OF 2-INCH CA, 2-INCH PVC, 3-INCH CA, 4-INCH CI, 4-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 127 SERVICE CONNECTIONS, REPLACE 127 METERS AND REPACE 2 FIRE HYDRANTS ON CAMERON AVENUE, MORRISON AVENUE, LINCOLN AVENUE AND FOURTH STREET.
9	346	104	1-inch and smaller	$402.9519		$41,907	SECOND STREET & TREKELL ROAD	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH DI AND 1,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 6,900 LF OF 2-INCH CA, 4-INCH CA, 6-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 104 SERVICE CONNECTIONS, REPLACE 104 METERS AND REPLACE 5 FIRE HYDRANTS ON ROOSEVELT AVENUE, COOLIDGE AVENUE, SECOND STREET AND TREKELL ROAD.
10	346	51	1-inch and smaller	$403.2745		$20,567	SECOND STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI TO REPLACE 5,100 LF OF 2-INCH CA, 3-INCH CA, 4-INCH CI, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 2 FIRE HYDRANTS ON FIRST STREET, SECOND STREET, THIRD STREET, CAMERON AVENUE, MORRISON AVENUE AND BROWN AVENUE.
11	346	58	1-inch and smaller	$402.7931		$23,362	SECOND STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 3,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 4,200 LF OF 2-INCH CI, 4-INCH CI, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 58 SERVICE CONNECTIONS, REPLACE 58 METERS AND REPLACE 3 FIRE HYDRANTS ON CAMERON AVENUE, MORRISON AVENUE, BROWN AVENUE AND FIRST STREET.
12	346	79 2	1-inch and smaller 2-inch	$403.0127 $2,418.0000		$36,674	SIXTH STREET & AMARILLO AVENUE	2022 or later		CONSTRUCT 3,100 LF OF 6-INCH DI AND 1,800 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,400 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 10-INCH CA WATER MAIN, REPLACE 81 SERVICE CONNECTIONS, REPLACE 81 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE BOULEVARD, PUEBLO DRIVE, TREKELL ROAD, LOVE STREET, SIXTH STREET AND AMARILLO STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
13	346	102 2	1-inch and smaller 2-inch	$403.3725 $2,420.0000		$45,984	TREKELL ROAD & FOURTH STREET	2022 or later		CONSTRUCT 4,300 LF OF 6-INCH DI AND 800 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,400 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 10-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 104 SERVICE CONNECTIONS, REPLACE 104 METERS AND REPLACE 4 FIRE HYDRANTS ON FOURTH STREET, FIFTH STREET, AMARILLO STREET, TREKELL ROAD AND PUEBLO DRIVE.
14	346	84 1	1-inch and smaller 2-inch	$402.6786 $2,416.0000		$36,241	TREKELL ROAD & SECOND STREET	2022 or later		CONSTRUCT 4,100 LF OF 6-INCH DI AND 700 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,100 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 85 SERVICE CONNECTIONS, REPLACE 85 METERS AND REPLACE 3 FIRE HYDRANTS ON SECOND STREET, THIRD STREET, AMARILLO STREET, PUEBLO DRIVE AND TREKELL ROAD.
15	346	75	1-inch and smaller	$403.4133		$30,256	PINAL AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 2,200 LF OF 6-INCH DI, 300 LF OF 8-INCH DI AND 1,500 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,000 LF OF 2-INCH CA, 3-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 75 SERVICE CONNECTIONS, REPLACE 75 METERS AND REPLACE 3 FIRE HYDRANTS ON PINAL AVENUE, ARBOR AVENUE, ELEVENTH STREET, THIRTEEN STREET AND McMURRAY BOULEVARD.
16	346	76	1-inch and smaller	$403.1842		$30,642	PARK AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 4,700 LF OF 6-INCH DI AND 800 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,600 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 2 FIRE HYDRANTS ON ELEVENTH STREET, THIRTEEN STREET, McMURRAY BOULEVARD, PARK AVENUE AND CENTER AVENUE.
17	346	50	1-inch and smaller	$402.9200		$20,146	OLIVE AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 3,600 LF 6-INCH DI AND 2,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,500 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 50 SERVICE CONNECTIONS, REPLACE 50 METERS AND REPLACE 3 FIRE HYDRANTS ON TENTH STREET, ORANGE DRIVE, WALNUT DRIVE , DATE DRIVE AND OLIVE AVENUE.
18	346	34 1	1-inch and smaller 2-inch	$403.3824 $2,420.0000		$16,135	PINAL AVENUE & FLORENCE BOULEVARD	2022 or later		CONSTRUCT 2,100 LF OF 6-INCH DI AND 1,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 35 SERVICE CONNECTIONS, REPLACE 35 METERS AND REPLACE 2 FIRE HYDRANTS ON EIGHT STREET, NINTH STREET, TENTH STREET, FLORENCE BOULEVARD, ARBOR AVENUE AND PINAL AVENUE.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
19	346	60	1-inch and smaller	$403.8333		$24,230	NINTH STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 5,400 LF OF 6-INCH DI WATER MAIN TO REPLACE 5,100 LF OF 2-INCH CA, 3-INCH CA, 4-INCH CA, 4-INCH CI, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 60 SERVICE CONNECTIONS, REPLACE 60 METERS AND REPLACE 5 FIRE HYDRANTS ON NINTH STREET, TENTH STREET, CAMERON AVENUE, MORRISON AVENUE, BROWN AVENUE AND KADOTA AVENUE.
20	346	69	1-inch and smaller	$402.7101		$27,787	NINTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 4,300 LF OF 6-INCH DI AND 1,000 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 69 SERVICE CONNECTIONS, REPLACE 69 METERS AND REPLACE 3 FIRE HYDRANTS ON TREKELL ROAD, COOLIDGE AVENUE, GILBERT AVENUE, LEHMBERG AVENUE, EIGHTH STREET AND NINTH STREET.
21	346	76	1-inch and smaller	$403.2237		$30,645	ELEVENTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 3,200 LF OF 6-INCH DI, 600 LF OF 8-INCH DI AND 1,300 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 2 FIRE HYDRANTS ON TREKELL ROAD, COOLIDGE AVENUE, GILBERT AVENUE, MCMURRAY BOULEVARD AND ELEVENTH STREET.
22	346	31	1-inch and smaller	$402.8710		$12,489	SAGUARO STREET	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 2-INCH PVC WATER MAIN, REPLACE 31 SERVICE CONNECTIONS AND REPLACE 31 METERS IN CUL-DE-SACS ON SAGUARO STREET.
23	346	94	1-inch and smaller	$403.6277		$37,941	MORRISON AVENUE & MANOR DRIVE	2022 or later		CONSTRUCT 3,200 LF OF 6-INCH DI WATER MAIN TO REPLACE 5,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 94 SERVICE CONNECTIONS, REPLACE 94 METERS AND REPLACE 3 FIRE HYDRANTS ON MORRISON AVENUE AND MANOR DRIVE.
24	346	55	1-inch and smaller	$403.6364		$22,200	LAUREL DRIVE & KADOTA AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 3,400 LF OF 3-INCH CA, 4-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 55 SERVICE CONNECTIONS, REPLACE 55 METERS AND REPLACE 4 FIRE HYDRANTS ON LAUREL DRIVE, MCMURRAY BOULEVARD, CAMERON AVENUE, BROWN AVENUE, MORRISON AVENUE AND KADOTA AVENUE.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
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Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
25	346	136	1-inch and smaller	$402.8382		$54,786	FRENCH STREET & OCOTILLA STREET	2022 or later		CONSTRUCT 5,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 4,700 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 136 SERVICE CONNECTIONS, REPLACE 136 METERS AND REPLACE 4 FIRE HYDRANTS ON OCOTILLA STREET, MELROSE DRIVE AND FRENCH STREET.
26	346	94	1-inch and smaller	$403.3404		$37,914	FIRST STREET & ALTA AVENUE	2022 or later		CONSTRUCT 3,700 LF OF 6-INCH DI, 1,400 LF OF 8-INCH DI AND 600 LF OF 12-INCH DI WATER MAIN TO REPLACE 5,600 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA AND 8-INCH DI WATER MAIN, REPLACE 94 SERVICE CONNECTIONS, REPLACE 94 METERS AND REPLACE 4 FIRE HYDRANTS ON FIRST STREET, DOAN STREET, TREKELL ROAD, ALTA AVENUE, AMARILLO STREET, VISTA AVENUE AND PUEBLO DRIVE.
27	346	88	1-inch and smaller	$403.8182		$35,536	COLORADO STREET & AVILA AVENUE	2022 or later		CONSTRUCT 2,500 LF OF 6-INCH DI AND 600 LF OF 8-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 88 SERVICE CONNECTIONS, REPLACE 88 METERS AND REPLACE 5 FIRE HYDRANTS ON RODEO ROAD, AVILA AVENUE, BARCELONA AVENUE AND COLORADO STREET.
28	346	35	1-inch and smaller	$404.3429		$14,152	SCOTT DRIVE & HAVASUPAI DRIVE	2022 or later		CONSTRUCT 3,200 LF OF 6-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 2-INCH PVC WATER MAIN, REPLACE 35 SERVICE CONNECTIONS AND REPLACE 35 METERS ON HAVASUPAI DRIVE, MASCALERO DRIVE AND CALGARY DRIVE.
29	346	12	1-inch and smaller	$404.3333		$4,852	MCCARTNEY ROAD & EVANS ROAD	2022 or later		CONSTRUCT 2,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 2,300 LF OF 1-INCH PVC AND 2-INCH PVC WATER MAIN, REPLACE 12 SERVICE CONNECTIONS AND REPLACE 12 METERS ALONG EVANS ROAD SOUTH OF MCCARTNEY ROAD.
30	346	92	1-inch and smaller	$403.4674		$37,119	COLORADO STREET & CORDOVA AVENUE	2022 or later		CONSTRUCT 4,000 LF OF 6-INCH DI AND 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,900 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 92 SERVICE CONNECTIONS AND REPLACE 92 METERS ON CORDOVA AVENUE, DELANO DRIVE, BLANCO DRIVE, AVENIDA ELLENA AND COLORADO STREET.
31	346	38	1-inch and smaller	$403.2632		$15,324	CARMICHAEL STREET & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 2,800 LF OF 6-INCH C-900, 800 LF OF 8-INCH C-900 AND 1,200 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 550 LF OF 2-INCH PVC, 2-INCH GS, 6-INCH PVC AND 6-INCH CA WATER MAIN, REPLACE 38 SERVICE CONNECTIONS AND REPLACE 38 METERS ON CARMICHAEL STREET, BATEMAN STREET, ARIZONA BOULEVARD AND HUDSON ROAD.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
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Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
32	346	97	1-inch and smaller	$403.6701		$39,156	ARIZONA BOULEVARD & VAH KI INN	2017	Start design in 2017 and construction in 2017	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 2,500 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 7,200 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA, 12-INCH CA, 4-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 97 SERVICE CONNECTIONS, REPLACE 97 METERS AND REPLACE 7 FIRE HYDRANTS ON VAH KI INN, HESS AVENUE, ARIZONA BOULEVARD, 4TH STREET AND 3RD STREET.
33	346	102	1-inch and smaller	$403.5000		$41,157	ARIZONA BOULEVARD & WALTON AVENUE	2019	Start design in 2018 and construction in 2019	CONSTRUCT 5,100 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 7,000 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 102 SERVICE CONNECTIONS, REPLACE 102 METERS AND REPLACE 5 FIRE HYDRANTS ON WALTON AVENUE, BEALY AVENUE, ARIZONA BOULEVARD, 4TH STREET AND 3RD STREET.
34	346	59	1-inch and smaller	$403.1186		$23,784	ARIZONA BOULEVARD & KENNEDY AVENUE	2020	Start design in 2019 and construction in 2020	CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,400 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 59 SERVICE CONNECTIONS, REPLACE 59 METERS AND REPLACE 3 FIRE HYDRANTS ON KENNEDY AVENUE, ARIZONA BOULEVARD,4TH STREET, 3RD STREET AND MAIN STREET.
35	346	65 1	1-inch and smaller 2-inch	$403.1538 $2,419.0000		$28,624	ARIZONA BOULEVARD & BYRD AVENUE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,900 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 8-INCH PVC WATER MAIN, REPLACE 66 SERVICE CONNECTIONS, REPLACE 66 METERS AND REPLACE 3 FIRE HYDRANTS ON BYRD AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
36	346	70	1-inch and smaller	$403.2143		$28,225	ARIZONA BOULEVARD & LINDBERGH AVENUE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 70 SERVICE CONNECTIONS, REPLACE 70 METERS AND REPLACE 3 FIRE HYDRANTS ON LINDBERGH AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
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Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
37	346	45 1	1-inch and smaller 2-inch	$403.7778 $2,423.0000		$20,593	ARIZONA BOULEVARD & NORTHERN AVENUE	2022 or later		CONSTRUCT 900 LF OF 6-INCH C-900 AND 2,600 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,700 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 46 SERVICE CONNECTIONS, REPLACE 46 METERS AND REPLACE 3 FIRE HYDRANTS ON NORTHERN AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
38	346	90	1-inch and smaller	$403.2000		$36,288	ARIZONA BOULEVARD & PIMA AVENUE	2022 or later		CONSTRUCT 5,500 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,800 LF OF 4-INCH CA, 6-INCH CA, 4-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 90 SERVICE CONNECTIONS, REPLACE 90 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, PIMA AVENUE, PINKLEY AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
39	346	107 4	1-inch and smaller 2-inch	$403.3645 $2,420.2500		$52,841	ARIZONA BOULEVARD & CENTRAL AVENUE	2022 or later		CONSTRUCT 6,300 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,500 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 111 SERVICE CONNECTIONS, REPLACE 111 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, CENTRAL AVENUE, ROOSEVELT AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
40	346	66	1-inch and smaller	$403.0455		$26,601	ARIZONA BOULEVARD & WILSON AVENUE	2022 or later		CONSTRUCT 4,700 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 5,900 LF OF 4-INCH CA, 6-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 66 SERVICE CONNECTIONS, REPLACE 66 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, WILSON AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
41	346	74 1	1-inch and smaller 2-inch	$403.1622 $2,419.0000		$32,253	ARIZONA BOULEVARD & HARDING AVENUE	2022 or later		CONSTRUCT 1,900 LF OF 6-INCH C-900 AND 1,700 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 1,700 LF OF 4-INCH CA WATER MAIN, REPLACE 75 SERVICE CONNECTIONS, REPLACE 75 METERS AND REPLACE 3 FIRE HYDRANTS ON ARIZONA BOULEVARD, HARDING AVENUE, COOLIDGE AVENUE, 4TH STREET AND 3RD STREET.
42	346	NA								
43	346	NA								

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Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
44	346	4 7	1-inch and smaller 2-inch	$403.2500 $2,419.0000		$18,546	PEART ROAD & DOAN STREET	2022 or later		CONSTRUCT 5,200 LF OF 24-INCH DI WATER MAIN TO REPLACE 5,200 LF OF 24-INCH AMERON WATER MAIN, REPLACE 11 SERVICE CONNECTIONS, AND REPLACE 11 METERS ON PEART ROAD FROM EARLY ROAD NORTH TO FLORENCE BOULEVARD.
45	346	2 5	1-inch and smaller 2-inch	$403.0000 $2,417.4000		$12,893	FLORENCE BOULEVARD & ARIZOLA ROAD	2022 or later		CONSTRUCT 2,800 LF OF 24-INCH DI WATER MAIN TO REPLACE 2,800 LF OF 24-INCH AMERON WATER MAIN, REPLACE 7 SERVICE CONNECTIONS AND REPLACE 7 METERS ON FLORENCE BOULEVARD FROM ARIZOLA ROAD TO HENNESS ROAD.
46	346	2	1-inch and smaller	$410.5000		$821	CASA GRANDE AVENUE & RODEO ROAD	2022 or later		CONSTRUCT 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 500 LF OF 6-INCH CA WATER MAIN, REPLACE 2 SERVICE CONNECTIONS AND REPLACE 2 METERS ON CASA GRANDE AVENUE BETWEEN RODEO ROAD AND HORSESHOE CIRCLE.
47	346	80 1	1-inch and smaller 2-inch	$403.2375 $2,419.0000		$34,678	ELEVENTH STREET & BROWN AVENUE	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH DI AND 700 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,800 LF OF 2-INCH CA, 4-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 81 SERVICE CONNECTIONS, REPLACE 81 METERS AND REPLACE 3 FIRE HYDRANTS ON BROWN AVENUE, KADOTA AVENUE, LEHMBERG AVENUE, ELEVENTH STREET AND MCMURRAY BOULEVARD.
50	346	64 1	1-inch and smaller 2-inch	$403.4531 $2,421.0000		$28,242	PARK AVENUE & FLORENCE BOULEVARD	2022 or later		CONSTRUCT 3,600 LF OF 6-INCH DI AND 900 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,700 LF OF 1-INCH PVC, 4-INCH CA, 6-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 65 SERVICE CONNECTIONS, REPLACE 65 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE BOULEVARD, EIGHTH STREET, NINTH STREET, TENTH STREET AND PARK AVENUE.
51	346	56	1-inch and smaller	$403.4821		$22,595	FLORENCE BOULEVARD & CENTER AVENUE	2022 or later		CONSTRUCT 3,100 LF OF 6-INCH DI AND 300 LF OF 12-INCH WATER MAIN TO REPLACE 3,400 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 56 SERVICE CONNECTIONS, REPLACE 56 METERS AND REPLACE 2 FIRE HYDRANTS ON EIGHTH STREET, NINTH STREET, TENTH STREET, FLORENCE BOULEVARD, CENTER AVENUE AND WALNUT AVENUE.

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Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
52	346	51	1-inch and smaller	$403.9020		$20,599	FLORENCE BOULEVARD & OLIVE AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 800 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,300 LF OF 2-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 4 FIRE HYDRANTS ON EIGHTH STREET, NINTH STREET, TENTH STREET, PICACHO AVENUE, OLIVE AVENUE AND FLORENCE BOULEVARD.
53	346	59	1-inch and smaller	$402.3390		$23,738	3RD STREET & HARDING AVENUE	2022 or later		CONSTRUCT 1,800 LF OF 6-INCH C-900 AND 1,100 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,200 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 59 SERVICE CONNECTIONS, REPLACE 59 METERS AND REPLACE 2 FIRE HYDRANTS ON HARDING AVENUE, COOLIDGE AVENUE, 3RD STREET, 1ST STREET AND MAIN STREET.
54	346	72 4	1-inch and smaller 2-inch	$403.8333 $2,423.0000		$38,768	ARIZONA BOULEVARD & RAYMOND STREET	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH C-900 AND 500 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,300 LF OF 4-INCH CA, 6-INCH CA, 2-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 5 FIRE HYDRANTS ON 8TH PLACE, 7TH PLACE, 6TH PLACE, ARIZONA BOULEVARD, RAYMOND STREET AND KENWORTHY PLACE.
55	346	44	1-inch and smaller	$402.9318		$17,729	NORTHERN AVENUE & 8TH STREET	2022 or later		CONSTRUCT 2,000 LF OF 6-INCH C-900 AND 2,000 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 5,300 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 44 SERVICE CONNECTIONS, REPLACE 44 METERS AND REPLACE 3 FIRE HYDRANTS ON NORTHERN AVENUE, PIMA AVENUE, 8TH STREET AND 7TH STREET.
56	346	50	1-inch and smaller	$403.3800		$20,169	ARIZONA BOULEVARD & NORTHERN AVENUE	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH C-900 AND 2,000 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,200 LF OF 4-INCH CA, 6-INCH CA,8-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 50 SERVICE CONNECTIONS, REPLACE 50 METERS AND REPLACE 5 FIRE HYDRANTS ON NORTHERN AVENUE, PIMA AVENUE, 8TH STREET, 6TH STREET AND ARIZONA BOULEVARD.
57	346	61	1-inch and smaller	$403.3443		$24,604	PINKLEY AVENUE & 7TH STREET	2022 or later		CONSTRUCT 4,200 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,700 LF OF 4-INCH CA, 6-INCH CA, 12-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON PINKLEY AVENUE, CENTRAL AVENUE, 8TH STREET AND 7TH STREET.

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Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
58	346	69	1-inch and smaller	$402.9275		$27,802	PINKLEY AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,000 LF OF 4-INCH CA WATER MAIN, REPLACE 69 SERVICE CONNECTIONS, REPLACE 69 METERS AND REPLACE 4 FIRE HYDRANTS ON PINKLEY AVENUE, CENTRAL AVENUE AND ARIZONA BOULEVARD.
59	346	49 2	1-inch and smaller 2-inch	$402.5306 $2,415.0000		$24,554	ROOSEVELT AVENUE & 7TH STREET	2022 or later		CONSTRUCT 4,100 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,400 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 4 FIRE HYDRANTS ON ROOSEVELT AVENUE, WILSON AVENUE, 8TH STREET AND 7TH STREET.
60	346	61	1-inch and smaller	$402.9508		$24,580	ROOSEVELT AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 1,900 LF OF 4-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON ROOSEVELT AVENUE, WILSON AVENUE, 6TH STREET AND ARIZONA BOULEVARD.
61	346	61	1-inch and smaller	$403.2787		$24,600	HARDING AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 1,900 LF OF 6-INCH C-900 AND 1,400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON WILSON PLACE, COOLIDGE PLACE, HARDING AVENUE, COOLIDGE AVENUE AND ARIZONA BOULEVARD.
62	346	NA								
63	346	NA								
					Estimated Total Cost	$1,634,854				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
1	348	4	$8,954.7500		$35,819	FLORENCE STREET & BEECH AVENUE	2018	Start design in 2017 and construction in 2018	CONSTRUCT 3,000 LF OF 6-INCH DI, 1,700 LF OF 8-INCH DI AND 500 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,900 LF OF 3-INCH CA AND 4-INCH CA WATER MAIN, REPLACE 77 SERVICE CONNECTIONS, REPLACE 77 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE STREET, ASH AVENUE, BEECH AVE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.
2	348	3	$8,963.6667		$26,891	FLORENCE STREET & CEDAR AVENUE	2019	Start design in 2018 and construction in 2019	CONSTRUCT 3,900 LF OF 6-INCH DI AND 700 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,800 LF OF 2-INCH CA, 3-INCH CA, AND 4-INCH CA WATER MAIN, REPLACE 52 SERVICE CONNECTIONS, REPLACE 52 METERS AND REPLACE 3 FIRE HYDRANTS ON FLORENCE STREET, CEDAR AVENUE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.
3	348	NA							
4	348	6	$8,966.8333		$53,801	FIRST STREET & PINAL AVENUE	2022 or later		CONSTRUCT 3,800 LF OF 6-INCH DI, 1,300 LF OF 8-INCH DI AND 400 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,900 LF OF 2-INCH STL, 4-INCH CI, 6-INCH CA AND 8-INCH CI WATER MAIN, REPLACE 77 SERVICE CONNECTIONS, REPLACE 77 METERS AND REPLACE 6 FIRE HYDRANTS ON FIRST STREET, SECOND STREET, THIRD STREET AND PINAL AVENUE.
5	348	3	$8,966.6667		$26,900	FOURTH STREET & CASA GRANDE AVENUE	2022 or later		CONSTRUCT 3,700 LF OF 6-INCH DI, 400 LF OF 8-INCH DI AND 900 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,700 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 72 SERVICE CONNECTIONS, REPLACE 72 METERS AND REPLACE 3 FIRE HYDRANTS ON THIRD STREET, FOURTH STREET AND FIFTH STREET.
6	348	6	$8,951.6667		$53,710	FIRST STREET & CASA GRANDE AVENUE	2022 or later		CONSTRUCT 2,100 LF OF 6-INCH DI AND 2,900 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,100 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CI WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 6 FIRE HYDRANTS ON FIRST STREET, SECOND STREET AND CASA GRANDE AVENUE.
7	348	3	$8,964.3333		$26,893	SIXTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI, 300 LF OF 8-INCH DI AND 2,900 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,700 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 3 FIRE HYDRANTS ON FLORENCE BOULEVARD AND SIXTH STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
8	348	2	$8,966.0000		$17,932	FOURTH STREET & BROWN AVENUE	2022 or later		CONSTRUCT 5,100 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,200 LF OF 2-INCH CA, 2-INCH PVC, 3-INCH CA, 4-INCH CI, 4-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 127 SERVICE CONNECTIONS, REPLACE 127 METERS AND REPACE 2 FIRE HYDRANTS ON CAMERON AVENUE, MORRISON AVENUE, LINCOLN AVENUE AND FOURTH STREET.
9	348	5	$8,954.6000		$44,773	SECOND STREET & TREKELL ROAD	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH DI AND 1,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 6,900 LF OF 2-INCH CA, 4-INCH CA, 6-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 104 SERVICE CONNECTIONS, REPLACE 104 METERS AND REPLACE 5 FIRE HYDRANTS ON ROOSEVELT AVENUE, COOLIDGE AVENUE, SECOND STREET AND TREKELL ROAD.
10	348	2	$8,961.5000		$17,923	SECOND STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI TO REPLACE 5,100 LF OF 2-INCH CA, 3-INCH CA, 4-INCH CI, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 2 FIRE HYDRANTS ON FIRST STREET, SECOND STREET, THIRD STREET, CAMERON AVENUE, MORRISON AVENUE AND BROWN AVENUE.
11	348	3	$8,950.6667		$26,852	SECOND STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 3,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 4,200 LF OF 2-INCH CI, 4-INCH CI, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 58 SERVICE CONNECTIONS, REPLACE 58 METERS AND REPLACE 3 FIRE HYDRANTS ON CAMERON AVENUE, MORRISON AVENUE, BROWN AVENUE AND FIRST STREET.
12	348	4	$8,955.7500		$35,823	SIXTH STREET & AMARILLO AVENUE	2022 or later		CONSTRUCT 3,100 LF OF 6-INCH DI AND 1,800 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,400 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 10-INCH CA WATER MAIN, REPLACE 81 SERVICE CONNECTIONS, REPLACE 81 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE BOULEVARD, PUEBLO DRIVE, TREKELL ROAD, LOVE STREET, SIXTH STREET AND AMARILLO STREET.
13	348	4	$8,963.7500		$35,855	TREKELL ROAD & FOURTH STREET	2022 or later		CONSTRUCT 4,300 LF OF 6-INCH DI AND 800 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,400 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 10-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 104 SERVICE CONNECTIONS, REPLACE 104 METERS AND REPLACE 4 FIRE HYDRANTS ON FOURTH STREET, FIFTH STREET, AMARILLO STREET, TREKELL ROAD AND PUEBLO DRIVE.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
14	348	3	$8,948.3333		$26,845	TREKELL ROAD & SECOND STREET	2022 or later		CONSTRUCT 4,100 LF OF 6-INCH DI AND 700 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,100 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 85 SERVICE CONNECTIONS, REPLACE 85 METERS AND REPLACE 3 FIRE HYDRANTS ON SECOND STREET, THIRD STREET, AMARILLO STREET, PUEBLO DRIVE AND TREKELL ROAD.
15	348	3	$8,964.6667		$26,894	PINAL AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 2,200 LF OF 6-INCH DI, 300 LF OF 8-INCH DI AND 1,500 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,000 LF OF 2-INCH CA, 3-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 75 SERVICE CONNECTIONS, REPLACE 75 METERS AND REPLACE 3 FIRE HYDRANTS ON PINAL AVENUE, ARBOR AVENUE, ELEVENTH STREET, THIRTEEN STREET AND McMURRAY BOULEVARD.
16	348	2	$8,959.5000		$17,919	PARK AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 4,700 LF OF 6-INCH DI AND 800 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,600 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 2 FIRE HYDRANTS ON ELEVENTH STREET, THIRTEEN STREET, McMURRAY BOULEVARD, PARK AVENUE AND CENTER AVENUE.
17	348	3	$8,953.6667		$26,861	OLIVE AVENUE & McMURRAY BOULEVARD	2022 or later		CONSTRUCT 3,600 LF 6-INCH DI AND 2,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,500 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 50 SERVICE CONNECTIONS, REPLACE 50 METERS AND REPLACE 3 FIRE HYDRANTS ON TENTH STREET, ORANGE DRIVE, WALNUT DRIVE , DATE DRIVE AND OLIVE AVENUE.
18	348	2	$8,964.0000		$17,928	PINAL AVENUE & FLORENCE BOULEVARD	2022 or later		CONSTRUCT 2,100 LF OF 6-INCH DI AND 1,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 35 SERVICE CONNECTIONS, REPLACE 35 METERS AND REPLACE 2 FIRE HYDRANTS ON EIGHT STREET, NINTH STREET, TENTH STREET, FLORENCE BOULEVARD, ARBOR AVENUE AND PINAL AVENUE.
19	348	5	$8,974.0000		$44,870	NINTH STREET & CAMERON AVENUE	2022 or later		CONSTRUCT 5,400 LF OF 6-INCH DI WATER MAIN TO REPLACE 5,100 LF OF 2-INCH CA, 3-INCH CA, 4-INCH CA, 4-INCH CI, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 60 SERVICE CONNECTIONS, REPLACE 60 METERS AND REPLACE 5 FIRE HYDRANTS ON NINTH STREET, TENTH STREET, CAMERON AVENUE, MORRISON AVENUE, BROWN AVENUE AND KADOTA AVENUE.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
20	348	3	$8,949.0000		$26,847	NINTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 4,300 LF OF 6-INCH DI AND 1,000 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 69 SERVICE CONNECTIONS, REPLACE 69 METERS AND REPLACE 3 FIRE HYDRANTS ON TREKELL ROAD, COOLIDGE AVENUE, GILBERT AVENUE, LEHMBERG AVENUE, EIGHTH STREET AND NINTH STREET.
21	348	2	$8,960.5000		$17,921	ELEVENTH STREET & TREKELL ROAD	2022 or later		CONSTRUCT 3,200 LF OF 6-INCH DI, 600 LF OF 8-INCH DI AND 1,300 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 2 FIRE HYDRANTS ON TREKELL ROAD, COOLIDGE AVENUE, GILBERT AVENUE, MCMURRAY BOULEVARD AND ELEVENTH STREET.
22	348	NA							
23	348	3	$8,969.6667		$26,909	MORRISON AVENUE & MANOR DRIVE	2022 or later		CONSTRUCT 3,200 LF OF 6-INCH DI WATER MAIN TO REPLACE 5,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 94 SERVICE CONNECTIONS, REPLACE 94 METERS AND REPLACE 3 FIRE HYDRANTS ON MORRISON AVENUE AND MANOR DRIVE.
24	348	4	$8,969.5000		$35,878	LAUREL DRIVE & KADOTA AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 3,400 LF OF 3-INCH CA, 4-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 55 SERVICE CONNECTIONS, REPLACE 55 METERS AND REPLACE 4 FIRE HYDRANTS ON LAUREL DRIVE, MCMURRAY BOULEVARD, CAMERON AVENUE, BROWN AVENUE, MORRISON AVENUE AND KADOTA AVENUE.
25	348	4	$8,952.0000		$35,808	FRENCH STREET & OCOTILLA STREET	2022 or later		CONSTRUCT 5,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 4,700 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 136 SERVICE CONNECTIONS, REPLACE 136 METERS AND REPLACE 4 FIRE HYDRANTS ON OCOTILLA STREET, MELROSE DRIVE AND FRENCH STREET.
26	348	4	$8,963.2500		$35,853	FIRST STREET & ALTA AVENUE	2022 or later		CONSTRUCT 3,700 LF OF 6-INCH DI, 1,400 LF OF 8-INCH DI AND 600 LF OF 12-INCH DI WATER MAIN TO REPLACE 5,600 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA AND 8-INCH DI WATER MAIN, REPLACE 94 SERVICE CONNECTIONS, REPLACE 94 METERS AND REPLACE 4 FIRE HYDRANTS ON FIRST STREET, DOAN STREET, TREKELL ROAD, ALTA AVENUE, AMARILLO STREET, VISTA AVENUE AND PUEBLO DRIVE.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
27	348	5	$8,973.6000		$44,868	COLORADO STREET & AVILA AVENUE	2022 or later		CONSTRUCT 2,500 LF OF 6-INCH DI AND 600 LF OF 8-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 88 SERVICE CONNECTIONS, REPLACE 88 METERS AND REPLACE 5 FIRE HYDRANTS ON RODEO ROAD, AVILA AVENUE, BARCELONA AVENUE AND COLORADO STREET.
28	348	NA							
29	348	NA							
30	348	NA							
31	348	NA							
32	348	7	$8,970.4286		$62,793	ARIZONA BOULEVARD & VAH KI INN	2017	Start design in 2017 and construction in 2017	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 2,500 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 7,200 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA, 12-INCH CA, 4-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 97 SERVICE CONNECTIONS, REPLACE 97 METERS AND REPLACE 7 FIRE HYDRANTS ON VAH KI INN, HESS AVENUE, ARIZONA BOULEVARD, 4TH STREET AND 3RD STREET.
33	348	5	$8,966.8000		$44,834	ARIZONA BOULEVARD & WALTON AVENUE	2019	Start design in 2018 and construction in 2019	CONSTRUCT 5,100 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 7,000 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 102 SERVICE CONNECTIONS, REPLACE 102 METERS AND REPLACE 5 FIRE HYDRANTS ON WALTON AVENUE, BEALY AVENUE, ARIZONA BOULEVARD, 4TH STREET AND 3RD STREET.
34	348	3	$8,958.0000		$26,874	ARIZONA BOULEVARD & KENNEDY AVENUE	2020	Start design in 2019 and construction in 2020	CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,400 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 59 SERVICE CONNECTIONS, REPLACE 59 METERS AND REPLACE 3 FIRE HYDRANTS ON KENNEDY AVENUE, ARIZONA BOULEVARD,4TH STREET, 3RD STREET AND MAIN STREET.
35	348	3	$8,959.0000		$26,877	ARIZONA BOULEVARD & BYRD AVENUE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,900 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 8-INCH PVC WATER MAIN, REPLACE 66 SERVICE CONNECTIONS, REPLACE 66 METERS AND REPLACE 3 FIRE HYDRANTS ON BYRD AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
36	348	3	$8,960.3333		$26,881	ARIZONA BOULEVARD & LINDBERGH AVENUE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 70 SERVICE CONNECTIONS, REPLACE 70 METERS AND REPLACE 3 FIRE HYDRANTS ON LINDBERGH AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
37	348	3	$8,973.0000		$26,919	ARIZONA BOULEVARD & NORTHERN AVENUE	2022 or later		CONSTRUCT 900 LF OF 6-INCH C-900 AND 2,600 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,700 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 46 SERVICE CONNECTIONS, REPLACE 46 METERS AND REPLACE 3 FIRE HYDRANTS ON NORTHERN AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
38	348	5	$8,960.0000		$44,800	ARIZONA BOULEVARD & PIMA AVENUE	2022 or later		CONSTRUCT 5,500 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,800 LF OF 4-INCH CA, 6-INCH CA, 4-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 90 SERVICE CONNECTIONS, REPLACE 90 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, PIMA AVENUE, PINKLEY AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
39	348	5	$8,963.8000		$44,819	ARIZONA BOULEVARD & CENTRAL AVENUE	2022 or later		CONSTRUCT 6,300 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,500 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 111 SERVICE CONNECTIONS, REPLACE 111 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, CENTRAL AVENUE, ROOSEVELT AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
40	348	5	$8,956.6000		$44,783	ARIZONA BOULEVARD & WILSON AVENUE	2022 or later		CONSTRUCT 4,700 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 5,900 LF OF 4-INCH CA, 6-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 66 SERVICE CONNECTIONS, REPLACE 66 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, WILSON AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.
41	348	3	$8,959.3330		$26,878	ARIZONA BOULEVARD & HARDING AVENUE	2022 or later		CONSTRUCT 1,900 LF OF 6-INCH C-900 AND 1,700 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 1,700 LF OF 4-INCH CA WATER MAIN, REPLACE 75 SERVICE CONNECTIONS, REPLACE 75 METERS AND REPLACE 3 FIRE HYDRANTS ON ARIZONA BOULEVARD, HARDING AVENUE, COOLIDGE AVENUE, 4TH STREET AND 3RD STREET.
42	348	NA							
43	348	NA							

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
44	348	NA							
45	348	NA							
46	348	NA							
47	348	3	$8,961.0000		$26,883	ELEVENTH STREET & BROWN AVENUE	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH DI AND 700 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,800 LF OF 2-INCH CA, 4-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 81 SERVICE CONNECTIONS, REPLACE 81 METERS AND REPLACE 3 FIRE HYDRANTS ON BROWN AVENUE, KADOTA AVENUE, LEHMBERG AVENUE, ELEVENTH STREET AND MCMURRAY BOULEVARD.
50	348	5	$8,965.6000		$44,828	PARK AVENUE & FLORENCE BOULEVARD	2022 or later		CONSTRUCT 3,600 LF OF 6-INCH DI AND 900 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,700 LF OF 1-INCH PVC, 4-INCH CA, 6-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 65 SERVICE CONNECTIONS, REPLACE 65 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE BOULEVARD, EIGHTH STREET, NINTH STREET, TENTH STREET AND PARK AVENUE.
51	348	2	$8,966.5000		$17,933	FLORENCE BOULEVARD & CENTER AVENUE	2022 or later		CONSTRUCT 3,100 LF OF 6-INCH DI AND 300 LF OF 12-INCH WATER MAIN TO REPLACE 3,400 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 56 SERVICE CONNECTIONS, REPLACE 56 METERS AND REPLACE 2 FIRE HYDRANTS ON EIGHTH STREET, NINTH STREET, TENTH STREET, FLORENCE BOULEVARD, CENTER AVENUE AND WALNUT AVENUE.
52	348	4	$8,975.5000		$35,902	FLORENCE BOULEVARD & OLIVE AVENUE	2022 or later		CONSTRUCT 3,900 LF OF 6-INCH DI AND 800 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,300 LF OF 2-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 4 FIRE HYDRANTS ON EIGHTH STREET, NINTH STREET, TENTH STREET, PICACHO AVENUE, OLIVE AVENUE AND FLORENCE BOULEVARD.
53	348	2	$8,941.0000		$17,882	3RD STREET & HARDING AVENUE	2022 or later		CONSTRUCT 1,800 LF OF 6-INCH C-900 AND 1,100 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,200 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 59 SERVICE CONNECTIONS, REPLACE 59 METERS AND REPLACE 2 FIRE HYDRANTS ON HARDING AVENUE, COOLIDGE AVENUE, 3RD STREET, 1ST STREET AND MAIN STREET.
54	348	5	$8,974.0000		$44,870	ARIZONA BOULEVARD & RAYMOND STREET	2022 or later		CONSTRUCT 4,900 LF OF 6-INCH C-900 AND 500 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,300 LF OF 4-INCH CA, 6-INCH CA, 2-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 5 FIRE HYDRANTS ON 8TH PLACE, 7TH PLACE, 6TH PLACE, ARIZONA BOULEVARD, RAYMOND STREET AND KENWORTHY PLACE.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
55	348	3	$8,954.0000		$26,862	NORTHERN AVENUE & 8TH STREET	2022 or later		CONSTRUCT 2,000 LF OF 6-INCH C-900 AND 2,000 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 5,300 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 44 SERVICE CONNECTIONS, REPLACE 44 METERS AND REPLACE 3 FIRE HYDRANTS ON NORTHERN AVENUE, PIMA AVENUE, 8TH STREET AND 7TH STREET.
56	348	5	$8,964.0000		$44,820	ARIZONA BOULEVARD & NORTHERN AVENUE	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH C-900 AND 2,000 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,200 LF OF 4-INCH CA, 6-INCH CA,8-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 50 SERVICE CONNECTIONS, REPLACE 50 METERS AND REPLACE 5 FIRE HYDRANTS ON NORTHERN AVENUE, PIMA AVENUE, 8TH STREET, 6TH STREET AND ARIZONA BOULEVARD.
57	348	3	$8,963.0000		$26,889	PINKLEY AVENUE & 7TH STREET	2022 or later		CONSTRUCT 4,200 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,700 LF OF 4-INCH CA, 6-INCH CA, 12-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON PINKLEY AVENUE, CENTRAL AVENUE, 8TH STREET AND 7TH STREET.
58	348	4	$8,953.7500		$35,815	PINKLEY AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,000 LF OF 4-INCH CA WATER MAIN, REPLACE 69 SERVICE CONNECTIONS, REPLACE 69 METERS AND REPLACE 4 FIRE HYDRANTS ON PINKLEY AVENUE, CENTRAL AVENUE AND ARIZONA BOULEVARD.
59	348	4	$8,945.2500		$35,781	ROOSEVELT AVENUE & 7TH STREET	2022 or later		CONSTRUCT 4,100 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,400 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 4 FIRE HYDRANTS ON ROOSEVELT AVENUE, WILSON AVENUE, 8TH STREET AND 7TH STREET.
60	348	3	$8,954.6667		$26,864	ROOSEVELT AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 1,900 LF OF 4-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON ROOSEVELT AVENUE, WILSON AVENUE, 6TH STREET AND ARIZONA BOULEVARD.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
61	348	3	$8,962.0000		$26,886	HARDING AVENUE & ARIZONA BOULEVARD	2022 or later		CONSTRUCT 1,900 LF OF 6-INCH C-900 AND 1,400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON WILSON PLACE, COOLIDGE PLACE, HARDING AVENUE, COOLIDGE AVENUE AND ARIZONA BOULEVARD.
62	348	NA							
63	348	NA							
				Estimated Total Cost	$1,577,246				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Project No.	Project Description	Cost Estimate[1]	Cost Estimate[2]
1	CONSTRUCT 3,000 LF OF 6-INCH DI, 1,700 LF OF 8-INCH DI AND 500 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,900 LF OF 3-INCH CA AND 4-INCH CA WATER MAIN, REPLACE 77 SERVICE CONNECTIONS, REPLACE 77 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE STREET, ASH AVENUE, BEECH AVE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.	$ 864,000	
2	CONSTRUCT 3,900 LF OF 6-INCH DI AND 700 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,800 LF OF 2-INCH CA, 3-INCH CA, AND 4-INCH CA WATER MAIN, REPLACE 52 SERVICE CONNECTIONS, REPLACE 52 METERS AND REPLACE 3 FIRE HYDRANTS ON FLORENCE STREET, CEDAR AVENUE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.	$ 667,000	
3	CONSTRUCT 4,000 LF OF 6-INCH DI AND 200 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,000 LF OF 2-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS AND REPLACE 51 METERS ON FLORENCE STREET, DATE AVENUE, BURGESS AVENUE, ELLIOT AVENUE AND GREEN AVENUE.	$ 572,000	
4	CONSTRUCT 3,800 LF OF 6-INCH DI, 1,300 LF OF 8-INCH DI AND 400 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,900 LF OF 2-INCH STL, 4-INCH CI, 6-INCH CA AND 8-INCH CI WATER MAIN, REPLACE 77 SERVICE CONNECTIONS, REPLACE 77 METERS AND REPLACE 6 FIRE HYDRANTS ON FIRST STREET, SECOND STREET, THIRD STREET AND PINAL AVENUE.	$ 946,000	
5	CONSTRUCT 3,700 LF OF 6-INCH DI, 400 LF OF 8-INCH DI AND 900 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,700 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 72 SERVICE CONNECTIONS, REPLACE 72 METERS AND REPLACE 3 FIRE HYDRANTS ON THIRD STREET, FOURTH STREET AND FIFTH STREET.	$ 823,000	
6	CONSTRUCT 2,100 LF OF 6-INCH DI AND 2,900 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,100 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CI WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 6 FIRE HYDRANTS ON FIRST STREET, SECOND STREET AND CASA GRANDE AVENUE.	$ 888,000	
7	CONSTRUCT 3,900 LF OF 6-INCH DI, 300 LF OF 8-INCH DI AND 2,900 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,700 LF OF 4-INCH CI, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 3 FIRE HYDRANTS ON FLORENCE BOULEVARD AND SIXTH STREET.	$ 1,035,000	
8	CONSTRUCT 5,100 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,200 LF OF 2-INCH CA, 2-INCH PVC, 3-INCH CA, 4-INCH CI, 4-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 127 SERVICE CONNECTIONS, REPLACE 127 METERS AND REPACE 2 FIRE HYDRANTS ON CAMERON AVENUE, MORRISON AVENUE, LINCOLN AVENUE AND FOURTH STREET.	$ 1,083,000	
9	CONSTRUCT 4,900 LF OF 6-INCH DI AND 1,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 6,900 LF OF 2-INCH CA, 4-INCH CA, 6-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 104 SERVICE CONNECTIONS, REPLACE 104 METERS AND REPLACE 5 FIRE HYDRANTS ON ROOSEVELT AVENUE, COOLIDGE AVENUE, SECOND STREET AND TREKELL ROAD.	$ 1,064,000	
10	CONSTRUCT 3,900 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI TO REPLACE 5,100 LF OF 2-INCH CA, 3-INCH CA, 4-INCH CI, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 2 FIRE HYDRANTS ON FIRST STREET, SECOND STREET, THIRD STREET, CAMERON AVENUE, MORRISON AVENUE AND BROWN AVENUE.	$ 701,000	
11	CONSTRUCT 3,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 4,200 LF OF 2-INCH CI, 4-INCH CI, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 58 SERVICE CONNECTIONS, REPLACE 58 METERS AND REPLACE 3 FIRE HYDRANTS ON CAMERON AVENUE, MORRISON AVENUE, BROWN AVENUE AND FIRST STREET.	$ 531,000	
12	CONSTRUCT 3,100 LF OF 6-INCH DI AND 1,800 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,400 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 10-INCH CA WATER MAIN, REPLACE 81 SERVICE CONNECTIONS, REPLACE 81 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE BOULEVARD, PUEBLO DRIVE, TREKELL ROAD, LOVE STREET, SIXTH STREET AND AMARILLO STREET.	$ 883,000	
13	CONSTRUCT 4,300 LF OF 6-INCH DI AND 800 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,400 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 10-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 104 SERVICE CONNECTIONS, REPLACE 104 METERS AND REPLACE 4 FIRE HYDRANTS ON FOURTH STREET, FIFTH STREET, AMARILLO STREET, TREKELL ROAD AND PUEBLO DRIVE.	$ 927,000	
14	CONSTRUCT 4,100 LF OF 6-INCH DI AND 700 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,100 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 85 SERVICE CONNECTIONS, REPLACE 85 METERS AND REPLACE 3 FIRE HYDRANTS ON SECOND STREET, THIRD STREET, AMARILLO STREET, PUEBLO DRIVE AND TREKELL ROAD.	$ 809,000	
15	CONSTRUCT 2,200 LF OF 6-INCH DI, 300 LF OF 8-INCH DI AND 1,500 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,000 LF OF 2-INCH CA, 3-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 75 SERVICE CONNECTIONS, REPLACE 75 METERS AND REPLACE 3 FIRE HYDRANTS ON PINAL AVENUE, ARBOR AVENUE, ELEVENTH STREET, THIRTEEN STREET AND McMURRAY BOULEVARD.	$ 750,000	
16	CONSTRUCT 4,700 LF OF 6-INCH DI AND 800 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,600 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 2 FIRE HYDRANTS ON ELEVENTH STREET, THIRTEEN STREET, McMURRAY BOULEVARD, PARK AVENUE AND CENTER AVENUE.	$ 805,000	
17	CONSTRUCT 3,600 LF 6-INCH DI AND 2,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,500 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 50 SERVICE CONNECTIONS, REPLACE 50 METERS AND REPLACE 3 FIRE HYDRANTS ON TENTH STREET, ORANGE DRIVE, WALNUT DRIVE , DATE DRIVE AND OLIVE AVENUE.	$ 794,000	

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Project No.	Project Description	Cost Estimate[1]	Cost Estimate[2]
18	CONSTRUCT 2,100 LF OF 6-INCH DI AND 1,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 35 SERVICE CONNECTIONS, REPLACE 35 METERS AND REPLACE 2 FIRE HYDRANTS ON EIGHT STREET, NINTH STREET, TENTH STREET, FLORENCE BOULEVARD, ARBOR AVENUE AND PINAL AVENUE.	$ 545,000	
19	CONSTRUCT 5,400 LF OF 6-INCH DI WATER MAIN TO REPLACE 5,100 LF OF 2-INCH CA, 3-INCH CA, 4-INCH CA, 4-INCH CI, 6-INCH DI AND 8-INCH CA WATER MAIN, REPLACE 60 SERVICE CONNECTIONS, REPLACE 60 METERS AND REPLACE 5 FIRE HYDRANTS ON NINTH STREET, TENTH STREET, CAMERON AVENUE, MORRISON AVENUE, BROWN AVENUE AND KADOTA AVENUE.	$ 746,000	
20	CONSTRUCT 4,300 LF OF 6-INCH DI AND 1,000 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 69 SERVICE CONNECTIONS, REPLACE 69 METERS AND REPLACE 3 FIRE HYDRANTS ON TREKELL ROAD, COOLIDGE AVENUE, GILBERT AVENUE, LEHMBERG AVENUE, EIGHTH STREET AND NINTH STREET.	$ 807,000	
21	CONSTRUCT 3,200 LF OF 6-INCH DI, 600 LF OF 8-INCH DI AND 1,300 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 2 FIRE HYDRANTS ON TREKELL ROAD, COOLIDGE AVENUE, GILBERT AVENUE, MCMURRAY BOULEVARD AND ELEVENTH STREET.	$ 839,000	
22	CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 2-INCH PVC WATER MAIN, REPLACE 31 SERVICE CONNECTIONS AND REPLACE 31 METERS IN CUL-DE-SACS ON SAGUARO STREET.	$ 228,000	
23	CONSTRUCT 3,200 LF OF 6-INCH DI WATER MAIN TO REPLACE 5,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 94 SERVICE CONNECTIONS, REPLACE 94 METERS AND REPLACE 3 FIRE HYDRANTS ON MORRISON AVENUE AND MANOR DRIVE.	$ 653,000	
24	CONSTRUCT 3,900 LF OF 6-INCH DI AND 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 3,400 LF OF 3-INCH CA, 4-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 55 SERVICE CONNECTIONS, REPLACE 55 METERS AND REPLACE 4 FIRE HYDRANTS ON LAUREL DRIVE, MCMURRAY BOULEVARD, CAMERON AVENUE, BROWN AVENUE, MORRISON AVENUE AND KADOTA AVENUE.	$ 734,000	
25	CONSTRUCT 5,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 4,700 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 136 SERVICE CONNECTIONS, REPLACE 136 METERS AND REPLACE 4 FIRE HYDRANTS ON OCOTILLA STREET, MELROSE DRIVE AND FRENCH STREET.	$ 973,000	
26	CONSTRUCT 3,700 LF OF 6-INCH DI, 1,400 LF OF 8-INCH DI AND 600 LF OF 12-INCH DI WATER MAIN TO REPLACE 5,600 LF OF 3-INCH CA, 4-INCH CA, 6-INCH CA AND 8-INCH DI WATER MAIN, REPLACE 94 SERVICE CONNECTIONS, REPLACE 94 METERS AND REPLACE 4 FIRE HYDRANTS ON FIRST STREET, DOAN STREET, TREKELL ROAD, ALTA AVENUE, AMARILLO STREET, VISTA AVENUE AND PUEBLO DRIVE.	$ 956,000	
27	CONSTRUCT 2,500 LF OF 6-INCH DI AND 600 LF OF 8-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 88 SERVICE CONNECTIONS, REPLACE 88 METERS AND REPLACE 5 FIRE HYDRANTS ON RODEO ROAD, AVILA AVENUE, BARCELONA AVENUE AND COLORADO STREET.	$ 656,000	
28	CONSTRUCT 3,200 LF OF 6-INCH DI WATER MAIN TO REPLACE 3,200 LF OF 2-INCH PVC WATER MAIN, REPLACE 35 SERVICE CONNECTIONS AND REPLACE 35 METERS ON HAVASUPAI DRIVE, MASCALERO DRIVE AND CALGARY DRIVE.	$ 414,000	
29	CONSTRUCT 2,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 2,300 LF OF 1-INCH PVC AND 2-INCH PVC WATER MAIN, REPLACE 12 SERVICE CONNECTIONS AND REPLACE 12 METERS ALONG EVANS ROAD SOUTH OF MCCARTNEY ROAD.	$ 250,000	
30	CONSTRUCT 4,000 LF OF 6-INCH DI AND 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,900 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 92 SERVICE CONNECTIONS AND REPLACE 92 METERS ON CORDOVA AVENUE, DELANO DRIVE, BLANCO DRIVE, AVENIDA ELLENA AND COLORADO STREET.	$ 748,000	
31	CONSTRUCT 2,800 LF OF 6-INCH C-900, 800 LF OF 8-INCH C-900 AND 1,200 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 550 LF OF 2-INCH PVC, 2-INCH GS, 6-INCH PVC AND 6-INCH CA WATER MAIN, REPLACE 38 SERVICE CONNECTIONS AND REPLACE 38 METERS ON CARMICHAEL STREET, BATEMAN STREET, ARIZONA BOULEVARD AND HUDSON ROAD.	$ 626,000	
32	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 2,500 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 7,200 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA, 12-INCH CA, 4-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 97 SERVICE CONNECTIONS, REPLACE 97 METERS AND REPLACE 7 FIRE HYDRANTS ON VAH KI INN, HESS AVENUE, ARIZONA BOULEVARD, 4TH STREET AND 3RD STREET.	$ 1,040,000	
33	CONSTRUCT 5,100 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 7,000 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 102 SERVICE CONNECTIONS, REPLACE 102 METERS AND REPLACE 5 FIRE HYDRANTS ON WALTON AVENUE, BEALY AVENUE, ARIZONA BOULEVARD, 4TH STREET AND 3RD STREET.	$ 950,000	
34	CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,400 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 59 SERVICE CONNECTIONS, REPLACE 59 METERS AND REPLACE 3 FIRE HYDRANTS ON KENNEDY AVENUE, ARIZONA BOULEVARD,4TH STREET, 3RD STREET AND MAIN STREET.	$ 512,000	
35	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,900 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 8-INCH PVC WATER MAIN, REPLACE 66 SERVICE CONNECTIONS, REPLACE 66 METERS AND REPLACE 3 FIRE HYDRANTS ON BYRD AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.	$ 602,000	

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Project No.	Project Description	Cost Estimate[1]	Cost Estimate[2]
36	CONSTRUCT 3,300 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 70 SERVICE CONNECTIONS, REPLACE 70 METERS AND REPLACE 3 FIRE HYDRANTS ON LINDBERGH AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.	$ 610,000	
37	CONSTRUCT 900 LF OF 6-INCH C-900 AND 2,600 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,700 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 46 SERVICE CONNECTIONS, REPLACE 46 METERS AND REPLACE 3 FIRE HYDRANTS ON NORTHERN AVENUE, ARIZONA BOULEVARD, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.	$ 641,000	
38	CONSTRUCT 5,500 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,800 LF OF 4-INCH CA, 6-INCH CA, 4-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 90 SERVICE CONNECTIONS, REPLACE 90 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, PIMA AVENUE, PINKLEY AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.	$ 883,000	
39	CONSTRUCT 6,300 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,500 LF OF 3-INCH CA, 4-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 111 SERVICE CONNECTIONS, REPLACE 111 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, CENTRAL AVENUE, ROOSEVELT AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.	$ 1,108,000	
40	CONSTRUCT 4,700 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 5,900 LF OF 4-INCH CA, 6-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 66 SERVICE CONNECTIONS, REPLACE 66 METERS AND REPLACE 5 FIRE HYDRANTS ON ARIZONA BOULEVARD, WILSON AVENUE, 4TH STREET, 3RD STREET, 1ST STREET AND MAIN STREET.	$ 786,000	
41	CONSTRUCT 1,900 LF OF 6-INCH C-900 AND 1,700 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 1,700 LF OF 4-INCH CA WATER MAIN, REPLACE 75 SERVICE CONNECTIONS, REPLACE 75 METERS AND REPLACE 3 FIRE HYDRANTS ON ARIZONA BOULEVARD, HARDING AVENUE, COOLIDGE AVENUE, 4TH STREET AND 3RD STREET.	$ 701,000	
42	CONSTRUCT 500 LF OF 36-INCH DI WATER MAIN TO REPLACE 500 LF OF 36-INCH AMERON WATER MAIN ON INTERSTATE 8 EAST TO PEART ROAD.	$ 449,000	
43	CONSTRUCT 5,400 LF OF 24-INCH DI WATER MAIN TO REPLACE 5,400 LF OF 24-INCH AMERON WATER MAIN ON PEART ROAD FROM SELMA HIGHWAY NORTH TO EARLY ROAD.	$ 1,729,000	
44	CONSTRUCT 5,200 LF OF 24-INCH DI WATER MAIN TO REPLACE 5,200 LF OF 24-INCH AMERON WATER MAIN, REPLACE 11 SERVICE CONNECTIONS, AND REPLACE 11 METERS ON PEART ROAD FROM EARLY ROAD NORTH TO FLORENCE BOULEVARD.	$ 1,749,000	
45	CONSTRUCT 2,800 LF OF 24-INCH DI WATER MAIN TO REPLACE 2,800 LF OF 24-INCH AMERON WATER MAIN, REPLACE 7 SERVICE CONNECTIONS AND REPLACE 7 METERS ON FLORENCE BOULEVARD FROM ARIZOLA ROAD TO HENNESS ROAD.	$ 953,000	
46	CONSTRUCT 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 500 LF OF 6-INCH CA WATER MAIN, REPLACE 2 SERVICE CONNECTIONS AND REPLACE 2 METERS ON CASA GRANDE AVENUE BETWEEN RODEO ROAD AND HORSESHOE CIRCLE.	$ 66,000	
47	CONSTRUCT 4,900 LF OF 6-INCH DI AND 700 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,800 LF OF 2-INCH CA, 4-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 81 SERVICE CONNECTIONS, REPLACE 81 METERS AND REPLACE 3 FIRE HYDRANTS ON BROWN AVENUE, KADOTA AVENUE, LEHMBERG AVENUE, ELEVENTH STREET AND MCMURRAY BOULEVARD.	$ 845,000	
50	CONSTRUCT 3,600 LF OF 6-INCH DI AND 900 LF OF 12-INCH DI WATER MAIN TO REPLACE 3,700 LF OF 1-INCH PVC, 4-INCH CA, 6-INCH CA AND 6-INCH DI WATER MAIN, REPLACE 65 SERVICE CONNECTIONS, REPLACE 65 METERS AND REPLACE 4 FIRE HYDRANTS ON FLORENCE BOULEVARD, EIGHTH STREET, NINTH STREET, TENTH STREET AND PARK AVENUE.	$ 741,000	
51	CONSTRUCT 3,100 LF OF 6-INCH DI AND 300 LF OF 12-INCH WATER MAIN TO REPLACE 3,400 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 56 SERVICE CONNECTIONS, REPLACE 56 METERS AND REPLACE 2 FIRE HYDRANTS ON EIGHTH STREET, NINTH STREET, TENTH STREET, FLORENCE BOULEVARD, CENTER AVENUE AND WALNUT AVENUE.	$ 542,000	
52	CONSTRUCT 3,900 LF OF 6-INCH DI AND 800 LF OF 12-INCH DI WATER MAIN TO REPLACE 4,300 LF OF 2-INCH CA, 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 4 FIRE HYDRANTS ON EIGHTH STREET, NINTH STREET, TENTH STREET, PICACHO AVENUE, OLIVE AVENUE AND FLORENCE BOULEVARD.	$ 688,000	
53	CONSTRUCT 1,800 LF OF 6-INCH C-900 AND 1,100 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 2,200 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 59 SERVICE CONNECTIONS, REPLACE 59 METERS AND REPLACE 2 FIRE HYDRANTS ON HARDING AVENUE, COOLIDGE AVENUE, 3RD STREET, 1ST STREET AND MAIN STREET.	$ 534,000	
54	CONSTRUCT 4,900 LF OF 6-INCH C-900 AND 500 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,300 LF OF 4-INCH CA, 6-INCH CA, 2-INCH PVC AND 6-INCH PVC WATER MAIN, REPLACE 76 SERVICE CONNECTIONS, REPLACE 76 METERS AND REPLACE 5 FIRE HYDRANTS ON 8TH PLACE, 7TH PLACE, 6TH PLACE, ARIZONA BOULEVARD, RAYMOND STREET AND KENWORTHY PLACE.	$ 824,000	
55	CONSTRUCT 2,000 LF OF 6-INCH C-900 AND 2,000 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 5,300 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 44 SERVICE CONNECTIONS, REPLACE 44 METERS AND REPLACE 3 FIRE HYDRANTS ON NORTHERN AVENUE, PIMA AVENUE, 8TH STREET AND 7TH STREET.	$ 633,000	
56	CONSTRUCT 1,300 LF OF 6-INCH C-900 AND 2,000 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,200 LF OF 4-INCH CA, 6-INCH CA,8-INCH CA AND 10-INCH CA WATER MAIN, REPLACE 50 SERVICE CONNECTIONS, REPLACE 50 METERS AND REPLACE 5 FIRE HYDRANTS ON NORTHERN AVENUE, PIMA AVENUE, 8TH STREET, 6TH STREET AND ARIZONA BOULEVARD.	$ 615,000	

PINAL VALLEY WATER SYSTEM - PWSID NO. 11-009
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Project No.	Project Description	Cost Estimate[1]	Cost Estimate[2]
57	CONSTRUCT 4,200 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,700 LF OF 4-INCH CA, 6-INCH CA, 12-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON PINKLEY AVENUE, CENTRAL AVENUE, 8TH STREET AND 7TH STREET.	$ 709,000	
58	CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 800 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,000 LF OF 4-INCH CA WATER MAIN, REPLACE 69 SERVICE CONNECTIONS, REPLACE 69 METERS AND REPLACE 4 FIRE HYDRANTS ON PINKLEY AVENUE, CENTRAL AVENUE AND ARIZONA BOULEVARD.	$ 613,000	
59	CONSTRUCT 4,100 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 4,400 LF OF 4-INCH CA, 6-INCH CA, 8-INCH CA AND 12-INCH CA WATER MAIN, REPLACE 51 SERVICE CONNECTIONS, REPLACE 51 METERS AND REPLACE 4 FIRE HYDRANTS ON ROOSEVELT AVENUE, WILSON AVENUE, 8TH STREET AND 7TH STREET.	$ 629,000	
60	CONSTRUCT 2,600 LF OF 6-INCH C-900 AND 400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 1,900 LF OF 4-INCH CA AND 6-INCH PVC WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON ROOSEVELT AVENUE, WILSON AVENUE, 6TH STREET AND ARIZONA BOULEVARD.	$ 519,000	
61	CONSTRUCT 1,900 LF OF 6-INCH C-900 AND 1,400 LF OF 12-INCH C-900 WATER MAIN TO REPLACE 3,600 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 61 SERVICE CONNECTIONS, REPLACE 61 METERS AND REPLACE 3 FIRE HYDRANTS ON WILSON PLACE, COOLIDGE PLACE, HARDING AVENUE, COOLIDGE AVENUE AND ARIZONA BOULEVARD.	$ 602,000	
62	CONSTRUCT 2,300 LF OF 24-INCH DI AND 400 LF OF 36-INCH DI WATER MAIN TO REPLACE 2,700 LF OF 24-INCH AND 36-INCH AMERON WATER MAIN FROM INTERSTATE 8 NORTH ON PEART ROAD.	$ 1,095,000	
63	CONSTRUCT 3,100 LF OF 24-INCH DI WATER MAIN TO REPLACE 3,100 LF OF 24-INCH AMERON WATER MAIN ON PEART ROAD NORTH TO SELMA HIGHWAY.	$ 992,000	
	Estimated Total Cost	**$ 46,677,000**	**$ -**

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

SIB TABLE I
STANFIELD

STANFIELD WATER SYSTEM - PWSID NO. 11-012
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 309 Supply Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
48	NA										
49	NA										
Estimated Total Cost							0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

STANFIELD WATER SYSTEM - PWSID NO. 11-012
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
48	343	1,800	6	DI	$89.7600		$161,568	NAVAJO WAY & PAPGO DRIVE	2022 or later		CONSTRUCT 1,800 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 45 SERVICE CONNECTIONS AND REPLACE 45 METERS ON PAPAGO DRIVE, PIMA DRIVE AND NAVAJO WAY.
49	343	1,100	6	DI	$89.7191		$98,691	NAVAJO WAY & COOPER DRIVE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 1,100 LF OF 6-INCH DI WATER MAIN TO REPLACE 900 LF OF 4-INCH CA WATER MAIN, REPLACE 17 SERVICE CONNECTIONS, REPLACE 17 METERS AND REPLACE 1 FIRE HYDRANT ON COOPER DRIVE, PAPAGO DRIVE AND NAVAJO WAY.
						Estimated Total Cost	$260,259				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

STANFIELD WATER SYSTEM - PWSID NO. 11-012
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
48	345	45	1-inch	Copper	$3,205.6889		$144,256	NAVAJO WAY & PAPGO DRIVE	2022 or later		CONSTRUCT 1,800 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 45 SERVICE CONNECTIONS AND REPLACE 45 METERS ON PAPAGO DRIVE, PIMA DRIVE AND NAVAJO WAY.
49	345	17	1-inch	Copper	$3,204.2941		$54,473	NAVAJO WAY & COOPER DRIVE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 1,100 LF OF 6-INCH DI WATER MAIN TO REPLACE 900 LF OF 4-INCH CA WATER MAIN, REPLACE 17 SERVICE CONNECTIONS, REPLACE 17 METERS AND REPLACE 1 FIRE HYDRANT ON COOPER DRIVE, PAPAGO DRIVE AND NAVAJO WAY.
						Estimated Total Cost	$198,729				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

STANFIELD WATER SYSTEM - PWSID NO. 11-012
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
48	346	45	1-inch and smaller	$403.9111		$18,176	NAVAJO WAY & PAPGO DRIVE	2022 or later		CONSTRUCT 1,800 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 45 SERVICE CONNECTIONS AND REPLACE 45 METERS ON PAPAGO DRIVE, PIMA DRIVE AND NAVAJO WAY.
49	346	17	1-inch and smaller	$403.7647		$6,864	NAVAJO WAY & COOPER DRIVE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 1,100 LF OF 6-INCH DI WATER MAIN TO REPLACE 900 LF OF 4-INCH CA WATER MAIN, REPLACE 17 SERVICE CONNECTIONS, REPLACE 17 METERS AND REPLACE 1 FIRE HYDRANT ON COOPER DRIVE, PAPAGO DRIVE AND NAVAJO WAY.
					Estimated Total Cost	$25,040				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

STANFIELD WATER SYSTEM - PWSID NO. 11-012
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
48	348	NA							
49	348	1	$8,972.0000		$8,972	NAVAJO WAY & COOPER DRIVE	2021	Start design in 2020 and construction in 2021	CONSTRUCT 1,100 LF OF 6-INCH DI WATER MAIN TO REPLACE 900 LF OF 4-INCH CA WATER MAIN, REPLACE 17 SERVICE CONNECTIONS, REPLACE 17 METERS AND REPLACE 1 FIRE HYDRANT ON COOPER DRIVE, PAPAGO DRIVE AND NAVAJO WAY.
				Estimated Total Cost	$8,972				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

STANFIELD WATER SYSTEM - PWSID NO. 11-012
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Project No.	Project Description	Cost Estimate[1]	Cost Estimate[2]
48	CONSTRUCT 1,800 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 45 SERVICE CONNECTIONS AND REPLACE 45 METERS ON PAPAGO DRIVE, PIMA DRIVE AND NAVAJO WAY.	$ 324,000	
49	CONSTRUCT 1,100 LF OF 6-INCH DI WATER MAIN TO REPLACE 900 LF OF 4-INCH CA WATER MAIN, REPLACE 17 SERVICE CONNECTIONS, REPLACE 17 METERS AND REPLACE 1 FIRE HYDRANT ON COOPER DRIVE, PAPAGO DRIVE AND NAVAJO WAY.	$ 169,000	
	Estimated Total Cost	**$ 493,000**	**$ -**

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

SIB TABLE I
AJO

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 309 Supply Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
68	NA										
69	NA										
70	NA										
71	NA										
72	NA										
						Estimated Total Cost	$0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
68	343	200	6	DI	$86.6650		$17,333	HOOVER STREET & BRANNON DRIVE	2017	Anticipate starting design in 2017 and construction in 2017	CONSTRUCT 200 LF OF 6-INCH DI WATER MAIN TO REPLACE 200 LF OF 4-INCH CA WATER MAIN AND REPLACE 1 FIRE HYDRANT ON HOOVER STREET WEST OF BRANNON DRIVE.
69	343	1,300	8	DI	$114.5585		$148,926	HIGHWAY 85 & RASMUSSAN ROAD	2022 or later		CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS, REPLACE 14 METERS AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 FROM RASMUSSAN ROAD SOUTH TO NORTH STREET.
70	343	1,000	6	DI	$89.3080		$89,308	LYONS AVENUE & DORSEY STREET	2022 or later		CONSTRUCT 1,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,000 LF OF 4-INCH CA WATER MAIN, REPLACE 20 SERVICE CONNECTIONS, REPLACE 20 METERS AND REPLACE 2 FIRE HYDRANTS ON LYONS AVENUE BETWEEN DORSEY STREET AND HOOVER STREET.
71	343	700	6	DI	$88.7829		$62,148	SAHUARO STREET & FIRST STREET	2019	Anticipate starting design in 2018 and construction in 2019	CONSTRUCT 700 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 5 SERVICE CONNECTIONS AND REPLACE 5 METERS ON SAHUARO STREET BETWEEN FIRST STREET AND PALO VERDE AVENUE.
72	343	200 300	6 8	DI	$90.9200 $116.8933		$53,252	HIGHWAY 85 & SEVENTH STREET	2021	Anticipate starting design in 2020 and construction in 2021	CONSTRUCT 200 LF OF 6-INCH DI AND 300 LF OF 8-INCH DI WATER MAIN TO REPLACE 600 LF OF 4-INCH CA WATER MAIN, REPLACE 1 SERVICE CONNECTION, REPLACE 1 METER AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 AND SEVENTH STREET.
						Estimated Total Cost	$370,967				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
68	345	NA									
69	345	14	1-inch	Copper	$3,182.2143		$44,551	HIGHWAY 85 & RASMUSSAN ROAD	2022 or later		CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS, REPLACE 14 METERS AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 FROM RASMUSSAN ROAD SOUTH TO NORTH STREET.
70	345	20	1-inch	Copper	$3,189.6000		$63,792	LYONS AVENUE & DORSEY STREET	2022 or later		CONSTRUCT 1,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,000 LF OF 4-INCH CA WATER MAIN, REPLACE 20 SERVICE CONNECTIONS, REPLACE 20 METERS AND REPLACE 2 FIRE HYDRANTS ON LYONS AVENUE BETWEEN DORSEY STREET AND HOOVER STREET.
71	345	5	1-inch	Copper	$3,170.8000		$15,854	SAHUARO STREET & FIRST STREET	2019	Anticipate starting design in 2018 and construction in 2019	CONSTRUCT 700 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 5 SERVICE CONNECTIONS AND REPLACE 5 METERS ON SAHUARO STREET BETWEEN FIRST STREET AND PALO VERDE AVENUE.
72	345	1	1-inch	Copper	$3,247.0000		$3,247	HIGHWAY 85 & SEVENTH STREET	2021	Anticipate starting design in 2020 and construction in 2021	CONSTRUCT 200 LF OF 6-INCH DI AND 300 LF OF 8-INCH DI WATER MAIN TO REPLACE 600 LF OF 4-INCH CA WATER MAIN, REPLACE 1 SERVICE CONNECTION, REPLACE 1 METER AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 AND SEVENTH STREET.
						Estimated Total Cost	$127,444				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
68	346	NA								
69	346	14	1-inch and smaller	$400.9286		$5,613	HIGHWAY 85 & RASMUSSAN ROAD	2022 or later		CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS, REPLACE 14 METERS AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 FROM RASMUSSAN ROAD SOUTH TO NORTH STREET.
70	346	20	1-inch and smaller	$401.9000		$8,038	LYONS AVENUE & DORSEY STREET	2022 or later		CONSTRUCT 1,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,000 LF OF 4-INCH CA WATER MAIN, REPLACE 20 SERVICE CONNECTIONS, REPLACE 20 METERS AND REPLACE 2 FIRE HYDRANTS ON LYONS AVENUE BETWEEN DORSEY STREET AND HOOVER STREET.
71	346	5	1-inch and smaller	$399.6000		$1,998	SAHUARO STREET & FIRST STREET	2019	Anticipate starting design in 2018 and construction in 2019	CONSTRUCT 700 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 5 SERVICE CONNECTIONS AND REPLACE 5 METERS ON SAHUARO STREET BETWEEN FIRST STREET AND PALO VERDE AVENUE.
72	346	1	1-inch and smaller	$409.0000		$409	HIGHWAY 85 & SEVENTH STREET	2021	Anticipate starting design in 2020 and construction in 2021	CONSTRUCT 200 LF OF 6-INCH DI AND 300 LF OF 8-INCH DI WATER MAIN TO REPLACE 600 LF OF 4-INCH CA WATER MAIN, REPLACE 1 SERVICE CONNECTION, REPLACE 1 METER AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 AND SEVENTH STREET.
					Estimated Total Cost	$16,058				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Replacement Plant Description (new plant) (SIB-eligible plant)	Site (location description)	Expected In-Service Date	Project Status	
68	348	1	$8,667.0000		$8,667	HOOVER STREET & BRANNON DRIVE	2017	Anticipate starting design in 2017 and construction in 2017		CONSTRUCT 200 LF OF 6-INCH DI WATER MAIN TO REPLACE 200 LF OF 4-INCH CA WATER MAIN AND REPLACE 1 FIRE HYDRANT ON HOOVER STREET WEST OF BRANNON DRIVE.
69	348	1	$8,910.0000		$8,910	HIGHWAY 85 & RASMUSSAN ROAD	2022 or later			CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS, REPLACE 14 METERS AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 FROM RASMUSSAN ROAD SOUTH TO NORTH STREET.
70	348	2	$8,931.0000		$17,862	LYONS AVENUE & DORSEY STREET	2022 or later			CONSTRUCT 1,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,000 LF OF 4-INCH CA WATER MAIN, REPLACE 20 SERVICE CONNECTIONS, REPLACE 20 METERS AND REPLACE 2 FIRE HYDRANTS ON LYONS AVENUE BETWEEN DORSEY STREET AND HOOVER STREET.
71	348	NA								
72	348	1	$9,092.0000		$9,092	HIGHWAY 85 & SEVENTH STREET	2021	Anticipate starting design in 2020 and construction in 2021		CONSTRUCT 200 LF OF 6-INCH DI AND 300 LF OF 8-INCH DI WATER MAIN TO REPLACE 600 LF OF 4-INCH CA WATER MAIN, REPLACE 1 SERVICE CONNECTION, REPLACE 1 METER AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 AND SEVENTH STREET.
				Estimated Total Cost	$44,531					

1. Provide narrative why Replacement Plant is necessary.
   - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility.
   - Replacement of existing plant to address excessive water loss (10% or more).
   - Replacement of existing plant for other reasons supported by persuasive showing by utility.
2. Provide narrative explaining why this segment of plant is a priority.
3. Provide narrative explaining how replacing this plant will benefit existing customers.
4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers.
5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.

[1] Per the Commission approved initial SIB Table I.

[2] Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Project No.	Project Description	Cost Estimate[1]	Cost Estimate[2]
68	CONSTRUCT 200 LF OF 6-INCH DI WATER MAIN TO REPLACE 200 LF OF 4-INCH CA WATER MAIN AND REPLACE 1 FIRE HYDRANT ON HOOVER STREET WEST OF BRANNON DRIVE.	$ 26,000	
69	CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS, REPLACE 14 METERS AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 FROM RASMUSSAN ROAD SOUTH TO NORTH STREET.	$ 208,000	
70	CONSTRUCT 1,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,000 LF OF 4-INCH CA WATER MAIN, REPLACE 20 SERVICE CONNECTIONS, REPLACE 20 METERS AND REPLACE 2 FIRE HYDRANTS ON LYONS AVENUE BETWEEN DORSEY STREET AND HOOVER STREET.	$ 179,000	
71	CONSTRUCT 700 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 5 SERVICE CONNECTIONS AND REPLACE 5 METERS ON SAHUARO STREET BETWEEN FIRST STREET AND PALO VERDE AVENUE.	$ 80,000	
72	CONSTRUCT 200 LF OF 6-INCH DI AND 300 LF OF 8-INCH DI WATER MAIN TO REPLACE 600 LF OF 4-INCH CA WATER MAIN, REPLACE 1 SERVICE CONNECTION, REPLACE 1 METER AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 AND SEVENTH STREET.	$ 66,000	
	Estimated Total Cost	**$ 559,000**	**$ -**

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

SIB TABLE I
AJO

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 309 Supply Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
68	NA										
69	NA										
70	NA										
71	NA										
72	NA										
						Estimated Total Cost	$0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
68	343	200	6	DI	$86.6650		$17,333	HOOVER STREET & BRANNON DRIVE	2017	Anticipate starting design in 2017 and construction in 2017	CONSTRUCT 200 LF OF 6-INCH DI WATER MAIN TO REPLACE 200 LF OF 4-INCH CA WATER MAIN AND REPLACE 1 FIRE HYDRANT ON HOOVER STREET WEST OF BRANNON DRIVE.
69	343	1,300	8	DI	$114.5585		$148,926	HIGHWAY 85 & RASMUSSAN ROAD	2022 or later		CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS, REPLACE 14 METERS AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 FROM RASMUSSAN ROAD SOUTH TO NORTH STREET.
70	343	1,000	6	DI	$89.3080		$89,308	LYONS AVENUE & DORSEY STREET	2022 or later		CONSTRUCT 1,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,000 LF OF 4-INCH CA WATER MAIN, REPLACE 20 SERVICE CONNECTIONS, REPLACE 20 METERS AND REPLACE 2 FIRE HYDRANTS ON LYONS AVENUE BETWEEN DORSEY STREET AND HOOVER STREET.
71	343	700	6	DI	$88.7829		$62,148	SAHUARO STREET & FIRST STREET	2019	Anticipate starting design in 2018 and construction in 2019	CONSTRUCT 700 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 5 SERVICE CONNECTIONS AND REPLACE 5 METERS ON SAHUARO STREET BETWEEN FIRST STREET AND PALO VERDE AVENUE.
72	343	200 300	6 8	DI	$90.9200 $116.8933		$53,252	HIGHWAY 85 & SEVENTH STREET	2021	Anticipate starting design in 2020 and construction in 2021	CONSTRUCT 200 LF OF 6-INCH DI AND 300 LF OF 8-INCH DI WATER MAIN TO REPLACE 600 LF OF 4-INCH CA WATER MAIN, REPLACE 1 SERVICE CONNECTION, REPLACE 1 METER AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 AND SEVENTH STREET.
						Estimated Total Cost	$370,967				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
68	345	NA									
69	345	14	1-inch	Copper	$3,182.2143		$44,551	HIGHWAY 85 & RASMUSSAN ROAD	2022 or later		CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS, REPLACE 14 METERS AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 FROM RASMUSSAN ROAD SOUTH TO NORTH STREET.
70	345	20	1-inch	Copper	$3,189.6000		$63,792	LYONS AVENUE & DORSEY STREET	2022 or later		CONSTRUCT 1,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,000 LF OF 4-INCH CA WATER MAIN, REPLACE 20 SERVICE CONNECTIONS, REPLACE 20 METERS AND REPLACE 2 FIRE HYDRANTS ON LYONS AVENUE BETWEEN DORSEY STREET AND HOOVER STREET.
71	345	5	1-inch	Copper	$3,170.8000		$15,854	SAHUARO STREET & FIRST STREET	2019	Anticipate starting design in 2018 and construction in 2019	CONSTRUCT 700 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 5 SERVICE CONNECTIONS AND REPLACE 5 METERS ON SAHUARO STREET BETWEEN FIRST STREET AND PALO VERDE AVENUE.
72	345	1	1-inch	Copper	$3,247.0000		$3,247	HIGHWAY 85 & SEVENTH STREET	2021	Anticipate starting design in 2020 and construction in 2021	CONSTRUCT 200 LF OF 6-INCH DI AND 300 LF OF 8-INCH DI WATER MAIN TO REPLACE 600 LF OF 4-INCH CA WATER MAIN, REPLACE 1 SERVICE CONNECTION, REPLACE 1 METER AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 AND SEVENTH STREET.
						Estimated Total Cost	$127,444				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
68	346	NA								
69	346	14	1-inch and smaller	$400.9286		$5,613	HIGHWAY 85 & RASMUSSAN ROAD	2022 or later		CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS, REPLACE 14 METERS AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 FROM RASMUSSAN ROAD SOUTH TO NORTH STREET.
70	346	20	1-inch and smaller	$401.9000		$8,038	LYONS AVENUE & DORSEY STREET	2022 or later		CONSTRUCT 1,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,000 LF OF 4-INCH CA WATER MAIN, REPLACE 20 SERVICE CONNECTIONS, REPLACE 20 METERS AND REPLACE 2 FIRE HYDRANTS ON LYONS AVENUE BETWEEN DORSEY STREET AND HOOVER STREET.
71	346	5	1-inch and smaller	$399.6000		$1,998	SAHUARO STREET & FIRST STREET	2019	Anticipate starting design in 2018 and construction in 2019	CONSTRUCT 700 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 5 SERVICE CONNECTIONS AND REPLACE 5 METERS ON SAHUARO STREET BETWEEN FIRST STREET AND PALO VERDE AVENUE.
72	346	1	1-inch and smaller	$409.0000		$409	HIGHWAY 85 & SEVENTH STREET	2021	Anticipate starting design in 2020 and construction in 2021	CONSTRUCT 200 LF OF 6-INCH DI AND 300 LF OF 8-INCH DI WATER MAIN TO REPLACE 600 LF OF 4-INCH CA WATER MAIN, REPLACE 1 SERVICE CONNECTION, REPLACE 1 METER AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 AND SEVENTH STREET.
					Estimated Total Cost	$16,058				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
68	348	1	$8,667.0000		$8,667	HOOVER STREET & BRANNON DRIVE	2017	Anticipate starting design in 2017 and construction in 2017	CONSTRUCT 200 LF OF 6-INCH DI WATER MAIN TO REPLACE 200 LF OF 4-INCH CA WATER MAIN AND REPLACE 1 FIRE HYDRANT ON HOOVER STREET WEST OF BRANNON DRIVE.
69	348	1	$8,910.0000		$8,910	HIGHWAY 85 & RASMUSSAN ROAD	2022 or later		CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS, REPLACE 14 METERS AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 FROM RASMUSSAN ROAD SOUTH TO NORTH STREET.
70	348	2	$8,931.0000		$17,862	LYONS AVENUE & DORSEY STREET	2022 or later		CONSTRUCT 1,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,000 LF OF 4-INCH CA WATER MAIN, REPLACE 20 SERVICE CONNECTIONS, REPLACE 20 METERS AND REPLACE 2 FIRE HYDRANTS ON LYONS AVENUE BETWEEN DORSEY STREET AND HOOVER STREET.
71	348	NA							
72	348	1	$9,092.0000		$9,092	HIGHWAY 85 & SEVENTH STREET	2021	Anticipate starting design in 2020 and construction in 2021	CONSTRUCT 200 LF OF 6-INCH DI AND 300 LF OF 8-INCH DI WATER MAIN TO REPLACE 600 LF OF 4-INCH CA WATER MAIN, REPLACE 1 SERVICE CONNECTION, REPLACE 1 METER AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 AND SEVENTH STREET.
				Estimated Total Cost	$44,531				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

AJO WATER SYSTEM - PWSID NO. 10-003
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Project No.	Project Description	Cost Estimate[1]	Cost Estimate[2]
68	CONSTRUCT 200 LF OF 6-INCH DI WATER MAIN TO REPLACE 200 LF OF 4-INCH CA WATER MAIN AND REPLACE 1 FIRE HYDRANT ON HOOVER STREET WEST OF BRANNON DRIVE.	$ 26,000	
69	CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS, REPLACE 14 METERS AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 FROM RASMUSSAN ROAD SOUTH TO NORTH STREET.	$ 208,000	
70	CONSTRUCT 1,000 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,000 LF OF 4-INCH CA WATER MAIN, REPLACE 20 SERVICE CONNECTIONS, REPLACE 20 METERS AND REPLACE 2 FIRE HYDRANTS ON LYONS AVENUE BETWEEN DORSEY STREET AND HOOVER STREET.	$ 179,000	
71	CONSTRUCT 700 LF OF 6-INCH DI WATER MAIN TO REPLACE 700 LF OF 4-INCH CA WATER MAIN, REPLACE 5 SERVICE CONNECTIONS AND REPLACE 5 METERS ON SAHUARO STREET BETWEEN FIRST STREET AND PALO VERDE AVENUE.	$ 80,000	
72	CONSTRUCT 200 LF OF 6-INCH DI AND 300 LF OF 8-INCH DI WATER MAIN TO REPLACE 600 LF OF 4-INCH CA WATER MAIN, REPLACE 1 SERVICE CONNECTION, REPLACE 1 METER AND REPLACE 1 FIRE HYDRANT ON HIGHWAY 85 AND SEVENTH STREET.	$ 66,000	
	Estimated Total Cost	**$ 559,000**	**$ -**

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

SIB TABLE I
WHITE TANK

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 309 Supply Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
73	309										
74	309										
75	309										
76	309										
77	309										
78	309										
79	309										
80	309										
81	309										
82	309										
83	309										
84	309										
85	309										
86	309										
87	309										
88	309										
						Estimated Total Cost	$0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	
73	343	300 2,700	12 16	DI	$147.2033 $224.0026		$648,968	CAMELBACK ROAD & JACKRABBIT TRAIL	2018	Start design in 2017 and construction in 2018	CONSTRUCT 300 LF OF 12-INCH DI AND 2,700 LF OF 16-INCH DI WATER MAIN TO REPLACE 3,000 LF OF 8-INCH CA WATER MAIN, REPLACE 10 SERVICE CONNECTIONS AND REPLACE 10 METERS ON CAMELBACK ROAD AND JACKRABBIT TRAIL.
74	343	2,600	16	DI	$224.1392		$582,762	JACKRABBIT TRAIL & INDIAN SCHOOL ROAD	2020	Start design in 2019 and construction in 2020	CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 7 SERVICE CONNECTIONS AND REPLACE 7 METERS ON JACKRABBIT TRAIL BETWEEN INDIAN SCHOOL ROAD AND CAMPBELL AVENUE.
75	343	2,800	12	DI	$146.6893		$410,730	INDIAN SCHOOL ROAD & 191ST AVENUE	2022 or later		CONSTRUCT 2,800 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,800 LF OF 8-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS AND REPLACE 14 METERS ON INDIAN SCHOOL ROAD BETWEEN JACKRABBIT TRAIL AND 191ST AVENUE.
76	343	2,600	16	DI	$224.0623		$582,562	JACKRABBIT TRAIL & OSBORN ROAD	2022 or later	Start design in 2021 and construction in 2022	CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON JACKRABBIT TRAIL BETWEEN OSBORN ROAD AND INDIAN SCHOOL ROAD.
77	343	2,600	16	DI	$224.0623		$582,562	JACKRABBIT TRAIL & THOMAS ROAD	2022 or later		CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON JACKRABBIT TRAIL BETWEEN THOMAS ROAD AND OSBORN ROAD.
78	343	1,300 500	6 8	DI	$90.0377 $115.7620		$174,930	OSBORN ROAD & 191ST AVENUE	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI AND 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,800 LF OF 4-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON OSBORN ROAD.
79	343	2,700	12	DI	$147.1067		$397,188	JACKRABBIT TRAIL & 191ST AVENUE	2022 or later		CONSTRUCT 2,700 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,700 LF OF 8-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON THOMAS ROAD BETWEEN JACKRABBIT TRAIL AND 191ST AVENUE.
80	343	1,300	8	DI	$115.0808		$149,605	191ST AVENUE & THOMAS ROAD	2022 or later		CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 6-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON 191ST AVENUE BETWEEN THOMAS ROAD AND EARLL DRIVE.

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
81	343	2,400	12	DI	$147.2396		$353,375	THOMAS ROAD & 191ST AVENUE	2022 or later		CONSTRUCT 2,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,400 LF OF 6-INCH CA WATER MAIN, REPLACE 6 SERVICE CONNECTIONS AND REPLACE 6 METERS ON THOMAS ROAD BETWEEN 191ST AVENUE AND JACKRABBIT TRAIL.
82	343	2,700	16	DI	$223.8500		$604,395	JACKRABBIT TRAIL & ENCANTO BOULEVARD	2022 or later		CONSTRUCT 2,700 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,700 LF OF 8-INCH CA WATER MAIN, REPLACE 6 SERVICE CONNECTIONS AND REPLACE 6 METERS ON JACKRABBIT TRAIL BETWEEN ENCANTO BOULEVARD AND THOMAS ROAD.
83	343	2,000	8	DI	$115.1850		$230,370	ENCANTO BOULEVARD & 202ND AVENUE	2022 or later		CONSTRUCT 2,000 LF OF 8-INCH DI WATER MAIN TO REPLACE 2,000 LF OF 6-INCH CA WATER MAIN, REPLACE 11 SERVICE CONNECTIONS AND REPLACE 11 METERS ON ENCANTO BOULEVARD BETWEEN 202ND AVENUE AND DINMORE ROAD.
84	343	2,400 700	8 16	DI	$115.4263 $224.4414		$434,132	ENCANTO BOULEVARD & JACKRABBIT TRAIL	2022 or later		CONSTRUCT 2,400 LF OF 8-INCH DI AND 700 LF OF 16-INCH DI WATER MAIN TO REPLACE 3,100 LF OF 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 26 SERVICE CONNECTIONS AND REPLACE 26 METERS ON ENCANTO BOULEVARD AND JACKRABBIT TRAIL.
85	343	1,300	6	DI	$89.7577		$116,685	193RD AVENUE & FILLMORE STREET	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 12 SERVICE CONNECTIONS AND REPLACE 12 METERS ON 193RD AVENUE BETWEEN FILLMORE STREET AND ROOSEVELT STREET.
86	343	1,300	6	DI	$89.9723		$116,964	193RD AVENUE & ROOSEVELT STREET	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON 193RD AVENUE BETWEEN ROOSEVELT STREET AND CULVER STREET.
87	343	4,200 1,500	6 8	DI	$89.5424 $115.1260		$548,767	PERRYVILLE ROAD & ROOSEVELT STREET	2022 or later		CONSTRUCT 4,200 LF OF 6-INCH DI AND 1,500 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,700 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 37 SERVICE CONNECTIONS AND REPLACE 37 METERS ON PERRYVILLE ROAD, ROOSEVELT STREET AND ON QUINTANA ESTATES SUBDIVSION.

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
88	343	3,000 1,100	6 8	DI	$89.6683 $115.2882		$395,822	ROOSEVELT STREET & 183RD DRIVE	2022 or later		CONSTRUCT 3,000 LF OF 6-INCH DI AND 1,100 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,100 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 30 SERVICE CONNECTIONS AND REPLACE 30 METERS ON ROOSEVELT STREET AND ON QUINTANA ESTATES SUBDIVSION.
						Estimated Total Cost	$6,329,817				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
73	345	10	1-inch	Copper	$3,200.0000		$32,000	CAMELBACK ROAD & JACKRABBIT TRAIL	2018	Start design in 2017 and construction in 2018	CONSTRUCT 300 LF OF 12-INCH DI AND 2,700 LF OF 16-INCH DI WATER MAIN TO REPLACE 3,000 LF OF 8-INCH CA WATER MAIN, REPLACE 10 SERVICE CONNECTIONS AND REPLACE 10 METERS ON CAMELBACK ROAD AND JACKRABBIT TRAIL.
74	345	7	1-inch	Copper	$3,202.0000		$22,414	JACKRABBIT TRAIL & INDIAN SCHOOL ROAD	2020	Start design in 2019 and construction in 2020	CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 7 SERVICE CONNECTIONS AND REPLACE 7 METERS ON JACKRABBIT TRAIL BETWEEN INDIAN SCHOOL ROAD AND CAMPBELL AVENUE.
75	345	14	1-inch	Copper	$3,188.9286		$44,645	INDIAN SCHOOL ROAD & 191ST AVENUE	2022 or later		CONSTRUCT 2,800 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,800 LF OF 8-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS AND REPLACE 14 METERS ON INDIAN SCHOOL ROAD BETWEEN JACKRABBIT TRAIL AND 191ST AVENUE.
76	345	9	1-inch	Copper	$3,200.8889		$28,808	JACKRABBIT TRAIL & OSBORN ROAD	2022 or later	Start design in 2021 and construction in 2022	CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON JACKRABBIT TRAIL BETWEEN OSBORN ROAD AND INDIAN SCHOOL ROAD.
77	345	9	1-inch	Copper	$3,200.8889		$28,808	JACKRABBIT TRAIL & THOMAS ROAD	2022 or later		CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON JACKRABBIT TRAIL BETWEEN THOMAS ROAD AND OSBORN ROAD.
78	345	13	1-inch	Copper	$3,215.6154		$41,803	OSBORN ROAD & 191ST AVENUE	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI AND 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,800 LF OF 4-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON OSBORN ROAD.
79	345	13	1-inch	Copper	$3,198.0000		$41,574	JACKRABBIT TRAIL & 191ST AVENUE	2022 or later		CONSTRUCT 2,700 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,700 LF OF 8-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON THOMAS ROAD BETWEEN JACKRABBIT TRAIL AND 191ST AVENUE.
80	345	9	1-inch	Copper	$3,196.6667		$28,770	191ST AVENUE & THOMAS ROAD	2022 or later		CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 6-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON 191ST AVENUE BETWEEN THOMAS ROAD AND EARLL DRIVE.

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
81	345	6	1-inch	Copper	$3,200.8333		$19,205	THOMAS ROAD & 191ST AVENUE	2022 or later		CONSTRUCT 2,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,400 LF OF 6-INCH CA WATER MAIN, REPLACE 6 SERVICE CONNECTIONS AND REPLACE 6 METERS ON THOMAS ROAD BETWEEN 191ST AVENUE AND JACKRABBIT TRAIL.
82	345	6	1-inch	Copper	$3,197.8333		$19,187	JACKRABBIT TRAIL & ENCANTO BOULEVARD	2022 or later		CONSTRUCT 2,700 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,700 LF OF 8-INCH CA WATER MAIN, REPLACE 6 SERVICE CONNECTIONS AND REPLACE 6 METERS ON JACKRABBIT TRAIL BETWEEN ENCANTO BOULEVARD AND THOMAS ROAD.
83	345	11	1-inch	Copper	$3,199.5455		$35,195	ENCANTO BOULEVARD & 202ND AVENUE	2022 or later		CONSTRUCT 2,000 LF OF 8-INCH DI WATER MAIN TO REPLACE 2,000 LF OF 6-INCH CA WATER MAIN, REPLACE 11 SERVICE CONNECTIONS AND REPLACE 11 METERS ON ENCANTO BOULEVARD BETWEEN 202ND AVENUE AND DINMORE ROAD.
84	345	26	1-inch	Copper	$3,206.3077		$83,364	ENCANTO BOULEVARD & JACKRABBIT TRAIL	2022 or later		CONSTRUCT 2,400 LF OF 8-INCH DI AND 700 LF OF 16-INCH DI WATER MAIN TO REPLACE 3,100 LF OF 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 26 SERVICE CONNECTIONS AND REPLACE 26 METERS ON ENCANTO BOULEVARD AND JACKRABBIT TRAIL.
85	345	12	1-inch	Copper	$3,205.6667		$38,468	193RD AVENUE & FILLMORE STREET	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 12 SERVICE CONNECTIONS AND REPLACE 12 METERS ON 193RD AVENUE BETWEEN FILLMORE STREET AND ROOSEVELT STREET.
86	345	13	1-inch	Copper	$3,213.3077		$41,773	193RD AVENUE & ROOSEVELT STREET	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON 193RD AVENUE BETWEEN ROOSEVELT STREET AND CULVER STREET.
87	345	37	1-inch	Copper	$3,197.9459		$118,324	PERRYVILLE ROAD & ROOSEVELT STREET	2022 or later		CONSTRUCT 4,200 LF OF 6-INCH DI AND 1,500 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,700 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 37 SERVICE CONNECTIONS AND REPLACE 37 METERS ON PERRYVILLE ROAD, ROOSEVELT STREET AND ON QUINTANA ESTATES SUBDIVSION.

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
88	345	30	1-inch	Copper	$3,202.4333		$96,073	ROOSEVELT STREET & 183RD DRIVE	2022 or later		CONSTRUCT 3,000 LF OF 6-INCH DI AND 1,100 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,100 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 30 SERVICE CONNECTIONS AND REPLACE 30 METERS ON ROOSEVELT STREET AND ON QUINTANA ESTATES SUBDIVSION.
						Estimated Total Cost	$720,411				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
73	346	10	1-inch and smaller	$403.2000		$4,032	CAMELBACK ROAD & JACKRABBIT TRAIL	2018	Start design in 2017 and construction in 2018	CONSTRUCT 300 LF OF 12-INCH DI AND 2,700 LF OF 16-INCH DI WATER MAIN TO REPLACE 3,000 LF OF 8-INCH CA WATER MAIN, REPLACE 10 SERVICE CONNECTIONS AND REPLACE 10 METERS ON CAMELBACK ROAD AND JACKRABBIT TRAIL
74	346	7	1-inch and smaller	$403.4286		$2,824	JACKRABBIT TRAIL & INDIAN SCHOOL ROAD	2020	Start design in 2019 and construction in 2020	CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 7 SERVICE CONNECTIONS AND REPLACE 7 METERS ON JACKRABBIT TRAIL BETWEEN INDIAN SCHOOL ROAD AND CAMPBELL AVENUE.
75	346	14	1-inch and smaller	$401.7857		$5,625	INDIAN SCHOOL ROAD & 191ST AVENUE	2022 or later		CONSTRUCT 2,800 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,800 LF OF 8-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS AND REPLACE 14 METERS ON INDIAN SCHOOL ROAD BETWEEN JACKRABBIT TRAIL AND 191ST AVENUE
76	346	9	1-inch and smaller	$403.3333		$3,630	JACKRABBIT TRAIL & OSBORN ROAD	2022 or later	Start design in 2021 and construction in 2022	CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON JACKRABBIT TRAIL BETWEEN OSBORN ROAD AND INDIAN SCHOOL ROAD.
77	346	9	1-inch and smaller	$403.3333		$3,630	JACKRABBIT TRAIL & THOMAS ROAD	2022 or later		CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON JACKRABBIT TRAIL BETWEEN THOMAS ROAD AND OSBORN ROAD.
78	346	13	1-inch and smaller	$405.1538		$5,267	OSBORN ROAD & 191ST AVENUE	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI AND 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,800 LF OF 4-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON OSBORN ROAD.
79	346	13	1-inch and smaller	$402.9231		$5,238	JACKRABBIT TRAIL & 191ST AVENUE	2022 or later		CONSTRUCT 2,700 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,700 LF OF 8-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON THOMAS ROAD BETWEEN JACKRABBIT TRAIL AND 191ST AVENUE.

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
80	346	9	1-inch and smaller	$402.7778		$3,625	191ST AVENUE & THOMAS ROAD	2022 or later		CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 6-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON 191ST AVENUE BETWEEN THOMAS ROAD AND EARLL DRIVE.
81	346	6	1-inch and smaller	$403.3333		$2,420	THOMAS ROAD & 191ST AVENUE	2022 or later		CONSTRUCT 2,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,400 LF OF 6-INCH CA WATER MAIN, REPLACE 6 SERVICE CONNECTIONS AND REPLACE 6 METERS ON THOMAS ROAD BETWEEN 191ST AVENUE AND JACKRABBIT TRAIL.
82	346	6	1-inch and smaller	$403.0000		$2,418	JACKRABBIT TRAIL & ENCANTO BOULEVARD	2022 or later		CONSTRUCT 2,700 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,700 LF OF 8-INCH CA WATER MAIN, REPLACE 6 SERVICE CONNECTIONS AND REPLACE 6 METERS ON JACKRABBIT TRAIL BETWEEN ENCANTO BOULEVARD AND THOMAS ROAD.
83	346	11	1-inch and smaller	$403.1818		$4,435	ENCANTO BOULEVARD & 202ND AVENUE	2022 or later		CONSTRUCT 2,000 LF OF 8-INCH DI WATER MAIN TO REPLACE 2,000 LF OF 6-INCH CA WATER MAIN, REPLACE 11 SERVICE CONNECTIONS AND REPLACE 11 METERS ON ENCANTO BOULEVARD BETWEEN 202ND AVENUE AND DINMORE ROAD.
84	346	26	1-inch and smaller	$404.0000		$10,504	193RD AVENUE & FILLMORE STREET	2022 or later		CONSTRUCT 2,400 LF OF 8-INCH DI AND 700 LF OF 16-INCH DI WATER MAIN TO REPLACE 3,100 LF OF 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 26 SERVICE CONNECTIONS AND REPLACE 26 METERS ON ENCANTO BOULEVARD AND JACKRABBIT TRAIL.
85	346	12	1-inch and smaller	$403.9167		$4,847	193RD AVENUE & FILLMORE STREET	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 12 SERVICE CONNECTIONS AND REPLACE 12 METERS ON 193RD AVENUE BETWEEN FILLMORE STREET AND ROOSEVELT STREET.
86	346	13	1-inch and smaller	$404.8462		$5,263	193RD AVENUE & ROOSEVELT STREET	2022 or later		CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON 193RD AVENUE BETWEEN ROOSEVELT STREET AND CULVER STREET.

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
87	346	37	1-inch and smaller	$402.9459		$14,909	PERRYVILLE ROAD & ROOSEVELT STREET	2022 or later		CONSTRUCT 4,200 LF OF 6-INCH DI AND 1,500 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,700 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 37 SERVICE CONNECTIONS AND REPLACE 37 METERS ON PERRYVILLE ROAD, ROOSEVELT STREET AND ON QUINTANA ESTATES SUBDIVISION.
88	346	30	1-inch and smaller	$403.5000		$12,105	ROOSEVELT STREET & 183RD DRIVE	2022 or later		CONSTRUCT 3,000 LF OF 6-INCH DI AND 1,100 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,100 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 30 SERVICE CONNECTIONS AND REPLACE 30 METERS ON ROOSEVELT STREET AND ON QUINTANA ESTATES SUBDIVISION.
						Estimated Total Cost	$90,772			

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
73	348	NA							
74	348	NA							
75	348	NA							
76	348	NA							
77	348	NA							
78	348	NA							
79	348	NA							
80	348	NA							
81	348	NA							
82	348	NA							
83	348	NA							
84	348	NA							
85	348	NA							
86	348	NA							
87	348	NA							
88	348	NA							
				Estimated Total Cost	$0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

WHITE TANK WATER SYSTEM - PWSID NO. 07-128
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Project No.	Project Description	Cost Estimate[1]	Cost Estimate[2]
73	CONSTRUCT 300 LF OF 12-INCH DI AND 2,700 LF OF 16-INCH DI WATER MAIN TO REPLACE 3,000 LF OF 8-INCH CA WATER MAIN, REPLACE 10 SERVICE CONNECTIONS AND REPLACE 10 METERS ON CAMELBACK ROAD AND JACKRABBIT TRAIL.	$ 685,000	
74	CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 7 SERVICE CONNECTIONS AND REPLACE 7 METERS ON JACKRABBIT TRAIL BETWEEN INDIAN SCHOOL ROAD AND CAMPBELL AVENUE.	$ 608,000	
75	CONSTRUCT 2,800 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,800 LF OF 8-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS AND REPLACE 14 METERS ON INDIAN SCHOOL ROAD BETWEEN JACKRABBIT TRAIL AND 191ST AVENUE.	$ 461,000	
76	CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON JACKRABBIT TRAIL BETWEEN OSBORN ROAD AND INDIAN SCHOOL ROAD.	$ 615,000	
77	CONSTRUCT 2,600 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,600 LF OF 8-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON JACKRABBIT TRAIL BETWEEN THOMAS ROAD AND OSBORN ROAD.	$ 615,000	
78	CONSTRUCT 1,300 LF OF 6-INCH DI AND 500 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,800 LF OF 4-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON OSBORN ROAD.	$ 222,000	
79	CONSTRUCT 2,700 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,700 LF OF 8-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON THOMAS ROAD BETWEEN JACKRABBIT TRAIL AND 191ST AVENUE.	$ 444,000	
80	CONSTRUCT 1,300 LF OF 8-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 6-INCH CA WATER MAIN, REPLACE 9 SERVICE CONNECTIONS AND REPLACE 9 METERS ON 191ST AVENUE BETWEEN THOMAS ROAD AND EARLL DRIVE.	$ 182,000	
81	CONSTRUCT 2,400 LF OF 12-INCH DI WATER MAIN TO REPLACE 2,400 LF OF 6-INCH CA WATER MAIN, REPLACE 6 SERVICE CONNECTIONS AND REPLACE 6 METERS ON THOMAS ROAD BETWEEN 191ST AVENUE AND JACKRABBIT TRAIL.	$ 375,000	
82	CONSTRUCT 2,700 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,700 LF OF 8-INCH CA WATER MAIN, REPLACE 6 SERVICE CONNECTIONS AND REPLACE 6 METERS ON JACKRABBIT TRAIL BETWEEN ENCANTO BOULEVARD AND THOMAS ROAD.	$ 626,000	
83	CONSTRUCT 2,000 LF OF 8-INCH DI WATER MAIN TO REPLACE 2,000 LF OF 6-INCH CA WATER MAIN, REPLACE 11 SERVICE CONNECTIONS AND REPLACE 11 METERS ON ENCANTO BOULEVARD BETWEEN 202ND AVENUE AND DINMORE ROAD.	$ 270,000	
84	CONSTRUCT 2,400 LF OF 8-INCH DI AND 700 LF OF 16-INCH DI WATER MAIN TO REPLACE 3,100 LF OF 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 26 SERVICE CONNECTIONS AND REPLACE 26 METERS ON ENCANTO BOULEVARD AND JACKRABBIT TRAIL.	$ 528,000	
85	CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 12 SERVICE CONNECTIONS AND REPLACE 12 METERS ON 193RD AVENUE BETWEEN FILLMORE STREET AND ROOSEVELT STREET.	$ 160,000	
86	CONSTRUCT 1,300 LF OF 6-INCH DI WATER MAIN TO REPLACE 1,300 LF OF 4-INCH CA WATER MAIN, REPLACE 13 SERVICE CONNECTIONS AND REPLACE 13 METERS ON 193RD AVENUE BETWEEN ROOSEVELT STREET AND CULVER STREET.	$ 164,000	
87	CONSTRUCT 4,200 LF OF 6-INCH DI AND 1,500 LF OF 8-INCH DI WATER MAIN TO REPLACE 5,700 LF OF 4-INCH CA, 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 37 SERVICE CONNECTIONS AND REPLACE 37 METERS ON PERRYVILLE ROAD, ROOSEVELT STREET AND ON QUINTANA ESTATES SUBDIVSION.	$ 682,000	
88	CONSTRUCT 3,000 LF OF 6-INCH DI AND 1,100 LF OF 8-INCH DI WATER MAIN TO REPLACE 4,100 LF OF 4-INCH CA AND 6-INCH CA WATER MAIN, REPLACE 30 SERVICE CONNECTIONS AND REPLACE 30 METERS ON ROOSEVELT STREET AND ON QUINTANA ESTATES SUBDIVSION.	$ 504,000	
	Estimated Total Cost	**$ 7,141,000**	**$ -**

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

SIB TABLE I
COOLIDGE AIRPORT

COOLIDGE AIRPORT WATER SYSTEM - PWSID NO. 11-707
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 309 Supply Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
65	NA										
66	NA										
67	NA										
						Estimated Total Cost	0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

COOLIDGE AIRPORT WATER SYSTEM - PWSID NO. 11-707
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
65	343	900	6	DI	$88.8889		$80,000	COOLIDGE AIRPORT WELL SITE	2020	Start design in 2019 and construction in 2020	CONSTRUCT 900 LF OF 6-INCH DI TO REPLACE 900 LF OF 6-INCH THIN LINE PVC WATER MAIN THAT CONNECTS THE COOLIDGE AIRPORT SYSTEM WELLS 1 AND 2.
66	343	1,200	12	DI	$147.5000		$177,000	COOLIDGE AIRPORT	2022 or later		CONSTRUCT 1,200 LF OF 12-INCH DI WATER MAIN TO REPLACE 1,200 LF OF 3-INCH GS WATER MAIN ALONG AN EASEMENT AT COOLIDGE AIRPORT.
67	343	1,100	12	DI	$148.1818		$163,000	COOLIDGE AIRPORT	2022 or later		CONSTRUCT 1,100 LF OF 12-INCH DI WATER MAIN TO REPLACE 1,100 LF OF 3-INCH GS WATER MAIN ALONG AN EASEMENT AT COOLIDGE AIRPORT.
							Estimated Total Cost	$420,000			

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

COOLIDGE AIRPORT WATER SYSTEM - PWSID NO. 11-707
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
65	345	NA									
66	345	NA									
67	345	NA									
						Estimated Total Cost	$0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

COOLIDGE AIRPORT WATER SYSTEM - PWSID NO. 11-707
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
65	346	NA								
66	346	NA								
67	346	NA								
					Estimated Total Cost	$0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

COOLIDGE AIRPORT WATER SYSTEM - PWSID NO. 11-707
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
65	348	NA							
66	348	NA							
67	348	NA							
				Estimated Total Cost	$0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

COOLIDGE AIRPORT WATER SYSTEM - PWSID NO. 11-707
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Project No.	Project Description	Cost Estimate[1]	Cost Estimate[2]
65	CONSTRUCT 900 LF OF 6-INCH DI TO REPLACE 900 LF OF 6-INCH THIN LINE PVC WATER MAIN THAT CONNECTS THE COOLIDGE AIRPORT SYSTEM WELLS 1 AND 2.	$ 80,000	
66	CONSTRUCT 1,200 LF OF 12-INCH DI WATER MAIN TO REPLACE 1,200 LF OF 3-INCH GS WATER MAIN ALONG AN EASEMENT AT COOLIDGE AIRPORT.	$ 177,000	
67	CONSTRUCT 1,100 LF OF 12-INCH DI WATER MAIN TO REPLACE 1,100 LF OF 3-INCH GS WATER MAIN ALONG AN EASEMENT AT COOLIDGE AIRPORT.	$ 163,000	
	Estimated Total Cost	**$ 420,000**	**$ -**

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

SIB TABLE I
TIERRA GRANDE

TIERRA GRANDE SYSTEM - PWSID NO. 11-076
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 309 Supply Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance and repair/replacement program.
64	NA										
						Estimated Total Cost	0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

TIERRA GRANDE WATER SYSTEM - PWSID NO. 11-076
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 343 T&D Mains	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
64	343	2,100	16	DI	$223.6367		$469,637	ULTIMA BOULEVARD & ELEVEN MILE CORNER ROAD	2018	Start design in 2017 and construction in 2018	CONSTRUCT 2,100 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,100 LF OF 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS AND REPLACE 14 METERS FROM ULTIMA BOULEVARD NORTH ON ELEVEN MILE CORNER ROAD.
						Estimated Total Cost	$469,637				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

TIERRA GRANDE WATER SYSTEM - PWSID NO. 11-076
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)											
Project No.	NARUC Acct. No: 345 Services	Units (Quantity)	Diameter / Size	Material	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
64	345	14	1-inch	Copper	$3,194.7857		$44,727	ULTIMA BOULEVARD & ELEVEN MILE CORNER ROAD	2018	Start design in 2017 and construction in 2018	CONSTRUCT 2,100 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,100 LF OF 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS AND REPLACE 14 METERS FROM ULTIMA BOULEVARD NORTH ON ELEVEN MILE CORNER ROAD.
						Estimated Total Cost	$44,727				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

TIERRA GRANDE WATER SYSTEM - PWSID NO. 11-076
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)										
Project No.	NARUC Acct. No: 346 Meters	Units (Quantity)	Diameter / Size	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
64	346	14	1-inch and smaller	$402.5714		$5,636	ULTIMA BOULEVARD & ELEVEN MILE CORNER ROAD	2018	Start design in 2017 and construction in 2018	CONSTRUCT 2,100 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,100 LF OF 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS AND REPLACE 14 METERS FROM ULTIMA BOULEVARD NORTH ON ELEVEN MILE CORNER ROAD.
					Estimated Total Cost	$5,636				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

TIERRA GRANDE WATER SYSTEM - PWSID NO. 11-076
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Replacement Plant Description (new plant) (SIB-eligible plant)									
Project No.	NARUC Acct. No: 348 Hydrants	Units (Quantity)	Cost / Unit (estimated)[1]	Cost / Unit (estimated)[2]	Subtotal Cost (estimated)	Site (location description)	Expected In-Service Date	Project Status	1. Provide narrative why Replacement Plant is necessary. - Replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility. - Replacement of existing plant to address excessive water loss (10% or more). - Replacement of existing plant for other reasons supported by persuasive showing by utility. 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include costs for extending or expanding facilities to serve new customers. 5. Provide reference to related page no. in the submitted detailed engineering analysis supporting the need for SIB. Engineering analysis shall also include narrative explaining the utility's systematic assessment,
64	348	NA							CONSTRUCT 2,100 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,100 LF OF 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS AND REPLACE 14 METERS FROM ULTIMA BOULEVARD NORTH ON ELEVEN MILE CORNER ROAD.
				Estimated Total Cost	$0				

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation

TIERRA GRANDE SYSTEM - PWSID NO. 11-076
SIB PLANT TABLE I

Information to be included with SIB-Eligible Project Filings

Project No.	Project Description	Cost Estimate[1]	Cost Estimate[2]
64	CONSTRUCT 2,100 LF OF 16-INCH DI WATER MAIN TO REPLACE 2,100 LF OF 6-INCH CA AND 8-INCH CA WATER MAIN, REPLACE 14 SERVICE CONNECTIONS AND REPLACE 14 METERS FROM ULTIMA BOULEVARD NORTH ON ELEVEN MILE CORNER ROAD.	$ 520,000	
	Estimated Total Cost	**$ 520,000**	**$ -**

[1]Per the Commission approved initial SIB Table I.

[2]Beginning with its SIB surcharge request filing for year two, the Company may request a change from the estimated Cost/Unit (in the Commission approved initial SIB Table I) due to inflation using the latest calendar year Consumer Price Index. This may be done only if the initial SIB Plant Table I unit cost did not account for inflation.

Reiker

ARIZONA WATER COMPANY

Docket No. W-01445A-15-0277

2015 WESTERN GROUP RATE HEARING

(For Test Year Ending 12/31/14)

Prepared

REBUTTAL TESTIMONY

of

JOEL M. REIKER

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"Insights into Declining Single-Family Residential Water Demands." Journal AWWA. June 2012..... **ATTACHMENT 23**

AWC's response to Staff data request BAB 2.13, provided to RUCO on October 23, 2015..... **ATTACHMENT 24**

"Why We Could See an Oil Price Shock in 2016." USA Today. Mar. 27, 2016..... **ATTACHMENT 25**

Arizona Water Company Test Year Ending December 31, 2014, Life Insurance Workpaper..... **ATTACHMENT 26**

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ARIZONA WATER COMPANY

Rebuttal Testimony of

Joel M. Reiker

I. Introduction

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

A. My name is Joel M. Reiker. I am employed by Arizona Water Company ("AWC" or "Company") as Vice President – Rates & Revenues.

Q. ARE YOU THE SAME JOEL M. REIKER THAT PROVIDED PRE-FILED DIRECT TESTIMONY IN THIS PROCEEDING?

A. Yes.

Q. HAVE YOU REVIEWED THE DIRECT TESTIMONY FILED BY THE OTHER PARTIES TO THIS PROCEEDING?

A. Yes. I have reviewed the testimony of each of the witnesses for the Residential Utility Consumer Office ("RUCO"), the Arizona Corporation Commission's ("Commission") Utilities Division Staff ("Staff"), and Abbott Laboratories, Inc. ("Abbott").

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to respond to the direct testimony of RUCO witness John Cassidy, Staff witness Briton A. Baxter and Abbott witnesses Kevin Kemp and Dan L. Neidlinger.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. My testimony is presented in five sections, including this introductory Section I. In Section II, I respond to RUCO witness John Cassidy's testimony regarding RUCO's recommended fictitious imputed cost of debt and recommended adjustments to rate base and operating income, as well as RUCO's recommended rate design. In Section III, I respond to Staff witness Briton A.

Baxter's testimony regarding Staff's recommended adjustments to AWC's rate base and operating income, as well as Staff's recommended rate design. In Section IV, I respond to Abbott witnesses Mr. Kemp and Mr. Neidlinger regarding Central Arizona Project water recharge credits and rate design. Finally, in Section V, I present and discuss AWC's proposed rebuttal pro forma adjustment to reflect a significant increase in property and liability insurance expense.

II. Response to RUCO

A. Cost of Captial

RUCO's Fictitious Imputed 5.43% Cost of Debt

Q. DO YOU HAVE ANY GENERAL COMMENTS ON RUCO'S RECOMMENDED OVERALL RATE OF RETURN ("ROR") IN THIS PROCEEDING?

A. Yes. RUCO recommends that the Commission adopt a 7.32% ROR, based on the Company's actual capital structure at the end of the test year consisting of 53.7% equity and 46.3% debt, and RUCO's recommended return on equity ("ROE") of 8.95%, and its fictitious imputed debt cost of 5.43%.[1]

AWC's actual recorded, Commission-approved and adopted cost of debt is 6.82% - a fact that RUCO witness Mr. Cassidy acknowledges in his direct testimony on cost of capital.[2] 6.82% represents the actual recorded, "out-of-pocket" cost that AWC is expressly obligated to pay its bondholders under the terms of the Company's General Mortgage Bond Indenture. AWC's bonds are secured by a general mortgage on all of its utility plant assets, which means if AWC cannot make its required bond interest payments, the Company is in default and the indenture trustee may take possession of such utility assets.

[1] *See* Direct testimony of John Cassidy on Cost of Capital, p. 3 at 5-8.
[2] *See* Decision 74081, Exhibit B, Decision 73736, p. 62, Decision 73144, Exhibit B, Schedule D-2 of the Company's Application) & Direct testimony of John Cassidy on Cost of Capital, p. 16 at 13 – p. 17 at 11.

By urging the Commission to adopt a fictitious imputed 5.43% cost of debt, RUCO would have the Commission disallow over $435,000 in out-of-pocket Commission-approved bond interest payments allocated to AWC's Western Group, and nearly $950,000 in bond interest companywide. Because AWC is contractually obligated to pay this bond interest, adopting RUCO's fictitious imputed cost of debt in this proceeding will force AWC's shareholders to pay the Company's creditors out of funds RUCO earmarks for the shareholders' return on common equity. As a result, RUCO's actual recommended ROE in this proceeding is 8.20% - 75 basis points lower than the purported 8.95% ROE Mr. Cassidy recommends in his testimony, as explained by Company witness Ms. Ahern in her rebuttal testimony.

Ms. Ahern addresses RUCO's recommended ROE and fictitious imputed cost of debt in her rebuttal testimony. Below, I explain why forcing a regulated utility's common shareholders to surrender a portion of their equity return to creditors in the form of fixed bond interest payments does not constitute a just and reasonable result. At the very least, RUCO's proposed disallowance of out-of-pocket bond interest expense is unjustified, unsupported, confiscatory and conflicts with long-standing ratemaking principles and this Commission's approval of AWC's issuance of its bonds and their corresponding interest rates. At worst, RUCO's recommendation constitutes shoddy, if not unlawful, ratemaking and bad public policy. As the evidence discussed below shows, Mr. Cassidy's testimony regarding AWC's cost of debt is fraught with selective omissions, factual errors, misleading statements, and misconceptions on the subject of utility finance.

Q. WHAT IS A JUST AND REASONABLE RESULT IN THE CONTEXT OF UTILITY RATEMAKING?

A. As I explained in my direct testimony,[3] a just and reasonable result is an overall rate level that provides the utility with a reasonable opportunity to recover its prudently incurred cost of service, including the cost of capital deployed in the provision of such service.[4] Mr. Cassidy acknowledges this important ratemaking principle in his direct testimony on cost of capital.[5] He goes on to define a "fair rate of return," stating that such a return should allow a well-managed utility "the ability to maintain its financial integrity, attract capital, and establish comparable returns for similar risk investments."[6]

As stated above, the principle of cost of service as the basis for utility ratemaking extends to the cost of capital.[7] Regarding a utility's debt, Leonard Goodman explains in The Process of Ratemaking:

> **The actual cost of debt is used to compute cost of capital**, since it is more realistic and more reliable than projecting future costs. Justice Brandeis provided the basic explanation for regulatory reliance on actual cost of debt:[8]
>
> *In essence, there is no difference between the capital charge and operating expenses, depreciation, and taxes. Each is a part of the current cost of supplying the service; and each should be met from current income.... The necessary cost, and hence the capital charge, of the money embarked recently in utilities, and of that which may be invested in the near future, may be more, as it may be less, than the prevailing rate of return required to induce capital to enter upon like enterprises at the time of the rate hearing ten*

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[3] *See* Reiker pre-filed direct testimony, pp. 6 – 9.
[4] *See* **ATTACHMENT 1** - Bonbright, James C., Albert L. Danielsen and David R. Kamerschen. Principles of Public Utility Rates. Public Utilities Reports, Inc. 2nd Ed. p. 109.
See also **ATTACHMENT** 2 - Hahne, Robert L. and Gregory E. Aliff. Accounting for Public Utilities. Matthew Bender. 1988. p. 3-11.
[5] *See* Cassidy direct testimony on cost of capital, p. 3 at 18 – 19.
[6] *Id.* p. 4 at 14 – 16.
[7] *See* **ATTACHMENT 1** - Bonbright, p. 313.
[8] Southwestern Bell Tel. 262 U.S. at 306. (footnote in original)

> *years hence.* ***To fix the return by the rate which happens to prevail at such future day, opens the door to great hardships. Where the financing has been proper, the cost to the utility of the capital, required to construct, equip and operate its plant, should measure the rate of return which the Constitution guarantees opportunity to earn***.[9]

In expounding the method regulators use to determine a utility's cost of capital, Professor Charles Phillips states in The Regulation of Public Utilities:

> Few problems arise in computing the cost of senior capital. By common practice, **the cost of senior capital is the embedded cost: the actual fixed charges on long-term debt** and the annual dividend requirements of preferred (and preference) stock... **Basing the cost of existing senior capital upon the hypothetical cost of doing senior financing under current conditions of the bond and stock market would represent (just as in the case of reproduction cost property values) an alternative not available to a utility**.[10]

As it relates to the cost of capital, RUCO simply disregards the cost of service principle as the basis of a just and reasonable rate and recommends that the Commission disallow out-of-pocket bond interest expense on capital required to construct and equip AWC's utility plant. As a result, Mr. Cassidy's recommended rates in this proceeding fail to provide AWC an opportunity to maintain its financial integrity and attract capital on reasonable terms, if at all. In fact, Mr. Cassidy's recommended rates will destroy the book value of AWC's equity capital.

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[9] *See* **ATTACHMENT 3** - Goodman, Leonard Saul. The Process of Ratemaking Vol. I. Public Utilities Reports, Inc. 1998. p. 601.

[10] *See* **ATTACHMENT 4** - Phillips, Jr., Charles F. The Regulation of Public Utilities. Public Utilities Reports, Inc. 1988. p. 375.

Q. DO REGULATORY COMMISSIONS HAVE THE AUTHORITY AND RESPONSIBILITY TO DISALLOW IMPRUDENT EXPENDITURES?

A. Yes, with the caveat that hindsight – which is the entire basis of Mr. Cassidy's testimony - is not sufficient to prove costs are unreasonable or imprudent.[11] As Justice Brandeis explains above, "where the financing has been proper, the cost to the utility of the capital, required to construct, equip and operate its plant, should measure the rate of return which the Constitution guarantees opportunity to earn." As I explain below, RUCO has failed to acknowledge that AWC's long-term bonds, including the interest rates and terms on which they were issued, were not only prudent and proper, but they were also expressly approved by the Commission, at the time they were issued.

Q. WHAT HAS THE COMMISSSION CONCLUDED AS A MATTER OF LAW REGARDING AWC'S LONG-TERM BONDS?

A. The Commission has found that all of AWC's currently outstanding long-term bonds are for lawful purposes, within AWC's corporate powers, compatible with the public interest, with sound financial practices, with proper performance of service as a public service corporation, and will not impair AWC's ability to perform that service.[12] In other words, to the extent AWC's Commission-approved bond debt finances prudently incurred expenditures for utility plant, the actual, out-of-pocket interest on those bonds is a prudently incurred cost that should be reflected in rates. Moreover, nowhere in Mr. Cassidy's testimony does he question whether such utility plant expenditures are necessary, used and

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[11] *See* **ATTACHMENT 5** - Howe, Keith M. and Eugene Rasmussen. Public Utility Economics and Finance. Prentice-Hall, Inc. 1982. p. 74.
See also **ATTACHMENT 6** - Kahn, Alfred E. The Economics of Regulation. The M.I.T. Press. 1988. pp. xxvi – xxvii.
See also **ATTACHMENT 4** - Phillips, p. 326.
See also **ATTACHMENT 1** - Bonbright, p. 292.
See also **ATTACHMENT 3** - Goodman, p. 861.

[12] *See* Dec. 63418, dated March 9, 2001, Conclusion of Law No. 4, Dec. 68694, dated May 5, 2006, Conclusion of Law No. 4, and Dec. 70392, dated June 20, 2008, Conclusion of Law No. 5.

useful. Accordingly, the Commission has consistently adopted AWC's actual, embedded cost of debt when setting rates for the Company.[13]

Disallowing recovery of any portion of this prudently incurred and previously approved cost from AWC's revenue requirement in this proceeding contradicts longstanding Commission decisions, findings, and practice, and presupposes that the Company will fail to recover its out-of-pocket costs going forward. This is the definition of a confiscatory rate.[14]

Q. WHY DOES RUCO RECOMMEND A FICTITIOUS IMPUTED 5.43% COST OF DEBT IN THIS PROCEEDING?

A. Beginning on page 17 of his direct testimony on cost of capital, Mr. Cassidy presents what he calls "four compelling reasons" why the Commission should adopt a fictitious imputed cost of debt and thereby disallow prudently incurred out-of-pocket bond interest expense. Mr. Cassidy's first reason is that subsequent to AWC filing an application in December 2008 requesting Commission approval to incur additional short-term debt to construct utility plant, circumstances changed and AWC ultimately did not require such debt authorization.[15] Those circumstances included the onset of the worst economic recession since the Great Depression and a sharp decline in AWC's cash flow and earnings, as explained by Company witness Mr. Harris in his rebuttal testimony.

Mr. Cassidy claims that "[f]or obvious reasons, withdrawal of the Company's financing application has accrued only to the benefit of AWC shareholders. Therefore, the Commission should feel no obligation to pass on

[13] *See* Dec. 74081, dated Sep. 23, 2013, Dec. 73736, dated Feb. 20, 2013, Dec. 73144, dated May 1, 2012, Dec. 71845, dated Aug. 25, 2010.
[14] *See* **ATTACHMENT 3** - Goodman, pp. 27 - 28.
[15] *See* Docket 08-0607.

what is admittedly a high cost of debt to AWC ratepayers in this proceeding when, given the opportunity to mitigate this high cost by obtaining authority to issue low cost debt, AWC management elected not to do so."[16]

Q. IS MR. CASSIDY CORRECT?

A. No, Mr. Cassidy's testimony does not make sense. RUCO elected not to intervene in the referenced financing proceeding and cannot now, eight years later, oppose AWC's withdrawal of its application in that proceeding simply because interest rates have declined. Regardless of RUCO's position eight years after the fact, withdrawing a financing application provides no evidentiary support, and certainly is not grounds, for imposing a fictitious and confiscatory rate. In his testimony, Mr. Cassidy applies his fictitious imputed 5.43% cost of debt to the entire $75 million balance of AWC's outstanding long-term bond debt when he knows that Staff, in the referenced financing docket, was unwilling to recommend approval of anything more than a $14.2 million cap on AWC's short-term line of credit ("LOC").

Staff's recommendation was based, in part, on Staff's conclusion that AWC's "capital structure [was] no longer sufficiently strong to continue assuming that the [LOC] can be refinanced."[17] Based on Staff's recommendation in that proceeding, Mr. Cassidy somehow leaps to the conclusion that AWC could have, and should have, called all of the Company's outstanding bonds and refinanced the entire $75 million balance of its long-term debt at a rate of 5.43%, and in doing so Mr. Cassidy fails to recognize the very important distinction between an LOC, which was the subject of AWC's financing application, and long-term debt.

[16] *See* Cassidy direct on cost of capital, p. 18 at 10 – 14.

[17] *See* Responsive Staff Report for Arizona Water Company's Application for Short-term Debt and the Delivery of a Promissory Note in Connection Therewith. Docket 08-0607.

Mr. Cassidy acknowledges that AWC filed the referenced application because the Company needed to incur additional short-term debt to fund the construction of improvements and additions to the Company's utility plant.[18] Mr. Cassidy also knows, but he conveniently omits from his testimony, that subsequent to AWC filing that application, the Company's financial condition declined significantly, and in one of many extraordinary steps taken to ensure the Company had enough cash to meet its day-to-day obligations during the pendency of its 2007 test year rate case, AWC's board of directors sharply reduced the Company's capital budget to approximately $5 million.[19] As a result, company-funded capital expenditures dropped from nearly $30 million in 2007 to just $5.7 million in 2009.[20] Mr. Cassidy either doesn't understand, or simply disregards, the relationship between necessary capital expenditures and the need to raise capital.

Q. WHY DID AWC CONTINUE TO PURSUE AN INCREASED LOC?

A. AWC continued to pursue authorization for an increased LOC because such authorization would have provided the flexibility to tap this source of capital if and when it needed to (a fact Staff was made aware of soon after AWC filed its application)[21] during a period Mr. Cassidy himself refers to as the "Great Recession."[22] However, AWC and Staff disagreed over assumptions in the Staff report, which delayed the proceeding. AWC ultimately withdrew its financing application in September 2010, in part thanks to the Commission providing much needed rate relief in Decision 71845 in Docket 08-0440 (the Company's 2007 test year total-company rate case).

[18] *See* Cassidy direct on cost of capital, p. 17 at 18-19.
[19] *See* Cassidy direct on cost of capital, Attachment 4.
[20] *See* charts on page 18.
[21] *See* **ATTACHMENT 7** - AWC's response to Staff data request KS 2.1 in docket 08-0607.
[22] *See* Cassidy direct on cost of capital, p. 6 at 3 – 12.

The following month, AWC's shareholders made an out-of-pocket cash equity infusion of $10.2 million to improve the Company's liquidity and cash position and to strengthen its capital structure. Two months later, in December 2010, AWC filed a rate case for its Western Group to recover additional costs and unrealized revenues from declining sales.[23] Since that time, AWC has maintained a balanced capital structure while continuing to provide safe and reliable service. RUCO does not dispute these facts.

Mr. Cassidy fails to understand that after AWC's capital budget was significantly reduced in response to the Company's deteriorating financial condition at the beginning of the Great Recession, AWC continued to seek financing approval because an increased LOC would provide an additional source of capital, if needed, during a period of great economic turmoil and tightened access to capital for water utilities.[24] Mr. Cassidy also doesn't understand that even if AWC had incurred short-term debt under its LOC during the period in question, which it did, its embedded cost of long-term debt would not change.[25] Mr. Cassidy also fails to recognize that incurring additional long-term debt simply to lower a utility's embedded cost of debt will not result in lower utility rates if outstanding long-term bonds cannot be retired before their maturity dates.

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[23] *See* Docket 10-0517.

[24] *See* **ATTACHMENT 8** - "Adapting to Change: Water Utility Financial Practices in the Early 21st Century." Journal AWWA. Jan. 2014. p. 63.

[25] *See* Arizona Water Company Arizona Corporation Commission Utilities Division Annual Report – Water for the year ending 12-31-2009, p. 7 & Arizona Water Company Arizona Corporation Commission Utilities Division Annual Report – Water for the year ending 12-31-2010.

Q. HAS AWC'S WITHDRAWAL OF ITS APPLICATION FOR AUTHORITY TO INCREASE ITS LOC "ACCRUED ONLY TO THE BENEFIT OF AWC SHAREHOLDERS," AS MR. CASSIDY CLAIMS?

A. No. The evidence in this proceeding contradicts Mr. Cassidy's unsupported argument. To the extent AWC has relied on the reinvestment of earnings and equity capital, instead of debt, to provide the capital to construct much needed utility plant additions, shareholders have experienced an economic loss, as AWC has under-recovered its cost of service by a total of $13 million since 2009.[26] The benefits of reducing spending to the bare minimum required to provide safe, adequate, and reliable service during the Great Recession have accrued to AWC's customers in the form of lower, below-cost rates. This is self-evident in AWC's lack of sufficient cost recovery over the past several years, and in the fact that even Mr. Cassidy recommends a rate increase in this proceeding.

AWC's balanced capital structure also means that the Company is less risky today than if the Company had incurred additional long-term bond debt during the Great Recession, assuming the Company even could have, to finance utility plant additions. In contrast, Mr. Cassidy would have had utilities issue debt willy nilly during "the worst financial crisis since the Great Depression."[27] Mr. Cassidy fails to recognize the very basic financial principle that as the proportion of debt in the capital structure increases, so does the riskiness and cost of common equity.[28]

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[26] *See* **ATTACHMENT 9** – Arizona Water Company – Authorized Rate of Return (ROR), Actual ROR & Under Recovery.

[27] *See* Cassidy direct testimony of cost of capital. p. 6 at 8 – 9.

[28] **ATTACHMENT 10** - Brealey, Richard A. and Stewart Myers. Principles of Corporate Finance. McGraw-Hill. 6th Ed. 2000. p 228.

Q. DESPITE FAILING TO RECOVER ITS COST OF SERVICE DURING THE GREAT RECESSION, DID AWC'S COMMON SHAREHOLDERS INVEST ADDITIONAL EQUITY CAPITAL IN THE COMPANY?

A. Yes. As mentioned above, in October 2010, just weeks after the Commission issued Decision 71845 in AWC's 2007 test year total-company general rate case, and just weeks after AWC withdrew its financing application, common shareholders made an out-of-pocket cash equity infusion of $10.2 million. Despite a decade-plus of chronic under-earnings, and at a time when others were actively seeking to unload their investment in Arizona water utilities, AWC's common shareholders demonstrated their commitment to Arizona, the Company, and its customers.[29]

Q. DOES MR. CASSIDY CRITICIZE AWC'S SHAREHOLDERS FOR INVESTING ADDITIONAL EQUITY CAPITAL IN THE COMPANY?

A. From reading Mr. Cassidy's testimony in which he acknowledges this measure, it is unclear if he is critical of this decision or not.[30] However, what is abundantly clear from Mr. Cassidy's testimony, is that RUCO simultaneously takes the opposing positions that AWC should not reduce risk by relying on common equity to meet its capital needs and that AWC should not make equity distributions in the form of dividends to shareholders. In other words, RUCO simultaneously opposes both the retention of equity within the utility and the distribution of equity in the form of dividends. Such contradictory positions only add to confusion and uncertainty about Arizona utility regulation, and undermine RUCO's credibility before the Commission.

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[29] *See* **ATTACHMENT 9–** Arizona Water Company – Authorized Rate of Return (ROR), Actual ROR & Under Recovery.
See also Docket 11-0101.
See also Docket 10-0309.

[30] *See* Cassidy direct on cost of capital, p. 19 at 8 – 14.

Q. BASED ON MR. CASSIDY'S TESTIMONY, WOULD RUCO FIND ANY UTILITY'S CAPITAL FINANCING PRACTICES PRUDENT?

A. No, certainly not if RUCO embraces the abject contradictory positions cited in response to the previous question. Mr. Cassidy simply rewrites history in an attempt to convince the Commission that AWC's management abused its discretion and made poor financing decisions during the Great Recession.

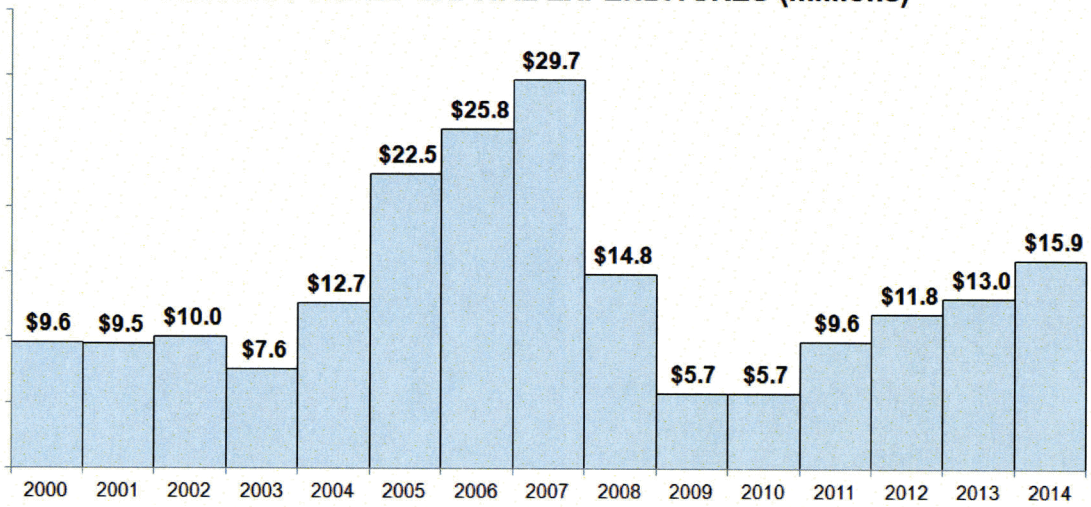
In reality, AWC's decision to reduce risk and strengthen its capital structure during a period of extreme economic turmoil and in anticipation of the need to spend upwards of $200 million replacing and upgrading aging infrastructure, not to mention meeting safe drinking water standards, was fiscally responsible and financially prudent.[31]

Mr. Cassidy's testimony fails to recognize that a utility's decision to incur long-term debt is dependent on, first and foremost, the current need for additional capital and the utility's ability to incur additional long-term bond debt at rates and under conditions that are prudent and reasonable to the utility and its customers. Beyond the current need and ability lies the utility's anticipated future capital requirements and its capital structure. The charts shown on the following page paint a clear picture, as they depict AWC's capital expenditures, debt ratio and earned ROR since 2000:

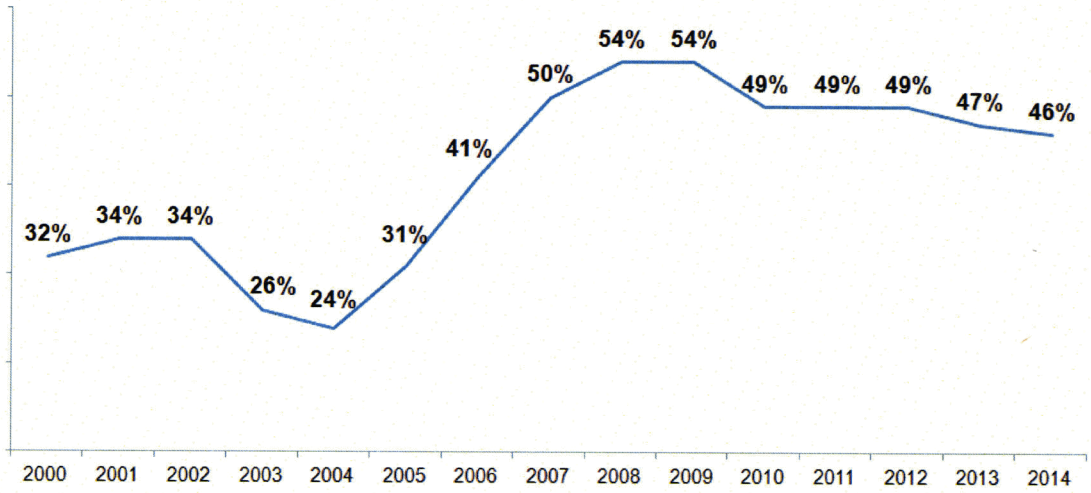
[31] *See* Decision 74081. p. 26 at 4 – 6.

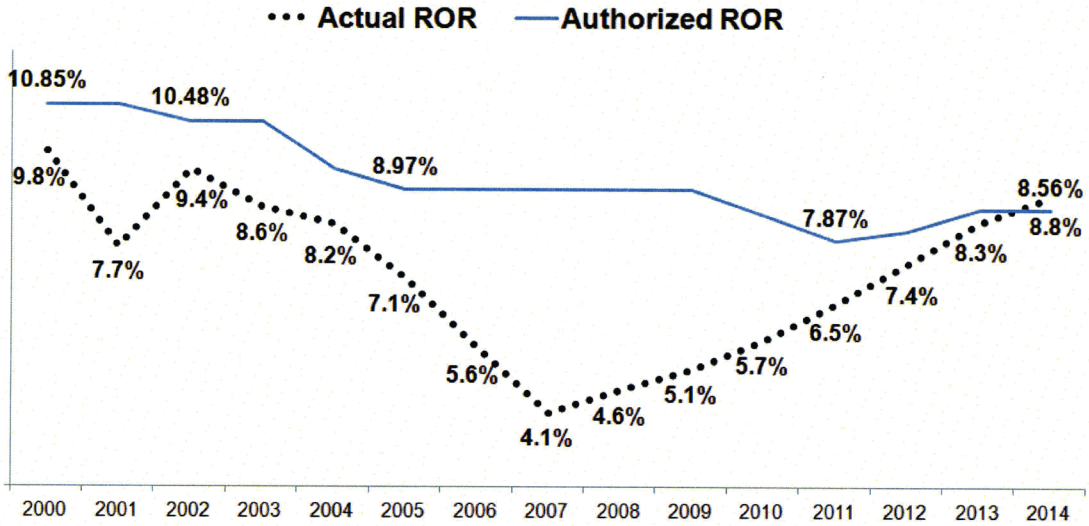
ARIZONA WATER COMPANY

COMPANY FUNDED CAPITAL EXPENDITURES (millions)



DEBT RATIO





As shown in the charts on the preceding page, AWC experienced unprecedented capital requirements from 2005 to 2008 to design and construct numerous water treatment plants to comply with the very stringent new safe drinking water standards for arsenic removal adopted by the U.S. Environmental Protection Agency ("EPA"), which sharply reduced the maximum contaminant level ("MCL") for arsenic in drinking water. This was at the dawn of what Mr. Cassidy describes as "the worst financial crisis since the Great Depression."[32] Of course, AWC had a legal obligation to, and did, comply with the new more stringent arsenic MCL, and the Company was fortunate to be able to do so prior to the end of 2008.

AWC had a healthy capital structure prior to undertaking the massive capital projects required to comply with this federal mandate, as shown in the chart above titled "Debt Ratio." In fact, it was AWC's low debt ratio in the years prior to 2005 that provided sufficient bonding capacity for the Company to issue an additional $35 million in long-term bond debt in 2008, without the Company's debt ratio rising above 65% - the maximum allowed under the Company's General Mortgage Bond Indenture. Mr. Cassidy simply disregards all of these compelling facts and concludes that AWC's management schemed to funnel dividends out the back door. I address AWC's dividends extensively below.

Q. DOES AWC NEED TO BUILD EQUITY NOW IN ANTICIPATION OF THE NEXT WAVE OF NECESSARY CAPITAL IMPROVEMENTS?

A. Yes. The trends shown in the first two graphs above are not random. They represent sound financial planning for the anticipated need to raise upwards of $200 million in capital to replace aging and failing infrastructure, in addition to meeting safe drinking water standards – all during a period of pervasive declines

[32] *See* Cassidy direct testimony of cost of capital. p. 6 at 8 – 9.

in customer sales. If Mr. Cassidy wants AWC to incur additional long-term bond debt, the Company must be financially positioned to do so.

However, because AWC issues bonds through private placement, the Company is limited to selling its bonds only to institutional lenders who are sufficiently sophisticated to make an independent determination of AWC's credit risk. Such entities primarily include life insurance companies and property and casualty insurance companies. Although the issuance costs are lower for private placements, purchasers of privately placed bonds typically require a higher yield and tighter covenant restrictions to compensate for illiquidity.[33] As a result, AWC must position itself for the future by continuing to build both equity and earnings, as it has in the past, if the Company has any chance of incurring a significant amount of additional long-term bond debt at rates and under terms that are favorable to the Company and its customers.

Q. JUST BECAUSE THE FEDERAL RESERVE ("FED") INITIATED AN ACCOMMODATIVE MONETARY POLICY DURING THE GREAT RECESSION, DOES IT FOLLOW THAT AWC, OR ANY PRIVATE ENTITY FOR THAT MATTER, COULD HAVE INCURRED ADDDITIONAL LONG-TERM DEBT?[34]

A. Definitely not. The Fed's attempt to stimulate demand for capital through supply-side policies that have the effect of lowering the federal funds rate does nothing to improve the creditworthiness of individual private entities. This is obvious in the fact that interest rates are still at historic lows – if greater demand for such capital existed, interest rates would be higher than they are today. Mr. Cassidy simply ignores this basic economic principle of supply and demand and naively assumes that cheap capital is equally available to everyone.

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[33] *See* **ATTACHMENT 11** - Emery, Douglas R. and John D. Finnerty. Principles of Finance with Corporate Applications. West Publishing Co. 1991. p. 379.

[34] *See* Cassidy direct on cost of capital, p. 14 at 6 – 13.

The fact is many private companies simply lack access to such capital because of ongoing concerns by lenders about the companies' creditworthiness. This is especially true for water utilities, like AWC, that saw significant declines in residential water sales and facilities-related hook-up fees as a result of the housing market collapse, and reductions in production by industrial and commercial customers.[35] Add to this the need to comply with increasingly stringent safe drinking water standards and replace and upgrade the nation's crumbling water distribution infrastructure,[36] and it is no wonder water utilities have shifted towards practices aimed at minimizing financial risk, rather than increasing it by over-leveraging their capital structures.[37]

Q. WHAT IS MR. CASSIDY'S SECOND REASON THE COMMISSION SHOULD ADOPT A FICTITIOUS IMPUTED 5.43% COST OF DEBT IN THIS PROCEEDING?

A. Mr. Cassidy argues that because San Gabriel Valley Water Company ("San Gabriel") issued $30 million in 10-year bonds in 2011 at an interest rate 3.75%, AWC should have done so too in order to "mitigate the high cost of its long-term debt." San Gabriel is an affiliate of AWC - a fact irrelevant to AWC's embedded cost of debt in this proceeding. Mr. Cassidy states that "while AWC has made no effort to mitigate the high cost of its long-term debt in today's low interest rate environment, its California affiliate, [San Gabriel], has actively taken steps to do so."[38]

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[35] See **ATTACHMENT 12** - "Minimizing Financial Risk in Today's Turbulent Economy." Journal AWWA. Apr. 2009.

[36] *See* Decision 73938, p. 4 at 17 – 25.

[37] *See* **ATTACHMENT 8** - "Adapting to Change: Water Utility Financial Practices in the Early 21st Century." Journal AWWA. Jan. 2014.

[38] *See* Cassidy direct on cost of capital, p. 20 at 1 – 3.

Q. DOES MR. CASSIDY'S TESTIMONY MAKE SENSE?

A. No. Once again Mr. Cassidy ignores the fact that Staff was only willing to recommend approval of a $14.2 million cap on AWC's short-term LOC in Docket 08-0607, and once again Mr. Cassidy confuses the concept of long-term debt with the purpose of an LOC, and erroneously concludes that issuing debt with a lower-than-embedded interest rate for any reason benefits utility customers. Mr. Cassidy also selectively omits the fact, which he is aware of, that San Gabriel issued the referenced 10-year, 3.75% bonds to repay the outstanding balance of short-term debt issued under an LOC to pay for the construction of necessary utility plant.[39]

As mentioned above, AWC slashed its capital expenditures shortly after seeking Commission approval to increase short-term borrowing under its LOC due to its deteriorating financial condition, and AWC pursued its request as a kind of insurance policy in the event the Company needed to augment its operating cash flow to meet its day-to-day obligations during the Great Recession. Once again, Mr. Cassidy doesn't understand that even if AWC had borrowed under an LOC, which it did, its embedded cost of long-term debt would not change.

Mr. Cassidy fails to recognize the different reasons public utilities borrow and as a result, he wrongly concludes that AWC's decision to minimize risk during a period of great economic turmoil and restricted cash flow harmed customers. But Mr. Cassidy offers no evidence of this in his testimony.

[39] *See* **ATTACHMENT 13** - AWC's response to RUCO data request 4.05.

Mr. Cassidy also conveniently omits the fact, which he is aware of, that the balance outstanding under San Gabriel's LOC bore an interest rate lower than 3.75%. Consequently, San Gabriel did not replace higher cost debt with lower cost debt, as Mr. Cassidy would have the Commission believe in this proceeding.[40]

Q. MR. CASSIDY CLAIMS THAT BECAUSE HE SEARCHED THE INTERNET AND LEARNED THAT SAN GABRIEL SOUGHT ADDITIONAL FINANCING APPROVAL FROM THE CALIFORNIA PUBLIC UTILITIES COMMISSION ("CPUC") IN 2013, THE COMMISSION SHOULD ADOPT A FICTITIOUS IMPUTED 5.43% COST OF DEBT FOR AWC IN THIS PROCEEDING.[41] DOES THIS MAKE SENSE?

A. No. Utilities issue bonds all the time based on their particular long-term capital requirements and unique circumstances. Just because one utility seeks financing authority does not mean that another utility with completely different capital requirements, operating in a different state under different circumstances, should do the same. Mr. Cassidy references San Gabriel's 2013 financing application with the CPUC, but he conveniently omits the fact that in that application, San Gabriel estimated that it needed an additional $105.5 million in funds from outside sources during 2013, 2014 and 2015. Mr. Cassidy simply brushes aside the fact that AWC's capital requirements, which were met with internally generated funds, reinvested earnings, and additional shareholder equity infusion during those years, were just $46.8 million.[42]

Since 2009, AWC's capital requirements have been met, thanks in part to the Commission granting rate relief, by internally-generated funds and, thanks to

[40] *Id.*
[41] *See* Cassidy direct on cost of capital, p. 20 at 5 – p. 21 at 15.
[42] *See* AWC's application, Sch. A-4, p. 1.

AWC's shareholders demonstrating their commitment to the Company, reinvested earnings and additional paid-in capital.[43] As a result, AWC has a balanced capital structure and continues to provide safe, adequate and reliable water service. RUCO does not dispute these facts.

Q. DOES MR. CASSIDY EXPLAIN EXACTLY WHAT IT IS HE THINKS AWC SHOULD HAVE FUNDED WITH ADDITIONAL LONG-TERM BOND DEBT DURING THE "THE WORST FINANCIAL CRISIS SINCE THE GREAT DEPRESSION?"[44]

A. No. To the extent AWC might have been able to issue additional long-term bonds during the Great Recession, Mr. Cassidy's testimony lacks any explanation of exactly what it is he thinks AWC should have funded with such debt, as all of AWC's capital needs were met with internally-generated cash flow, reinvested earnings and paid-in capital, while at the same time maintaining a balanced capital structure.

As I discussed previously, AWC has shown that it will need to raise upwards of $200 million in capital to replace aging and failing infrastructure. If Mr. Cassidy wants AWC to incur additional long-term debt, the Company must be creditworthy and must first be positioned to do so by retaining a sufficient amount of equity and earnings.

Q. WHAT ABOUT ISSUING LONG-TERM DEBT AND USING THE PROCEEDS TO "RETIRE EQUITY," AS RUCO SUGGESTED IN ONE OF THEIR DATA REQUESTS?[45]

A. Issuing long-term debt for the sole purpose of distributing a special cash dividend to common shareholders, thereby reducing equity and increasing the proportion

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[43] *See* Decisions in Docket Nos. 12-0348, 11-0310, 10-0517 & 08-0440.
[44] *See* Cassidy direct testimony of cost of capital. p. 6 at 8 – 9.
[45] *See* **ATTACHMENT 14** - AWC's response to RUCO data request 4.13.

of debt in AWC's capital structure, is not only reckless and risky, but it is unnecessary because AWC's capital structure is already balanced. Further, as stated above AWC must position itself to attract future capital by retaining earnings and building equity, rather than overleveraging itself.

Q. WHAT IS MR. CASSIDY'S THIRD REASON THE COMMISSION SHOULD ADOPT A FICTITIOUS IMPUTED 5.43% COST OF DEBT IN THIS PROCEEDING?

A. Mr. Cassidy claims that AWC is not willing to issue bonds with a sinking fund requirement and because of this, the Commission should adopt a fictitious imputed 5.43% cost of debt and thereby disallow out-of-pocket Commission-approved interest expense on capital required to design, construct and equip AWC's utility plant.[46] If RUCO believes the interest expense on AWC's bonds is imprudent because the Company should have issued bonds with a sinking fund, RUCO has not stated their belief until now.

RUCO found the terms of AWC's long-term debt prudent enough to recommend recovery of 100% of the Company's bond interest expense, including issuance costs, in AWC's last seven general rate cases spanning the last 17 years.[47] It was during this period of time that AWC sought, and received, Commission approval prior to issuing each of the Company's currently outstanding Series' K, L and M bonds – and RUCO never disputed or questioned the Company's need to incur the long-term bond debt or the rates, terms, or conditions of those bonds.[48]

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[46] A sinking fund requires an annual payment that allows for the periodic retirement of the debt issue.

[47] *See* direct testimony of William A. Rigsby on cost of capital, Docket 12-0348, p. 57, direct testimony of William A. Rigsby on cost of capital, Docket 11-0310, p. 55, direct testimony of William A. Rigsby on cost of capital, Docket 10-0517, p. 52, direct testimony of William A. Rigsby on cost of capital, Docket 08-0440, p. 52, direct testimony of William A. Rigsby on cost of capital, Docket 04-0650, p. 4, cost of capital direct testimony of William A. Rigsby, Docket 02-0619, p. 36, direct testimony of William A. Rigsby, Docket 00-0962, pp. 40 – 45.

[48] *See* Docket Nos. 00-0749, 05-0886 & 07-0703.

RUCO chose not to intervene in those financing application proceedings despite receiving public notice of each of AWC's applications.[49] In fact, RUCO recommended full recovery of the cost of those bonds in subsequent rate proceedings. Now in 2016, based on a data response espousing the practical reasons utilities do not generally issue sinking fund debt,[50] RUCO, based on pure hindsight and speculation, "call[s] into question the assertion that AWC's exclusive reliance on non-sinking fund debt has not '*unnecessarily increased customers' rates.*"[51]

Q. IS AWC WILLING TO ISSUE SINKING FUND DEBT?

A. Yes, to the extent that AWC's traditional institutional purchasers of bonds are even willing to incorporate a sinking fund provision, and such bonds would offer the lowest overall cost on the best possible terms. However, Mr. Cassidy seems to think that had AWC issued sinking fund debt in the past, the Company could have replaced debt retired through the sinking fund with lower cost debt.

Assuming Mr. Cassidy presented any evidence showing that customers' rates would be lower today had AWC issued sinking fund bonds, which he doesn't, such hindsight evidence is irrelevant, as neither AWC nor the Commission nor the Chair of the Federal Reserve had advance knowledge of the future Great Recession when the Commission authorized AWC to issue its Series M bonds in September 2008. Professor Phillips addresses such hindsight prudency determinations in The Regulation of Public Utilities:

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[49] *See* **ATTACHMENT 15** - Certificates of Publication filed in Docket Nos. 00-0749, 05-0886 & 07-0703.
[50] *See* **ATTACHMENT 5** - Howe & Rasmussen, pp. 263 - 264.
See also **ATTACHMENT 11** - Emery & Finnerty, p. 395.
[51] *See* Cassidy direct testimony on Cost of Capital. p. 22 at 20 – 22.

> Prudence according to *The Random House Dictionary,* "is care, caution, and good judgement, as well as wisdom in looking ahead... [footnote omitted] Prudence thus involves foresight, not hindsight. **Decisions must be judged as to their reasonableness at the time they were made and not after the fact**.[52]

AWC's currently outstanding bonds, the cost of which the Commission has consistently found prudent, were issued on the most favorable terms and at the lowest possible cost available at the time. The interest rates on AWC's currently outstanding bonds reflect all of the information available to the Company and the bond purchasers at the time of their issuance, including expectations of future interest rates. Mr. Cassidy does not challenge or dispute these facts. Just because interest rates subsequently declined does not mean that Mr. Cassidy can travel back in time with hindsight knowledge to second guess the prudency of those bonds.

Mr. Cassidy discusses the Great Recession in his testimony, describing it as "the worst financial crisis since the Great Depression..."[53] But Mr. Cassidy fails to realize just how fortunate AWC was to be able to issue $35 million in long-term bonds just weeks before the dawn of the "worst financial crisis since the Great Depression,"[54] during which water utilities experienced tightened access to capital.[55]

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[52] *See* **ATTACHMENT 4** - Phillips, p. 326.
[53] *See* Cassidy direct testimony on cost of capital, p. 6 at 1 – 20.
[54] *See* Cassidy direct testimony of cost of capital. p. 6 at 8 – 9.
[55] *See* **ATTACHMENT 8** - "Adapting to Change: Water Utility Financial Practices in the Early 21st Century." Journal AWWA. Jan. 2014.

Q. WHAT IS MR. CASSIDY'S FOURTH AND FINAL REASON THE COMMISSION SHOULD ADOPT A FICTITIOUS IMPUTED 5.43% COST OF DEBT IN THIS PROCEEDING?

A. Mr. Cassidy, not satisfied with AWC's explanation of why public utilities typically issue non-sinking fund bonds, simply concludes that non-sinking fund bonds must be a scheme to facilitate the payment of dividends. Mr. Cassidy recommends that, because AWC has issued traditional public utility style bonds, and because AWC did not reduce its embedded cost of debt by incurring additional long-term debt during "the worst financial crisis since the Great Depression,"[56] the Commission should now punish the Company by disallowing prudently incurred, Commission-approved interest expense on the capital used to finance AWC's utility plant.[57]

Q. DOES MR. CASSIDY'S TESTIMONY MAKE SENSE?

A. No. Again, Mr. Cassidy fails to recognize that incurring long-term debt simply to lower a utility's embedded cost of debt will <u>not</u> result in lower rates if outstanding long-term bonds cannot be retired before their maturity dates. Mr. Cassidy acknowledges that to the extent AWC could call its existing bonds, it would not be cost effective to do so. But Mr. Cassidy characterizes the terms of those bonds as "highly restrictive."[58] If RUCO believes the terms of AWC's bonds are "highly restrictive," RUCO did not express this belief to AWC at any point in the past 15 years, which is the period of time AWC's oldest series of bonds has been outstanding. In fact, RUCO did not oppose or question the terms of AWC's bonds when the Company sought Commission approval to issue those bonds, or in any subsequent general rate case in which their full cost was reflected in the Company's revenue requirement.

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[56] *See* Cassidy direct testimony of cost of capital. p. 6 at 8 – 9.
[57] *Id.* p. 23 at 1 – 13.
[58] *Id.* pp. 16 at 13 – 17 at 5.

It is only because interest rates in general have declined since AWC issued its currently outstanding bonds that Mr. Cassidy now argues their terms are "highly restrictive." This once again is nothing more than hindsight on the part of Mr. Cassidy, as nobody could have known the future of the world economy in September 2008. If RUCO or Mr. Cassidy had inside information regarding future borrowing costs in September 2008, they did not share this information with AWC or the Commission at the time.

What's worse is that Mr. Cassidy fails to recognize that the very terms he now finds, in hindsight, to be so "highly restrictive" actually reduced AWC's (and its customers) exposure to interest rate risk, and provided for a lower interest rate, and ultimately lower water rates, than if AWC had insisted on a sinking fund, a more rapid pay down schedule, or a lower-cost call provision.[59] RUCO may now favor such provisions, but they are not free - they come at a price in the form of a higher coupon interest rate. Contrary to what Mr. Cassidy may think, there is no such thing as a free lunch when it comes to incurring debt.

Q. HOW DO YOU RESPOND TO MR. CASSIDY'S RECOMMENDATION THAT THE COMMISSION ADOPT A FICTITIOUS IMPUTED 5.43% COST OF DEBT BECAUSE AWC'S DIVIDENDS ARE ALLEGEDLY TOO HIGH?

A. Mr. Cassidy's recommendation amounts to punishing the utility for providing a return in the form of dividends to its shareholders. As I explained above and in my direct testimony, the principle of cost of service as the basis for utility ratemaking extends to the cost of capital, including, of course, the cost of equity. A utility's authorized ROE includes the provision for a return in the form of a cash dividend.

[59] *See* **ATTACHMENT 16** - Brealey, Richard A., Stewart Myers and Franklin Allen. Principles of Corporate Finance. McGraw-Hill. 8th Ed. p. 677.

Mr. Cassidy thinks AWC's dividends are too high, but he provides no evidence that AWC's payment of a regular cash dividend has come at the expense of maintaining and improving its utility plant, maintaining a balanced capital structure, and providing safe, adequate and reliable service. In fact, Mr. Cassidy does not even attempt to refute any of these facts.

RUCO is simply opposed to investor owned water utilities paying dividends (and, conversely, is also opposed to water utilities relying on equity to meet capital their financing requirements), but dividends are the lifeblood of an equity investment in a public utility. Investor owned public utilities are mature, stable companies whose stocks and bonds represent stable, income producing investments.[60] Accordingly, investor owned utilities normally pay out a higher proportion of their earnings as dividends than companies in other industries.[61]

Public utility stocks have long been popular with retirees and other income-oriented investors.[62] In fact, many people, including retirees and the elderly (e.g. "widows and orphans"), need and depend on a reliable stream of utility dividends for their cash income requirements.[63] And while it is true that shareholders of publicly-traded utilities can sell off some of their shares as an alternative source of current income, the same is not true for AWC's shareholders because AWC is privately-held, and the owners of privately-held firms generally invest the bulk of their wealth in the business.[64] As a result,

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[60] *Id.* p. 66.
[61] *Id.* p. 418.
[62] *See* **ATTACHMENT 17** - "Utilities: It Takes a Litter." USA Today. Dec. 12, 2014.
[63] *See* **ATTACHMENT 18** - Moyer, R. Charles, James R. McGuigan and William J. Kretlow. Contemporary Financial Management. Thomson South-Western. 10th Ed. p. 529.
[64] *See* **ATTACHMENT 19** - Damodaran, Aswath. Corporate Finance: Theory and Practice. John Wiley & Sons. 2004. p. 211.

AWC's common shareholders would be forced to sell the Company in order to receive any income in the absence of a reasonable cash dividend.

Q. HOW DOES MR. CASSIDY SUPPORT HIS CLAIM THAT AWC'S DIVIDENDS ARE TOO HIGH?

A. Mr. Cassidy simply thinks AWC's ten-year historical average dividend payout ratio is too high when compared to that of the publicly traded water utilities he relies upon to estimate AWC's cost of equity. Regardless of Mr. Cassidy's unsupported opinion, it is obvious from looking at the chart on page 18 depicting AWC's debt ratio that the Company, despite a history of chronic under earnings, has retained a sufficient amount of its earnings to build its equity ratio.

Mr. Cassidy's analysis of dividend payout ratios, which he thinks warrants the Commission disallowing prudently incurred, Commission-approved bond interest expense, is faulty, misleading and fails to demonstrate an understanding of the information content and signaling effect of dividends – a fundamental concept of corporate finance.

Q. HOW IS MR. CASSIDY'S ANALYSIS FAULTY?

A. The dividend payout ratio tells the Commission nothing about the adequacy of the level of cash being retained in the utility to fund ongoing infrastructure improvements and additions. If this is not self-evident, then I direct Mr. Cassidy to the chart shown on page 18 depicting AWC's debt ratio, and the fact that AWC continues to provide safe, reliable and adequate service.

The reason the dividend payout ratio tells the Commission nothing about the adequacy of cash being retained in a utility is because the payout ratio compares dividends, which are paid out of cash, to net income, which is an accrual-based, non-cash accounting concept. As a result, the dividend payout

ratio for a utility that distributes cash dividends at the expense of maintaining and improving its utility infrastructure can be low in any given year compared to other utilities if, due to accounting adjustments, the utility recorded high net income. Likewise, the dividend payout ratio of a utility like AWC that experiences a transitory period of poor earnings during the "worst financial crisis since the Great Depression,"[65] but that generates sufficient cash flow to maintain and improve infrastructure, can be high compared to other utilities.

This is especially true in the case of Mr. Cassidy's faulty, misleading analysis of payout ratios, in which he compares AWC to large, publicly traded water utilities that operate in multiple service areas and multiple jurisdictions and experienced much higher recorded earnings than AWC during his study period. Consequently, all Mr. Cassidy's analysis shows is that AWC's earnings during that biased period were woefully inadequate compared to larger, publicly traded water utilities, as evidenced by actual earned ROEs:

[65] *See* Cassidy direct testimony of cost of capital. p. 6 at 8 – 9.

ACTUAL EARNED ROEs

Year	AWC[66]	Larger, Publicly Traded Water Utilities[67]
2005	8.8%	9.6%
2006	9.1%	8.4%
2007	5.5%	8.7%
2008	**4.2%**	8.8%
2009	**4.2%**	7.9%
2010	**4.8%**	8.6%
2011	6.3%	8.5%
2012	8.2%	9.0%
2013	9.9%	9.2%
2014	10.0%	10.6%
	7.1%	8.9%

Thus, to the extent the dividend payout ratio can be used to glean anything about a firm's dividend policy, it is not an average taken over a biased period of time that was dominated by economic recession, but the long-run target dividend payout ratio, that is relevant.[68] As a result, Mr. Cassidy's "observation" that AWC was able to "achieve such a high dividend payout ratio," fails to demonstrate an understanding of mainstream corporate dividend policy and investor behavior.[69] Nobel Laureate Professor William Sharpe[70] explains in Fundamentals of Investments:

> Few firms attempt to maintain a constant ratio of dividends to **current earnings**, since doing so would result in a fluctuating dollar amount of dividends. The reason the dividends would fluctuate is that earnings on a year-to-year basis are likely to be quite variable. Instead, firms attempt to maintain a desired ratio of dividends to earnings over some relatively long period, meaning that there is a target payout ratio of dividends to long-run or sustainable earnings. As a result, **dividends are usually kept at a constant dollar**

[66] *See* **ATTACHMENT 20** – Arizona Water Company – Actual Earned ROE 2005 – 2014.
[67] *See* Cassidy direct testimony on cost of capital, Schedule JAC-5.
[68] *See* **ATTACHMENT 16** - Brealey, Myers & Allen. p. 418.
[69] *See* Cassidy direct testimony on cost of capital, p. 25.
[70] In 1990, the Nobel Prize in Economic Sciences was awarded to Harry Markowitz, Merton Miller, and William Sharpe for their contribution to modern portfolio theory and the capital asset pricing model, which is commonly presented in rate proceedings before the Commission.

> **amount** and are increased only when management is confident that it will be relatively easy to keep paying this increased amount in the future.[71]

The tendency for dividends, unlike earnings, to remain relatively constant and grow gradually over time can be explained by their information content and signaling effect - dividend changes "signal" to investors management's assessment of the firm's prospects for future earnings.[72] This is consistent with AWC's suspension of dividend increases during the height of the Great Recession – another fact that Mr. Cassidy conveniently omits from his testimony.[73] But Mr. Cassidy rejects this fundamental principle of corporate finance, and instead thinks AWC's dividends should vary with its recorded earnings (or perhaps should not be paid at all). A sufficient understanding of the financial theory underlying corporate dividend policy is also essential to estimating the cost of equity.

As explained by Professor Sharpe above, it is changes (i.e. growth) in the level of dividends that convey relevant information to investors. Accordingly, it is investors' expected growth in dividends that is relevant to estimating a utility's cost of equity.[74] Mr. Cassidy analyzes historical and projected dividend growth for the water utility industry as part of his cost of equity analysis, but he conveniently ignores AWC's historical dividend growth.[75] Had Mr. Cassidy examined and reported AWC's actual history of dividend growth, the evidence

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[71] **ATTACHMENT 21** - Sharpe, William F., Gordon J. Alexander and Jeffery V. Bailey. Fundamentals of Investments. 2nd Ed. Prentice Hall. p. 425.

[72] *See* **ATTACHMENT 11** - Emery & Finnerty. p. 499.
See also **ATTACHMENT 16** - Brealey & Myers (8TH Ed.) pp. 418 – 419.
See also **ATTACHMENT 18** - Moyer, McGuigan & Kretlow. p. 529.
See also **ATTACHMENT 19** - Damodaran. p. 661 – 664.
See also **ATTACHMENT 21** - Sharpe, Alexander & Bailey, p. 428.

[73] *See* Cassidy direct testimony on cost of capital, Exhibit JAC-A.

[74] *Id.* Section VII – DCF Analysis.

[75] *Id.*

would show that AWC's dividend distributions are conservative compared to the water utility industry, and far more conservative than what Mr. Cassidy himself testifies is appropriate.

Q. HOW DOES AWC'S DIVIDEND GROWTH RATE COMPARE TO THAT OF MR. CASSIDY'S SAMPLE OF PUBLICLY TRADED WATER UTILITIES, AND HIS OWN OPINION OF WHAT IS AN APPROPRIATE RATE OF DIVIDEND GROWTH?

A. As shown in the table below, **AWC's actual five- and ten-year dividend growth rates are 3.10% and 3.11%, respectively, compared to 5.72% and 3.71% for Mr. Cassidy's sample of publicly traded water utilities**. Further, **AWC's actual dividend growth rate is nearly half the rate at which Mr. Cassidy concludes overall water utility industry dividends will grow indefinitely into the future.**

HISTORICAL & PROJECTED INFINITE DIVIDEND GROWTH

	AWC[76]	Mr. Cassidy's Sample Publicly Traded Water Companies[77]	Mr. Cassidy - Recommended[78]
5-Year Historical Dividend Growth	**3.10%**	5.72%	
10-Year Historical Dividend Growth	**3.11%**	3.71%	
Infinite Future Dividend Growth			**5.92%**

The Commission should be incredulous that Mr. Cassidy would testify that investors expect overall water utility industry dividends will grow at nearly 6% per year, forever, and at the same time argue that AWC's dividends are too high when AWC's dividends have grown at nearly half that rate. Based on this and all

[76] *See* Cassidy direct testimony on cost of capital, Exhibit JAC-A. AWC's 2004 dividend was $3,677,400.
[77] *Id.* Attachment 2.
[78] *Id.* p. 32 at 9 – 14 and Schedule JAC-3, p. 1, col. G at 13.

of the evidence in this proceeding, Mr. Cassidy's testimony should be given no weight.

Q. BASED ON THE EVIDENCE IN THIS PROCEEDING ARE AWC'S DIVIDENDS TOO HIGH?

A. No. Despite experiencing such poor earnings during the Great Recession, the fact that AWC has not needed to issue long-term debt since 2008, and has built equity in order to maintain a balanced capital structure (see chart of debt ratios shown on page 18) while continuing to provide safe, reliable and adequate service is evidence that AWC is not paying dividends to the detriment of its obligation as a public service corporation.

In fact, Mr. Cassidy's testimony alleging that AWC's dividends are too high is completely void of any discussion of the Company's balanced capital structure and continued provision of safe, reliable and adequate water service – the two areas critical to determining if a utility's dividend distributions have in any way harmed customers.

Q. HOW DO YOU RESPOND TO MR. CASSIDY'S TESTIMONY THAT AWC "WAS ABLE TO RETURN THE EQUITY INFUSION MADE BY SHAREHOLDERS IN THE FORM OF A DIVIDEND DISTRIBUTION IN SUCH A SHORT PERIOD OF TIME..."?[79]

A. Mr. Cassidy's testimony is nothing more than an attempt to mislead the Commission into believing AWC's dividends are too high, but he fails to realize that AWC has a healthier capital structure, and has $10.2 million in additional common equity capital today than it would otherwise have as a result of the Company's shareholders providing this $10.2 million investment. As discussed

[79] *See* Cassidy direct on cost of capital, p. 25 at 24 – p. 26 at 4.

above, the actual evidence in this proceeding contradicts Mr. Cassidy's unsupported opinion regarding common equity and dividends.

Q. DO YOU HAVE ANY ADDITIONAL COMMENTS ON HOW MR. CASSIDY ARRIVED AT HIS FICTITIOUS IMPUTED 5.43% COST OF DEBT?

A. Yes. Notwithstanding the Commission's approval of the rates and terms of AWC's long-term bonds, Mr. Cassidy simply calculates the average embedded cost of debt for the publicly traded water utilities in his sample, and applies it to the entire $75 million outstanding balance of AWC's long-term bonds. Mr. Cassidy completely ignores the fact that because AWC is privately held, it must incur long-term debt through private placement and, although the issuance costs are lower for private placements, purchasers of privately placed bonds typically require a higher yield to compensate for illiquidity.[80]

Mr. Cassidy also ignores the fact that all of the publicly traded water utilities in his sample have Standard & Poor's ("S&P") bond ratings of A or higher.[81] In contrast, AWC's bonds, if rated, would be in the lower BBB category.[82] Mr. Cassidy doesn't even attempt to assess AWC's creditworthiness, or whether AWC could have even incurred additional long-term debt during "the worst financial crisis since the Great Depression," during which water utilities experienced tightened access to capital."[83]

As discussed above, AWC must position itself for the future by continuing to build both equity and earnings if the Company has any chance of issuing a significant amount of long-term bonds at rates and on terms favorable to the Company and its customers. Mr. Cassidy simply brushes aside all of these facts

[80] *See* **ATTACHMENT 11** - Emery & Finnerty, p. 379.
[81] *See* Parcell direct testimony, Sch. 13.
[82] *See* Ahern pre-filed direct testimony, p. 42 at 21 – 22.
[83] *See* Cassidy direct testimony of cost of capital. p. 6 at 8 – 9.

and wrongly concludes that debt capital is equally available to everyone at the very same terms and cost, and that severe economic recessions represent great opportunities for investor owned water utilities to over-leverage themselves.

Q. DO YOU HAVE ANY FINAL COMMENTS ON MR. CASSIDY'S RECOMMENDED FICTITIOUS 5.43% COST OF DEBT IN THIS PROCEEDING?

A. Yes. Mr. Cassidy's testimony and recommendations amount to pure after-the-fact second guessing the Commission's prior prudency determination and approval of AWC's cost of debt. As I discussed above, all of AWC's currently outstanding bonds were issued at the lowest possible cost and on the best terms available at the time. Whether Mr. Cassidy realizes it or not, the cost and terms of AWC's long-term bonds incorporate the universe of information regarding investors' expectations of the economy and interest rates that was available at the time the Company's bonds were issued.

To confiscate a portion of the return earmarked for common shareholders, and thereby destroy the book value of a utility's equity, nearly a decade after the fact simply because reality did not match investor expectations is bad economics, bad ratemaking, and bad public policy. Regarding dividends, Mr. Cassidy's testimony is just a misleading attempt to perpetuate the RUCO myth that investor owned water utilities should not provide a fair return to their shareholders in the form of a reasonable cash dividend.[84] RUCO's message to potential investors in Arizona utilities that they should take their investment dollars elsewhere does not serve the interests of residential utility consumers.

[84] *See* Reiker pre-filed direct testimony, p. Section III.

Finally, Mr. Cassidy simply cannot reconcile his recommendation with the facts that:

1) It would not be cost effective (i.e. benefit customers) for AWC to call its existing bonds;

2) AWC has not needed to incur additional long-term bond debt in the past eight years because its capital needs have been met with internally generated funds, reinvested earnings, and additional shareholder investment;

3) AWC has a balanced capital structure;

4) AWC must continue to build equity now if it intends to incur additional long-term debt in the future to fund a portion of the $200 million that will be required to upgrade and replace aging infrastructure,

5) AWC's dividend distributions are more conservative than those of the water utility industry as a whole, and far more conservative than what Mr. Cassidy testifies investors currently expect, and;

5) AWC continues to live up to its end of the regulatory compact, despite a history of not recovering its costs, by providing safe, reliable and adequate water service.

Based on all of the evidence in this proceeding, the Commission should disregard Mr. Cassidy's unsupported testimony and recommendations.

B. **Rate Base**

Q. WHICH OF RUCO'S RATE BASE ADJUSTMENTS DO YOU ADDRESS IN THIS SECTION OF YOUR REBUTTAL TESTIMONY?

A. In this section I address RUCO's rate base adjustment No. 3 regarding working cash. Company witnesses Jamie R. Moe, Joseph D. Harris and Fredrick K. Schneider address RUCO's other rate base adjustments in their rebuttal testimony.

RUCO Rate Base Adjustment No. 3 – Working Cash

Q. HOW DID RUCO ADJUST WORKING CASH?

A. According to Mr. Cassidy's direct testimony on revenue requirement, RUCO adjusted the lead/lag expense levels to reflect RUCO's various adjustments to operating expenses.[85] In addition, Mr. Cassidy added interest expense to AWC's lead/lag study.[86] The result of RUCO's adjustment is to reduce working cash and rate base by a total of $329,867 in the Western Group.

Q. DOES AWC AGREE WITH RUCO'S ADJUSTMENTS TO THE CALCULATION OF WORKING CASH?

A. No. AWC does not agree with RUCO's recommendation to include the interest expense component of operating income in the calculation of working cash. For purposes of consistency, if the cost associated with the debt component of operating income is included in the calculation of required working cash, then a corresponding adjustment to include the cost associated with the equity component should be made as well.

RUCO failed to make this corresponding adjustment to include the equity component. The cost associated with equity is as much a cost of providing service as the cost associated with debt, and if the Commission includes the debt

[85] *See* Cassidy direct testimony on revenue requirement, p. 14 at 6 – 10.
[86] *Id.* p. 14 at 17 – p. 15 at 2.

component of operating income in the calculation of working cash, then AWC should be compensated for the additional investment related to the time the Company must wait to recover this component of its cost of service as well.

Q. IS IT AWC'S POSITION THAT IF ONE COMPONENT OF THE OPERATING INCOME IS RECOGNIZED IN THE CALCULATION OF REQUIRED WORKING CASH, THEN ALL COMPONENTS SHOULD BE RECOGNIZED?

A. Yes. The *entire* amount of a utility's operating income finances its rate base. Because an appropriate estimate of the required working cash associated with this operating income (which includes both the debt and equity components) has little effect on the rate base of a utility with a well-balanced capital structure, the Company is indifferent to its inclusion in the lead/lag study. For this reason, AWC did not include any portion of operating income in its calculation of required working cash.

However, if RUCO puts its thumb down on the scale and includes only the portion due creditors in the lead/lag study and excludes the portion due shareholders, as RUCO recommends, the measurement of total rate base will be far less accurate than if operating income had been excluded from the lead/lag study altogether. In other words, the Company should not be penalized, as RUCO proposes to do, for maintaining a balanced capital structure.

Q. ARE THERE ERRORS IN MR. CASSIDY'S CALCULATION OF WORKING CASH?

A. Yes. Including interest expense in the calculation of working cash, as RUCO proposes, reduces rate base. In this proceeding, Mr. Cassidy recommends the Commission adopt rates that are based on a fictitious imputed 5.43% cost of debt. But when calculating working cash, Mr. Cassidy assumes AWC's cost of debt is 6.78%. Besides the obvious contradiction and conflict with his fictitious

imputed cost of debt testimony, Mr. Cassidy fails to explain how he arrived at a 6.78% cost of debt for purposes of calculating AWC's working cash requirement. AWC's actual embedded cost of debt is 6.82%.

Mr. Cassidy has also applied the wrong number of purchased water lag days in his calculation of the working cash requirement for the Ajo service area. Mr. Cassidy uses 38.97 days, when the actual number of days is 35.95.[87]

C. <u>Operating Income</u>

Q. WHICH OF RUCO'S OPERATING INCOME ADJUSTMENTS DO YOU ADDRESS IN THIS SECTION OF OUR REBUTTAL TESTIMONY?

A. In this section I address RUCO operating income adjustments No. 2 (weather & usage normalization), No. 7 (service vehicle costs), and No. 8 (rate case expense). Mr. Moe addresses RUCO's remaining operating income adjustments in his rebuttal testimony.

RUCO Operating Income Adjustment No 2 – Weather & Usage Normalization

Q. PLEASE EXPLAIN RUCO OPERATING INCOME ADJUSTMENT NO. 2 REGARDING AWC'S WEATHER AND USAGE NORMALIZATION.

A. RUCO recommends reversing AWC's income statement adjustment IS-7 to normalize residential revenues to reflect typical weather and usage. In explaining RUCO's adjustment, Mr. Cassidy states that "RUCO believes the Company's weather normalization declining usage analysis to be speculative, for [sic] as a determinant of customer usage fluctuations in weather patterns are not, *'known and measurable.'*"[88] RUCO's adjustment increases operating revenues

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[87] *See* **ATTACHMENT 22** – Computation of Working Cash Requirement – RUCO.
[88] *See* Cassidy direct testimony on revenue requirement, p. 17 at 2 – 4.
See also Cassidy direct testimony on rate design, p. 5 at

by $165,791 and increases operating expenses by $80,566. For the reasons stated below, AWC opposes RUCO's adjustment.

Q. HOW DO YOU RESPOND?

A. Mr. Cassidy's recommendation is based on his unsupported opinion, rather than any evidence, that weather patterns are not "known and measurable." Mr. Cassidy's testimony is incorrect and misses the point. Weather conditions and patterns are known, measurable, and readily available. In fact, Mr. Cassidy was provided with 60 data points, each representing a known and measureable weather related condition for each month ending with December of the test year, as part of the analysis supporting AWC's weather and usage normalization in this proceeding.

Mr. Cassidy's testimony that weather patterns are not known and measurable for use in regression analysis is tantamount to arguing that New York Stock Exchange returns are not known and measureable for use in calculating "beta," which Mr. Cassidy employs as a measure of risk in his capital asset pricing model ("CAPM") analysis.[89] Further, it should be common knowledge among ratemaking professionals, particularly in the arid southwest, that weather conditions influence water sales. Professor Bruce Billings of the University of Arizona explains in Forecasting Urban Water Demand:

> **Many factors influence water use, including the weather, over which utility operators have no influence**; population and industrial location, over which they have some limited influence; and price and conservation programs, which are determined or at least strongly influenced by utility officials.[90]

[89] *See* Cassidy direct on cost of capital, p. 33 at 1 – 4.

[90] *See* **ATTACHMENT 27** – Billings, Bruce R. and C. Vaughan Jones. Forecasting Urban Water Demand. American Water Works Association. 1996. p. 2.

Q. IS AWC'S DECLINING USAGE ADJUSTMENT SPECULATIVE AS MR. CASSIDY CLAIMS?

A. No. As I explained in Section VIII of my pre-filed direct testimony, declining per-customer sales are a fact of life in the water utility industry.[91] In that section of my direct testimony I cited six prior statistical studies of AWC's customer usage patterns, all of which show a statistically significant decline in per customer sales over time. The multiple regression analysis supporting AWC's weather and usage normalization adjustment in this proceeding also shows a statistically significant decline in residential per customer sales. These pervasive declines in per customer water sales are both known, and measurable.

The statistically significant results of all seven studies of AWC's declining residential customer sales are also consistent with the findings and conclusions of the U.S. EPA and the Water Research Foundation, as well as others.[92] For example, in 2012, the Journal of the American Water Works Association ("AWWA") published a peer-reviewed article examining data from a series of residential water use studies. Based on those studies, the authors found that water use, particularly indoor use by residential customers, has declined since 1995, and that such declines are not related to economic conditions. The authors conclude that household and per capita water use is expected to <u>continue to decline</u>:

> The results from four residential water use studies and five study groups summarized in this report lead to several important conclusions. There is a clear trend toward lower single-family indoor water use from both the household and the per capita perspective. ...As time goes on, it is safe to assume that more homes will be retrofit with high-efficiency fixtures and appliances

[91] *See also* **ATTACHMENT 8** - "Adapting to Change: Water Utility Financial Practices in the Early 21st Century." Journal AWWA. Jan. 2014.

[92] *See* Reiker pre-filed direct testimony, pp. 41 – 42.

> and that household water use in the existing customer pool will continue to decrease both on a per capita and household basis. ...Water Planners should incorporate these changes in demand into future demand projections or run the risk of significantly overestimating future residential demands. ...The declines in indoor water use identified in this article were not an artifact of the economic recession of 2008 – 2010.[93]

Evidence in the form of expert findings, based on numerous studies completed over varying time periods demonstrates that there is a known and measurable pattern of decline in residential water sales and that pattern of decline will continue. Based on all of this evidence, declining water sales are anything but speculative.

Q. HOW DO YOU RESPOND TO MR. CASSIDY'S CRITICISM THAT AWC'S REGRESSION ANALYSIS ONLY COVERS A PERIOD OF FIVE YEARS?

A. Mr. Cassidy criticizes AWC's use of a five year period to calculate average weather conditions, but he provides no evidence that average weather conditions over the past five years cannot reasonably be relied upon as an estimate of normal weather conditions during the period new rates will be in effect. Further, had AWC examined a longer period in this proceeding, RUCO would likely argue that the results are biased by old data from the Great Recession.

However, as stated above, AWC's six prior statistical studies of the Company's residential water sales all show a statistically significant decline in per customer sales over time. Those studies were completed over the course of the past eight years and studied varying time periods dating back to 2001. No matter how you look at it – water sales are declining. The following table shows the decline in total residential per customer sales in the Western Group:

[93] *See* **ATTACHMENT 23** - "Insights into Declining Single-Family Residential Water Demands." Journal AWWA. June 2012.

ACTUAL RESIDENTIAL SALES DECLINES

	Pinal Valley	White Tank	Ajo
Since 2000	-38.2%	-13.4%	-30.4%
Since 2005	-20.4%	-14.4%	-26.0%
Since 2010	-11.4%	-17.6%	-16.4%

It is not surprising that the service area with the largest percentage decline in residential per customer sales since 2010 is the White Tank service area. In AWC's last Western Group rate case, in which a 2010 test year was used, the Company agreed to a "much more aggressive [rate design] in terms of conservation."[94] In the White Tank service area, AWC agreed to increase the first and second quantity rate tier break-over points and increase the price differential between the quantity rate tiers.[95] This was done to provide "a better tool to customers who can reduce their usage and thereby save money."[96] Those customers did save money (and groundwater) - so much so that 33% of AWC's requested revenue increase in the White Tank service area in this proceeding is the direct result of sales declines. What's worse, is that Mr. Cassidy recommends the very same rate design for the White Tank service area in this proceeding.[97]

Q. IS MR. CASSIDY'S CRITICISM THAT AWC'S REGRESSION ANALYSIS ONLY COVERS A PERIOD OF FIVE YEARS EQUALLY APPLICABLE TO HIS OWN TESTIMONY?

A. Yes. The *Value Line* betas Mr. Cassidy relies upon in his CAPM analysis represent the slope of the regression line fitted to five years of historical data, further adjusted to reflect the long-term tendency of beta to converge towards 1.0. AWC's declining usage adjustment is no different in that it is based on the

[94] *See* Decision 73144, p. 35, Finding of Fact 135.
[95] *Id.*
[96] *Id.*
[97] *See* Cassidy direct testimony on rate design, p. 4 at 1 – 5.

slope of the regression line fitted to five years of historical data. In addition, AWC has provided all of the regression statistics (in addition to the calculated slope) that result from the regression analysis – something *Value Line* does not do.

Q. DID THE COMPANY PROVIDE RUCO WITH EVIDENCE OF A CONTINUED DECLINE IN RESIDENTIAL PER CUSTOMER SALES AFTER THE END OF THE TEST YEAR IN A FORM THAT MEETS RUCO'S INTERPRETATION OF THE KNOWN AND MEASURABLE STANDARD?

A. Yes. On October 23, 2015, AWC provided Mr. Cassidy updated customer usage data showing that through September 2015, recorded residential per customer sales were down 3.12%, 2.28% and 1.80% in the Pinal Valley, White Tank and Ajo service areas, respectively, compared to the 12 months ending September of the 2014 test year.[98]

RESIDENTIAL PER CUSTOMER WATER SALES (x1,000 Gals.)

	12-Mos. - Sept. 2014	12-Mos. – Sept. 2015	% Change
Pinal Valley	106.74	103.40	-3.12%
White Tank	137.23	134.10	-2.28%
Ajo	48.13	47.26	-1.80%

These actual recorded declines in residential sales since the end of the 2014 test year represent over $255,000 in unrealized revenues at proposed rates in this proceeding. If such declines are not factored into the rates developed and approved in this proceeding, the rates will be inadequate to produce the Commission-adopted revenue requirement from the first day the rates go into effect.

Q. WHAT PORTION OF AWC'S PROPOSED REVENUE INCREASE IN THIS PROCEEDING IS THE RESULT OF SALES DECLINES?

[98] *See* **ATTACHMENT 24** - AWC's response to Staff data request BAB 2.13, provided to RUCO on October 23, 2015.

A. Since the Commission's adoption of AWC's current Western Group rates in Decision 73144, total per customer sales (not just residential) have declined 6.6%, 11.9% and 13.5% in the Pinal Valley, White Tank and Ajo service areas, respectively. These declines represent over $1.5 million, or 25%, of AWC's total requested increase of $6.0 million in this proceeding. Had even a fraction of these actual declines been incorporated into AWC's current rates, the Company's requested revenue increase in this proceeding would be lower than it is.

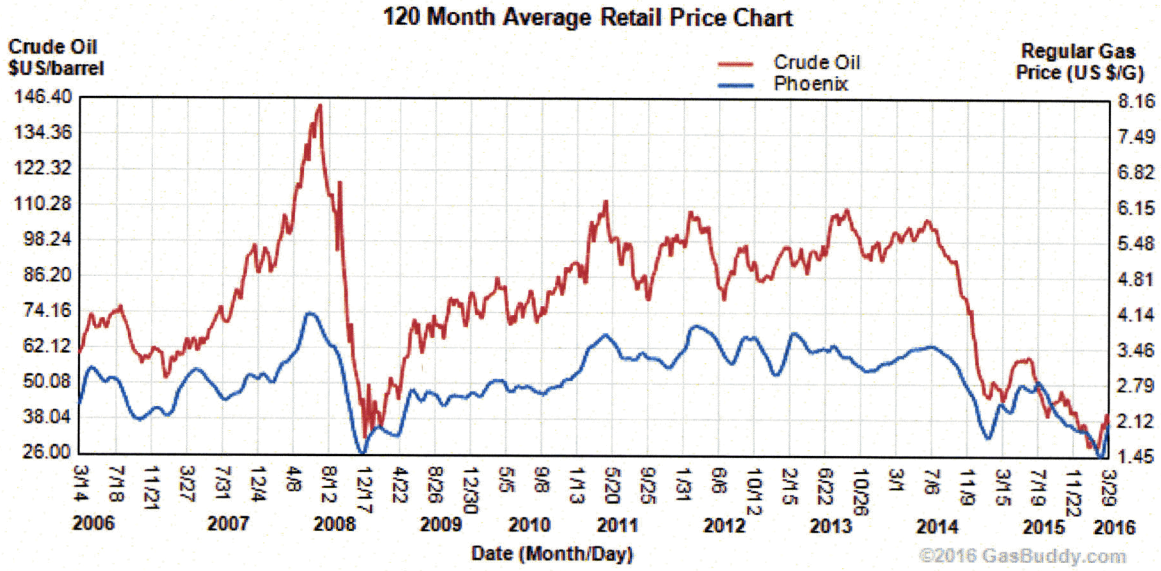
RUCO Operating Income Adjustment No. 7 – Service Vehicle Fuel Costs

Q. PLEASE EXPLAIN RUCO'S OPERATING INCOME ADJUSTMENT NO. 7 REGARDING SERVICE VEHICLE FUEL COSTS.

A. Mr. Cassidy thinks AWC will incur an average cost of $1.87 per gallon to fuel the Company's fleet of service vehicles during the period new rates approved in this proceeding are in effect. Mr. Cassidy calculates his recommended cost by averaging two data points – one taken on February 4, 2016, and another taken one year earlier, and calculates an adjustment to reduce operating expense by $11,220.

Q. IS MR. CASSIDY'S RECOMMENDED ADJUSTMENT APPROPRIATE?

A. No. Unlike residential per customer water sales which have exhibited a pervasive decline over the past several years, and which can easily be forecasted using historical data, gasoline prices are volatile and vary with crude oil prices, as shown in the following chart:



Averaging just two data points measured one year apart to estimate the future price of a product derived from a commodity whose price tends to be random, is inappropriate. Mr. Cassidy's adjustment fails to recognize the well-publicized reasons crude oil prices, and consequently gasoline prices, are currently low and the reasons such prices are likely to increase.[99]

RUCO Operating Income Adjustment No. 8 – Rate Case Expense

Q. HOW DID RUCO ADJUST RATE CASE EXPENSE IN THIS PROCEEDING?

A. Mr. Cassidy recommends an adjustment to reduce annual rate case expense by $55,482, to reflect RUCO's recommended total rate case expense of $319,827, recovered over three years.[100] RUCO's recommended level of rate case expense is based on the Commission's adopted rate case expense of $250,000 in AWC's last fully litigated Western Group rate case, filed in 2004. Mr. Cassidy used an inflation factor to escalate this figure to a current-year amount of $319,827.

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[99] *See* **ATTACHMENT 25** - "Why We Could See an Oil Price Shock in 2016." USA Today. Mar. 27, 2016.

[100] *See* Cassidy direct on revenue requirement, p. 23 at 2 – 25 at 21.

Q. DOES THE COMPANY AGREE WITH RUCO'S RECOMMENDED LEVEL OF RATE CASE EXPENSE?

A. No. If Mr. Cassidy believes it is appropriate to rely on the Company's last fully litigated Western Group rate case (Docket 04-0650) as the basis for his recommendation in this proceeding, then a more appropriate figure to apply in calculating his estimate is the $363,644 AWC actually incurred in that case. Had Mr. Cassidy applied this figure, his recommended level of rate case expense would be $465,213, which is in the same range as AWC's proposed level of rate case expense of $486,274.

Purchased Power Adjustment Mechanism

Q. WHY DOES RUCO OPPOSE A PURCHASED POWER ADJUSTMENT MECHANISM ("PPAM") IN THIS PROCEEDING?

A. According to Mr. Cassidy, "[s]uch an adjuster would allow an increase in rates without the benefit of determining fair value," and as a result would violate the Arizona constitution.[101]

Q. HOW DO YOU RESPOND?

A. Mr. Cassidy's testimony does not address the merits of the PPAM. Instead, it amounts to legal opinion, and should be disregarded as an attempt to circumvent the Commission's decision making authority by telling it how to decide an issue.

Q. DO YOU AGREE WITH MR. CASSIDY'S TESTIMONY THAT "IN NO INSTANCE SHOULD AUTOMATIC ADJUSTMENT MECHANISMS BE A SUBSTITUTE FOR A FORMAL RATE CASE?"[102]

A. Yes, I agree with Mr. Cassidy. While purchased power represents one of AWC's largest single expense items, a PPAM will not eliminate the need to file general rate cases on a regular basis. However, a PPAM can provide AWC an opportunity to recover the increased cost of electric power that results from any

[101] *See* Cassidy direct on revenue requirement, p. 29 at 13 – 16.
[102] *See* Cassidy direct testimony on revenue requirement, p. 30 at 1 – 2.

of the 14 surcharges and adjusters the Company currently pays in the Western Group, nine of which emanate from Commission-approved tariffs.[103]

D. Rate Design

Q. DO YOU HAVE ANY COMMENT ON RUCO'S PROPOSED RATE DESIGN IN THIS PROCEEDING?

A. Yes. As I explained in my direct testimony, under AWC's proposed rate design, the residential customer class will not subsidize any other customer class.[104] In contrast, Mr. Cassidy, despite his statutory mandate to "represent the interests of residential utility consumers in regulatory proceedings...,"[105] recommends rates that would have the residential customer class in the White Tank service area subsidize the commercial, industrial and private fire service customer classes, as shown on page 3 of **ATTACHMENT 29**.

Mr. Cassidy doesn't explain in his testimony why he proposes to have the residential customer class in the White Tank service area pay above-cost rates and subsidize other customer classes. Absent a compelling reason, and a declining usage adjustment to reflect unrealized revenues, AWC opposes Mr. Cassidy's recommendation to impose above-cost rates on residential customers in the White Tank service area.

Further, no manner of rate design can compensate for a recommended revenue requirement that severely understates the actual cost of service. Based on all of the evidence discussed herein, RUCO's recommended revenue requirement is just too low, and as a result, RUCO's rate design is inapplicable.

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[103] *See* Reiker pre-filed direct testimony, p. 48 at 16 – 24.
[104] *Id.* p. 37 at 16 – 21.
[105] *See* Arizona Revised Statutes § 40-462.

III. Response to Staff

A. Rate Base

Q. WHICH OF STAFF'S RATE BASE ADJUSTMENTS DO YOU ADDRESS IN THIS SECTION OF YOUR REBUTTAL TESTIMONY?

A. In this section I address Staff's rate base adjustment No. 2 regarding working cash. Company witnesses Jamie R. Moe, Joseph D. Harris and Fredrick K. Schneider address Staff's other rate base adjustments.

Staff Rate Base Adjustment No. 2 – Working Cash

Q. HOW DID STAFF ADJUST WORKING CASH?

A. According to Mr. Baxter's testimony, Staff adjusted AWC's lead lag study to include interest expense on long-term debt, just as RUCO does. For the same reasons discussed in Section II.B above, AWC does not agree with Staff's adjustment.

Q. DO YOU HAVE ANY OTHER COMMENTS ON STAFF'S RECOMMENDED LEVEL OF WORKING CASH?

A. Yes. Mr. Baxter adjusted AWC's lead lag study to reflect Staff's recommended operating expenses, including Staff's adjustment to rate case expense. However, AWC did not include rate case expense in the adjusted test year operating expenses used to calculate working cash in the Company's lead lag study.[106] As a result, the operating expenses Mr. Baxter uses to calculate working cash are understated by the amount of Staff's rate case expense adjustment.

B. Operating Income

Q. WHICH OF STAFF'S OPERATING INCOME ADJUSTMENTS DO YOU ADDRESS IN THIS SECTION OF OUR REBUTTAL TESTIMONY?

[106] *See* Appendix to Schedule B-5 of AWC's rate application.

A. In this section I address Staff's operating income adjustments No. 1 (weather and usage normalization), No. 4 (life insurance expense), and No. 5 (rate case expense). Mr. Moe addresses Staff's remaining operating income adjustments in his rebuttal testimony.

Staff Operating Income Adjustment No. 1 – Weather and Usage Normalization

Q. PLEASE EXPLAIN STAFF'S OPERATING INCOME ADJUSTMENT NO. 1 REGARDING AWC'S WEATHER AND USAGE NORMALIZATION.

A. Mr. Baxter recognizes the need to make an adjustment for declining sales in this proceeding.[107] However, according to Mr. Baxter's testimony Staff continues to oppose the types of regression analyses that are commonly used to normalize sales for regulated energy utilities. Instead, Mr. Baxter calculates an average of the decline in sales during the nine month period ending in September of each of the last five years. Staff believes this method is superior to a multiple regression analysis like the ones commonly used to normalize revenues for regulated energy utilities. The effect of Staff's recommended adjustment is to increase test year revenues by $12,916 and expenses by $7,531.

Q. IS THE METHOD STAFF USED TO ESTIMATE THE LEVEL OF DECLINING SALES DURING THE PERIOD NEW RATES WILL BE IN EFFECT MORE RELIABLE THAN AWC'S MULTIPLE REGRESSION ANALYSIS IN THIS PROCEEDING?

A. No. Mr. Baxter's recommendation is based on his calculation of an average decline in sales using data going back to January 2010. This is no different than AWC's multiple regression analysis, only Mr. Baxter has added back in to his estimate the abnormal factors affecting sales that regulators, including the Commission, typically remove when normalizing revenues, such as weather and

[107] *See* Baxter direct testimony, p. 28 at 11 – 18.

other seasonal variations. The Company's regression analysis controls for these random influences on the test year sales volumes. In addition, Staff's analysis only considers water sales in the months of January through September, and doesn't consider water sales in October, November and December.

While Mr. Baxter is correct to recommend an adjustment, Staff must ultimately realize that in order to appropriately estimate the average annual decline in per customer water sales (i.e. the annual change not related to weather) it is necessary to use regression models. Such models are commonly used to normalize revenues in ratemaking proceedings.

Staff Operating Income Adjustment No. 4 – Life Insurance

Q. HOW DID STAFF ADJUST LIFE INSURANCE EXPENSE?

A. According to Mr. Baxter's direct testimony, Staff believes AWC made an error in calculating the Class-1 premium volumes for life insurance expense that resulted in a doubling of the adjusted expense.[108] As a result, Mr. Baxter recommends decreasing administrative & general expenses by $17,697.

Q. DID AWC MAKE AN ERROR IN CALCULATING THE CLASS-1 PREMIUM VOLUMES FOR LIFE INSURANCE?

A. No. Life insurance premiums are based on a rate of $0.20 per $1,000 of covered payroll. After five years of continuous full-time employment, AWC employees are eligible for life insurance in an amount equal to two (2) times their annual salary. Therefore, the correct volume for calculating the Class-1 life insurance premium, which includes all employees with five or more years of employment, is two (2) times the annual salary.

[108] *See* Baxter direct testimony, p. 31 at 7 – 12.

In developing its life insurance adjustment, AWC calculated a total Class-1 volume $19,669,000. This is based on AWC's total adjusted payroll for employees with five or more years of employment of $9,834,461, multiplied by two (2), and rounded up to the nearest thousand dollars. AWC explained this calculation in the work paper that was provided in response to Staff data request BAB 1.3.[109]

Q. IS STAFF'S RECOMMENDED ADJUSTMENT IN ERROR?

A. Yes. As explained above, AWC's calculation is correct. Further, Staff's calculated adjustment reduces life insurance expense by a total of $17,697 in the Western Group. Staff's calculation cannot be correct because AWC's total pro forma annual life insurance expense proposed in the Western Group is only $13,833. Staff's recommended adjustment essentially disallows the entire premium cost of life insurance coverage, and then some, for all of AWC's Western Group employees.

Staff Operating Income Adjustment No. 5 – Rate Case Expense

Q. WHAT LEVEL OF RATE CASE EXPENSE DOES STAFF RECOMMEND IN THIS PROCEEDING?

A. According to Mr. Baxter, Staff recommends total rate case expense of $335,117 in this proceeding.[110] Staff made various adjustments to AWC's proposed rate case expense budget, the largest of which reduces legal costs by $175,000.

Q. DOES THE COMPANY AGREE WITH THOSE ADJUSTMENTS?

A. No. Mr. Baxter doesn't explain why he thinks AWC's estimated legal costs, which were provided by the Company's outside legal counsel, are unreasonable or too high. Given the unusual position RUCO has taken in this proceeding

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[109] *See* **ATTACHMENT 26** – Arizona Water Company Test Year Ending December 31, 2014, Life Insurance Workpaper.

[110] *See* Baxter direct testimony, p. 33 at 1 – 6.

regarding AWC's cost of debt, it is very likely that evidentiary hearings will be drawn out and require more work on the part of AWC's outside legal counsel.

C. Rate Design

Q. ARE AWC AND STAFF IN AGREEMENT WITH RESPECT TO RATE DESIGN IN THIS PROCEEDING?

A. Yes. The only differences between AWC and Staff with respect to rate design arise from the level of the proposed rates, which are a function of the parties' recommended revenue requirements. Otherwise, AWC and Staff are in agreement.

IV. Response to Abbott

A. Central Arizona Project ("CAP") Water Use Plan

Q. DOES AWC COMMITT TO USE ANY ANNUAL AND LONG-TERM STORAGE CREDITS EARNED THROUGH THE RECHARGE OF THE COMPANY'S PINAL VALLEY CAP WATER ALLOCATION FOR THE SOLE BENEFIT OF ITS PINAL VALLEY SERVICE AREA CUSTOMERS?

A. Yes.

B. Rate Design

Q. DO YOU AGREE WITH MR. NEIDLINGER'S TESTIMONY THAT AWC'S COST OF SERVICE STUDY ("COSS") OVER-ALLOCATES COSTS TO ABBOTT?

A. Yes. In preparing its COSS, AWC elected to segregate all industrial class customers with a 6-inch or larger size meter into a new "large industrial" class to better estimate the cost to serve such customers who have usage patterns and demands that differ greatly from those industrial customers with smaller meter sizes. In doing so, AWC made an adjustment to the coincident peak demand allocation factors to reflect the fact that Abbott is not connected to the Company's potable water distribution system, and therefore does not place additional

demands on the system.[111] While this adjustment reduces the proportion of demand-related costs that are allocated to the large industrial class, no adjustment was made to the commodity allocation factor, which reflects, among other costs, a significant proportion of water treatment costs.

As explained by both Mr. Kemp and Mr. Neidlinger,[112] the water Abbott purchases from AWC is only chlorinated, and not treated for arsenic. As a result, AWC's COSS over-allocates water treatment-related costs to the large industrial class.

Q. DOES AWC CONCUR WITH THE STAND-ALONE COST OF SERVICE ANALYSIS FOR ABBOTT PRESENTED BY MR. NEIDLINGER IN HIS TESTIMONY?

A. Yes. AWC provided this information to Mr. Neidlinger, and it constitutes a reasonable estimate of the actual cost to serve Abbott.

Q. DOES AWC OPPOSE MR. NEIDLINGER'S RECOMMENDATION THAT THE COMMISSSION ADOPT A 15% RATE REDUCTION FOR ABBOTT IN THIS PROCEEDING?

A. No. Whether to grant Abbott a 15% rate reduction in this proceeding is ultimately a policy decision for the Commission. Given the minimal impact on the other customer classes and the fact that under Mr. Neidlinger's proposed discount, Abbott will continue to provide a hefty rate subsidy to residential customers, AWC does not oppose Mr. Neidlinger's recommended rate design in this proceeding.

Further, in considering Abbott's request, the Commission should consider a number of factors, including the reason Abbott is currently subject to a discriminatory rate. As I explained in Section VIII of my direct testimony, a rate

[111] *See* Schedule G-7, page 3, lines 18 – 27 of AWC's Application.
[112] *See* Kemp direct testimony, p. 2 at 14 – 27, and Neidlinger direct testimony, p. 4 at 18 – 19.

structure that intentionally causes one class of customers to subsidize another class of customers can be considered just and reasonable if it is done for the overall benefit of all customers.[113] However, the current subsidies provided by the large industrial class, including Abbott, are not intentional. Rather, they are a remnant of general service tariffs that did not differentiate between customer classes. One of the reasons AWC gave for proposing to segregate customer classes for purposes of rate design in its 2007 test year total company rate case was to gradually bring rates for each customer class closer to the actual cost of serving those customer classes.[114] Accordingly, AWC proposed a lower, flat quantity rate for the industrial class in that proceeding, which the Commission, recognizing the importance of gradualism, adopted.[115] Further segregating Abbott for purposes of rate design in this proceeding is consistent with the Commission's adoption of AWC's proposed rate design in its 2007 test year total company rate case.

Other factors the Commission should consider when making this policy decision include Abbott's size, line of business, contribution to the local economy as an employer, their incentive to conserve (regardless of price) as a matter of sound business practice, and the fact that Abbott will continue to provide a hefty rate subsidy to residential customers.

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[113] *See* Reiker pre-filed direct testimony, p. 35 at 5 – 17.
[114] *See* Reiker pre-filed direct testimony in Docket 08-0440, p. 34 at 21 – p. 35 at 25.
[115] *See* Decision 71845, p. 59 at 18 – 24.

Q. DID YOU PREPARE RATE SCHEDULES FOR ALL CUSTOMER CLASSES UNDER MR. NEIDLINGER'S RECOMMENDED RATE DESIGN AS WELL AS UNDER AWC'S ORIGINALLY PROPOSED RATE DESIGN IN THIS PROCEEDING?

A. Yes. **ATTACHMENT 30** shows AWC's proposed total revenue increase by customer class and rates under Mr. Neidlinger's proposed rate design, under which Abbott would receive a 15% rate reduction, and **ATTACHMENT 31** shows AWC's proposed total revenue increase under its originally proposed rate design. As shown in the attachments and summarized in the table below, the effect of adopting Abbott's proposed rate design in this proceeding has a minimal effect on the revenue increases allocated to the other customer classes:

PINAL VALLEY SERVICE AREA

	Abbott's Proposed Rate Design - Total Increase		AWC's Originally Proposed Rate Design - Total Increase	
	Dollars	%	Dollars	%
Residential Class	$3,255,076	28.81%	$3,154,468	27.92%
Commercial Class	1,874,306	34.63%	1,807,572	33.39%
Industrial Class	57,147	35.31%	55,542	34.32%
Large Industrial Class	75,548	35.99%	72,641	34.61%
Abbott	-88,207	-15.05%	85,805	14.64%
Private Fire Class	48,660	40.00%	48,660	40.00%
Other Water Revenues	87,964	40.74%	85,805	39.74%
	$5,310,493	29.49%	$5,310,493	29.49%

Q. DOES AWC AGREE WITH MR. NEIDLINGER'S RECOMMENDATION THAT ABBOT BE EXEMPT FROM ANY FUTURE SURCHARGES DESIGNED TO RECOVER COSTS REQUIRED TO MEET WATER QUALITY STANDARDS?

A. Yes, AWC agrees that Abbott's main 6-inch connection should be exempt from any future surcharges implemented under the arsenic cost recovery mechanism or nitrate cost recovery mechanism.

V. Rebuttal Income Statement Adjustments

Q. AWC PROPOSING ANY REBUTTAL PRO FORMA ADJUSTMENTS?

A. Yes. Mr. Moe sponsors various adjustments to rate base and operating income in his rebuttal testimony. Below I address the significant increase in property and liability insurance that became effective March 1, 2016.

A. Property & Liability Insurance

Q. PLEASE EXPLAIN AWC'S ADDITIONAL PRO FORMA ADJUSTMENT TO REFLECT AN INCREASE IN PROPERTY AND LIABILITY INSURANCE EXPENSE.

A. AWC's property and liability insurance policy, which covers property, general liability and auto, expires on March 1st of each year. In AWC's original application, the Company included a pro forma adjustment to insurance expense to reflect the policy premium, effective March 1, 2015, of $649,891. Of this total premium, $239,228 was allocated to operating expense in the Western Group. Effective March 1, 2016, AWC's property and liability insurance premium increased to $851,959.[116] Of this amount, $313,610 is allocated to operating expense in the Western Group. The resulting increase to property and liability insurance expense in the Western Group in this proceeding is $74,382 ($313,610 - $239,228). AWC made additional adjustments to reduce total insurance expense by $190 to reflect adjustments to payroll expense, addressed by Mr. Moe in his rebuttal testimony. The total rebuttal adjustment to AWC's original adjusted insurance expense is an increase of $74,192, as shown in **ATTACHMENT 28**.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes.

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[116] *See* **ATTACHMENT 27** – Rebuttal Property & Liability Expense Pro Forma Adjustment & Invoice.

ATTACHMENT 1

Principles of Public Utility Rates

Second Edition

by
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CHAPTER 5

COST OF SERVICE AS A BASIC STANDARD OF REASONABLENESS

INTRODUCTION

THE COST-BASED OR COST-PRICE STANDARD
- Widespread Acceptance of a Cost-based Standard
- Qualifications to Universal Acceptance
- Threefold Rationale of a Cost-based Standard
  - *Consumer Rationing*
  - *Capital Attraction*
  - *Compensatory Income Transfers*
  - *An Exception: Efficiency Incentive*

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- Private Versus Social Costs
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- Fixed Versus Escapable Costs
- Direct Versus Common and Joint Costs
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CRITIQUE OF THE COST-PRICE STANDARD
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  - *Subsidies*
  - *Taxes*
- Principles Under a Capital Attraction Standard
- Principles Under a Consumer Rationing Standard

CONCLUSION

INTRODUCTION

One of the reasons for the popularity of a cost-of-service standa of ratemaking no doubt lies in the flexibility of the standard itse "Cost," like "value," is a word of many meanings, with the resı that people who disagree, not just on minor details but on maj principles of ratemaking policy, all may subscribe to some version the principle of service at cost. The best known, though not the mc important, illustration of such a disagreement is that between supporte of an original-cost basis of ratemaking and supporters of a reproductio cost basis. A more important disagreement is that between those wl identify cost of service with some kind of average or prorated tot costs, and those who identify it with differential or marginal cos However, before exploring the many alternative meanings of cost service, let us first turn our attention to the reasons for the widespre acceptance of a cost-based or cost-price standard.

THE COST-BASED OR COST-PRICE STANDARD

No writer whose views on public utility rates command respe purports to find a single yardstick by sole reference to which rate may be judged reasonable or socially desirable as distinguished fro rates that are unreasonable or adverse to the public interest. A comple of tests of acceptability is required just as would be the case with th tests of a good automobile, a good income-tax law, or a good poem Nevertheless, one standard of reasonable rates can fairly be said t outrank all others in the importance attached to it by experts an public opinion alike — the standard of costs of service, often qualifie by the stipulation that the relevant cost is necessary, true (i.e., privat and social) cost or cost reasonably or prudently incurred.

Widespread Acceptance of a Cost-based Standard

True, other factors of ratemaking are potent and are sometime controlling — especially the so-called value-of-service factor and Ramse pricing in the determination of the individual rate schedules. But th cost standard has the widest range of application. Rates found to b far in excess of cost are at least highly vulnerable to a charge o unreasonableness. Rates found well below cost are likely to be tolerated if at all, only as a necessary and temporary evil. For if rates are no compensatory, they are not subsidy free. In fact, the golden rule o socially optimal ratemaking is that, whenever possible, prices shoulc

track all the identifiable (marginal private and social) costs occasioned by a service's provision.

A cost standard of ratemaking has been most generally accepted in the regulation of the levels of rates charged by private utility companies. But even more significant is the widespread adherence to cost, or to some approximation of cost, as a basis of ratemaking under public ownership. Thus the Hydro-Electric Power Commission of Ontario purports to apply the principle of "service at cost" in its charges for wholesale power supplied to the various municipal distribution systems of the province. And thus most of the federal power projects in the United States, including the Tennessee Valley Authority, purport to sell electric power at rates designed to cover operating expenses plus a compensatory return on allocable capital investment — one form of a cost-of-service standard. To be sure, critics of these projects have insisted that, under appropriate accounting, revenues would be shown to fall short of full-cost coverage. But the mere fact that these allegations have often been denied by the responsible managements of the federal agencies implies that these managements themselves concede the validity of a cost principle of ratemaking.

Qualifications to Universal Acceptance

Lest the foregoing remarks be taken to imply an adherence to a cost standard more rigid than the facts would justify, let us at once note exceptions. In the first place, the principle is followed far more closely as a measure of general rate levels than as a measure of individual rate schedules. In the second place, it is deliberately violated by those municipal utility operations, once thought to be fairly numerous, that use the sale of their services as a source of profits for the city treasury. And in the third place, it has been waived to a minor degree through the use of indirect subsidies in support of rural electrification in the United States; and waived to a major degree through the use of heavy subsidies for rural electrification in the province of Ontario. One also may note, historically, that huge deficits have been incurred in the operation of many railroads, and most metropolitan transit systems fail to charge rates which cover both operating expenses plus fixed charges. Important, however, as are these and other deviations from a cost-price standard, they are generally treated as exceptions to the general rule of ratemaking. Great Britain, even with its recent moves toward privatization, contains a richer admixture of nationalized industry than is found in the U.S. and has not seen fit to abandon the general criterion of service at cost for its

public utilities. Instead, it instructed the various boards to undertak to realize total revenues sufficient to meet total outlays properl chargeable to revenue account, avoiding deficits or surpluses, withou expressly forbidding the sale of services at prices designed to yiel revenues in excess of total costs.

Threefold Rationale of a Cost-based Standard

What reasons are advanced in favor of a cost-based standard (ratemaking, or a standard under which an attempt is made to transfe the cost of supplying the service from the producer to the consume: no more and no less? The answer is that there are at least thre related, though not identical, reasons, each one associated with different function of public utility rates (Lewis, 1952, p. 181 suggests fourth defense of a cost-based standard of utility rates based on th desire to maintain price stability). As will be shown, a cost-base standard carries us far toward the attainment of goals regarding th consumer rationing, capital attraction and the compensatory incom transfers. The incentive for management efficiency is the only primar goal with a possible conflict. This chapter will include only a few (the many distinctions between alternative meanings of "cost of service. For a much more exhaustive treatment, see Clark (1923).

Consumer Rationing. The first support for the cost-price standar is concerned with the consumer-rationing function when performe under the principle of consumer sovereignty. Under this principl potential consumers should be free to enjoy whatever kinds of servic in whatever amounts, they desire as long as they are ready to indemnif the producers, and hence society in general, for the costs of renditior Only in this way can the consumers be put in a position, as it wer to ration themselves by striking a balance between benefits receive and sacrifices imposed. If the rates were set at less than cost, eithe overt rationing would be necessary or else service would have to b supplied in wasteful amounts. If the rates were set at more than cos use of the services thus priced would be unduly restricted.

Capital Attraction. But the pricing of public utility services at co of production not only is supposed to bring about a proper control (demand; in addition, and at the same time, it is supposed to motivat and enable the producing company to supply the service in the amour demanded, thereby avoiding the need for resort to tax-finance subsidies. That is to say, the sale of the service at cost will supply th

company with necessary revenues to pay operating expenses and capital charges. For this purpose, to be sure, cost must be given a broader definition than is customary in the language of accounting, since it must include allowance for a capital-attracting rate of return on investment. But a capital-attracting rate of profit is here considered a part of the necessary cost of service.

Compensatory Income Transfers. The third defense of the cost-price standard is related to the compensatory income-transfer function of rates in the more generally acceptable compensatory version specified in Chapter 4. Under this standard, any person with a given income who decides to draw upon the producer, and hence on society, for a supply of public utility services should be made to "account" for this draft by the surrender of a cost-equivalent opportunity to use personal cash income for the purchase of other things. Compare this with Taylor's (1929, pp. 1-8) discussion of price setting in a socialist economy, in which he declares that, under socialism, prices should equal cost of production in order to give meaning to any given income-allotment by the state to the individuals therein.

An Exception: Efficiency Incentive. Of the four primary functions of rates set forth in the preceding chapter, the only one that may require a deviation from any kind of a cost-price standard is the efficiency-incentive function, which calls upon the price system to impose penalties for inefficient management, and to award special profits for superior performance. But even this function could be subserved, in theory at least, by a factitious definition of cost to mean, not necessarily the cost of service actually incurred under the existing management but, rather, an estimate of the cost that *would be* incurred under a management of standard efficiency. The application of such a hypothetical-cost criterion presents formidable practical difficulties. But U.S. regulation has attempted a very limited and crude application through the acceptance of the doctrine that, in public utility rate cases, companies may secure reimbursement only for "prudent" or "legitimate" or "reasonable" operating expenses and capital outlays. Some commissions, moreover, have purported to consider efficiency factors in their allowance of a fair rate of return.

PARTIAL CONFLICT AMONG THE OBJECTIVES OF A COST-PRICE STANDARD

In view of what has just been said, one might suppose that,

with the possible exception of the efficiency incentive function, all the primary functions assigned to public utility rates could be perform in complete harmony, since all of them agree in calling for a co based, or cost-price, measure of reasonable or socially optimum rat That is to say, when utility rates are fixed at costs, they simultaneou will serve effectively to

(a) keep the demand for the service within economic boun without resort to overt rationing;
(b) enable and induce private capital to undergo the expenses supplying whatever service is thus demanded; and
(c) transfer from the consumer beneficiaries to the produci enterprise, and hence to the suppliers of the factors production, compensatory amounts of purchasing power.

This harmony of objectives under a cost-based system of rate regulati would thus be similar to the harmony of functions supposec performed by unregulated prices when determined under the forc of market competition.

Unfortunately, however, the harmony attainable under a co based system of utility rates is far from complete. On the contra the functions are in partial conflict, sometimes seriously so. The maj source of the conflict lies in the fact that a cost-based standard subject to many different interpretations and that the interpretati which would best comport with any single objective of ratemaking almost sure to be ill-adapted to the attainment of some of the otl objectives.

Some of the more serious dilemmas presented by differe meanings of "cost-of-service" include (1) the possible divergence private and social costs, (2) the necessary choice between establishi rates that cover total costs as opposed to those that cover the cost each and every component of service separately, (3) whether to inclu all costs or simply those that are avoidable, (4) the need to distingui direct from common and joint costs, (5) measurement choices, especia the choice between original and replacement costs, and, (6) whetl to base rates on short-run or long-run cost. Each of these dilemmas discussed briefly in the following paragraphs.

Private Versus Social Costs

A cost is always a cost of something to some individual or gro of individuals. When cost of service is offered as a measure reasonable rates, the answer to the question, "Cost to whom?" m

require that deferred taxes be deducted from the rate base and many state commissions follow this practice. The utilities prefer normalization as it increases their profitability and preserves a stimulus or incentive to investment.

The FERC and many of the state commissions now require that full interperiod income tax allocation be followed for accounting and ratemaking purposes. In all of the jurisdictions that we are aware of in which income tax normalization is followed, the accumulated deferred income tax balances are used as a rate base deduction (or included in the capital structure for rate of return calculation purposes at zero cost). Further, even in those jurisdictions where some flow-through of taxes is required for ratemaking purposes, the Internal Revenue Code requires that most property-related timing differences be normalized in order for the utility to be eligible for liberalized depreciation.

Summary of Final Rule Requiring Tax Normalization

FERC Docket No. RM80-42, R-424, R-446. In a ruling that became effective July 6, 1981, the FERC amended its regulations to require tax normalization for the tax effects of certain timing differences of transactions involving electric utilities and interstate gas pipelines. The final rule also codified the existing Commission rulemaking practice of adjusting rate base for accumulated deferred income taxes. Finally, the final rule required adjustments in the deferred taxes for utilities' and pipelines' cost of service for two types of circumstances:

(1) when inadequate or excessive provision for deferred taxes had been made for the tax effects of timing different transactions within the scope of the rulemaking that had previously been given flow-through treatment.
(2) when inadequate or excessive provision for deferred taxes had been made as a result of changes in tax rates.

Although the limited extent of FERC jurisdicition restricts required range of applicability, the companies often argue for their application to properties devoted to both jurisdictional and nonjurisdictional service. Not only does this simplify their accounting procedures, but it also helps to avoid a "no one's land" where incurred costs can be charged to neither federal nor state jurisdictions.

Allowing the Recovery of Cost for Abandoned Investment

In order to complete a discussion of depreciation, we take up the recent ratemaking practices relating to plant abandonments, plant allowances, and plant phase-ins and of the impact of the recent pronouncements of the Financial Accounting Standards Board on their accounting treatment (Statement Nos. 90 and 92). These statements, although not yet fully implemented, could have a profound effect on the way that the cost of plant related activities affect ratemaking and the recovery, over a reasonable period of time, of canceled projects, but does not allow recovery of a return on the investment. The basic points for the Commission's findings are:

The investor and ratepayer should be equal risk takers, hence recovery of cost, but not recovery of a return.

1. Recovery of cost:

> It is evident that unless securityholders are shielded against risk of losses resulting from aborted projects by way of inclusion in cost of service, the cost of capital will be higher to an extent necessary to compensate for the additional risk. Thus, if rate of return is required to be sufficiently high to enable public utility to attract capital, the risk of such losses must be borne by ratepayers either directly (through cost of service) or indirectly (through rate of return) . . . . shareholders [could] . . . bid up cost of capital . . . would result in double counting . . . no evidence of such occurrence in this record (*New England Power Co.*, Opinion No. 49, 8 FERC 61,054, 1979, p. 61,177).

2. but NOT recovery of a return:

> Ratepayers are not required to ensure that a utility receive a return on all monies invested in the enterprise; rate payers are required to pay a return on only those investments in properties that are used and useful in the public service.
> . . . While a regulated utility may have a lesser degree of risk than unregulated companies that must compete for their markets, this is not to say that it is in the public interest to shield utility security holders from all risks, including the risk that management may initiate projects that do not become productive. This is the risk of any business (*New England Power Co.*, Opinion No. 49, 8 FERC 61,054, 1979, pp. 61,175 and 61,176).

In 1985, FERC decided to reexamine the policy stated in Opinion 49, and invited intervention by interested parties by November 15, 1985. The following are some of the arguments for allowing not only the recovery of the investment, but also, a recovery of a return on the investment. First, consider the testimony of Guy W. Nichols:

> The commission should apply the "prudent investment" test, which provides that a utility and its investors be permitted to earn on capital prudently invested for the purpose of providing service — regardless of whether the investment turns out to be successful. Because construction of facilities occurs over several years, conditions change which on a hindsight basis would mean that the utility might not construct the facility. However, along the way, prudent decisions, based on the information at hand were made. Investors should NOT be penalized for those prudent decisions should the conditions change which cause the project to be cancelled.

The reader should also review the testimony of W.W. Hogan and A.L. Kolbe:

> The goal of regulatory policy on prudently incurred expenditures on abandoned plants should be to achieve the lowest possible costs for customers by encouraging economically efficient decisions on : a) whether to start a new plant; and b) whether to abandon a plant now in progress. This goal is achieved when regulators allow a full return on and return of prudently incurred expenditures on abandoned plants.
>
> Failure to allow full return of and on prudent expenditures for abandoned plants denies investors recovery of investment prudently made to provide utility service, and thus creates incentives for utility managers to underinvest in new capacity, to the substantial disadvantage of future ratepayers.
>
> Failure to allow full recovery, including a fair rate of return, of prudent expenditures gives managers a disincentive to abandon plants even when the economically efficient decision is to do so, in order to prevent investor losses. These disincentives can be quite large, which implies that there can be substantial pressure on utility management to make economically inefficient decisions.

As of October 1985, all parties had filed their positions into the factual records, but no policy decisions have been made as this is written. It seems unlikely that the FERC will make any changes, although a slim possibility exists.

PAUSE FOR REFLECTION

We return to the primary question raised at the beginning of this chapter. What is the relevance of any deduction for depreciation in the measurement of a rate base under an original-cost standard as distinct from a current-value standard? These different standards require different rules for the treatment of depreciation and even require different definitions of "depreciation" as the amount to be deducted from cost new in the determination of the rate base. But it does not follow, as has sometimes been stated or implied, that the allowance for depreciation under an original-cost standard has nothing to do with the decline in the values of the depreciable assets. For even an original-cost rate base, while not measured by the value of the property at the time of a rate case, should be related approximately to this value and, especially, should be kept from exceeding the value to a serious extent. The rules for depreciation accounting or capital-cost amortization summarized in this chapter are designed to serve this practical purpose. Hence, the annual allowances for depreciation as an operating deduction are properly designed to reflect the general downward trend in the service values of the depreciable fixed assets during their ineluctable march to the junk heap. To this extent, as in other respects noted in Chapter 11, an original-cost standard of rate control is not a standard completely devoid of value concepts.

REPLACEMENT COST AS AN ALTERNATIVE RATE-BASE STANDARD

We now turn to the fundamentally different replacement-cost, reproduction-cost or current-value principle of rate base determination. These terms are often used interchangably, but some writers restrict the use of the term reproduction cost to indicate the cost of rebuilding the existing plant with a substantially identical new plant, thus reserving replacement cost to indicate the cost of replacing the present output of services using a plant of modern vintage. Both of these are thought by many to reflect the current value or current worth of the assets. We deliberately eschew the term "present value", which was at one time used to designate what we are calling "current value", simply because the term "present value" has been appropriated largely by the financial community to indicate the discounted value of an expected future income stream.

In the following sections, the alternative definitions of reproduction

the existence of a cost minimizing capital structure. Whether this also implies the minimization of revenue requirements, hinges on the passing along of the interest tax savings to utility customers. Patterson also concluded that utilities tend to have capital structures with less than the optimal debt ratio so as to permit financing flexibility and a cushion of borrowing capacity. This is consistent with the position that the public interest is not necessarily served by resorting to debt ratios high enough to minimize the cost of capital. Lower ratios may well be worth their higher costs by reducing the risks of financial adversities which would have a serious impact on the quality and expansion of the supply of utility services. But the question where the line should be drawn between needlessly low and dangerously high debt ratios is subject to major differences of opinion. (For a discussion of the optimum capitalization structure see Abel, 1984 and Brigham *et al.*, 1987.)

ESTIMATION OF THE COST OF CAPITAL

Determination of the Cost of Senior Capital

Having determined the appropriate capital structure, such as the one used previously for purposes of illustration, the analyst usually finds no difficulty in computing the embedded cost of senior capital with precision. Actual fixed charges on the debt including any amortized discount or premium and issuance expense and actual dividend requirements on the preferred stock represent the annual cost in dollar terms. The dollar figures then are converted into percentages for each type of capital as measured by the net proceeds which the company has received from the issuance of the bonds and preferred stock.

Short-term Debt Debate. Some commissions include short-term debt in the capital structure, some do not. Whether or not short-term debt is included often depends on the purposes of the short-term debt. It is more likely to be included if it is permanent in nature, that is, it represents a reasonably constant proportion of total capital over time. Frequently, short-term debt is used as bridge financing. Construction is financed with short-term debt until it accumulates to an amount sufficient to justify a bond issue, then is rolled over into permanent financing.

There is no reason to believe that a utility should not be entitled to recover short-term interest expense just because it is short-term rather than long-term. Indeed, it likely would be in the ratepayers' best interests if a utility used short-term debt extensively when rates are low or if it is anticipated that long-term rates are likely to decline. If short-term debt is not allowed in the capital structure, the effect is to impute the overall cost of capital to short-term debt. If the weighted average cost of capital is above the cost of short-term debt, this could result in the imposition of an additional burden on ratepayers. In reality, and provided the proportion of short-term debt is small, the consequences of including or excluding short-term debt are usually minimal on the weighted average cost of capital. If short-term debt is included in the capital structure, it usually is carried at its current cost rate.

If a projected test year is used, sometimes a proxy for the company's actual short-term rate will be used. One proxy short-term rate that may be used is the rate on commercial paper. Commercial paper is unsecured notes issued by large corporations usually through a dealer market. The rate charged on commercial paper is generally lower than the prime rate, and the assumption is that the utility could raise capital in this market. The implication is that the prime rate is not the rate that a large company such as a utility would pay for short-term money.

Actual Versus Hypothetical Cost. Occasionally in a rate case, a witness will contend that the allowance for interest on long-term debt and preferred dividend requirements should be based, not on charges actually imposed by securities now outstanding but, rather, on the hypothetical cost of what that financing would cost under current market conditions. As will be noted later in this chapter, this position comports with the logic of a reproduction-cost theory of rate control; and it is arguably applicable even to a fair-value rate base which gives material, though not controlling, weight to reproduction-cost appraisals.

But in a calculation based on an actual-cost standard of reasonable utility rates, the objective is to determine, not what the senior capital would cost if it had to be secured *de novo*, but rather what it really does or will soon cost in view of the fact that much of it has been secured at an earlier date and under market conditions differing from those prevailing today. For ratemaking purposes, this actual or experienced cost is significant as indicating what the company presently will need in order to meet its interest and preferred-dividend requirements. Hence, the estimated *current* cost of new bonds and new preferred stock is directly relevant only as evidence of the probable cost of new senior issues that the company must contemplate in the near future for purposes of refunding or new financing.

The actual cost approach to long-term debt may be somewhat

more complicated in the case of the treatment of the refunding of a high yield bond. Company witnesses argue that the cost rate assigned to the refunding bond should include an allowance designed to amortize, over the lives of the outstanding bonds, any unamortized debt discounts, call premiums, and financing expenses on the bonds called prior to maturity for the purpose of interest savings. For income-tax purposes, these prematurity refunding costs are treated as an immediate loss rather than as a deferred charge; and accounting-minded witnesses have urged similar treatment for ratemaking purposes. But the other position is defended on the ground that the losses, net of tax savings, should be borne by future ratepayers and not by the stockholders, since these ratepayers will be the primary beneficiaries of the refunding action.

Consistently applied, either of these alternative rules of ratemaking would be tenable and fair. For, if any losses from refunding operations are to fall on the stockholders, in the form of a resulting erosion of corporate surplus, the allowed fair rate of return can be made high enough to compensate stockholders for the risk of exposure to such losses in the future. But there is a practical ground for preferring the other alternative: namely, that a management may well hesitate to call high-yield bonds if the immediate financial loss must fall on the stockholders while the reduction in annual interest charges must be passed on to the ratepayers.

Derivation of the Cost of Equity Capital

The really critical problem in the determination of the weighted average cost of capital is that of estimating the cost of the common-stock component, or rather that of estimating the allowed return on common equity which can be said to reflect cost in a loose sense of that word. Here, the primary difficulty lies in the very nature of the common stock of ordinary business corporations, including most American public utility corporations; namely, the absence of any expressed or implied commitment as to the level of dividends. In this absence, the annual cost actually incurred by a company in floating stock issues, whether by rights offerings to old stockholders or by public offerings, is simply indeterminant. Dividend payments are contingent on earnings; yet the allowable amount of earnings is the very objective of inquiry in a rate case. Thus, there arises a vicious-circle difficulty somewhat similar to that which precludes the acceptance of the commercial or market value of utility property as the measure of the rate base. Hence, a public service commission, in its allowance

of a reasonable rate of return, lacks any predetermined measure either of required earnings or of required dividends on the common stock.

Legal Framework:* Bluefield *and* Hope *Cases. Although none of the analytical techniques to be discussed later provide mathematical formula which can be mechanically applied to determine the cost of equity, landmark decisions of the U.S. Supreme Court provide the underlying legal principles of a fair rate of return. The two landmark cited cases are *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia* (262 U.S. 679, 1923) and *Federal Power Commission v. Hope Natural Gas Company* (320 U.S. 391, 1944). These cases are so familiar that they are referred to simply as *Bluefield* (1923) and *Hope* (1944). In addition to these cases, reference is sometimes made to somewhat more recent cases which reiterate the principles of *Bluefield* and *Hope*. Two of the more frequently cited cases are *Federal Power Commission v. Memphis Light, Gas & Water Division*, 411 U.S. 458 (1973), and *Permian Basin Area Rates*, 390 U.S. 747 (1968). Frequently, references to the decisions of the particular commission hearing a case are cited as additional support for the basic principles involved, but, in reality, these later decisions add little, if anything, to the basic mandates of *Bluefield* and *Hope*.

It is interesting to note that the *Bluefield* and *Hope* cases were decided long before the analytical techniques now used in rate cases were developed. Occasionally, some discussion will be offered suggesting the consistency of the results produced by the analytical techniques and the mandates of *Bluefield* and *Hope*. However, the decisions themselves endorsed no specific method of estimating the cost of equity. The major principles of the cases are summarized in a couple of paragraphs. The *Bluefield* case set the standard by which reasonable rates are judged:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties . . . The return should be reasonable, sufficient to assure confidence in the financial soundness of the utility, and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise money necessary for the proper discharge of its public duties.

ATTACHMENT 2

Accounting for Public Utilities

by

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vince the court that there is any legal reason why such a method cannot be used."[4]

The FERC's policy concerning CWIP in rate base, as set forth in Order Number 555, was amended in 1983 by FERC Order Number 298.[4.1] Order Number 555 had generally restricted CWIP in rate base to those instances in which a utility demonstrated "financial distress." By contrast, Order Number 298 permits electric utilities generally to include up to 50 percent of their FERC jurisdictional CWIP in rate base. Financial distress is no longer a criterion for eligibility for rate base treatment.

[3] Regulatory Role in Rate Making

As observed earlier, the style of rate making used to measure costs is of significance primarily in meeting the rate-making limitations imposed by practical and legal considerations. Conceptually, the objective is quite simple and does not dictate any particular approach. The regulated utility is entitled to an opportunity to recover all costs prudently incurred in providing services. Concurrently, the consumer has an obligation to reimburse the utility at rates that will provide such an opportunity. Consequently, the regulator has the responsibility of fixing rates, normally on a prospective basis using test period costing data (data that are considered to be representative of operating conditions when the rates will be in effect), that will meet the dual interests of the provider of services (the utility) and the user of services (the consumer). These interests are expressed as follows:

Utility

The rates should be high enough to provide the utility with a reasonable opportunity to recover the total costs of providing service and to sustain its financial integrity.

Consumer

The rates should be at the minimum levels required to provide recovery of ongoing costs and to maintain dependable and reliable service.

In fulfilling this role, the regulator is often said to be a substitute for competition, and, in the sense that the regulator sets prices in

[4] *Id* at 668.

[4.1] FERC Order No 298. Dkt No RM 81–38 (May 16, 1983).

As these components suggest, no *profit* is anticipated or provided for in a regulated utility. *Cost* of service equals revenue requirements, and profit (as viewed in an economic context) is not a factor. Of course, the earnings to which the equity owners are entitled (which in accounting terms is labeled net income and is, in turn, often considered from a financial perspective as "profit") are not ignored or denied. The earnings requirements of common equity (consisting of the owners' investment through direct purchases of stock or from prior earnings which the owners have left in the business as added investments) and preferred stock investments are simply considered to be part of the *cost* components that rates should cover. To the extent that rates do not produce the revenues necessary to cover costs (including earnings for the equity holders), it may be held that a "loss" (a shortfall in the required equity earnings) has occurred. Conversely, if rates produce revenues that are more than required to adequately reimburse the equity holders, a "profit" results. When rates are functioning properly, the utility recovers the *cost* of service as viewed under regulatory principles and no profit or loss is produced. This discussion illustrates a sharp distinction between commonly used accounting or financial terms and regulatory terms, and it is important to bear this distinction in mind when discussing regulatory concepts.

Figure 3–1 presents simplified financial statements used in producing a typical cost of service measure using the rate base approach.

Figure 3–1

Balance Sheet

Plant in service	$1,000	Common stock	$ 200
Accumulated depreciation	220	Retained earnings	120
		Common equity	$ 320
Net plant in service	$ 780	Preferred stock	80
Construction work in progress	150	Long-term debt	400
		Total capitalization	$ 800
Cash	5	Notes payable	85
Receivables	20	Accounts payable	10
Inventories	28	Taxes payable	5
Prepayments	2	Deferred federal income taxes	75
Deferred debits	5		

Rate of Return

Rate Base	$750
Net operating income	$ 75
Rate of return	10%

These calculations reveal the rate of return produced by the rates in effect during the period. They do not, however, reveal the required rate of return nor the adequacy of existing rates to recover the cost of service. The required rate of return is derived from a determination of the composite cost of capital. Figure 3–3 illustrates the calculation of the composite cost of capital, using the data from Figure 3–1:

Figure 3–3

	Amount	Ratio	Cost Rate	Weighted Cost
Long-term debt	$400	50.0%	10.0%	5.0%
Preferred stock	80	10.0	8.0	.8
Common equity	320	40.0	16.0	6.4
Total capital	$800	100.0%		12.2%

Both in format and in identification of capital cost components, the cost of capital measure is quite simple and straightforward. There are variations in the items included, but the variations usually have little effect on the composite result. For example, many commissions include one or more other items (discussed in the following sections) in the capital structure.

[1] Deferred Federal Income Taxes

Most commissions have treated accumulated income tax deferrals as a cost-free source of funds (although at one time the Federal Power Commission assigned a nominal cost rate of 1.5 percent to these funds). Although most commissions have deducted these reserves directly from the rate base, as shown in Figure 3–2, some have included the reserves as a capital component at a zero cost. The result produced by either approach may be the same, as is illustrated in the following example.

Required return	$ 92	(No change from prior example.)

	Amount	Ratio	Cost Rate	Weighted Cost
Long-term debt	$ 800	47.8%	10.0%	4.78%
Preferred stock	160	9.5	8.0	.76
Common equity	640	38.2	16.0	6.11
Deferred taxes	75	4.5	-0-	-0-
Total	$1,675	100.0%		11.65%

Restated to Include Tax Reserves in Cost of Capital

Rate base	$ 825	
Cost of capital	11.65%	
Required return	$ 96	(Increase is due to watered-down impact of deferred income taxes at a zero cost.)

[2] Accumulated Investment Tax Credits

Accumulated investment tax credits have no impact on the cost of capital, since they are generally assigned a cost equal to the composite cost of other capital sources. This is illustrated as follows:

Example:

	Amount	Ratio	Cost Rate	Weighted Cost
Long-term debt	$ 400	49.1%	10.0%	4.91%
Preferred stock	80	9.8	8.0	.78
Common equity	320	39.3	16.0	6.29
Deferred Investment Tax credit	15	1.8	12.2	.22
Total	$ 815	100.0%		12.20%*

* Same composite cost as capital cost measured without deferred investment tax credits.

The funds from the Job Development Investment Tax Credits (often referred to simply as investment tax credits) are a direct rebate of taxes. Even though these funds are obtained at no cost to the utili-

ATTACHMENT 3

The

PROCESS

OF

RATEMAKING

Volume I

By

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The overall scheme under a regulatory statute typically, nearly universally in this country, calls for "a flexible, non-mechanical approach to ratemaking.... One statutory factor cannot be isolated out of context, or blindly exalted at the expense of others that are at least co-equal in importance.... The whole thrust of ratemaking ... is balancing."[1]

CONSTITUTIONAL RELEVANCE OF THE "JUST AND REASONABLE" STANDARD. The just and reasonable test has become in more recent years even more than the prevailing legislative test for a lawful rate of a regulated enterprise. It is also relevant to the constitutionality of a regulated rate under the Takings Clause of the Fifth Amendment and the Due Process Clause of the Fourteenth Amendment of the Constitution.

The Fifth Amendment provides that, "No person shall ... be deprived of ... property, without due process of law; nor shall private property be taken for public uses without just compensation." The Fourteenth Amendment provides that "No State ... shall ... deprive any person of ... property, without due process of law...."

A just and reasonable rate is a constitutional rate, but, as we shall see, a rate need not pass every just and reasonable test, which indeed may vary from state to state, to pass muster as a constitutional rate.

The judiciary at first attempted to formulate their own threshold test for a constitutionally approved rate of a regulated company. The experiment was eventually abandoned in deference to the emerging just and reasonable standard already applicable to those companies.

Background. Convinced that the regulated company could not be denied the right to question whether a prescribed rate was "confiscatory,"[2] the courts at first established a substantive test for a confiscatory rate in terms of its effect on property values. The Supreme Court held in 1898 that the reasonableness of rates must be decided in accordance with the "fair value" of the property devoted to the public service.[3] In order to ascertain that value, an agency, and ultimately the courts, had to consider original cost, market value, earning capacity, all "to be given such weight as may be just and right in each case."

It was only in the 1940s after 50 years under the rule of fair value that the Supreme Court conceded it had created a judicial quandary with the fair value doctrine.

[1] PSC of Indiana v. I.C.C., 749 F.2d 753, 763, 765 (D.C.Cir., 1984).

[2] The Supreme Court rejected a legislative delegation of ratemaking authority to a Minnesota agency, when the legislature had foreclosed all opportunity for judicial review, in Chicago, M.St.P.& P.Ry.Co. v. Minnesota, 134 U.S. 418, 456-58 (1890). The Minnesota statute (Minn.Gen.Laws, 1887, ch. 10) required railroad rates to be "equal and reasonable." The state court later upheld a revised regulation that regulated rates subject to judicial review holding that the judicial question under the new statute was whether the approved rate was "confiscatory." Steenerson v. Great N.Ry.Co., 72 N.W. 713 (Minn. 1897).

In a more recent case, a lower court in Maine ruled that an insurer is unable to raise an issue of confiscation, when it simply may leave the market. The case arose under a Maine statute that had ordered a workers compensation insurance rate reduction in the state and a limit on future rate increases. The lower court ruled that an insurer suffers no confiscation of its property under such a statute, since unlike a utility it loses none of its costs of service when it decides to leave the market rather than comply with the new statute. *See* National Council on Comp. Ins. v. Superintendent of Ins., 538 A.2d 759 (Me. 1988), dismissing the appeal as moot when the state legislature amended the insurance statute to remove the clauses in question.

[3] Smyth v. Ames, 169 U.S. 466 (1898), discussed further at p. 755, *infra*.

It now recognized that the lowest reasonable rate fixed by an agency is already one that is not confiscatory in the constitutional sense;[1] and hence there is no further fact-finding function for any court to perform.

An equation was drawn by the Supreme Court between the development of just and reasonable rates and the due process test only gradually, and indeed not completely, as we noted above, until the mid-1940s. In that period after 50 years under "fair value" as a constitutionally prescribed test, the Court decided the *Natural Gas Pipeline*[2] and *Hope*[3] cases, opening the door to a wholly new relation between the federal courts and administrative agencies under the just and reasonable test.

In the *Natural Gas Pipeline* case the Supreme Court now held that the Constitution did not "bind ratemaking bodies to the service of any single formula or combination of formulas"; it added that if the agency's order "in its entirety, produces no arbitrary result, our inquiry is at an end." Later in the *Hope* case, the Supreme Court added there were various "permissible ways in which any rate base on which the return is computed might be arrived at," and it is constitutionally enough if the "result reached" by the agency is just and reasonable from the investor or company viewpoint.[4] Thus, "the just and reasonable standard ... coincides with the applicable constitutional standards."[5]

The Supreme Court reiterated this dovetailing of the just and reasonable test with the constitutional standards as late as *Permian Basin*,[6] adding the following to its holding in *Hope*:[7]

> any rate selected by the Commission by the broad zone of reasonableness permitted by the [Natural Gas] Act cannot properly be attacked as confiscatory.... [A]ny such rates, determined in conformity with the Natural Gas Act and intended to 'balanc[e] ... the investor and the consumer interests,' are constitutionally permissible [citation to *Hope* omitted].

Exceeding the constitutional minimum. Only regulation that "goes too far ... will be recognized as a taking,"[8] and that question must be decided on the basis of ad hoc, factual inquiries.[9] Such inquiries include the character of the regulation, the extent to which regulation interferes with investment-backed expectations, and whether regulation results in "complete destruction," rather than only "minor diminution" of property values.[10]

[1] F.P.C. v. Nat. Gas Pipeline Co., 315 U.S. 575, 585 (1942). Or, as the Supreme Court later added, "all that is protected against, in a constitutional sense, is that the rates fixed by the Commission be higher than a confiscatory level." F.P.C. v. Texaco, Inc., 417 U.S. 380, 391-92 (1974).

[2] F.P.C. v. Nat.Gas Pipeline Co., 315 U.S. 575 (1942).

[3] F.P.C. v. Hope Nat. Gas Co., 320 U.S. 591 (1944).

[4] 320 U.S. at 602-03.

[5] 315 U.S. at 586.

[6] Permian Basin Area Rate Cases, 390 U.S. 747 (1968).

[7] *Id.* at 770.

[8] Pennsylvania Coal Co. v. Mahon, 260 U.S. 393, 415 (1922).

[9] Kaiser Aetna v. United States, 444 U.S. 164, 175 (1979).

[10] Penn Central Transp. Co. v. New York City, 438 U.S. 104, 123-26 (1978); Re Competition for Local Exch.Svc., 165 PUR4th 127, 133-34 (Cal.PUC, 1995).

Chief Justice Rehnquist recently restated the utilities' right to raise the constitutional issues of the Takings Clause of the Fifth Amendment. Since the legislatures have imposed public duties on utilities and limited their earnings, the "guiding principle has been that the Constitution protects utilities from being limited to a charge for their property serving the public which is so "unjust as to be confiscatory." A rate historically has been considered "so unjust," if for all practical purposes it would "destroy the value of [the utility] property."[1]

Justice Rehnquist with hindsight dismissed *Smyth* v. *Ames* as simply calling for findings of "the actual present value of the assets employed in the public service";[2] but in fact the issue was never so nicely drawn. "Fair value" required as well a consideration of various "elements of value," and included all the problems associated with finding "current value" without limitation to those problems. Justice Rehnquist, of course, was correct in describing these early efforts on the part of the judiciary prior to the 1940s as attempts to introduce market considerations into the constitutional test.[3] However, the judicial forum was the wrong forum for the test, and the test itself was inherently unsound for other reasons.

The California Supreme Court in a leading case in that state read Justice Rehnquist's opinion in *Barasch* to create an exact equivalence between the just and reasonable rate and the constitutional rate.[4] No such equivalence will be found in the *Barasch* opinion. Justice Rehnquist carefully noted that it was not every just and reasonable rate that raised constitutional questions. It is only "at the margins" that just and reasonable tests bearing on rate of return and rate base have "constitutional overtones."[5] Above that the agency acts within a "zone of reasonableness."[6]

Thus, a court reviews rate orders under the Constitution only for the "total effect" of the orders, and in so doing will ask whether the orders,[7]

> jeopardize the financial integrity of the companies, either by leaving them insufficient operating capital or by impeding their ability to raise future capital.

The Constitution protects a regulated company far less than the just and reasonable standard. The Constitution protects the company only from "the net effect of the rate order on its property."[8]

The principles under which a constitutional minimum value are computed are well understood. If the enterprise is continually losing money as a going concern, its

[1] Duquesne Light Co. v. Barasch, 488 U.S. 299, 307 (1989).

[2] 488 U.S. at 308.

[3] *Id.* at 308-09.

[4] 20th Century Ins.Co. v. Garamendi, 8 Cal.4th 216, 878 P.2d 566, 614 (1994) ("If it [the contested rate] is not just and reasonable, it is confiscatory."); *and see* 878 P.2d at 631 ("The constitutional question is whether a rate is "unjust and unreasonable and hence confiscatory").

[5] 488 U.S. at 310.

[6] Confiscatory rates are outside the permissible zone. Southern Bell Tel.& Teleg.Co. v. F.C.C., 781 F.2d 209, 214 (D.C.Cir. 1986). In the zone between the lowest reasonable rate of return and a confiscatory rate of return, the return "will not attract the investment of new capital on favorable terms and yet will not result in the withdrawal of capital already invested in the enterprise." Barnes, Economics, p. 522.

[7] 488 U.S. at 312.

[8] *Id.* at 314.

minimum value is the net salvage value of its assets; if the enterprise has "demonstrated a capacity for profitable operations under reasonable rates" it may be entitled to consideration of reproduction-cost-new less depreciation, including an intangible "going concern value," under certain circumstances.[1]

Just and reasonable tests strive for a fair balancing between investor and ratepayer by allowing the regulated company an opportunity for a fair return. Those efforts may differ from state to state; but what may be unjust and unreasonable in one state, albeit just and reasonable in another, does not prove the rate is unconstitutional in the first state. Consistent with this thought, the Supreme Court in *Barasch* refused to adopt the prevailing "prudent investment" rule as a "constitutional standard":[2]

> The Constitution within broad limits leaves the States free to decide what rate-setting methodology best meets their needs in balancing the interests of the utility and the public.

Relevance of out-of-pocket costs. There are few occasions when an agency will order the just and reasonable rate at the level of the regulated company's "out-of-pocket" or cash incremental costs.[3] There is established law to the effect that any rate that recovers the out-of-pocket costs is non-confiscatory and otherwise constitutional. Although out-of-pocket costing is an exceptional basis for a just and reasonable rate, it is an appropriate threshold for a constitutional minimum rate. Again we must conclude that the just and reasonable standard for a prescribed rate normally exceeds the constitutional minimum.

The Supreme Court has ruled in this regard that a court may refuse to invalidate a rate when the regulated company's out-of-pocket expenses in connection with the regulated service exceed its revenue.[4] To prevail on constitutional grounds against an agency-prescribed rate under the just and reasonable standard, a company must have shown deep financial hardship,[5] or an inability to operate successfully under the rate.[6]

The California insurance commissioner has helpfully summarized the "deep financial hardship" and "inability to operate successfully" tests for an unconstitutional rate:[7]

> an agency need not afford relief when the regulated firm cannot show a failure to recover its out-of-pocket costs.... While mere recoupment of out-of-pocket costs certainly could not substitute for a minimally-nonconfiscatory rate of return determined pursuant to a comprehensive, constitutional scheme for ascertaining that rate, still it does serve as an objective means for identifying

[1] New Haven Inclusion Cases, 399 U.S. 392, esp. at 472 note 74 and 482 note 80 (1970), and cases cited.

[2] 488 U.S. at 315, 316.

[3] *See* p. 303, *infra*.

[4] F.E.R.C. v. Pennzoil Producing, 439 U.S. 508, 517 (1979); *and see* Dorchester Gas Producing v. F.E.R.C., 571 F.2d 823 (5th Cir. 1978).

[5] Duquesne Light Co. v. Barasch, 488 U.S. 299, 307-08 (1989); Jersey Central Power & Light Co. v. F.E.R.C., 810 F.2d 1168, 1181 note 3 (D.C.Cir. 1987).

[6] F.P.C. v. Hope Nat.Gas Co., 320 U.S. 591, 605 (1944); Market Street Ry.Co. v. Commission, 324 U.S. 548, 566 (1945).

[7] In the Matter of the Rate Rollback Liability of State Farm Mutual Auto.Ins.Co., Cal.Ins.Comm'r, File No. REB-5184, p. 9, Dec. and order of Apr. 19, 1996.

deep financial hardship, taking into account the many expenses the regulations would not recognize, for purposes of an ultimate constitutional variance.

I will discuss later the retraction by the courts of their initial introduction of market considerations into the constitutional law surrounding a reasonable rate;[1] the courts learned it could not be done through simple labels called "fair value" applied to company investment. The larger lesson was the realization that the search for constitutionally permissible rates was essentially superseded by the search for fairness and justice that the agencies were undertaking in their development of principles for "just and reasonable" rates.

The decisions of those few state courts after *Hope* that continue to substitute their judgment for that of an administrative agency read today as intrusive anachronisms.[2]

We shall also see throughout this work that agency discretion to decide rate reasonableness has generally been constrained by statute to approve rates as interpreted by the courts at points substantially above the constitutional minima. The New Hampshire commission, for example, while defending its authority to adopt price cap regulation for the competitive services of a local exchange carrier (LEC) (local telephone company), concluded that the courts of that state would also require it to find "a reasonable return on the cost of the property of the utility used and useful in the public service."[3]

Abstention at the federal judicial level. State rate cases typically involve complex questions of law and fact, and matters of substantial public interest and concern. Where there are difficult or unresolved state law questions with which federal issues are intimately joined, federal courts will exercise an equitable discretion to abstain from reviewing the federal questions and defer to the state courts for all necessary judicial review.[4] Federal courts also find abstention and deference to parallel state court proceedings are appropriate to avoid forum shopping, and to conserve judicial resources, where "exceptional circumstances," such as the effect of factors external to the litigation that may not be fully known at the time of the hearing in federal court, are present.[5]

Threshold tests for a constitutional rate level. To administer rate rollbacks ordered by a state legislature or by voter initiative, some states, notably California and Pennsylvania, have developed threshold earnings tests to determine how far the rates may constitutionally be rolled back. Rather than pinpoint the constitutional minimum level of earnings for any company, these states chose a profit test based on the long-term experienced returns in the industry. Their ratemaking theory was that, a) a

[1] *See* p. 761.

[2] For example, *see* City of Miami v. Florida PSC, 208 So.2d 249, 256-58 (Fla. 1968) (relying on the end result test reluctantly "to wash out erroneous administrative ... judgments" on the choice of a year-end rate base while stating its strong preference for an average rate base).

[3] Re New England Tel.and Teleg.Co., 123 PUR4th 289, 303 (N.H.PUC, 1991), citing N.H. Statutes RSA 378:27-:28, and LUCC v. Pub.Svc.Co. of N.H., 119 N.H. 332, 341, 402 A.2d 626 (1979).

[4] Burford v. Sun Oil Co., 319 U.S. 315, 332 (1943); Fireman's Fund Ins.Co. v. Quakenbush, 87 F.3d 290 (9th Cir. 1996), discussing also issues of "ripeness" of the claims made under the Constitution.

[5] Colorado River Water Conserv.Dist. v. United States, 424 U.S. 800 (1876); O'Neill v. United States, 50 F.3d 677, 688 (9th Cir. 1995), cert. denied, 116 S.Ct. 672 (1995); Fireman's Fund Ins.Co. v. Quackenbush, *supra*, 87 F.3d at 297-98.

company earning less than the industry average can fairly be exempted from the rollback; b) that the more successful companies, opposing all rate reductions, cannot successfully show that a rollback of rates to the experienced industry average earnings level will subject them to hardship; and c) the threshold test applies industrywide and is much easier to administer than a company-by-company test when hundreds of companies are refiling their rates.

California. In administering the rate freeze and rollback stemming from the voter initiative of 1988 (Prop. 103), the California insurance commissioner created a constitutional threshold test based on the industrywide average return on surplus over the prior 10 years. The commissioner held that insurers were constitutionally entitled to a rate level "no higher than necessary for the rates not to be confiscatory," and for purposes of the rollback, he would adopt an after-tax return of 10 percent on surplus.[1] As the commissioner later explained, the 10 percent figure was merely "a baseline for determining confiscation" or a "constitutional baseline for avoidance of confiscation," and not a just and reasonable earnings test.[2]

The California Supreme Court sustained the commissioner's threshold approach, holding the "excessive/inadequate" standard of the rate statute did not apply; and a complaining company could upset the test only by showing deep financial hardship would result under the test.[3]

Pennsylvania. An insightful discussion of the threshold test in the context of a rate rollback appears in a series of Pennsylvania insurance cases following the enactment of tort reform in that state. Like California, Pennsylvania faced the prospect of rate refilings by hundreds of insurers. The Pennsylvania commissioner expedited the rollbacks ordered by the legislature by a) finding all evidence of a just and reasonable minimum rate was irrelevant; b) finding that based on industrywide data no company would experience extreme hardship if the rollbacks left it earning 12 percent on statutory surplus;[4] and c) ordering each insurer which had petitioned for relief from the rollback to reduce rates down to the level of a 12 percent return. In each case the Pennsylvania commissioner distinguished the threshold standard from a just and reasonable or capital attraction standard.

The commissioner derived the 12 percent threshold return on surplus from a study published by the Insurance Services Office (ISO), a statistical and rate filing arm of the industry.[5] The study purported to demonstrate that the property and casualty insurers had earned a 10.4 percent return on equity under generally accepted accounting practice (GAAP) in the 10-year period 1978 to 1988. The commissioner

[1] 10 CCR §§2645.2(b), 2645.6(a). This decision is discussed further at pp. 698 and 1280, *infra*.

[2] In the Matter of the Rate Rollback Liability of State Farm Mutual Auto.Ins.Co., et al., File No. REB-5184, Decision and Order of the Calif.Ins.Comm'r, Apr. 5, 1996.

[3] 20th Century Ins.Co. v. Garamendi, 8 Cal.4th 216, 878 P.2d 566, 610, 616 (1994), cert. denied, 115 S.Ct. 1106, cert. dismissed, 115 S.Ct. 1085 (1995).

[4] Statutory surplus includes paid-in capital and retained earnings. It excludes loss reserves and unearned premium reserves, which are carried on the insurers' books as liabilities.

[5] Insurer Profitability: A Long Term Perspective, Ins.Svcs.Ofc., N.Y. (1989).

rounded this number to 10 percent, and adjusted it upwards by a factor to 1.2 to approximate the equivalent return on statutory surplus.[1]

The commissioner continually found in a series of "extraordinary circumstances" filings by individual insurers that a 12 percent after tax return is "neither confiscatory under the Constitution or unfair";[2] and that "the 12 percent return as a target" would meet the legislative "directive to grant relief from the mandated rollbacks only in extraordinary circumstances and the constitutional standard that rates may not be confiscatory."[3]

In the *Allstate* case, finding that no conversion from a GAAP based return to a statutory accounting based return could readily be made,[4] the commissioner found that a 10.4 percent after tax return on GAAP equity is neither confiscatory under the Constitution nor unfair."[5]

I believe it was no accident that the constitutional tests developed in these states were equivalent to the profit and contingencies allowance under the 1921 All Industry Bill. Rather than hold that the 5 or 6 percent of premium, which was widely used by the industry in rate filings, was a fair threshold test, the commissioners in a more roundabout fashion adopted returns on GAAP equity of 10 percent.[6] In Pennsylvania, the commissioner increased the 10 percent on GAAP equity to 12 percent on statutory surplus, and employed a 2 to 1 premium-to-surplus ratio, so that the end result was a constitutional threshold 6 percent of premium. California reached a similar result by ignoring the differences between GAAP and statutory equity, finding 10 percent applicable on *both* GAAP and statutory equity, and covering negative returns that had been experienced on a statutory basis.[7] The industry could hardly complain that it was being held to its own earnings test.

The Pennsylvania commissioner distinguished her role under the Constitution from her role in an ordinary rate case. Evidence regarding a "fair return" was "irrelevant"

[1] For discussion of this conversion technique, *see* p. 673, *infra*.

[2] In re Nationwide Mutual Ins.Co. and Nationwide Mutual Fire Ins.Co., Private Pass.Auto.Rate Rev., Docket No. R90-05-39, Pa.Ins.Comm'r, Order and Adjudication, Aug. 10, 1990, pp. 25-26; In re Erie Ins.Co., Private Pass.Auto.Rate Rev., Docket No. R90-06-21, Pa.Ins.Comm'r Order and Adjud., Oct. 19, 1990, p. 56; In re Boston Old Colony Ins.Co., *et al.* Private Pass.Auto.Rate Rev., Docket No. R90-09-44, Pa.Ins.Comm'r, Order and Adjud., Feb. 4, 1991, p. 38; In re Horace Mann Ins.Co. and Teachers Ins.Co. Private Pass.Auto.Rate Rev., Docket No. R90-06-27, Pa.Ins.Comm'r, Order and Adjud., Sept. 21, 1990, pp. 28-29.

[3] In re Travelers Ins.Co. and Travelers Indemnity Co., Docket No. R90-06-23, Pa.Ins.Comm'r, Order and Adjud., Sept. 14, 1990, p. 21.

[4] In re Allstate Ins.Co. and Allstate Indemnity Co., Private Pass.Auto.Rate Rev., Docket No. R90-07-01, Pa.Ins.Comm'r, Order and Adjud., Feb. 8, 1991, p. 19. For the problems generally inherent in using a rule-of-thumb conversion factor of 1.2, *see* pp. 736-37.

[5] Unlike the other cases, the commissioner relied on the 1972-87 period and found a 10-year average was higher than 10.4 percent (Allstate case, pp. 6, 17-18.) The ISO study in fact understated the earned returns on GAAP equity of property and casualty insurers in several respects. For example, it used year-end equity, rather than average equity, to compute the annual return on GAAP equity. The use of year-end investment rather than average investment was inconsistent with the commissioner's precedent in which she rejected use of year and assets rather than average assets to compute an annual return on net assets. *See* In re Mutual Benefit Ins.Co., Private Pass.Auto.Rate Rev., Docket No. R90-09-35, Pa.Ins.Comm'r, Order and Adjud., Jan. 18, 1991, p. 52.

Second, ISO created deferred taxes, but apparently did not subtract the deferred taxes from the equity base. It is also unclear how catastrophe losses and reinsurance were handled. For a revised, somewhat later, study, *see* Long-Term Profitability: The Risk-Return Tradeoff, Ins.Svcs. Office, N.Y., Sept. 1990.

[6] Allstate Ins.Co. case, *op.cit.supra*, p. 20.

[7] *See* p. 1280, *infra*.

under the threshold approach. The insurer's burden was to show it "will experience confiscation if it achieves" the threshold return.[1] Citing *Duquesne Light Co.* v. *Barasch*,[2] the commissioner held that the insurer's burden was to prove that the target return would "adversely impact it," if not "destroy its value." The commissioner reasonably assumed that her allowing a company to achieve the average return attained in the marketplace almost by definition was not confiscatory.[3]

In distinguishing the statutory standard of rate adequacy from the constitutional test, the Pennsylvania commissioner variously noted that the "constitutional threshold is not very high,"[4] or that,[5]

> statutory standard of adequacy lies somewhere between lowest non-confiscatory rate and excessive rate.... Constitution protects only against confiscatory rates but adequacy is [a] higher standard.

The commissioner recognized that the constitutional minimum was below an "adequate" rate level, and by implication below the adopted threshold. A prime indication that a Pennsylvania rollback to 10.4 percent on GAAP equity was constitutional for Allstate was that it had operated for five years at a return of 8.5 percent, which not only "belied" its contention that 10.4 percent was unconstitutional but also its contention such a return was "inadequate."[6] In all these cases the 12 percent rate of return was "more than adequate to meet a constitutionally confiscatory standard."[7]

The downside of the threshold approach is that the legislative rate rollback is not fully achieved. Yet, it would be too harsh a verdict to conclude that the legislative goal is entirely sacrificed to administrative convenience under such a test. The administrators generally are under court mandates to allow no rate reduction below the constitutional minimum level, which varies from company to company. The threshold salvages some rollback from a potential total collapse in years of litigation devoted to company-by-company proceedings.

REGULATION OFFERS THE REGULATED COMPANY AN OPPORTUNITY FOR EARNING A FAIR RETURN BUT NO GUARANTY. Unless there are statutory provisions in place that authorize a subsidy to the regulated company,[8]

[1] Allstate case, *op.cit.supra*, pp. 25, 26-27, 30; *and see* Travelers Ins.Co. case, *op.cit.supra*, p. 23; Erie Ins.Co. case, *op.cit.supra*, p. 54; and Boston Old Colony Ins.Co. case, *op.cit.supra*, pp. 33-34. Relevant to the confiscation issue were the facts that the affected insurers had operated successfully in the past and exhibited growth under lesser profit levels and far less than they were seeking to establish as constitutional minima.

[2] Duquesne Light Co. v. Barasch, 488 U.S. 199 (1989).

[3] Allstate case, *op.cit.supra*, p. 23.

[4] Allstate Ins.Co. case, *op.cit.supra*, p. 24.

[5] Boston Old Colony Ins. Co., *op.cit.supra*, p.33; Allstate Ins.Co., *op.cit.supra*, p. 15.

[6] Allstate Ins.Co., *op.cit.supra*, p. 27.

[7] In re Erie Ins.Co. and Erie Ins.Exch., Private Pass.Auto.Rate Rev., Docket No. R90-06-21, Pa.Ins.Comm'r, Order and Adjud., Oct. 19, 1990, p. 56. Thus in using 12 percent as a "threshold," the 12 percent level was considered adequate, not a level below which a rate was confiscatory. In re Penna.Comp.Rating Bur. 1992 Workers' Comp.Rate Rev. Proposal C-330, Docket No. R91-09-21, Pa.Ins.Comm'r, Order and Adjud., Oct. 21, 1992, p. 82.

[8] For example, the Civil Aeronautics Act of 1938 and its successor the Federal Aviation Act of 1958 provided federal subsidies to the airline industry through the compensation paid by the federal government for carriage of the mail; and the federal government subsidizes certain flood insurance rates. Both are discussed in later pages. *See* pp. 156 and 362.

It has been held there is no public policy that requires a regulatory agency to protect utility investors against future risks of unrealized inflation. The New York commission stated this proposition succinctly:[1]

> If it were within our power to insure utility investors against inflation, we would simply create a class (according to the company's testimony, another class) who would have no interest in combating it and who might even profit by it. As a matter of elemental justice, consumers of utility services are entitled to the same protection against inflation produced by governmental policies as are utility owners.

The New York commission later elaborated:[2]

> We find nothing in our statutes, or the reported decisions, which guarantees to the investor of utility equities insurance against the results of economic forces or even the political policies of any national administration....
>
> ... [W]e must in like manner consider the cumulative effect of current economic forces upon the company whose rates we are fixing. Certainly the investor considers these before committing his money to the enterprise.
>
> ... We appreciate that a utility must earn an adequate amount to make its securities attractive in the current money market. When that test has been met our obligation in that respect has been discharged.

In the words of Prof. Bonbright, an estimate of cost of capital (which considers dividend yields as well as earnings), "not only makes allowance, but makes full allowance for this factor [the inflation factor to the extent that this factor has actively influenced investors in their desire to buy AT&T stock].... My estimate of cost of capital accepts whatever rate of return investors themselves find acceptable in view of their option to buy any industrial stocks which they might prayerfully hope to provide them with a hedge against inflation."[3]

Relation to economic recession. In a period of recession or depression, the I.C.C. only reluctantly authorized railroad rate increases, and only upon a clear showing of revenue need when weighed against the effect on individual freight commodities or industries.[4] It recognized that railroad earnings must inevitably fall below normal in times of depression. In such periods there is less need for new capital, and the railroads could as well be considering rate reductions as much as specific increases to stimulate business.

[1] Re New York Telephone Co., 91 PUR(NS) 231, 248 (N.Y.PSC, 1951); *but see* the discussion of "attrition" at p. 636, *infra*.

[2] Re New York Telephone Co., 5 PUR3d 33, 47-48 (N.Y.PSC, 1954).

[3] Quotation from Prof. Bonbright's testimony in an article by Walter A. Morton entitled "Rate of Return and the Value of Money in Public Utilities", 28 Land Economics 117 (May, 1952). For other considerations that relate to inflation under the general heading of "attrition" *see* p. 630, *infra*.

[4] Fifteen Per Cent Case, 1931, 178 ICC 539, 572, 577 (1931); Fifteen Percent Case, 1937-1938, 226 ICC 41, 144-46 (1938); *see also* p. 906, *infra*.

The Massachusetts regulatory department more recently observed that, "Unfortunately, utility rates tend to rise during recessions, as fixed costs are spread over fewer units of sales." Responsible regulation, therefore, must "ensure that utility companies are operating as efficiently as possible."[1] Such a promise requires the devotion of more resources to rate regulation than most states are willing to commit.

The better rule followed by the I.C.C. in its earlier cases is that the regulated companies in periods of economic downturn bear an especial burden of proving efficient performance. At the same time there is no reason for the agency to attempt to stabilize the company's earnings when, a) the economy of its service area is basically the cause of lowered earnings; b) reduced rates may be in order; and c) there is little need to attract new capital. The attraction of capital standard in periods of recession arguably overstates the fair and reasonable return.

COST OF DEBT. Embedded cost. The current and near term future cost of debt, or the "senior capital," of the regulated enterprise is generally uncomplicated, since debt commitments are made well in advance of major capital expenditures. The cost of debt may be experienced or projected for the "test year"; but whether based on current or contracted for debt should consider the near-term future capital requirements of the enterprise.

Traditional v. yield to maturity. Under the traditional method of computing cost of debt (as well as cost of preferred), a weighted rate is computed from the company's books including unamortized balances of premium, discount, and issuance expenses. By contrast, the yield-to-maturity method uses a hypothetical amortization schedule subject to adjustments for early retirement costs. Most state and federal agencies use the yield-to-maturity method or some combination of the two methods.[2]

Long-term debt. Long-term debt is debt that matures more than one year after issuance or assumption, and remains in that status until maturity. The nature of a five-year loan, for example, does not change merely because a little more than a year remains before maturity.[3] Includable long-term debt refers to the net proceeds after issuance, rather than the face amount of the debt instruments as issued.[4]

The actual cost of debt is used to compute cost of capital, since it is more realistic and more reliable than projecting future costs. Justice Brandeis provided the basic explanation for regulatory reliance on actual debt cost:[5]

> In essence, there is no difference between the capital charge and operating expenses, depreciation, and taxes. Each is a part of the current cost of supplying the service; and each should be met from current income.... The

[1] Re Western Mass.Elec.Co., 133 PUR4th 138, 142 (Mass.DPU, 1992).

[2] *See* Re Iowa Elec.Light and Power Co., 118 PUR4th 179, 204 (Iowa UB, 1990) (adhering to the traditional method).

[3] Re Nantucket Elec.Co., 129 PUR4th 10, 48 and note 23 (Mass.DPU, 1991), citing for support F.E.R.C. Account 224, "Other long-term debt," 18 CFR Part 101.

[4] Re Potomac Elec.Power Co., 124 PUR4th 1, 31 (Md.PSC, 1991).

[5] Southwestern Bell Tel. case, *supra*, 262 U.S. at 306.

> necessary cost, and hence the capital charge, of the money embarked recently in utilities, and of that which may be invested in the near future, may be more, as it may be less, than the prevailing rate of return required to induce capital to enter upon like enterprises at the time of a rate hearing ten years hence. To fix the return by the rate which happens to prevail at such future day, opens the door to great hardships. Where the financing has been proper, the cost to the utility of the capital, required to construct, equip and operate its plant, should measure the rate of return which the Constitution guarantees opportunity to earn.

The F.P.C. in passing upon this question stated:[1]

> It is, of course, true that the most recent issue of notes sold by Colorado [Interstate Gas Co.] bears an interest rate of 3.75 percent which rate exceeds the average rate of 3.21 percent for all of its outstanding long-term debt. It may well be that Colorado, in the indefinite future, may find it necessary to incur a higher interest cost than the average rate it is now paying, in order to raise additional debt capital. But Colorado's contention presupposes that rate-making is not a continuing process and that appropriate adjustments of rates cannot be made when experience demonstrates that adjustment is required. We find that the actual cost of the company's outstanding long-term debt ... is a proper measure of the cost of borrowed money ... in determining a fair rate of return for Colorado in this case.

On rehearing, the F.P.C. added:[2]

> There are no facts of record which show what the rate of debt money will be some unknown time in the future when the company may raise additional

[1] Colorado Interstate Gas Co., 95 PUR(NS) 97, 1131 (FPC, 1952).

[2] Colorado Interstate Gas Co., Docket No. G-115, Opinion No. 235A, Sept. 26, 1952, p. 5. *See also* Panhandle Eastern Pipe Line Co. v. F.P.C., 143 F.2d 488 (8th Cir. 1944); State Corp. Comm'n of Kan. v. F.P.C., 206 F.2d 690, 718 (8th Cir. 1953); Los Angeles v. Nev.-Calif. Elec. Corp., 2 FPC 94, 32 PUR(NS) 193, 204-205 (1940); Panhandle Eastern Pipeline Co. (Phase I), 40 FPC 98, 40 FPC 452, 453-54 (1968); Fla. Gas Transmission Co., 42 FPC 74, 87 (1979). *And see* Adequacy of Railroad Revenue (1978 Determination), 361 ICC 79, 103 (1978), 362 ICC 199, 202 (1979) (embedded debt adjusted for "some near-term borrowing at current rates").

The state agencies are in agreement. *E.g.* Re Chesapeake & Potomac Tel. Co., 93 PUR(NS) 215, 236 (Md.PSC, 1952) ("It seems reasonable to conclude that the cost of debt capital should be the actual cost and not the cost which the company might hereafter be required to pay. Such additional or latter cost would be a proper item for consideration in a future proceeding"); New England Tel. & Teleg. Co. v. Dept.Pub.Utils., 327 Mass. 81, 97 N.E.2d 509, 513 (1951):

> In determining the fair rate of return upon the rate base the department [the Commission] adopted the 'cost of capital' method. As to debt capital this means that the company is entitled to earnings which will pay its actual interest obligations as they accrue on existing debt capital and upon new debt capital required in the immediate future ...

And see Re Wisc. Tel. Co., 93 PUR(NS) 490, 504 (Wisc.PSC, 1952), finding,

> The significant [debt] cost is not the current interest cost, *i.e.*, the cost the company would have to pay for debt capital if it borrowed it now, but rather what the company is actually paying on debt obligations outstanding.... The Commission believes that the actual cost of debt capital is more realistic than estimates as to what debt capital might cost if all existing debt capital had to be obtained under current market conditions.

See also Re Southern Bell Tel. & Teleg. Co., 4 PUR3d 195, 230 (Ala.PSC, 1954). *But compare* National Forge & Ordnance Co. *et al.* v. Pennsylvania Electric Co., 99 PUR(NS) 161, 169 (Pa.PUC, 1953), relying on the latest debt cost without rationale.

> debt capital. As a matter of fact, there is nothing in the record which shows that the company has either definite or indefinite plans to raise additional debt capital. The use of a higher rate of interest than that which is presently being paid by the company would, therefore, merely represent an unwarranted additional allowance for the common stock equity and would not represent proper cost of debt capital.

When an agency relies on the embedded debt cost of a regulated company, it must also rely on the company's actual capital structure. If the agency for ratemaking purposes substitutes a normalized capital structure, or the capital structure of a parent company, it will need to consider whether the change also affects the cost of debt.[1]

The Kentucky commission uses the "carrying value" of debt to compute the long-term debt component. Rather than only the outstanding principal amount, it includes as well the unamortized debt discounts, premiums, and expenses at the date of calculation, finding that "the booked costs ... are appropriate to use in setting rates."[2]

The Wisconsin commission relies on the "Blue Chip Financial Forecasts" newsletter for short-term and long-term debt costs of a subsidiary LDC. For the latter cost, it uses the Treasury bill rate plus an appropriate spread for a "AA" utility bond for newly issued debt in the future test year.[3]

Short-term debt. Inclusion of short-term debt in the capital structure is the exception, rather than the rule.[4] Coverage of short-term debt costs is usually undertaken in the working capital allowance.[5]

An agency may include short-term debt in developing cost of debt, if, a) short-term debt is a regular and continuing component of company capital;[6] or, b) the short-term debt is expected to be converted to long-term debt.[7] The latter commission also tested the result simply by asking itself rhetorically whether it would be "comfortable" with the resulting leverage if the company were to convert its short-term debt to long-term debt.

The Connecticut regulatory authority applies the rule "that a tenet of sound financial management generally prefers that long-term assets be matched to long-term liabilities," and only "under certain circumstances [such as the extraordinarily high cost of short-term debt in the mid-1980s] short-term debt may be included in the capital structure" for rate of return purposes.[8]

[1] For discussion of prudent or normal capitalization, *see* p. 718. For discussion of the effect of debt ratio on risk, *see* p. 642.

[2] Re Union Light, Heat and Power Co., 134 PUR4th 139, 159 (Ky.PSC, 1992).

[3] Re Wisconsin Gas Co., 138 PUR4th 294, 302 (Wisc.PSC, 1992).

[4] *See* Re Massachusetts Elec.Co., 164 PUR4th 393, 434 (Mass.DPU, 1995) (holding that its policy is to exclude short-term debt from capital structures).

[5] Working capital is discussed at p. 828.

[6] *See* Pease v. New England Tel.and Teleg.Co. d/b/a NYNEX, 162 PUR4th 110, 116 (Me.PUC, 1995); *and cf.* Re Providence Gas Co., 120 PUR4th 228, 236 (R.I.PUC, 1991).

[7] Re Monongahela Power Co., 125 PUR4th 126, 144 (W.Va.PSC, 1991).

[8] Re Southern New England Tel.Co., 124 PUR4th 304, 355-56 (Conn.DPUC, 1991).

The North Carolina commission held that the proper level of short term debt for inclusion in the capital structure of an LDC should equal the amount of gas inventory included in rate base. Such a level of short term debt "reasonably matches the amount of short-term financing needed to finance rate base assets on an ongoing basis."[1]

The Missouri commission excluded short-term debt in the parent's capital structure, which it used as a proxy for the utility's capital structure, on the grounds that "it is the nature of short-term debt that it will soon be converted into long-term debt." As usual when one form of capital is omitted, it ordered that the effect of the removal of the short-term debt "should be distributed equally among the other forms of capital."[2] By this it meant that the relation of each remaining form of capital to other forms of capital should remain constant.

Capital Structure of a Missouri Utility With and Without Short-Term Debt

Component	Amount ($ thousands)	Ratio With Short-Term Debt	Ratio Without Short-Term Debt
Short-term debt	$ 52,102	5.41%	0.00%
Long-term debt	436,428	45.30	47.89
Preferred stock	97,362	10.11	10.68
Common equity	377,503	39.18	41.42
Total	963,395	100.00	100.00

For example, in the case before the Missouri commission, as shown in the box, the percentage of the capital that is long-term debt increased when short-term debt was excluded, but the ratio of long-term debt to common equity would remain 1.156 with or without short-term debt. It redistributed the capital after excluding short-term debt using a new total capital of $911.3 million for purposes of the computation.[3]

The Wisconsin commission included short-term debt in the capital structure of an LDC, including a compensating balance charge to cover the administrative costs of the utility's parent company, which supplied it with short-term funds.[4] The commission held that if the utility supplied its own short-term debt funds, "it would also incur similar costs."

Stock conversion factors. While it may be appropriate to adjust the embedded cost of convertible debentures to reflect the added risk to shareholders due to the conversion privilege, the company bears the burden of showing the likelihood of an increase in stock prices that would make conversion an attractive option. The company must also show that the resulting increase in stock value would not itself serve to offset the risk of conversion by indicating the shareholders' reduced expectation of a return on equity.[5]

[1] Re Pennsylvania and Southern Gas Co., a Div.of NUI Corp., 164 PUR4th 52, 62 (N.C.UC, 1995).

[2] Re Missouri Pub.Svc., a div.of UtiliCorp United, Inc., 118 PUR4th 215, 242 (Mo.PSC, 1990).

[3] The sum of the long-term debt, preferred stock, and common equity in the Missouri case was $911.3 million.

[4] Re Northern States Power Co., 165 PUR4th 580, 585 (Wisc.PSC, 1995).

[5] *See* Re Potomac Elec.Power Co., 124 PUR4th 1, 32 (Md.PSC, 1991).

Commitment fees. The costs of future drawdowns on standby loans are normally amortized over the lives of the loans to which they pertain, or other reasonable future period.

Flotation costs, call premiums. The costs of selling debt securities in the open market, including filing fees, commissions, and attorney's fees, are allowed when they are actual costs; they are not otherwise a proper addition to the cost of debt. Call premiums and the costs of financing and refinancing debt are typically amortized over the lives of the loans to which they pertain.[1]

Gains/losses on reacquired debt. If debt is retired at a loss (that is, upon payment of a premium) the losses may be included in unamortized debt expense, and the annual amortization is included in the company's annual interest requirement.[2] One-time gains may be excluded from the computation of cost of debt.[3]

Where the company defers and amortizes its losses for book purposes, but currently deducts them for tax purposes, the tax timing difference creates deferred income taxes. As the D.C. commission found, it is appropriate in these circumstances for the agency to deduct the deferred income taxes from the net amount of debt outstanding in developing a cost rate for debt.[4]

In the alternative, premiums paid to retire debt may be allowed as extraordinary non-recurring expenses, if incurred in the test year. If such expenses were incurred prior to the test year without permission to defer and amortize, they may be disallowed. In any event in order to effect a sharing of the risk of large, unanticipated expenses between ratepayers and shareholders, they are not includible in rate base.[5]

Purchased power agreements. Agreements to purchase power are not considered as equivalent to company debt for regulatory purposes, whether or not a bond rating organization may think otherwise.[6] When the California utilities requested an increase in the equity ratios to offset the alleged effect of action taken by rating organizations, which included purchased power agreements in debt capital, the California commission rejected the request. It noted that purchased power is preapproved and hence carries little risk of disallowance; integrated resource planning in the meantime avoids overcapacity. It also held that the record failed to show whether an increased coupon rate on bonds would hurt ratepayers more than an increase in equity ratio or return on equity.[7]

[1] Re Southern Bell Tel. and Teleg.Co., 159 PUR4th 449, 455-56 (S.C.PSC, 1995); Re Massachusetts Elec.Co., 164 PUR4th 393, 433 (Mass.DPU, 1995). For the consequent effect of this practice on the computation of the debt and equity portions of the company's capital structure, *see* p. 649.

[2] *See* Re Atlanta Gas Light Co., 119 PUR4th 404, 412 (Ga.PUC, 1991).

[3] Re Williston Basin Interstate Pipeline Co., 52 FERC ¶61,170, 115 PUR4th 195, 201 (1990).

[4] Re Potomac Elec.Power Co., 162 PUR4th 417, 431-32 (D.C.PSC, 1995).

[5] Re Massachusetts Elec.Co., 114 PUR4th 73, 82-83 (Mass.DPU, 1990).

[6] Re North Carolina Power, 142 PUR4th 117, 156-57 (N.C.UC, 1993), citing Re Pacific Gas and Elec.Co., 137 PUR4th 449 (Cal.PUC, 1992).

[7] Re Pacific Gas and Elec.Co., *supra*, 137 PUR4th at 480-81.

net investment rate base, it responded "regulatory common law."[1] Most of the other commissions could equally respond with respect to the prudent management test, since it has been so widely recognized for such a long period as a usual and necessary regulatory inquiry. The basic authority for an agency's insisting on prudent investment rests on the just and reasonable standard itself. If the regulated company has been subjected to the just and reasonable standard, it is on notice that imprudent expenditures are inconsistent with the standard and may be disallowed. No further or other notice is required under applicable law.

The Supreme Court early held that the regulator was not required to accept all costs claimed by a regulated company.[2] Similarly, the original cost investment must be reviewed before the consumers are charged with full payment for the investment. As Justice Brandeis, concurring and dissenting with Justice Holmes, stated:[3]

> The term prudent investment is not used in a critical sense. There should not be excluded from the finding of the base, investments which, under ordinary circumstances, would be deemed reasonable. The term is applied for the purpose of excluding what might be found to be dishonest or obviously wasteful or imprudent expenditures.

Today each ratemaking commission governed by a reasonableness test, whether federal or state and whether acting under general or specific powers, may be thought to have the authority to review the "prudence" of rate base investment and other cost incurrence.

Following the detailed review of utility expenditures on the Callaway I nuclear plant in the neighboring state of Missouri, the parties in an Iowa rate case stipulated that the Missouri findings would be accepted as *prima facie* evidence of imprudence up to $284 million. The Iowa utility was given the opportunity to rebut the presumption of disallowance. The Iowa agency eventually reviewed each of the Missouri disallowances pursuant to the stipulation.[4]

In the aftermath of a lengthy outage of a nuclear power plant, the Connecticut commission found the outage resulted from imprudence and disallowed the cost of replacement power. The reviewing court sustained this part of the commission's decision, holding the company was properly found "guilty of specific acts or omissions of imprudence that caused damage and prolonged the plant shutdown."[5]

A Michigan statute requires the state commission to disallow any net increased costs attributable to a generating plant outage of more than 90 days unless the utility shows that the outage "was not caused or prolonged by the utility's negligence or by unreasonable or imprudent management."[6] The utility's performance of mitigating

[1] NARUC, Utility Regulatory Policy, p.66.

[2] Chicago & Grand Trunk Ry. Co. v. Wellman, 143 U.S. 339, 345-46 (1892). *And see* N.A.A.C.P. v. F.P.C., 425 U.S. 647, 666 (1976) (in protecting the consumer, the commission's task is "seeing that no unnecessary or illegitimate costs are passed along to that consumer").

[3] Missouri ex rel.Southwestern Bell Tel. Co. v. PSC of Mo., 262 U.S. 276, 289 note 1 (1923).

[4] Office of Consumer Advocate v. Iowa State Commerce Comm'n, 452 N.W.2d 588 (Iowa 1990), order on remand in Re Union Elec.Co., 119 PUR4th 228 (Iowa UB 1990), modified 119 PUR4th 240 (Iowa UB 1990).

[5] Connecticut Light and Power Co. v. Conn.DPUC, 1993 Conn.Super. LEXIS 3151, 148 PUR4th 364, 370 (Conn.Sup.Ct., 1993).

[6] MCL 460.6j(13)(c).

work does not reduce the costs attributable to the outage that must be disallowed under this statute.[1] On the other hand, a utility's combining a forced outage to repair a steam leak with a refueling outage involved prudent maintenance work outside the foregoing statute.[2]

A utility in Michigan will be held to a standard of prudent management in connection with increased costs attributable to short, forced outages of less than 30 days. The commission considers these costs in the utility's annual reconciliation case, except for the increased replacement due to the outage, which along with all the 90-day outage costs can be considered even in its power supply cost recovery case.[3]

Mis-citing Prof. Bonbright,[4] one author claims that all regulatory rules relating to prudent management should be published in advance to avoid undue risk in engaging in large projects. The suggestion imposes an impossible burden, and merely attempts to shift responsibility from the stockholders to the agency to control management. That responsibility is not displaced but only enhanced by the regulatory statute, because utility investors in a company governed by such a statute must oversee management actions not merely in their own interest but in the public interest as well. They must act in the public interest, not by reason of any agency-principal relation, as the author mentioned above also attempts to establish, but because they have invested in an enterprise affected by the public interest. They "invested their capital in a public utility that does owe an obligation to the public" and they "assumed the risk that ... the interests of the public would be considered as well as theirs."[5]

GENERAL CONSIDERATIONS. Relation to "used and useful." An alternative legal basis for removing imprudent investment applies where plant has been abandoned or canceled. In those jurisdictions strictly enforcing the "used and useful" principle, the commissions and courts never reach the question of prudence or imprudence, but rather exclude investment from rate base that does not provide service to the public.

An NRRI study in 1985 found that the most common reason for some states' disallowing all recovery of abandoned or canceled plant costs was a strong allegiance to the used and useful concept.[6] The Ohio commission declined to reach prudence issues upon disallowing $210 million of a nuclear plant's costs that had not contributed to used and useful plant. The plant had been converted to coal and with

[1] Re Consumers Power Co., 116 PUR4th 177, 184-85 (Mich.PSC, 1990).

[2] *Id.* at 190-92.

[3] *Id.* at 194-97.

[4] Tye, William B., "Prudent Investment in Large Complex Projects: The Case of the Trans-Alaska Pipeline System," 57 Transp. Pract. J. 17 (1989). The author claims that Prof. Bonbright insists on investors' knowing the "rules of the game—'no matter how onerous or how profitable those terms may prove to be in the light of hindsight'"(*id.* at 26). The quotation from Bonbright, Principles, p. 127 (1961) is out of context. Prof. Bonbright later concedes (at p. 129) that such "good faith standards of fairness" have "dubious standing in view of the generally accepted principle that public utility rates are subject to revision if and when they become 'unreasonable.'"

[5] Reconstruction Finance Corp. v. Denver & R.G.W.R.Co., 328 U.S. 495, 535-36 (1946).

[6] Burns, Robert E., *et al.*, "The Prudent Investment Test in the 1980s," *supra*, pp. 79-84, citing *inter alia*, Consumer's Counsel v. PUC, 67 Ohio St.2d 153 (1984).

the disallowance the ratepayer costs per kilowatt were now reduced to the level for a comparable coal-fired plant.[1]

The Massachusetts commission in 1984 announced a change in policy; after July 31, 1984, if any electric plant on which construction was begun was thereafter canceled or abandoned, "the utility will bear the entire risk of loss" under the used and useful test.[2]

Michigan follows a "prudent investment" test for inclusion or exclusion of abandoned plant from rate base, rather than adhere to a "used and useful" standard.[3] Most states will not automatically disallow canceled or abandoned plant due to the presumption, considered next, which supports the prudence of management decisions.[4]

Presumption favors utility management. A legal presumption that utility management has acted prudently surrounds their investment decisions. In the absence of specific evidence of imprudence, the investment, including related AFUDC or IDC, must be included in rate base. Justice Brandeis, for example, carefully constrained his definition of prudent investment:[5]

> Every investment may be assumed to have been made in the exercise of reasonable judgment, unless the contrary is shown.

Three court decisions involving the former C.A.B. illustrate this presumption. Some of the work of the former C.A.B. involved airline subsidy determinations for past periods, and its fixing maximum reasonable rates for those periods. In one such case the board disallowed all losses incurred by an airline in a strike of airline pilots on the grounds that allowing any such losses would tend to favor airlines in their labor disputes. The Court of Appeals reversed and remanded, holding that such considerations were outside the agency's enabling statute. The court required, "that the figures past or prospective, of the carrier in question be used unless some item or items are due to dishonest, inefficient or uneconomical management."[6]

Later, when the C.A.B. disallowed a portion of strike losses in another airline subsidy proceeding on the grounds management had imprudently prolonged the strike by its intransigence, the Court of Appeals sustained the decision. This time the court held that the agency employed a "standard ... not fundamentally different from that applicable in conventional utility rate regulation where the commission may disregard waste and improvidence but must not usurp the role of management" although it necessarily "reflects a view of how business should be conducted."[7]

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[1] Re Cincinnati Gas and Elec. Co., 135 PUR4th 208 (Ohio PUC, 1992).

[2] In re Western Mass.Elec.Co., Mass.DPU Order 84-25 (Mass.DPU 1984).

[3] Discussed further at p. 818, *supra*.

[4] Where canceled or abandoned plant costs are prudently incurred and recovered from ratepayers, the commissions typically divide the costs between investors and ratepayers. Most commissions allow amortization of the costs as a utility expense over a period of years while removing the costs from rate base, and some disallow recovery of any AFUDC. *See* p. 819.

[5] Missouri ex rel. Southwestern Bell Tel. Co. v. PSC, 262 U.S. 276 (1923).

[6] American Overseas Airlines v. C.A.B., 254 F.2d 744, 749 (D.C.Cir. 1958).

[7] Trans World Airlines, Inc. v. C.A.B., 385 F.2d 648, 655-56 (D.C.Cir. 1967), cert.denied, 390 U.S. 944 (1967).

On the other hand, where a specific consideration, such as depreciation, is "peculiarly within the decisional province of the ratemaking authority," the agency may adopt a totally different test of revenue need from that proposed by the company:[1]

> There is more than one method of depreciation which may be honest, economical and efficient.... The Board may prescribe a different method from that used by the carrier without finding that the carrier's method was due to dishonest, uneconomical or inefficient management. Such a difference is not a 'management' difference.

An allegation of imprudence must be supported by evidence that creates a serious doubt regarding the prudence of the investment.[2] The mere existence of a serious construction cost overrun for a nuclear power plant is some evidence of imprudence;[3] as well as the timing of decisions to abandon or cancel a plant;[4] but a comparison of construction costs with the costs of other comparable units is hardly conclusive given the wide acceptance in the past of a custom-made construction plan for each such power plant in this country.[5]

When evidence is presented that a computer model, substituting a combustion turbine for the electric utility's share of a pumped storage plant, shows that ratepayers would have saved $140 million, a commission is justified in ordering the utility to prove, a) that the pumped storage project was economically justified when construction began; and b) that cancellation at a later time would not have been justified, before including the project in the utility's rates.[6]

Once the presumption of prudent management has been overcome with a *prima facie* case of imprudence, then the burden of going forward with evidence shifts to the utility. The utility must set forth appropriate evidence that management acted with care and diligence in controlling the project. Agencies here often employ outside consultants to provide an objective evaluation of management's control and direction of the project.

Irrelevance of hindsight. The prudence test is not based on hindsight, but rather on whether the decisions at the time they were made were reasonable in the circumstances. As Prof. Bonbright suggests, the term "prudent" in relation to rate base,[7]

> imports the requirement that the investment, in order to gain recognition in the rate base, must have been prudently incurred in the light of foresight rather than of hindsight.

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[1] Northwest Airlines, Inc. v. C.A.B., 340 F.2d 789, 791 (D.C.Cir. 1964).

[2] Minnesota Power and Light Co., 11 FERC ¶61,312 (1980).

[3] Where a plant should have been abandoned sooner than management acted, costs beyond the time of prudent action will be disallowed. *E.g., see* In re Commonwealth Elec.Co., 47 PUR4th 229 (Mass.DPU 1982); In re Houston Light & Power Co., 50 PUR4th 157 (Tex.PUC 1982).

[4] In re Detroit Edison Co., 24 PUR4th 326 (Mich.PSC, 1978).

[5] Discussed further at p. 879, *infra*.

[6] Re Georgia Power Co., 164 PUR4th 113, 118, 121, 122 (Ga.PSC, 1995).

[7] Bonbright, Principles, p. 238 (1988); Bonbright, Principles, p. 174 note 2 (1961).

The prudence test was similarly described by the New York commission in its lengthy *Shoreham* proceeding. In ordering an investigation into the expenditures of Long Island Lighting Company (LILCO) for the construction of the Shoreham Nuclear Generating Facility, the PSC stated:[1]

> Our inquiry is simply intended to determine whether the construction methods and decisions of LILCO management and the costs associated with those methods and decisions were prudent, in the circumstances that prevailed at the time those methods were employed and those decisions made.

The PSC added, "that a company must be held to account if it fails to respond adequately to changing circumstances or to new challenges that may arise as a project progresses." "Mismanagement" results, when management is "unresponsive or inept" in the face of such changing circumstances, and runs afoul of the "just and reasonable" rate standard.[2] The New York commission reiterated in its final decision in the *Shoreham* investigation that the company's conduct must be judged on the basis of asking,[3]

> whether the conduct was reasonable at the time, under all the circumstances, considering that the company had to solve its problems prospectively rather than in reliance on hindsight.

Nevertheless, hindsight may and should be employed in prudence cases in ways that preserve the overall fairness of the administrative procedures. First, to quantify the damages from imprudent management decisions it may be necessary to employ hindsight, rather than the damages foreseeable at the time of the decision. Management should not be responsible for more damages than in fact occurred—and likewise should not be responsible for less than in fact occurred. In addition, the agency may have no choice but to analyze specific remodes and change authorizations of a large project in order to quantify the avoidable costs.

Second, let us assume that management was imprudent in reaching a decision that resulted in no damages, although some damages were reasonably foreseeable at the time of management's decision. Hindsight here will assist the regulator in reaching the conclusion that no damages should be awarded.

New purchaser. Imprudence of the prior operator of a regulated company follows the assets in the hands of the new purchaser. Thus, when a prior operator of a gas distribution company improperly installed 3,700 service lines using backfill, the Kansas commission held that the ratepayers would not pay for this installation twice; and hence the successor company could not recover the costs of replacing the improperly installed service lines from ratepayers.[4]

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[1] Order issued May 21, 1979, and quoted in the Shoreham decision, *op.cit.supra*, p. 857, note 4, at p. 60,528; *and see* Violet v. F.E.R.C., 800 F.2d 280, 282-83 (1st Cir. 1986); Connecticut Light & Power Co. v. Conn.DPUC, 216 Conn. 627, 583 A.2d 906 (1990); Re Puget Sound Power and Light Co., 147 PUR4th 80, 98 (Wash.UTC, 1993).

[2] Shoreham decision, *supra*.

[3] Shoreham decision, *supra*, at p. 60,529.

[4] Re United Cities Gas Co., 140 PUR4th 382, 403 (Kans.SCC, 1993).

Amortization of imprudent costs disallowed. If investment or other costs are imprudent, it is inappropriate for the agency to allow the regulated company to amortize the imprudent expenses over a period of time. Amortization would only penalize the stockholders with a temporary loss of profits, while it would require the ratepayers to bear the ultimate burden and risk of the imprudence.[1]

Limitations on disallowances. State commissions in a variety of ways may choose to cushion the effect of property disallowances; the large monetary disallowances from rate base, therefore, may only be a first step in a larger settlement or other balancing of investor and shareholder interests.[2]

The general rule is that ratepayers should not bear any costs that are found to be imprudent. An agency may require a balancing of non-used and useful investments only to the extent the investments were prudent when made.[3]

A state review court has held that an agency may limit the disallowance of imprudent investment to protect the utility from insolvency. Although the actual dollar effect of the imprudence had been $2 billion, the agency disallowed only $1.4 billion. The court held that the agency exercised a reasonable discretion in holding that ratepayers were better served by limiting the disallowance to maintain the utility's solvency.[4]

State prudence review v. federal pre-emption. The wholesale rate fixed by the F.E.R.C. is binding upon the state regulatory commissions. A state commission may not reopen the issue of reasonableness of a rate that the F.E.R.C. has approved; it must permit utilities to recover the costs of their wholesale purchases, such as under power pooling agreements approved by the F.E.R.C., from ratepayers making retail purchases.[5] A state commission may not collaterally attack the federal decision by refusing to recognize costs that underlie the federal decision, whether through a prudence review,[6] take-or-pay cost review,[7] or other rate or cost review proceeding.

Prudence of purchase doctrine. The federal pre-emption of the rate does not foreclose the state agency's inquiring into whether the utility prudently chose to purchase power when other options were available. This exception, where the agency may

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[1] *See* Natural Gas Pipeline Co. of Am., 27 FERC ¶61,201 (1984).

[2] Discussed in more detail at p. 819.

[3] Alliance for Affordable Energy, Inc. v. Council of the City of New Orleans, 578 So.2d 949 (La. 4 Cir. 1991).

[4] Gulf States Utils. Co. v. La.PSC, 578 So.2d 71 (La. 1991), cert. denied, 502 U.S. 1004 (1991).

[5] Mississippi Power & Light Co. v. Mississippi, 487 U.S. 354 (1988); Nantahala Power & Light Co. v. Thornburg, 476 U.S. 953 (1986); Narragansett Elec.Co. v. Burke, 119 R.I. 559, 381 A.2d 1358 (1977); Northern States Power Co. v. Minn.PUC, 344 N.W.2d 374 (Minn.PUC 1984), cert.denied 467 U.S. 1256; Pub. Serv. Co.of Colorado v. PUC, 644 P.2d 933 (Colo. 1982); Eastern Edison Co. v. DPU, 388 Mass. 292, 446 N.E.2d 684 (1983); Washington Gas Light Co. v. PSC, 508 A.2d 930 (D.C. 1986). *See* generally Pfeffer, Jerry L., and Lindsay, William W., "The Narragansett Doctrine: An Emerging Issue in Federal-State Electricity Regulation," NRRI, Columbus, Ohio (Dec. 1984).

[6] *But see* the apparently contrary opinion of the Louisiana court in Alliance for Affordable Energy, Inc. v. Council of the City of New Orleans, 578 So.2d 949 (La.4 Cir. 1991).

[7] General Motors Corp. v. Illinois CC, 574 N.E.2d 650, 125 PUR4th 527 (Ill. 1991).

review a utility's voluntary decision to purchase electricity, may become more important as more wheeling options are exercised.

The "prudence of purchase doctrine" was first adopted in Pennsylvania[1] and later in other states.[2] The Pennsylvania statute, which includes a "least-cost" provision, was sustained on judicial review;[3] the federal court held that a state "may legitimately inquire into whether the retailer [LDC] prudently chose to pay the FERC-approved wholesale rate of one source, as opposed to the lower rate of another source."[4] Most states follow a case-by-case approach in the review of gas purchasing practices.[5]

The state agency may consider the prudence of a utility's decision not to diversify its sources of wholesale electric power supply.[6] The state may also consider whether the utility should purchase power from an affiliate at F.E.R.C.-approved wholesale rates or retain ownership of the plant.[7] A state commission finding that a utility's incurrence of energy capacity costs was imprudent does not constitute "trapping" of the F.E.R.C. mandated wholesale rate. The local utility typically is not under any obligation to purchase any particular quantity of power.[8]

The California commission has held that the DOE's approving a Canadian purchase of gas by a U.S. pipeline does not protect the pipeline from a subsequent prudence review of those purchases by a state commission.[9] The courts had settled the jurisdictional controversy within the DOE as between its Economic Regulatory Administration (succeeded by its Office of Fossil Energy) and the F.E.R.C. over these matters,[10] but had not thereby foreclosed all state jurisdiction.

Sales of excess capacity. By disallowing 399 megawatts of Limerick 2 power as excess capacity, the Pennsylvania commission reduced the affected utility's proposed rate increase in 1990 by $106 million plus another $40 million for imprudent delay in constructing that facility in the 1970s. The delay increased the costs of construction. By 1991 the commission was able to approve an overall settlement that

[1] Pike County Light & Power Co. v. Pa.PUC, 77 Pa. Commw. 268, 465 A.2d 735, 737-38 (1983).

[2] Appeal of Sinclair Machinery Products, Inc., 698 A.2d 696 (N.H. 1985); Spence v. Smyth, 686 P.2d 597, 601 (Wyo. 1984).

[3] 66 Pa.CSA §§1307, 1317-18, sustained in Kentucky W.Va.Gas Co. v. Pa.PSC, 837 F.2d 600 (3d Cir. 1988), cert. denied, 488 U.S. 941 (1988). *See also* N.Y. Pub.Serv.L. §§66-e, 66-f (Mckinney Supp.1989); Ill.Ann.Stat., ch. 112/3, para. 9-220 (Smith-Hurd 1988).

[4] 837 F.2d at 609.

[5] *E.g.* Re Piedmont Nat.Gas Co., 99 PUR4th 495, 506-08 (N.C.UC 1989); Re Gas Cost Tracking Procedures, 75 PUR4th 262, 269 (Ind.URC 1986). Virginia sets out guidelines for LDCs to follow. *See* Re Gas Purchasing and Procurement Practices, 99 PUR4th 262, 268 (Va.SCC 1988).

[6] New Orleans Pub.Svc., Inc. v. Council of the City of New Orleans, 911 F.2d 993 (5th Cir., 1990), cert. dismissed, 502 U.S. 954 (1992).

[7] Re Consumers Power Co., 133 PUR4th 289, 302-306 (Mich.PSC, 1992), citing Palisades Generating Co., F.E.R.C. Docket No. ER 89-256-000, 48 FERC ¶61,144 at 61,574 (1989), in accord.

[8] Gulf States Utils.Co. v. PUC of Texas, 841 S.W.2d 459 (Tex. 1992).

[9] Re Pacific Gas and Elec.Co., 135 PUR4th 424, 432-33 (Cal.PUC, 1992), aff'd 137 PUR4th 346 (Cal.PUC, 1992).

[10] Trans Canada Pipelines Ltd. v. F.E.R.C., 878 F.2d 401 (D.C.Cir. 1989).

allowed the company to sell the excess capacity and to retain up to $106 million in added revenue through 1994.[1]

The above settlement in Pennsylvania included other important features. First, the electric utility undertook to refrain from filing rate increases, except for extraordinary events before 1994, and to effect a rate reduction prior to that year. Second, the company might retain 16.5 percent of energy savings resulting from operation of Limerick 2, thereby giving the utility an incentive to attain savings. Both the energy savings and sales efforts were made subject to the $106 million maximum retention of new revenue, which was close to the dollar effect of the disallowed excess capacity.

The Connecticut Supreme Court affirmed the state commission's imposition of a $17.5 million penalty on a utility for imprudent out-of-state sales of peak capacity.[2] The commission had found there was a market for base load capacity, and that the utility had merely attempted to avoid paying penalties for excess capacity mandated by state law.

PERIODIC V. POST-CONSTRUCTION REVIEW. Some have suggested that regulatory commissions should limit their prudence reviews to periodic reviews during construction, rather than engage in post-construction "second guessing" of management decisions.[3] Coupled with this suggestion is the thought the regulator can periodically decide whether to suggest cancellation of the project based on the best available evidence of the continuing need for the additional capacity. Others rightly note "it is difficult for today's regulators to bind future regulators."[4]

Few regulators would want to supplant management's responsibility to decide whether a project should be continued or discontinued. On the other hand, most prudence reviews, certainly the larger, more recent ones, have not concerned "excess capacity," but the more narrow issues relating to the over-budget, high-cost projects. Periodic reviews of management decisions would not prevent faulty decisions from being made, nor should they. The availability of periodic reviews is not intended even by its promoters to interfere with day-to-day management. Therefore, while it is arguable whether periodic reviews of "the decision to commit or to continue" the project might plausibly occur, it seems doubtful they could occur with any effectiveness on the issues of ongoing design and construction.

Interim standards in lieu of continuing review. Short of periodic review of the details of project construction, the New York commission developed alternative approaches to the prudence review of the Nine Mile 2 nuclear generating project prior to completion of construction. These interim standards were intended to promote better cost control by management, as we next show.

[1] Re Philadelphia Elec.Co., 122 PUR4th 171 (Pa.PUC, 1991).

[2] Connecticut Light & Power Co. v. Conn.DPUC, 216 Conn. 627, 583 A.2d 906, 1990 Conn.LEXIS 419 (1990).

[3] *E.g., see* Badger, William A., "Prudence Reviews: New Approaches Are Needed," 130 Pub.Utils.Fortnightly 22, Jul. 15, 1992; Berlin, Edward, "Excess Capacity, Plant Abandonments, and Prudent Management," 114 Pub.Utils. Fortnightly 26, Nov. 22, 1984.

[4] Kolbe, A. Lawrence, and Tye, William B., "Who Pays for Prudence Risk?" 130 Pub.Utils.Fortnightly 13, 14, Aug. 1, 1992. In the alternative these authors suggest the very dubious requirement that ratepayers pay an "insurance premium" for prudence risk as if the risk (read "responsibility") for prudent management must be borne by ratepayers rather than the stockholder-owners of the enterprise.

ATTACHMENT 4

The Regulation of Public Utilities

Theory and Practice

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the FCC and the FERC — base property valuations on original cost.[80] Among the state commissions, practices vary. In a study of the impact of the *Hope* decision on utility valuations, Rose found that twenty-seven state commissions changed from fair value to original cost.[81] That trend has continued. As of 1985, in regulating electric, gas, or telephone utilities, forty-three commissions (including the District of Columbia commission) use original cost or prudent investment, eight use fair value or current value, and two consider all evidence presented.[82]

Measures of Reproduction Cost

Where reproduction cost or fair value measures are employed, two important issues arise.[83] First, how should reproduction cost be determined? Second, what weight should the commissions attach to this measure in arriving at a fair value rate base? Only generalized answers can be given to these questions, for each rate case is unique in that the evidence presented and accepted varies according to the case, industry, state, and year.

With respect to the first question, reproduction cost estimates usually are obtained in three ways. (*1*) General price indices are used. These indices include the Bureau of Labor Statistics' "Consumer Price Index" or the Gross National Product deflator. The resulting estimate, frequently referred to as "reproduction cost new," represents the original cost of the property expressed in dollars of current purchasing power.[84] (*2*) Construction cost indices are used. The most widely employed construction cost index is the "Handy-Whitman Index of Public Utility Construction Costs." The resulting valuation is known as "trended" original cost.[85] As with general price indices, the purpose of the index is to translate original costs into values expressed in current dollars. (*3*) Unit cost pricing is employed. This method involves pricing like units of property directly by means of price indices representing the price movement of the specific property under consideration.[86]

The advantages and disadvantages of each of these methods have been enumerated in journal articles, as well as in commission and court decisions, for many years.[87] If reproduction cost valuations are to be made, unit cost pricing would seem to be the most desirable. General price indices measure purchasing power changes and are entirely unrelated to the cost of reproducing the property of any particular utility. Such a valuation represents an imaginary figure. Construction cost indices, while more closely related to the actual cost of constructing buildings and equipment, have the same general drawbacks. However, when like units of property cannot be easily identified or separated, either general price indices or construction cost indices must be used in obtaining a reproduction cost valuation.

With respect to the second question concerning the weighting problem, the commissions generally do not allow the full valuation estimate based upon reproduction cost or trended original cost. As a result, the final valuation figure chosen represents a compromise. In his 1962 study, for example, Rose concluded:

> The Illinois Commission has assigned one-quarter weight to reproduction cost and three-quarters to original cost; Alabama has assigned one-third to reproduction cost and two-thirds to original cost; Minnesota, Delaware, Pennsylvania, and Arizona have given approximately equal weight to each element. North Carolina and Indiana have also attributed equal weight to each in some proceedings, but in others have given greater weight to original cost. New Mexico, Maryland, and New Jersey have used original cost as the principal factor and added an increment to compensate for reproduction cost, while Missouri has given "greater weight" to original cost than to reproduction cost. And in Kentucky, Nebraska, and Montana, where the statutes also require fair value, no generalization at all can be made concerning the findings of the regulatory authorities.[88]

Used and Useful, Prudent Investment, and Excess Capacity

There are several valuation issues that are of particular significance to the electric utility industry. Under traditional ratemaking principles, public utilities are entitled to recover "prudent" investments when they become "used and useful." Certain items may be excluded from the rate base, including "excess capacity." But since the late 1970s, it has become clear that all three terms lack precise definitions.

Used and Useful. For decades, used and useful referred to needed capacity; that is, a determination as to whether a plant was actually used in service and was useful in providing service. If not, or if any expenditures were imprudent, all or part of the investment in a plant would be excluded from rate base. Today, however, used and useful has been held by some commissions to be a broader concept. The Massachusetts commission, to cite one example, holds that under the used and useful standard it must "determine whether a utility investment is needed *and economically desirable*."[89] Explains the commission:

> . . . Need for a new electric utility production plant is established if it can be shown that the investment in question can provide either capacity which is required by the utility or energy, at a net cost which is lower than the cost of the capacity which it displaces. Once need for capacity or reliability, as the case may be, and/or energy savings has been established, the [Commission] then must determine the extent to which an investment is useful and thus the extent to which a return should be allowed on the investment. . . .[90]

Thus, a threshold issue arises: Are the used and useful test and the prudent investment test two distinct tests and, if so, must both tests be satisfied before an investment will be included in the rate base?

Prudent Investment.[91] Prudence, according to *The Random House Dictionary,* "is care, caution, and good judgment, as well as wisdom in looking ahead. . . ."[92] Prudence thus involves foresight, not hindsight. Decisions must be judged as to their reasonableness at the time they were made and not after the fact. To quote two commissions:

> A prudence review must determine whether the company's actions, based on all that it knew or should have known at the time were reasonable and prudent in light of the circumstances which then existed. It is clear that such a determination may not properly be made on the basis of hindsight judgments, nor is it appropriate for the [commission] merely to substitute its best judgment for the judgments made by the company's managers.[93]
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> * * *
>
> . . . the company's conduct should be judged by asking whether the conduct was reasonable at the time, under all the circumstances, considering that the company had to solve its problems prospectively rather than in reliance on hindsight. In effect, our responsibility is to determine how reasonable people would have performed the task that confronted the company.[94]

In their prudence investigations, commissions have disallowed billions of dollars due to imprudence, generally running between 8 and 15 percent of a plant's final cost,[95] but sometimes much higher. The New York commission, for instance, found that $1.395 billion of Long Island Lighting's Shoreham plant (about 30 percent of the estimated total cost of $4.62 billion) was incurred because of construction imprudence.[96] Construction-related issues, however, are only one aspect of prudence reviews. Disallowances have been made because (*a*) of excess capacity (discussed below), (*b*) a plant should have been canceled sooner,[97] (*c*) the capacity cost more than it should have cost in terms of alternative energy sources[98] or the optimal supply alternative,[99] and/or (*d*) cost overruns related to Nuclear Regulatory Commission (or other regulatory bodies) policy changes were not supported.[100] In some of these cases, it should be noted, disallowances were based upon the used and useful test; they were not found to be imprudent.[101]

Excess Capacity. Excess capacity has been defined as "capacity over and above that necessary to meet peak demand plus that capacity to insure that there is a margin to allow for day-to-day variations in the operating condition of installed generation."[102] For electric utilities, a 15 to 20 percent reserve margin has been viewed historically as necessary. But ever since the

Arab oil embargo in 1973, the industry's reserve margin has climbed, remaining above 30 percent over the last decade (and nearer to 50 percent for some firms). Notes Studness: "The recent frightful cost escalations of nuclear plant construction, of course, proved to be the catalyst that finally precipitated the realization that the industry's excess capacity is no longer an unavoidable product of unforeseeable events. Similarly, disallowance has emerged as the vehicle with which ratepayers are attempting to shift the costs of excess capacity onto shareholders."[103]

The possibility of excess capacity raises several regulatory problems. How, for example, should excess capacity be identified? The most common method is physical excess capacity: capacity determined to be over-and-above a required reserve margin.[104] Is excess capacity plant specific or system specific? It is generally considered to be plant specific. To illustrate: The Pennsylvania commission determined that 945 megawatts of Pennsylvania Power & Light's interest in Susquehanna Unit 2 were excess and disallowed $443.2 million,[105] while the Kansas commission determined that 327 megawatts of Kansas Gas & Electric's interest in Wolf Creek were excessive and disallowed $716.3 million.[106] In contrast, in an earlier case, the Pennsylvania commission determined that Philadelphia Electric's investment in Salem Unit 1 resulted in 775 megawatts of excess capacity and disallowed $25 million based on *"the least economical units."*[107]

Ratemaking Treatment. Whenever disallowances are made, the issue of their proper ratemaking treatment arises. Construction-related imprudent investment is generally excluded from the rate base and written off.[108] All other disallowances, including these for excess capacity, are generally shared between the ratepayers and the stockholders by (*a*) excluding the excess investment from the rate base, allowing no return[109] or a return to be deferred until the investment is deemed used and useful[110] or (*b*) including the excess investment in the rate base, but deducting from revenue requirements a complete[111] or partial[112] equity return, while permitting annual operating and maintenance expenses and annual depreciation.[113] In the Kansas commission's original decision regarding Kansas Gas & Electric's investment in Wolf Creek, for example, 10 percent was disallowed as construction imprudence (without recovery), 68 percent was excluded from the rate base (but with recovery through annual depreciation charges), and 22 percent was included in the rate base (with recovery of and full return on).[114]

Critics of such significant disallowances have argued that risk-sharing methodologies have both financial consequences (including higher capital costs and, possibly, bankruptcy) and future investment disincentives.[115] And while the actual treatment adopted by a commission has been constrained by its impact on the financial strength of the particular utility, far too little attention has been paid to the investment disincentive issue.[116]

TABLE 9-3

Example of Double Leverage

A) AT&T's Capital Structure and Cost of Capital

	Capital Structure	*Cost*	*Weighted Cost*
Debt	25%	6.50%	1.63%
Preferred Stock	9	7.80	.70
Common Equity	66	11.50	7.59
Overall Cost of Capital			9.92%

B) Subsidiary's Capital Structure and Cost of Capital

	Capital Structure	*Cost*	*Weighted Cost*
Debt	45.0%	6.99%	3.15%
Common Equity:			
AT&T Supplied	47.3	9.92	4.69
Minority Supplied	7.7	11.50	.89
Overall Cost of Capital			8.73%

Source: *New England Teleph. & Teleg. Co. v. Maine Pub. Utilities Comm.*, 27 PUR4th 1, 38, 39 (1978).

cost of capital for AT&T's capital structure and associated embedded cost of debt. It then used the overall cost of capital for AT&T as the cost of equity capital on 86 percent of the subsidiary's common stock and a cost of 11.5 percent on the remaining 14 percent of common equity held by outside investors. In overturning the commission's decision on this approach, the Maine Supreme Judicial Court noted, among other things, that "the commission is unable to cite to us any authority in which a double leveraging adjustment or a consolidated capital structure has been applied where a substantial minority interest exists."[90]

The Annual Cost of Capital

The second step in estimating the overall cost of capital involves the determination of the cost of senior capital and of equity capital. These costs are then applied to the capitalization of a utility to find the weighted cost of capital.

The Cost of Senior Capital. Few problems arise in computing the cost of senior capital. By common practice, the cost of senior capital is the embedded cost: the actual fixed charges on long-term debt and the annual dividend requirements of preferred (and preference) stock.[91] When a future test year is used, the embedded cost is used for existing debt and the current cost for additional indebtedness contemplated in the projected test year.[92] When a hypothetical capital structure is used which contains "imputed debt" (*i.e.*, the hypothetical debt is higher than the utility's actual debt outstanding), the embedded cost is used for outstanding debt and the current cost for the imputed debt.[93] Except for these circumstances, the embedded cost of senior capital is appropriate. Basing the cost of existing senior capital upon the hypothetical cost of doing senior financing under current conditions of the bond and stock market would represent (just as in the case of reproduction cost property valuations) an alternative not available to a utility.[94]

In addition, allowances are usually made for the costs of financing, such as discounts and premiums on sale, call premiums paid when bonds are retired before maturity, underwriting fees, and other flotation costs. Such allowances, however, are not uniform. For example, with respect to call premiums, some commissions have charged such costs of refunding bonds to stockholders,[95] while others have charged them to ratepayers by amortizing the premiums over a reasonable period[96]; with respect to flotation costs, some commissions deny them unless a new stock issue is planned.[97]

The Cost of Equity Capital. The most difficult problem in determining the overall cost of capital arises in estimating the cost of equity capital. The relevant question is: How much must a utility earn to induce investors to hold and to continue to buy common stock? In answering this question, it is important to realize that circular reasoning is involved. In the absence of a fixed, expressed, or implied commitment as to the dividend rate, the actual cost of floating a stock issue is indeterminate. Investors' decisions are largely based on a utility's expected earnings and upon their stability, as well as upon alternative uses of investment funds. Yet, since the allowable amount of earnings is the object of a rate case, a commission's decision, in turn, will affect investors' decisions.

There are several approaches for estimating the cost of equity capital, but two principal ones have evolved in recent years: the "market-determined" standard and the "comparable earnings" standard.[98] The former is a market-oriented approach that focuses on investor expectations in terms of a utility's earnings, dividends, and market prices. The latter is an alternative investment approach that focuses on what capital can earn in various alternatives with comparable risk.

The Market-Determined Standard. The market-determined standard relies upon stock market transactions and estimates of investor expectations. Three major approaches have been, or are being, employed: e/p ratios

(earnings/price ratios), the DCF or Discounted Cash Flow Model, and the CAPM or Capital Asset Pricing Model.

The earnings/price ratio approach holds that the cost of equity capital to a utility is equal to the ratio of current earnings per share to the market price per share. Thus, if a utility's annual earnings are $5 per share and the average market price of its common stock for that same period is $38, the earnings/price ratio is 13.16 percent. (The ratio must be increased to allow for flotation costs. An allowance of 5 percent would result in an adjusted ratio of 13.85 percent — 13.16 percent divided by .95.) The method was widely used in the 1950s and early 1960s, although there was growing recognition of an underlying theoretical problem: The earnings/price ratio approach ignores the fact that investors purchase common stock for future growth and not for past or current earnings alone.[99] As a result, a growth factor must be added in computing the cost of equity capital.

Finance theory holds that the cost of common equity capital

> . . . is the equity investors' capitalization rate, or required market rate of return, competitively determined in the capital markets, adjusted by an appropriate allowance for underpricing in connection with sales of additional shares, including allowance for market pressure and for costs of flotation and underwriting. The capitalization rate before the allowance for underpricing is the discount rate that equates all expected dividends in the future plus the market price that investors eventually expect to realize to the present market price. While this is a simple enough concept, it is difficult to measure since measurement requires the estimation of the expectations of the investors who determine the present market price. Such estimates, of course, involve the exercise of informed judgment.[100]

The discounted cash flow model (DCF) represents an attempt to estimate the equity investors' capitalization rate. Mathematically,

$$k = \frac{d}{p} + g$$

where: k is the investor's capitalization or discount rate (*i.e.*, the cost of capital);
d is the current dividend per share;
p is the current market price per share; and
g is the expected rate of growth in dividends per share.[101]

Thus, if the stock of a particular utility pays a $3 dividend, which is expected to grow at a rate of 6 percent per year, and if investors are willing to pay $38 for the stock, the required return on common equity (assuming a 5 percent allowance for flotation costs) is 14.31 percent.[102] However, use of the DCF model for regulatory purposes involves both theoretical and practical difficulties.

The theoretical issues include the assumption of a constant retention ratio (*i.e.*, a fixed payout ratio) and the assumption that dividends will continue to grow at rate "g" in perpetuity. Neither of these assumptions has any validity, particularly in recent years. Further, the investors' capitalization rate and the cost of equity capital to a utility for application to book value (*i.e.*, an original cost rate base) are identical only when market price is equal to book value.[103] Indeed, DCF advocates assume that if the market price of a utility's common stock exceeds its book value, the allowable rate of return on common equity is too high and should be lowered; and vice versa.[104] Many question the assumption that market price should equal book value, believing that "the earnings of utilities should be sufficiently high to achieve market-to-book ratios which are consistent with those prevailing for stocks of unregulated companies."[105]

Most frequently, the major practical issue involves the determination of the growth rate; a determination that is highly complex and that requires considerable judgment.[106] The crux of the measurement problem is this: How can investors' expectation of *future* growth be measured? When past growth rates are used as a proxy for future growth rates, which is a common practice, it is far from obvious as to (*a*) which time periods have the most relevance to investors and (*b*) whether the prospective growth rate should be determined by using trends in dividends per share, earnings per share, and/or book value per share and exactly how the information contained in these various measures is used by investors.[107] Indeed, one study showed that the expectations of security analysts outperformed the extrapolation of historical trends in explaining share prices.[108] But when future growth rates are used, it is not clear whether the prospective growth rate should be determined by using analysts' estimates, surveys of institutional investors, or the expected return on common equity times the retention ratio.[109] And, even when all of these issues have been settled, there remains the circularity problem: Since regulation establishes a level of authorized earnings which, in turn, implicitly influences dividends per share, estimation of the growth rate from such data is an inherently circular process. For these reasons, the DCF model "suggests a degree of precision which is in fact not present"[110] and leaves "wide room for controversy and argument about the level of k."[111]

The newest entrant[112] is the capital asset pricing model (CAPM), which holds that the cost of equity capital or expected return on a utility's common equity is equivalent to that on a riskless security plus a risk premium related to the risk inherent in a particular utility's stock; that is, the model combines risk and return in a single measure.[113] The formula is as follows:

$$R = R_f + (R_m - R_f)\,\beta$$

where: R is the total return;
R_f is the risk free return;
R_m is the stock market return (or the expected return on a stock market portfolio); and
β is the beta coefficient (or the utility's relevant market risk).

Thus, assuming a stock market return of 13.9 percent, a risk free return (Treasury bills) of 7.8 percent, and a beta of 1.057, the total return or cost of equity capital would be 14.25 percent.[114]

Despite its appeal, the CAP model also has both theoretical and practical problems. The theoretical issues include the reliability of the model's basic assumptions[115] and the static nature of the model.[116] The practical problems surround the beta coefficient; "the only variable in the CAPM equation that is unique to the particular firm for which the cost of equity capital is being determined."[117] They include: How should beta be measured — stock market price alone or total return on investment (*i.e.*, dividends plus capital gains)? What period of time should be used for such measurement? What is the proper measure of stock market performance (*i.e.*, Dow Jones index, Standard & Poor's index, etc.)? Finally, the evidence suggests that betas are unstable over time and that they move in the opposite direction from investors' perceptions of risk.[118] For these reasons, many would agree that the CAP model, at least at this stage in its development, "is inaccurate, incomplete, and unreliable as a measure of a firm's equity cost of capital."[119]

The Comparable Earnings Standard. The comparable earnings standard[120] recognizes a fundamental economic concept; namely, opportunity cost. This concept states that the cost of using any resource — land, labor and/or capital — for a specific purpose is the return that could have been earned in the next best alternative use. The opportunity cost to a farmer using his land for beef grazing is what the land would yield after expenses if used for raising tobacco or for growing wheat; the opportunity cost to a worker in accepting one job is what he forgoes by not accepting the next best alternative. Likewise, the opportunity cost to an investor in a utility's common stock is what that capital would yield in an alternative investment — in another utility's or industrial's common stock; in utility, corporate, or government bonds; in real estate; etc. Stated another way, the opportunity cost of capital concept holds "that capital should not be committed to any venture unless it can earn a return commensurate with that prospectively available in alternative employments of similar risk."[121]

The relevance of the opportunity cost concept was recognized by Judge Hand in a 1920 case:

> The recurrent appeal to a just rate and a fair value assumes that the effort is to insure such a profit as would induce the venture originally and that the public will keep its faith so impliedly given. That, I think, involves a tacit comparison of the profit possible under the rate with profits available elsewhere; *i.e.*, under those competitive enterprises which offer an alternative investment. The implication is that the original adventurer would compare future rates, varying as they would with the going profit, and would find them enough, but no more than enough, to induce him to choose this investment. By insuring such a return it is assumed that the supply of capital will be secured necessary to the public service. As the profits in the supposed alternative investment will themselves vary, so it is assumed to be a condition of the investors' bargain that their profit shall measurably follow the general rates. It is, of course, not relevant here to discuss these presuppositions, since they have now the support of authoritative law.[122]

The comparable earnings approach is implemented by examining earnings on book common equity for enterprises that have comparable risks *or* by examining earnings on book common equity for enterprises that have different risks and then making an allowance for those risk differences. Earnings on book common equity are used since the resulting cost of common equity is to be applied to an original cost rate base (in most jurisdictions).[123] The comparable earnings approach, further, requires that comparisons be made with both regulated and nonregulated alternatives, if the results are to have any validity, for two basic reasons. First, the alternatives confronting investors include both regulated and nonregulated enterprises. There is active competition for investor capital; no company enjoys a monopoly of the capital markets. Investors will seek the opportunity which provides the greatest profit, commensurate with the risks involved. Second, returns of regulated firms always must be used with extreme caution. At best, they reflect what the informed judgments of regulatory commissions have permitted such utilities to earn and may not be indicative of what could have been earned in the competitive market.[124]

The most difficult problem in applying the comparable earnings standard is the determination of relative risk. Prior to the 1970s, it was frequently argued that regulation tended to eliminate some of the risks to which nonregulated enterprises are subject, so that utilities' overall or business risk tended to be less than the corresponding business risk of industrial firms. As a result, utilities financed with larger amounts of senior capital (*i.e.*, they had significantly higher debt ratios). But there is clear evidence that the risk of public utilities has increased in more recent years, particularly with the introduction of competition and significant disallowances,[125] and there is also support for the proposition that regulation itself is a risk.[126] Yet, the fact remains that there is no accepted method of measuring relative risk. Some have argued that risk can be measured by instability of earnings; statistically, by use of the standard deviation or coefficient of variation. Some advocate the use of market price-book value ratios and/or market price-earnings ratios to reflect how investors appraise relative risk.[127] Beta

has received attention in some cases although, as noted earlier, betas tend to be unstable over time. Still others maintain that the higher debt ratios of utilities serve to offset their overall lower business risk, with the result that the financial or equity risks of utilities and industrials are similar under current economic conditions. And, finally, some rely upon the various indices published by Merrill Lynch (the Merrill Lynch Suitability Rating), Standard & Poor's (the S&P's Quality Rating), and/or Value Line (the Value Line Safety and Timeliness Ratings).

Despite the difficulty of measuring relative risk, the comparable earnings standard is no harder to apply than is the market-determined standard. The DCF method, to illustrate, requires a subjective determination of the growth rate the market is contemplating. Moreover, as Leventhal has argued: "Unless the utility is permitted to earn a return comparable to that available elsewhere on similar risk, it will not be able in the long run to attract capital."[128]

Other Methods. Several other approaches have been used to estimate the cost of common equity. Two of these should be noted. First, there is the risk premium method which is based upon the premise that common equity carries a higher risk than debt.[129] This approach is relatively straightforward: (*1*) determine the historic spread between the return on debt and the return on common equity and (*2*) add this risk premium to the current debt yield to derive an approximation of current equity return requirements. Thus, the Federal Communications Commission, in its 1981 decision regarding the American Telephone and Telegraph Company, determined that the appropriate risk premium (for an Aaa-rated utility) was 2.5 percentage points which, when added to the then-current cost of debt of 14.9 percent, resulted in a cost of equity capital of 17.4 percent.[130]

Like other methods, however, there are a number of specific problems. Over what historic period of time should the spread be established? Does the spread between the return on debt and the return on equity remain constant over time and at all interest levels?[131] Should the spread be expressed on a before- or after-tax basis to the investor? What debt instruments should be used (*e.g.*, government securities versus corporate or utility bonds)? What equity securities should be used? How should the resulting return requirement be adjusted for the risk that corresponds to a given utility? At this stage, the risk premium approach is only a subsidiary method.

Second, and at least as another possible subsidiary method, one can test the likely results of the recommended cost of equity or overall cost of capital. In the 1970s, due to low interest coverages, many electric utilities had difficulty financing. Several commissions sought an allowed return that would result in sufficient interest coverage.[132] Other factors which have been considered are cash flow, internal funds for construction expenditures, and cash earnings for dividends. Many utilities have detailed financial models which permit such results to be readily estimated.[133]

Conclusions on Cost of Capital. It is clear that determining the cost of

capital is not an exact science. It is based on as objective and comparable data as possible, but experience and judgment must be used in drawing conclusions from that data. In the words of the National Energy Board:

> One of the few things upon which the regulated industries, the regulatory agencies, and the courts which review their decisions have all been agreed is that the consideration of the two objectives, just and reasonable rates or prices to the consumer, and just and reasonable return to the regulated enterprise, is a function requiring informed and scrupulous judgment. Many tests and techniques for assisting the process of reaching a just decision have been used, but no single test is conclusive, nor is any group of them definitive: whatever tests may be used, in the last analysis the adjudicating body cannot escape the responsibility of exercising judgment as to what, in a stated set of circumstances, is a just and reasonable return or rate of return, or what is a range of justness and reasonableness of return or rate of return.
>
> . . . While such tests as the earnings of comparable enterprises and the interest coverages of the Applicant and of other enterprises can be applied, it is difficult to assign precise weights to these respective considerations. The final conclusion as to what is enough but not too much in the way of return, and rate of return, is not precisely supportable on a mathematical basis. If it were, one computer and a few programmers could replace all the regulatory boards in North America, and dispense undeniable justice instantaneously. . . .[134]

It is especially difficult to estimate the cost of equity capital.[135] Given the variety of approaches, it is little wonder that estimates of the cost of equity capital differ significantly. To cite AT&T's 1981 rate case before the FCC once again, seven witnesses presented the estimates, shown in Table 9-4, ranging from 12.50 to 17.60 percent. The FCC's trial staff recommended a cost of equity of 14.25 percent, the administrative law judge found 14.60 percent, and the full commission allowed 17.40 percent. Here, as is true with many other aspects of regulation, the quality of the commissions is crucial.

The Incentive to Efficiency

The cost of capital standard, as discussed above, has one serious limitation: it makes no specific allowance for efficiency. Justice Brandeis argued that an efficient utility might properly be allowed more than a rate of return barely above the level of confiscation.[136] And the Florida commission has stated:

ATTACHMENT 5

Public Utility Economics and Finance

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TABLE 4.2 Accounting Rate of Return

Year	Original Cost of Investment	Gross Return	Depreciation	Net Return	Rate of Return[a]	Accumulated Depreciation	Net Investment (year end)
1	$1000	$257	$200	$57	5.7%	$ 200	$800
2	1000	257	200	57	7.125	400	600
3	1000	257	200	57	9.5	600	400
4	1000	257	200	57	14.25	800	200
5	1000	257	200	57	28.5	1000	0

[a] Based on net return divided by net investment at beginning of year.

satisfies both the economist's and the accountant's definition of the average return on investment. The cost of capital becomes the rate of return included in the revenue requirement/cost of service formula.

The Principles of Revenue Requirement Determination

The determination of the revenue requirement using the cost of service formula relies upon several principles of rate making. These include the following concepts: the test period; actual cost; the matching principle; allowance of necessary, prudent, and efficient costs; *pro forma* adjustments; and used and useful property in the rate base.

The *test period* is a fundamental rate-making concept. A period of time is selected and that period's revenues, costs, and rate base are examined. The accounting records of the revenues and costs for the test period, generally a 12-month period, are audited to see that only reasonable and proper costs are included and to determine the nature of the transactions included. The nature of these transactions determines the proper manner in which to reflect these costs in the cost of service. A review of test-year data is important, for "wherever costs enter into financial accounts, non-objectively measured data are produced having their own sources and forms of errors."[9] This inherent error, coupled with the moral hazard that

TABLE 4.3 Rate Making Rate of Return

Year	Investment	Accumulated Depreciation	Net Investment	Net Return	Rate of Return	Depreciation	Gross Return
1	$1000	0	$1000	$90	9%	$200	$290
2	1000	$200	800	72	9	200	272
3	1000	400	600	54	9	200	254
4	1000	600	400	36	9	200	236
5	1000	800	200	18	9	200	218

[9] Oskar Morgenstern, *On the Accuracy of Economic Observations*, 2nd ed. (Princeton, N.J.: Princeton University Press, 1963), p. 79.

the utility will try to represent a high level of annual costs and the morale hazard that the utility may be indifferent to certain types of excessive costs such as "gold-plating" of rate base and non-arms-length bargains, makes the review of test-year financial data a critical task.

Two basic types of test years are used—historical test periods, which predominate, and forecast test periods, an approach recently used in some jurisdictions. Various combinations of historical and forecast test periods have also been used, such as six months historical and six months forecasted data. Justice Cardozo, writing in the 1935 *West Ohio Gas Co.* decision, stated well the distinction between a historical test period relying on actual operating data and a forecast test period employing estimates:

> There are times, to be sure, when resort to prophecy becomes inevitable in default of methods more precise. At such times, "an honest and intelligent forecast of probable future values made upon a view of all the relevant circumstances." . . . is the only organon at hand, and hence the only one to be employed in order to make the hearing fair. But prophecy, however honest, is generally a poor substitute for experience. "Estimates for tomorrow cannot ignore prices of today." . . . We have said of an attempt by a utility to give prophecy the first place and experience the second that "elaborate calculations which are at war with realities are to no avail." . . . We say the same of a like attempt by officers of government prescribing rates to be effective in years when experience has spoken. A forecast gives us one rate. A survey gives another. To prefer the forecast to the survey is an arbitrary judgment.[10]

In its 1977 *West Iowa Telephone Co.* decision rejecting a forecast test period, the Iowa State Commerce Commission stated:

> We have always rejected attempts at using projected data in lieu of known and measurable facts. Speculation is the anathema of regulation.[11]

Use of a historical test period dominates the use of forecast test periods. Notable exceptions such as the New York Public Service Commission exist. Future test periods are among the regulatory methods used to deal with inflation. With a future test period, the increased concern with inflation and rising costs exacts its toll, a reduced ability to control both the moral and the morale hazards in the rate case.

A second important concept is that of *actual costs*. Actual costs from a test period reflect the amount of money actually paid for property or services. The use of historical test periods permits the examination of the transactions that incurred these costs, the isolation of legitimate costs, and a high degree of protection against the moral and morale hazards. A con-

[10] 294 U.S. 79, 82.

[11] 18 PUR 4th 227.

tinuing exception to the actual cost principle began during the 1970s, as a result of the federal income tax laws. Accelerated depreciation for tax purposes and the investment tax credit—except in jurisdictions that flow through to the consumer the tax savings from accelerated depreciation and in California, which sends through the tax savings of the investment tax credit—results in hypothetical or deferred taxes charged consumers exceeding the actual taxes paid to the government.[12] This excess over the actual cost paid is a capital contribution to the utility, a contribution legally but involuntarily obtained from consumers. Generally, however, only actual costs serve as the basis for the test period revenue requirement.

The *matching principle* is another fundamental concept in rate making. Matching means identifying all revenues and expense items along with the associated rate base that should be included in the test period. Since the utility services and associated revenues and costs represented on an income statement for a utility occur *over time,* while the costs represented on the balance sheet occur *at a point in time,* it is necessary to match revenues, sales, and expenses with rate base and capital costs. For example, operating expenses for a full calendar year do not match the year-end rate base. A 1982 income statement matches an *average* 1982 balance sheet, not a December 31, 1982, balance sheet.

Investment in utility property *throughout* the test year provides service coincident with a full year's sales, revenues, and costs. Revenues, expenses, capital costs, and depreciation for the annual test period match or are appropriately associated with the average rate base of the test period. Use of a year-end rate base, on the other hand, requires the estimation of the matching year-end levels of sales, revenues, and costs. Such estimates require recognition that plant is added generally to meet a different, probably increasing, level of utility demand, and to take advantage of operating efficiencies. Since nowhere in the records of a utility are year-end levels of revenues and expenses recorded, use of a year-end rate base requires seasonally adjusted, annualized estimates of year-end levels of revenues and expenses.

Early in the history of utility accounting and rate making, depreciation expense was not matched with the accumulated depreciation on the balance sheet or deducted in the rate base. Straight-line depreciation expense was included in the cost of service, but the observed condition of the property determined the accumulated depreciation. High depreciation expenses were included as increased operating expenses, but the lower accumulated depreciation increased the rate base. Today, amounts charged to depreciation expense are also credited to accumulated depreciation. Upon subsequent retirement of items of property, both the utility plant

[12] This is discussed in detail later in this chapter under taxes.

and accumulated depreciation are reduced. Depreciation expense matches the accumulated depreciation in the rate base.

Jurisdiction matching is important as well. Utilities commonly have nonutility unregulated operations such as merchandising, manufacturing, or real estate investments. Also, jurisdictional utility costs must be matched with jurisdictional utility services; nonutility costs with nonutility sales and plant; nonjurisdictional utility revenues with nonjurisdictional utility cost and rate base. One utility may provide different kinds of utility service, such as gas and electricity, operate in several states, or be subject to various state and federal commission jurisdictions. For example, telephone utilities often operate in several states, have affiliated manufacturing and telephone directory publishing companies, and nonutility affiliates selling directly to the public.

Since the 1960s several utilities have established holding companies that own a single gas or electric utility, thereby conforming to the Public Utility Holding Company Act. Telephone and water utilities, not covered by the Public Utility Holding Company Act, continue to have controlling interests in several utilities and follow the older pattern of an integrated holding company. The single utility holding company today diversifies its investments into real estate, computer services, energy exploration and the like. With diversified interests, the matching of general corporate overhead expenses and capital charges becomes difficult. For example, the nonutility operations can trade on the lower risk of the utility. The high, stable dividend stream from the utility can be used to support nonutility financing. But the more risky financing and its costs cannot be readily traced to the nonutility investments. A direct cost of capital adjustment is required to match lower capital costs with the utility.

Having examined the concepts of the test period, actual cost, and matching, we can turn to more realistic, less general, principles of rate making—allowance of necessary, prudent and efficient cost, *pro forma* adjustments, and used and useful property in the rate base.

In 1936, the U.S. Supreme Court ruled in *Acker* v. *United States* that when a charge is for a public service, "regulation cannot be frustrated by a requirement that the rate be made to compensate extravagant or unnecessary costs."[13] If such expenditures do not result from arms-length bargaining, then "more proof is required than mere description of activities engaged in or their reasonableness"[14] to establish the level of expense chargeable in rates. Where an arms-length bargain has occurred, a commission may still disallow costs that result from an abuse of discretion on

[13] 298 U.S. 426.

[14] *Park View Utilities Co.* v. *Iowa State Commerce Commission*, 360/2-63163 (Iowa Court of Appeals, Slip Opinion, April 29, 1980), p. 6.

the part of management. The discretion of utility management to incur costs and have these costs reflected in rates does not extend to rates based on imprudent, extravagant, unnecessary, or inefficient costs. Costs associated with illegal activities are likewise not permitted in rates. The Federal Energy Regulatory Commission, in its general instructions for its system of accounts, states:

> All amounts included in the accounts prescribed herein for electric plant and operating expenses shall be just and reasonable and any payments or accruals by the utility in excess of just and reasonable charges shall be included in account 426.5, Other Deductions.[15]

Only prudent and efficient costs should be charged to the consumer. In other words, the consumer is responsible for the lowest cost of providing reasonable service, and no more. And the commission is responsible for seeing that the consumer does not pay more. However, hindsight is not sufficient to prove costs were unreasonable or imprudent. Rather, a commission should show that at the time of the questionable transactions, the utility's management, acting reasonably, should have known or did know that the cost was unreasonable. Costs frequently questioned include the costs of goodwill and institutional advertising, charitable contributions, social memberships, and political activities. These expenditures are generally unnecessary for a utility to maintain its market, as it has an exclusive franchise. Provision of a reasonable level and quality of service serves to enhance the utility's public image, in any case. The utility is not prohibited from making such unreasonable expenditures; it is only prevented from recovering from rates the costs of such activities.

The cost of service determined by a commission is to be representative of the conditions that will prevail when the rates will be effective; i.e., rate making is prospective. As a result, *pro forma* adjustments are made to the test year actual costs to represent more accurately prospective conditions. For example, during the test period, negotiation of a union contract will usually raise labor rates. An increase in postage will increase customer billing expense. Such increases are annualized, and the revenue requirement includes a full year of the higher expenses. Separating the known and measurable changes from changes that might cause unknown effects on costs and revenues is the difficult task. Various changes, particularly additions to plant in service, are associated with an unforeseeable level of sales, revenues, and costs. A new power plant is built usually to meet growing demand and to achieve operating efficiencies, for example. To annualize such new construction violates the principle that the rate base be matched with the corresponding level of sales, revenues, and costs. All

[15] Code of Federal Regulations, Title 18 (Washington, D.C.: U.S. Government Printing Office, 1979), p. 311.

concomitant annual levels of sales, revenues, and costs accompanying the change in rate base are probably not known.

Another type of *pro forma* adjustment includes adjustments for abnormal and extraordinary revenues or costs. Abnormal levels of revenues and costs may be changed to normal levels. For example, abnormally cold winters may increase sales of gas for heating. Adjustment of gas expense and revenues of heating and curtailed industrial customers are made in many jurisdictions. A strike at a large industrial customer of a utility during the test period may likewise reduce revenues and costs abnormally. To determine prospective rates, normal levels of sales, revenues, and costs would be included in the cost of service. Extraordinary costs are removed from the cost of service when costs are unlikely to be incurred prospectively. An example of an extraordinary expense is the cost of repairing a turbine generator damaged in an accident. To incorporate extraordinary costs would generate revenues unneeded in the future to cover actual costs incurred. A windfall profit would occur, a windfall profit not needed to cover costs.

A final important rate-making principle relates to rate base. The *rate base*, in original cost jurisdictions, reflects the investment in property used and useful in rendering utility services.[16] (In those few fair value jurisdictions, the requirement that the property be used and useful also holds, although the original cost standard does not.) The asset side of the utility balance sheet segregates the investment in property used in utility operations from other investments or property. Property that provides a different type of utility service, utility service for another regulatory jurisdiction, nonutility services, or property that has been retired from service is not "used and useful." Commissions may also find unnecessary plant, gold-plated or extravagant property, or excessive duplication of property and declare that such property is not "used and useful." Property that is not used and useful is then excluded from the rate base.

By developing the original cost rate base from the asset side of the balance sheet, the rate base can be limited to investments in utility property. The righthand or liabilities and owner's equity side of the balance sheet shows total capitalization, but utility capitalization alone cannot generally be segregated. Therefore, the righthand side of the balance sheet is used to determine the cost of capital and the lefthand or asset side is used to segregate the investment in "used and useful" utility property.

Table 4.4 shows a simplified example of the determination of general rate levels for a utility. The revenue requirement or cost of service formula is used, $RR = O + T + (V - D)R$. The $1.4 million cost of service results in a rate or cost to the ratepayer of $0.02 per unit of service. The public utility rates are set so that the firm has the opportunity to earn revenues

[16] *Davenport Water Co.* v. *Iowa State Commerce Commission*, 190 NW 2d 588.

TABLE 4.4 Simplified Example of Utility Rate Determination

	Test Period Amount per Book	Pro Forma Adjustments	Adjusted Test Period Cost
Operating expenses (O)	$ 600,000	$100,000	$ 700,000
plus: Annual depreciation (d)	230,000	(80,000)	150,000
plus: Taxes (T)	350,000	(50,000)	300,000
Subtotal	$1,180,000	$(30,000)	$1,150,000
Rate base ($V - D$)	$3,000,000	$(500,000)	$2,500,000
Cost of capital/rate of return (R)			10%
Net operating income (R) ($V - D$)			$ 250,000
Cost of service = $O + d + T + R(V - D)$			$1,400,000

that cover the adjusted costs of service. Suppose the following figures have been established for the utility as shown in Table 4.4:

a. Operating expenses (O) = $700,000
b. Annual depreciation (d) = $150,000
c. Taxes (T) = $300,000
d. Rate base ($V - D$) = $2,500,000
e. Rate of return (R) = 10 percent

Then the cost of service equals: $O + d + T + (V - D)R = 700{,}000 + 150{,}000 + 300{,}000 + (.10)(2{,}500{,}000) = \$1{,}400{,}000$. The commission would next attempt to set rates so that the utility would earn $1.4 million in revenues. If the utility is expected to provide 70 million units of a single type of service, the price per unit would be $1.4 million divided by 70.0 million units, or $0.02 per unit. At a price of $0.02 per unit, the utility may earn more or less than the 10 percent return allowed, depending on a variety of conditions that may occur in the future.

Our review of the determination of the general rate level continues with a discussion of each part of the revenue requirement/cost of service formula: operating expenses, including depreciation expense; taxes, including tax depreciation; rate base; and rate of return.

Operating Expenses

Operating expenses include expenses related to the utility's operation, such as maintenance expenses, wages and labor benefits, administrative expenses, and the like. Depreciation is another important expense. These expenses range from 50 to 65 percent of electric and telephone revenues.

Operating expenses incurred by the utility are subject to challenge

by the commission and the public, as the Acker decision pointed out.[17] The commission's authority to disallow improper categories or levels of expenses was determined early in the history of public utility regulation.[18] The utility carries the burden of showing that a challenged expense is proper. It must demonstrate that the expenditure was in fact made, reasonable in amount, and necessary to the provision of utility service. Commissions generally control expenses deemed improper by disallowing them for rate-making purposes—i.e., by excluding them from the cost of service used in setting rates and thereby forcing stockholders to absorb the expense, not consumers.

Table 4.5 sets forth the operating expense chart and selected accounts for class A and B electric utilities, class A and B gas utilities and class A telephone companies as adopted by the Federal Energy Regulatory Commission and the Federal Communications Commission. The expenses related to each of these activities will be charged to individual accounts. Fuel used in steam production is a major electric cost. Fuel is an inventory item. Therefore, fuel is first charged to inventory accounts for fuel stock and fuel handling. Subsequently, using inventory costing methods such as last-in, first-out (LIFO); first-in, first-out (FIFO); or average cost, fuel expense will be charged to Account 151—steam power generation, operation, fuel. This fuel expense includes salaries and wages as well as the costs of the fuel itself, transportation, operating supplies, associated excise taxes, and insurance.

The repair of central office equipment, for a telephone company, account 604, includes costs of salaries, supplies, and materials used in inspecting and reporting on conditions of the equipment; repairing central office equipment and batteries; routine work of operating equipment or disconnecting customers' lines in the central offices upon termination of service; employee training; supervision; and maintenance.

Not all salaries, materials and supplies, and supervisory and administrative costs are expensed. Parts of such expenditures are capitalized. For example, costs of construction of telephone plant include the cost of labor, materials and supplies, transportation, contract work, social security and property taxes, insurance, and overhead costs. These construction costs are included in the original cost of the plant and are to be depreciated. A common regulatory task is to ensure that such construction-related expenses are properly and fully capitalized and do not end up in current operating expense. By capitalizing such expenses, the future consumers receiving the service are responsible for and charged the costs of providing their service.

[17] *Acker* v. *U.S.*, 298 U.S. 426 (1936).

[18] *Chicago and Grand Trunk Railway* v. *Wellman*, 143 U.S. 339 (1892).

some measure a matter of managerial experience and judgment, but over the long haul the impact of financial markets and regulatory conditions determines the range of possibilities.

Typically, utility managers think in terms of target debt ratios. Financial executives design their financing to fluctuate within limits around this target. Some think of the optimal capital structure in terms of a range. For example, John Scanlon, former vice-president and treasurer of AT&T, described his company's policy in terms of a range: "All of the foregoing considerations led us to conclude, and reaffirm for a period of many years, that the proper range of our debt was 30% to 40% of total capital."[12] The target for AT&T increased somewhat in the late 1970s. Among the factors cited as primary considerations in the determination of this target capital structure are: (1) maintenance of the quality of the firm's credit position (bond ratings), (2) current level of business risk (the degree of volatility in earnings), (3) protection of existing debt suppliers, (4) maintenance of access to capital markets under almost all conditions, (5) provision of an adequate borrowing cushion or reserve, and (6) advantages of financial leverage (lower cost and tax advantage). The Bell System's stated capital structure objective is to seek a balance between consumers' and investors' interests by employing a debt ratio slightly less than that necessary to maintain a high-quality credit rating, thereby always assuring access to capital markets.

Continued access to capital markets requires a good credit rating. Utility bonds are rated by services such as Standard and Poor's and Moody's. Bond ratings range from AAA, the highest, down to D, the lowest, which is reserved for bonds in default. Bonds rated BB and below are considered speculative. Generally speaking, the higher the rating, the lower the required rate of return. Several factors that rating agencies cite as important in bond ratings are the use of financial leverage, firm size, use of subordinated debt, variability of earnings, and profitability of operations. Interest coverage ratios are believed inferentially to be an important measure of leverage considered by bond rating services. These rating services do not give specific rating criteria and, in fact, may have no fixed and predetermined criteria. In recent years, utility bond ratings have progressively deteriorated. Almost every telephone company carried bonds with an AAA or AA rating in the early 1970s. Many of these companies found their bonds rated at AA and A (or below) in the early 1980s. Consider the plight of U.S. electric utilities: Only 4 percent of their bonds were rated BBB, the lowest investment grade rating, in 1970. In 1980 nearly 30 percent were rated BBB. These lower ratings and the higher required rates of return associated with them reflect the assessments of the bond rating agencies and the financial markets.

[12] "Bell System Financial Policies," *Financial Management*, 1 (summer 1972), 16–26.

Forms of Public Utility Financing

Public utilities use several types of securities and sources of funds for financing. Though such securities and sources are used by business in general, utilities make greater relative use of senior securities and mortage bonds than industrial firms. However, small businesses rely upon debt, especially bank loans, even more heavily than public utilities. Also utilities have available consumer-contributed capital such as the tax savings from accelerated depreciation and the investment tax credit. The capital intensity, the monopoly power, and the ability to pass taxes on to consumers makes such consumer-contributed capital a significant source of capital. Here, however, we will look at investor-contributed capital such as short-term debt, long-term debt, and equity.

Senior securities such as debt and preferred stock provide much of the financing used by utilities. Short-term debt is a temporary part of capitalization; that of long-term debt is permanent. In addition, common stock equity finances the remainder of utility assets. As an illustration, see the balance sheet presented in Table 8.1.

Short-term debt finances construction and temporary working capital needs. Construction financing is refinanced by issuance of long-term securities after completion of the project. Bank loans and commercial paper are two significant sources of short-term debts. Commercial and industrial loans by banks to public utilities, communications, and transportation companies at year-end 1980 were 13.8 percent of outstanding loans.[13] Such bank loans may take two forms: lines of credit and specific loans. A *line of credit* commits a bank to supply funds up to a maximum amount. As the utility draws on its line of credit, the amount is added to the utility's outstanding loan. Upon maturity, the outstanding loans made under the line of credit are paid. Compensating balances may be required of utilities by banks providing the lines of credit. Of course, any regularly maintained deposit goes toward covering the compensating balance and reduces the additional cost caused by compensating balances. *Specific loans* may be negotiated between the utility and the bank. The interest rate utilities pay on bank loans is often at or near the prime rate charged by banks.

Another source of short-term debt for large public utilities is commercial paper, an unsecured negotiated note issued in bearer form by the utility. The term of the note may be from a few days up to nine months. Commercial paper generally has a lower rate than the bank prime rate and does not require the maintenance of compensating balances. At times, however, a line of credit is required to support commercial paper issues.

As noted earlier, public utilities use much larger proportions of long-

[13] Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin*, 67, 1 (January 1981), A22.

term debt financing than industrial corporations. Since utility long-term debt tends to be permanent, all issues are refinanced as due through new issues. Some utilities, particularly very small ones, may retire debt through sinking funds and periodic redemptions. A sinking fund requires an annual payment that allows for the periodic retirement of the debt issue. It eliminates the potential danger of repayment problems at the maturity date if the firm then is faced with temporary financial distress. Most utility long-term debt is in the form of mortgage bonds. Industrials, on the other hand, make wider use of debentures, bonds supported by the general credit standing of the firm. Some utilities do rely on debentures. For example, the major source of long-term debt for American Telephone and Telegraph and many of its subsidiaries is debentures. But generally, utilities issue only a limited number of debentures.

Utility mortgage bonds are secured not only by the creditworthiness of the utility, but also by a lien on specific assets. Only first mortgages are widely used. Should a default of the interest or principal payments on the mortgage bond occur, the mortgage holders have first claim to the proceeds from the sale of the mortgaged assets. Any remaining shortage then has equal status with other unsecured notes and bonds.

A contractual agreement exists between the debtor and the utility. This agreement, the *indenture*, sets forth the terms and conditions of the outstanding bonds. Among the terms and conditions are restrictive convenants, a description of any property mortgaged, the amount and place of payments, and call privileges. A trustee, acting as an agent for the bondholder, polices compliance of the debtor with this indenture. The term of utility bonds is commonly 25 to 30 years, though shorter and longer periods have been provided, with interest being paid twice annually. The open-ended mortgages permit subsequent property additions to be used to support new series of mortgage bonds, series with different interest rates and maturities. The amount of new mortgage debt that may be issued relative to the property additions may be limited by restrictive covenants in the bond indenture. Commonly, issuance of new series of senior or equivalent securities is restricted if certain coverage ratio tests, generally a pre-income-tax interest-coverage ratio test, are not met. Various funds, such as replacement or maintenance funds, require that either cash payments or capital and operating expenditures be made by the utility. The *call privilege* gives the utility issuing the security the right to redeem the bond or other security at a specified price. The call of a bond may reduce the cost of capital to a utility if the saving in interest cost compensates for any premium paid when exercising the privilege. Indentures are only a private contract between creditor and debtor and as such cannot bind a third party, a utility commission. Unreasonably restrictive covenants, such as post-tax interest-coverage tests, have been set aside by commissions in determining a fair rate of return.

Utilities, in early years, used few leases and still use leases only occasionally. Some utilities, particularly some electric utilities, have paid little,if any, income taxes in recent years because of low income levels and accelerated depreciation and investment tax credits. Sale leasebacks and leveraged leasing have been used to convert a potential income tax savings into a lower effective cost of financing. Therefore, these leases are not particularly attractive for some electric utilities today.

Preferred stock, though a senior security, has a claim junior to the utility's debt but is more widely used by utilities than by industrials and is a larger proportion of utility capitalization as well. Preferred stock, carrying a higher rate than bonds, permits the utility to not pay a dividend without defaulting. Most utility preferred stock dividends are cumulative, so that past unpaid preferred stock dividends must be paid before any common stock dividends can be declared. To some extent, this protects preferred stockholders from omitted preferred dividends. However, dividends on preferred stock have not been omitted since the Great Depression. In recent years, some utilities have issued *preference stock*, which has a lower priority claim to earnings for payment of dividends than traditional preferred stock.

Preferred stock, issued because it is less costly than common stock, may be at the same time easier to issue than debt because of bond indentures or tight credit. The preferred stock of most utilities has no maturity date, though issues that mature or are callable do exist. The issuance of preferred stock can impose certain conditions and terms on the utility similar to though less strict than those imposed by a bond indenture. Restrictive covenants may restrict the payment of common dividends or the issuance of future preferred stock or senior securities under various conditions. Voting rights may be granted if a specified number of preferred dividends is not paid.

Public utilities commonly have only one class of common stock. Again, exceptions among small or new utility corporations do exist. The common stockholders have a residual claim on the earnings of the utility. The common stock in publicly traded public utilities is more widely held by small investors and less widely held by institutional investors. Many utilities, unlike industrials, issue new common stock on a regular basis.

The common stock can be accounted for in three parts—common stock, paid-in capital, and retained earnings. In addition to paying cash dividends, utilities from time to time have made stock splits or paid stock dividends. As a matter of accounting treatment, a stock split does not raise or lower the total amount of common stock, paid-in capital, or retained earnings, but only distributes it over more shares. A stock dividend, however, reduces total retained earnings by transferring an amount to common stock or paid-in capital.

The public utility, when issuing securities, uses both public and pri-

vate placement of primary issues. Private placements usually tailor, by negotiation, the rates and conditions and terms of the security to the needs of the utility and a particular investor, frequently an insurance company for senior securities. Public issues are subject to detailed requirements and procedures. Underwriting of public security issues requires an investment bank that is compensated for its services. The underwriter will advise the utility on the type of security to issue and help prepare the information required for a prospectus and by regulatory agencies such as the Securities and Exchange Commission. Usually, the underwriting syndicate guarantees a price to the utility. Upon distribution to the public, the market price received produces the profit or loss for the underwriting syndicate.

Other methods are used by utilities to issue new securities. *Rights offerings* that permit existing shareholders to purchase, at a discount below market price, a *pro rata* share of new common or preferred stock have been used. If shareholders choose to, the rights may be sold to prospective investors who in turn will purchase the securities. American Telephone and Telegraph Company had generally, before the 1970s, relied upon rights offerings to issue new common equity. Presently, *dividend reinvestment programs* are popular among public utilities. Rather than receiving a cash dividend, an investor may purchase shares of common stock at a price slightly below market price. Public utilities, particularly telephone utilities, have occasionally used other methods of issuing securities. Convertible bonds and preferred stock or warrants for the purchase of other securities have been a right available on certain issues of senior securities. Mergers and acquisitions, made through pooling of interests and direct purchases, have required the issuance of new securities.

An important point of this section is that because of their immense capital needs, public utilities tend to tap virtually every major financial market for funds. Probably the most notable features of public utilities are their regular issuance of new securities, their heavy reliance on mortgage debt and other senior securities, and their practice of permanent financing of utility capitalization. Such features are not unique to public utilitities, though the preponderance of these features in the public utility industry makes the industry's financial structure unique.

THE PARTICIPATION OF REGULATORY COMMISSIONS

Public utilities do not have a free hand in their capital budgeting and financing decisions. Capital investments and financing are subject to review by utility regulatory commissions and other governmental bodies. Imprudent costs are not charged to customers, but are charged "below-the-line"—i.e., charged against investors' equity. A determination of prudence is part of a cost of service determination. Other reviews by commissions take place prior to financing or capital investment. The commission's authorization must be secured before certain transactions occur. As we will see below, three such transactions are reviewed by many commissions and agencies: securities issuance, use of eminent domain powers, and certificates of convenience and necessity.

Securities Regulation

Massachusetts first regulated security issues by public utilities. New York, in a 1907 statute, undertook the regulation of utility security issues. In 1978, the District of Columbia and some 44 states regulated security issuance by public utilities.[14] The Federal Energy Regulatory Commission and the Securities and Exchange Commission also regulate security issuance by public utilities. In order to assure utility customers and investors access to financing, security regulation was introduced. Protection against overcapitalization and undercapitalization, and the assurance that security issues secure capital and not just income, are functions of security regulation.

Equity and debt capitalization can approximately equal utility assets, but overcapitalization can occur when the capitalization exceeds the asset value. Undercapitalization, on the other hand, occurs when asset value exceeds capitalization. Since debt and preferred stock are fixed income securities, overcapitalization leads to a lowered return on common equity, while undercapitalization leads to an increased return. Because the fair rate of return is applied to a utility's rate base, rather than to capitalization, overall equity earnings rise and fall with under- and overcapitalization, respectively. For example, assume $1 million in rate base upon which a 10 percent return is earned. With capitalization also of $1 million, of which debt is 60 percent, and a cost of debt of $8\frac{1}{3}$ percent, the return to common equity is 12.5 percent. The utility would be overcapitalized if instead $1.2 million worth of securities were issued. Then, for 60 percent debt at $8\frac{1}{3}$ percent and a 10 percent return on the rate base, the earnings available to common stock are reduced to $40,000 on $480,000 of common equity. The overall return on common equity declines to $8\frac{1}{3}$ percent.

Overcapitalization could hinder the ability of utilities to secure capital in two ways. Since utilities traditionally have high dividend payout ratios, the net income available to pay dividends is reduced to at or below the level of the dividends themselves. Also, indentures are entered into by utilities upon issuance of debt and preferred stock. These indentures gen-

[14] National Association of Regulatory Utility Commissioners, *1978 Annual Report on Utility and Carrier Regulation* (Washington, D.C.: National Association of Regulatory Utility Commissioners, 1979), p. 447.

ATTACHMENT 6

The Economics of Regulation
Principles and Institutions

Volume I Economic Principles
Volume II Institutional Issues

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The quality of the air travel experience has, however, clearly deteriorated—congestion, delays, and customer complaints have increased sharply in recent years—and deregulation bears a large part of the responsibility. Whether this has involved a net social welfare loss is far less obvious: the low fares to which travelers have responded in such profusion necessarily entail lower-quality service—tighter seating, longer lines, fewer amenities, and higher load factors. The enormous response of travelers to the availability of these new options has been, in itself, a vindication of deregulation, not a condemnation of it.[14]

Moreover, the upsurge of traffic need not have entailed the great increase in congestion that we have actually experienced. Responsibility properly rests, instead, with major failures of government policy—inadequate staffing of the Federal Aviation Administration with safety inspectors and flight controllers; failure to expand airport and air corridor capacity sufficiently; inefficient pricing of airport takeoff and landing "slots" at the congested airports. A reader of these two volumes would be astounded to discover that these last rights, instead of being either auctioned off or priced at marginal opportunity costs (volume I, pp. 79–80, 87–88), through variable landing fees, are instead typically priced on the basis of the weight of the planes, without differentiation between peak and off-peak, at levels intended merely to cover the historic costs of construction. The simple market solution would be for the airport authorities to price their services efficiently (volume I, p. 100).[15]

It is necessary to confront the possibility, finally, that the benefits of the competition unleashed by deregulation will prove only temporary—that, as many opponents of deregulation have consistently predicted, competition will ultimately kill itself off. The discovery by the large incumbent airlines of effective ways of blunting the competition of the low-cost, aggressively price-cutting new-entrant carriers—by control of computerized reservations

[14]This is by no means to dismiss the increasingly frequent complaints about lost baggage, misleading scheduling, last minute cancellations of flights with few bookings, involuntary bumping of passengers on overbooked flights, and severe delays. Travelers had no reason to believe these were part of the service package they were buying. There is no necessary incompatibility between economic deregulation—dropping comprehensive governmental restraints on competition—and vigilant governmental protection of consumers from the misrepresentations and violations of implicit contracts that such practices involve. On the response to bumping, see note 15.

[15]In principle, the rules adopted by the Civil Aeronautics Board in 1977, still essentially in effect, prohibiting involuntary bumping of passengers on overbooked flights and requiring the airlines instead to offer compensation sufficient to induce the requisite number of passengers to give up their seats voluntarily, accomplishes exactly the same result. No traveler for whom the value of remaining on the flight is greater than the value of the bribe has to give up a seat; only passengers for whom the cost of the time lost waiting for a later flight is less than the value of the bribe volunteer. Similarly, landing fees set at marginal opportunity costs (the value of taking off or landing at that particular time and place to the first excluded flight and passenger) would have the effect of offering travelers to whom it is important to take off and land at those particular times and places the high-value service they require, delay free, at its correspondingly high marginal cost, and travelers for whom money is more valuable than those conveniences could be offered corresponding bargains to travel off-peak or to use less convenient airports.

In principle, incidentally, the bumping rules could be expected also to produce the economically optimal amount of overbooking, with airlines equating the (rising) marginal costs of the requisite bribes (reflecting the real cost to consumers of giving up their seats) at successively higher percentages of seats of flights overbooked with the (declining) anticipated marginal revenue—in the form of increasing assurance that every seat will be sold.

systems, by getting their own costs under control, and by developing such successful marketing devices as frequent flyer programs and deeply discounted fares confined to seats expected otherwise to be unfilled; the domination of hubs, and, therefore, of traffic originating and terminating there, by one or two carriers; the failures of most of the new entrants; and the wave of mergers that has reconcentrated the industry on a national level—all these make the question both legitimate and important. It must suffice for our purposes to observe that competition has not killed itself off in American industry generally, even where oligopoly has become typical; that even though concentration at the national level has, after an initial sharp decline, now surpassed prederegulation levels, the average number of carriers serving individual markets has apparently increased, as the removal of regulatory restrictions has made each an active or potential competitor of the other; that competition remains extremely intense; and that, in any event, the possibility in this or any other industry that competition might ultimately prove unviable was hardly a justification for having comprehensively restricted it in the first place.[16]

The verdict of the great majority of economists would, I believe, be that deregulation has been a success—bearing in mind, as always, the central argument of these two volumes that society's choices are always between or among imperfect systems, but that, wherever it seems likely to be effective, even very imperfect competition is preferable to regulation (volume II, pp. 112, 328–329, and passim).

Changes in Utility Regulatory Practices—Aggregate Revenue Requirements

Among the public utilities proper, the principal initial response to the acceleration of inflation and explosion of fuel prices in the 1970s was not deregulation but refinements of traditional regulatory practices, aimed mainly at making rate awards more responsive to rapidly rising costs. After two decades of relative quiescence, during which regulators were comparatively complaisant about costs falling faster than rates and earned rates of return tending systematically to exceed levels determined previously to be "just and reasonable," requests for rate increases began suddenly to press hard one upon another, as each award proved to be inadequate even before it went into effect, and achieved returns fell systematically short of the cost of capital.[17]

[16]These concerns about the viability of airline competition may have been vindicated unnecessarily by the failure of the federal government vigorously to enforce the antitrust laws' proscriptions of competition-suppressing mergers, predatory pricing, and exercise of control over bottleneck facilities such as computerized reservations systems and airport slots in such a way as to deny competitors a fair opportunity to compete on the basis of their comparative efficiency in serving the public. Here, as in antitrust enforcement generally, all of these possibilities raise the familiar and difficult problem of distinguishing interventions that on balance preserve competition from interventions that on balance suppress it, by protecting competitors from deserved extinction.

[17]See Paul L. Joskow, "Inflation and Environmental Concern: Structural Change in the Process of Public Utility Price Regulation," *Journal of Law and Economics* (October 1974), XVII:291–314. Market-to-book ratios of electric companies, in consequence, which had run at something like a comfortable 2.0, dropped well below 1.0 after 1973. See, for example, the table in my "Utility Regulation Revisited," an address before the New England Conference of Public Utility Commissioners Annual Symposium, June 15, 1981 (National Economic Research Associates: White Plains), p. 14.

Considering the extremity of the change, it is surprising that, for several years, comparatively little attention was paid to the ancient issue of reproduction versus original cost rate bases (volume I, pp. 35–41). Instead, while continuing preponderantly to set permissible revenues on the basis of original or book capital costs, commissions attempted in various ways to make their rate awards more realistic—adjusting the costs and revenues in the historic "test year" for known changes, determining aggregate revenue requirements on the basis of forecasted test years, incorporating "attrition allowances" in the form of a supplement to the allowed rate of return, allowing for the automatic passing through of changes in fuel and purchased gas prices, and other such automatic escalations or indexations. While evidently falling far short of moving average rates up to marginal or replacement costs, all of these expedients had the essential virtue in economic efficiency terms of bringing them closer to those levels.

A separate consideration that became increasingly important in motivating these various departures from traditional practice was a perceived need to permit the companies an increased cash flow to finance capacity expansions. The most important and intensely controverted method of achieving that end was one that, I think it worth pointing out, I had not even mentioned in these volumes—the incorporation of construction work in progress (CWIP) in company rate bases. Regulation (and I) had tended previously to assume that both the incentive and the ability of public utility companies to finance construction could be taken for granted, if the allowed return exceeded the marginal cost of capital. The assumption was not incorrect. The particularly severe inflation of the costs of constructing new utility facilities (including the cost of capital), however, along with the persistent failure of utility companies to earn their allowed returns, had the effect of drastically reducing their cash flows relative to the requirements for new construction.[18] In these circumstances, the traditional regulatory practice of keeping the accruing expenditures on plant under construction (including the accruing returns on that investment—the "allowance for funds used during construction," or AFUDC) out of rate base until the plant came into service confronted commissions with the prospect of downratings of bonds, sharply increased cost of both debt and equity, and in extreme cases a simple inability to finance.

One solution, which commissions understandably resisted, was simply to allow much higher returns on equity, reflecting the apparently increased marginal cost of capital—sufficiently also to offset the growing suspicion among investors that the companies would not in fact earn the "allowed" return.[19]

The other, which came increasingly into usage (and has now greatly diminished in importance, as both inflation and construction have fallen off

[18]Another contributing factor was the introduction of accelerated depreciation and investment tax credits into the Internal Revenue Code, which, in the absence of normalization—see volume I, pp. 33–34—narrowed the gap between before-tax and after-tax income. This, along with the other adverse developments, sharply depressed interest coverages, which are calculated as the ratio between *pretax* earnings and interest obligations.

[19]One manifestation of this suspicion was their increasing tendency to discount reported earnings that consisted in very large measure (50 and even 100 percent in the case of companies with unusually large construction programs) of AFUDC—in effect, regulatory promises to pay by eventually admitting those accumulations into rate base.

and average market-to-book ratios risen well above 1.0), was to admit some portion of the accruing, capitalized CWIP into rate base, there to earn a return from ratepayers currently in the form of cash rather than accrue in the form of AFUDC.

Needless to say, this practice, typically involving much larger rate increases than would otherwise have been necessary, generated extremely bitter, often demagogic, criticism. The most frequent complaint, that ratepayers were being forced to supply capital interest-free to the companies, was simply wrong: since the traditional alternative was to let the return on the invested capital accumulate in the form of AFUDC, on which, once it entered the rate base, customers would ultimately have to pay carrying charges, putting CWIP in rate base spared customers those carrying charges, inflated by the passage of time. In short, when ratepayers supply the capital in advance in this way, they earn a return on those additional up-front payments equivalent to the companies' own allowed rate. Moreover, to the extent that the resulting conversion of company earnings from AFUDC to cash and improved interest coverage ratios reduced the companies' cost of capital (and such other future costs as property taxes on the plant, because of its reduced book value), the return to investors would actually have exceeded the regulatorily allowed return on rate base.

At the same time, this kind of forced levy on present ratepayers—regardless of their own, varying rates of time preference—could in itself be an economically inefficient way of raising capital. Moreover, since the benefit to customers—in the form of reduced future carrying charges on rate base—would accrue only over the life of the investment, it raised inescapable questions of intergenerational equity. Hostile intervenors argued also, not entirely unreasonably, that practices like these merely encouraged the companies (still, perhaps, subject to the Averch-Johnson-Wellicz distortion—however anomalous that would be in a period in which market-to-book ratios below unity suggested investors were expecting returns to fall short of the cost of capital) to construct more capacity than would in fact prove to be needed.[20]

Severe as these problems were, and much as they challenged traditional regulatory practice, they might well have worked themselves out—indeed, the recovery of electric company market-to-book ratios to levels in excess of 1.0 by the early '80s suggests that was indeed occurring—had it not been for (1) the piling on of a second outburst of double-digit inflation, with an even more painful inflation of capital costs, (2) another trebling of world oil prices—both of these in the 1979–1981 period—(3) the explosion in the costs of nuclear plants into the multibillion dollar range, and (4) a dramatic

[20]For a survey of the literature since 1970 assessing the AJW model (see volume II, pp. 49–59, and both volumes, passim) and attempting to test it empirically, see Joskow and Rose, op. cit., pp. 42–44. Joskow himself has supplied one of the most telling criticisms—namely, that the model assumes incorrectly that the central goal of regulation is to hold the realized rate of return to the allowed level (op. cit., *Journal of Law and Economics*, 1974). For a preview of his more realistic model—according to which regulators are far less concerned about the returns companies achieve in the context of stable or declining rates than when confronted with requests for rate increases—which he documents persuasively, see volume II, pp. 66–67. This suggests, Joskow observes, that the AJW effect is more likely to be observed in periods of rising than of declining costs (op. cit., p. 304). At such times, however, the resistance of regulators and the public to rate increases could well be an at least equally powerful deterrent to excessive employment of capital.

deceleration in the growth of demand, so that completion of plants left the industry with a large amount of excess capacity. This combination of developments raised problems of a magnitude that our traditional regulatory institutions proved ill-equipped to handle.

The problems took two principal forms: The first was the threat of rate shock as these huge lumps of investment came or threatened to come into the rate base (or were canceled and part or all of the costs recovered from ratepayers). One result was the exploration of ways to introduce these investments more gradually into rate base, in some cases beginning at the CWIP stage, but in any event continuing after the plants actually came into service. This had the virtue not only of being less unattractive politically but also of being more equitable to the various generations of ratepayers, by producing a somewhat better synchronization between the opposing effects on rates of heavy capital costs, on the one side, and fuel savings, on the other. It also made economic sense: after 50 years of dormancy, the old controversies over original versus reproduction cost regulation came alive again, and it became necessary to confront the economic as well as political irrationality of an original cost regulatory system that (a) held rates totally stable until a plant came in (indeed, caused them to decline, as depreciation eroded the original-cost rate base), even though marginal costs were probably increasing, then (b) would have increased them as much as 40 to 70 percent when that plant came into rate base and had applied to it a current cost of equity capital that incorporated a compensation for anticipated *future* inflation (at a time when, with a large lump of capacity coming into service, marginal costs were presumably dropping), only then (c) to decline over the ensuing 20 or 30 years as that cost of capital was applied to a declining rate base, even though marginal costs would presumably once again be rising (cf. volume I, pp. 103–109).

Increasingly, therefore, economists began to advocate either a return to some kind of reproduction cost (or inflation-indexed original cost) rate base, on the principle that this would cause rates more closely to track current costs, or some form of economic depreciation that would cause the rate base to reflect the actual change in the economic value of a plant (and could well therefore be negative during a period of inflation).[21] No regulatory commission has to my knowledge actually adopted either of these formal techniques, but phasing in of the costs of these lumpy investments became very widespread.

The other, even more dramatic challenge was to the concept, fundamental to original cost regulation, that utility companies are entitled to a fair opportunity to earn a "reasonable" return on all dollars prudently invested in fulfilling their service responsibilities. Regulatory commissions have of course both the authority and responsibility, under that system, to disallow imprudent expenditures. But judgments of prudence can, in principle—and

[21]Myron J. Gordon, "Comparison of Historical Cost and General Price Level Adjusted Cost Rate Base Regulation," *Journal of Finance* (December 1977), XXXII:1501–1512; Sally Hunt Streiter, "Trending the Rate Base," *Public Utilities Fortnightly* (May 13, 1982), CIV (No. 10):32–37, "Indexed Bonds and Other Issues," ibid. (June 10, 1982), CIV (No. 12):40–47, and "Avoiding the 'Money-Saving' Rate Increase," ibid. (June 24, 1982), CIV (No. 13):18–22; Stewart C. Myers, A. Lawrence Kolbe, and William B. Tye, "Inflation and Rate of Return Regulation," *Research in Transportation Economics* (1985), II:83–119; Peter Novarro, Bruce C. Petersen, and Thomas R. Stauffer, "A Critical Comparison of Utility-Type Ratemaking Methodologies in Oil Pipeline Regulation," *Bell Journal of Economics* (Autumn 1981), XII:392–412.

in fairness—be made only as of the time when the pertinent commitments and expenditures were made.

These doctrines proved totally inadequate to the inescapable task of distributing the burdens of multibillion dollar investments that turned out (or appeared to have turned out) catastrophic mistakes.[22] It was very difficult to demonstrate honestly that the pertinent decisions along the way had been imprudent: nuclear plants already in operation were producing power at very low cost, and while the costs of plants under construction were escalating from the $300 to $400 range originally estimated to many thousands of dollars per kW, under the impact of inflation and the multiplying safety requirements imposed after the 1979 Three Mile Island accident, the price of oil was likewise going up, from approximately $12 to $35–40 a barrel, and it constantly appeared, even to disinterested observers, that the *incremental* costs of completing plants already in process of construction would be smaller than the cost of alternative supply sources.

On the other hand, the political process simply could not tolerate making ratepayers bear the entire cost of hundred million or even multibillion dollar mistakes. The modal treatment of abandoned nuclear plants has been to permit the amortization of the accumulated capital costs over periods of 10 years, while denying the companies a return on the unamortized balance—which involves a very substantial disallowance in present value terms and could totally eradicate the stockholder equity in those plants.[23] And in the case of completed plants, commissions have found one ground or another for major disallowances, often departing explicitly from original cost valuation in favor of one version or another of minimum incremental cost.[24]

What made these departures particularly violative of the principles of original-cost regulation was not so much that the valuations were based on hindsight—in effect holding utility managements to a standard of perfect foresight—as that they were selectively and asymmetrically so. Regulators,

[22]In the case of nuclear plants abandoned in mid-construction, the conclusion was of course unequivocal that those investments were not "used and useful." In the case of plants completed, however, even at costs two and three times either the national nuclear average or the costs of newly constructed coal plants, and in many cases leaving the companies with grossly excessive capacity, the possibility can not be excluded of external circumstances changing so radically over their productive lives—another multiplication of the price of oil, or an upsurge in demand—as to vindicate even those investments. The foresight of regulatory commissions judging the value of such plants upon their completion could of course prove to be just as faulty as the foresight of the company managements in having previously undertaken their construction or deciding to complete them.

[23]A study commissioned by the Department of Energy estimated that this modal treatment would, depending on the pertinent discount rate, impose some 30 percent of the burden each on investors and ratepayers, with the Treasury bearing the remainder, because of the ability of the company to take an immediate write-off of the investment for tax purposes (*Nuclear Plant Cancellations: Causes, Costs, and Consequences*, Washington, DC: Energy Information Administration, U.S. Department of Energy, April 1983, pp. 35–57).

If, then, that investment had been financed 70 percent or more with senior securities, the equity in the plant would have been wiped out entirely: that is, the dollar returns annually to the company would suffice to cover only interest on the debt and dividends on the preferred stock.

[24]An unpublished study by Lewis Perl, of National Economic Research Associates (White Plains, NY), in 1986, estimated, on the basis of the experience to date, that total disallowances for both canceled and completed nuclear plants would total $35 billion. This would amount to almost 54 percent of the industry's total equity in those plants, and 16 percent of the entire equity of all privately owned electric utilities in the country.

continuing to hold the rate bases associated with the other plants to original cost, were in effect opting for original or replacement cost, depending upon which produced the lower result, and in so doing denied investors a reasonable opportunity to earn the cost of capital on the sum total of their prudent investments. And yet, to repeat, strict application of the prudence test alone would have struck regulators and ratepayers as at least equally unfair.

It was precisely the unbridgeability of that gap between what appeared to be fair to the company under original cost principles and what appeared to be fair to consumers in these circumstances that produced institutional breakdown, and opened up the possibility of a true "passing of the public utility concept."[25]

Changes in Utility Regulatory Practices—Rate Structures

Well before these radical developments of the 1980s, regulatory commissions had responded to the 1973–1974 fuel crisis and outburst of inflation, as well as to the intensified national concerns about energy conservation and environmental preservation, with a sharply increased attention to utility rate structures. This shift in emphasis was in itself one that an economist would applaud (volume I, pp. 54–57). In addition, regulatory commissions were, in so doing, increasingly motivated explicitly by considerations of economic efficiency: the conviction became increasingly widespread that more efficient rate structures could, by discouraging inefficient consumption, contribute to conservation and, by relieving pressures to expand capacity at a time of rising capital costs, hold down rates and mitigate environmental degradation.[26]

One sign of this development was the resolution of the National Association of Regulatory Utility Commissioners in 1974 calling on the Edison Electric Institute and Electric Power Research Institute to undertake a far-reaching "study of the technology and costs of time-of-day metering and electronic methods of controlling peak-period usage of electricity, and also a study of the feasibility and cost of shifting various types of usage from peak to off-peak periods." This eventuated in a mammoth *Electric Utility Rate Design Study*, which ultimately ran to some 95 reports.[27] Another similar sign was the Public Utility Regulatory Policies Act of 1978 (PURPA), which, among many other provisions, requires the state commissions to consider and make explicit determinations of the cost effectiveness (measured by comparisons of incremental savings and incremental costs) of rates to the various classes of customers (a) based on the respective costs of serving them, (b) reflecting variations in costs by time of day and season, (c) eliminating non-cost-justified declining blocks, and (d) offering industrial and commercial customers interruptible rates reflecting the lower costs of such service.[28]

[25]In considering the implications of these developments, below, we shall allude also to evidences of a similar breakdown in natural gas transmission and distribution, where long-term commitments to purchase high-cost gas, quite possibly prudently incurred, provide the analogy to the sunk costs of nuclear electric generating stations.

[26]See the very interesting account of these developments, particularly in New York State and California, in Douglas D. Anderson, *Regulatory Policies and Electric Utilities*, Boston: Auburn House, 1981.

[27]See the *EPRI Guide, Technical Reports Published 1972–1981*, Palo Alto: Electric Power Research Institute, September 1986.

The change in state regulatory practice has apparently been dramatic. A survey by Parmesano, Bridgman, and Perry-Failor found that electric utilities in 25 states were in 1987 using marginal costs explicitly in setting retail rates (see the bibliography). In further illustration, New York State instituted

- separate charges for telephone directory assistance; the institution of a 10 cent per call charge, with all customers beginning each month with three free calls and a 30 cent rebate, produced within the first two months a reduction of 40 to 45 percent in the volume of these calls and the full rebate for 85 percent of the residential customers—a $25 million rate reduction;
- an order to the New York Telephone Company to offer all customers the option of measured local service, with timing of messages and a cost-based charge per minute, accompanied by what purported to be a correspondingly cost-justified reduction in either the basic monthly charge or in the rate for individual messages;[29]
- a reduction in the minimum charging time for intrastate toll calls from three to two minutes, in recognition of the fact that the third minute imposes a separate marginal cost, which had the additional attraction of avoiding a rate increase (for calls of two minutes or less);
- an insistence that the Telephone Company raise its charges for customer premises equipment up to current costs (which exceeded embedded or book costs);
- a reduction in intrastate toll charges, in explicit recognition of the fact that they far exceeded marginal cost and that demand for this service was relatively elastic;
- a prohibition of the inclusion of utility services in the rents on new residental buildings,[30] accompanied by
- relaxations in the previous prohibitions of commercial landlords and cooperatives submetering both new and existing premises—in both cases in order to confront users of those services with a measure (however rough) of the positive incremental costs that their use imposes on society;
- requirements that water companies, particularly ones facing supply shortages and the prospect of markedly increasing costs, install meters;
- an order to all major electric companies of the state to propose marginal-cost-based, time-of-day electric rate schedules to customers large enough to be equipped economically with the requisite meters, and to develop promotional rates for customers willing to have their appliances—particularly water heaters—"rippled off" during peak periods, and, similarly,

[28]Public Law 95-617, 95th Congress, November 8, 1978, 92 Stat. 3117, Title I, Subtitle B. While the term "marginal cost" nowhere appears among the standards stipulated, the concept is implicit—for example, in instructions to commissions to determine the extent to which total costs would change with additions to capacity and additional consumption of energy: ibid., Sec. 115(a)(2). While most of the debate over PURPA concentrated on this provision and very little on Title II, the former appears to have had very little effect, while Title II has turned out to be very important. See note 38.

[29]For a survey of more recent studies casting doubt on the cost effectiveness of local measured service, see Kahn and Shaw, op. cit., pp. 234–239.

[30]PURPA later incorporated a similar prohibition of master metering, subject to a cost effectiveness test: loc. cit., Sec. 113(b)(1).

ATTACHMENT 7

ARIZONA WATER COMPANY'S RESPONSES TO
ARIZONA CORPORATION COMMISSION
STAFF'S SECOND SET OF DATA REQUESTS TO
ARIZONA WATER COMPANY
DOCKET NO. W-01445A-08-0607

January 26, 2009

Company Response Number: KS 2.1

Q. According to the application, the Company is planning to borrow $30,000,000 for construction of improvements and additions to its utility plant in 2009.

How was $30,000,000 cost for construction of improvements and additions derived?

a) Please provide a copy of supporting cost estimates, including description of specific projects and construction schedules.

b) Please provide a narrative explaining the need for these projects.

A. Please note that the application does not state that the Company is planning to construct $30,000,000 of improvements. Rather, the application states that the "Company's short-term indebtedness is incurred for the construction of improvements and additions to the Company's utility plant and for the reimbursement of monies actually expended from monies in the Company's treasury for such purposes." Further, having a line of credit does not mean that the Company has borrowed, or will borrow, this amount.

The Company is seeking authority to enter into a line of credit agreement not to exceed $30,000,000. A line of credit provides the Company with the financial flexibility to tap this source of capital if and when it needs to. The upper limit of $30,000,000 was determined based on the projected amount of construction for the coming year *plus an amount to cover contingencies and the estimated amount necessary to reimburse the Company's treasury for funds expended for this purpose*. The actual amount of borrowings will be based on the actual amount of debt outstanding at year end 2008, plus the cost of construction in 2009. Further, based on the turmoil in the short term financial markets the Company felt it would be prudent to apply for an amount greater than its needs to ensure that it would have sufficient working capital available (if needed) to react to any unexpected events during the year.

a) A copy of the Company's 2009 construction budget is attached. Early in January of this year the Company's Board reduced the amount of the projected budget to the

approved budget which is attached. The Board's decision was based upon the Company's poor financial performance.

Projects marked as "CO" were under construction in 2008. The remaining projects will be started in 2009 with most projects being completed during the year.

b) Each specific project is described in the attached 2009 Capital Budget. The projects listed in the 2009 Capital Budget are necessary to maintain safe and reliable water service for the customers of Arizona Water Company.

Response provided by: Joseph D. Harris
Title: Vice President & Treasurer
Address: 3805 North Black Canyon Highway
Phoenix, AZ 85015

ATTACHMENT 8

Adapting to change: Water utility financial practices in the early twenty-first century

CHRISTINE E. BOYLE[1]

[1]Valor Water Analytics, San Francisco, Calif.

Water and wastewater utility managers are encountering a host of financial challenges beyond their control. From the recent economic recession to the health of financial markets, aging infrastructure, and a changing climate, complex issues threaten utilities' financial health. Many water utilities are responding to address these challenges. To date, few studies have examined how widespread innovative financial practices are among the nation's public water systems and how these practices are helping utilities cope with mounting financial challenges. This article examines the major financial challenges facing water utilities and reviews the current state of the US water sector's financial management practices with the aim of strengthening policymakers' understanding of the drivers and impacts of available financial mechanisms. Utility financial practices are evaluated on the basis of their ability to minimize risk and create financial resilience in utility financial management.

Keywords: *water utility finance, water rates, conservation, alternative rate structures, financial management, financial resiliency*

In the early twenty-first century, water and wastewater utility managers in the United States are coming up against resource and financial constraints that are transforming how utility services are provided to the public. Whereas the mid- to late twentieth century was a time for large investments in water-related infrastructure and adequate water supply in most areas of the nation, utilities today cannot rest easy with status quo assumptions that their water or financial futures will be secure unless fundamental management and strategy shifts occur. Causes of the current stressors on water utility finances are wide-ranging. From the recent economic recession (Murphy, 2012) to increasing water shortages (Smith & Wang, 2008), declining demand (DeOreo & Mayer, 2012), aging infrastructure (WUC, 2012; USEPA, 2009), tightened access to capital (Augustyn et al, 2012; Haarmeyer, 2011), and climate change, each stressor is complicated in its own right. The news is not all bad, however. A variety of water management techniques, financial practices, and innovative business strategies are being developed in the US water sector, showing much promise to provide solutions to the numerous challenges.

This article examines the financial challenges and new solutions among the nation's 53,000 public water systems (USEPA, 2008). The author describes the causes of current financial challenges, examines emerging responses in the form of internal policies and innovations in financial strategies and mechanisms, and then explains how water conservation is a tool to fortify utilities' financial security. The underlying thesis of this article is that although challenges are immense (the bad news), if more utilities continue to innovate, solutions will be within reach (the good news). Likewise, the strongest financial solutions will be those that increase utilities' capacity to adapt to change (Figure 1). The optimal strategy for each utility to meet challenges successfully is to minimize risks associated with external changes and to increase internal financial resilience.

DRIVERS OF CURRENT FINANCIAL CHALLENGES

The financial challenges met by utilities are not caused by one single factor but rather represent the crossroads of a changing water resource and financial environment. This section outlines the main drivers behind current financial challenges and demonstrates that they are forcing a shift from the budget-balancing practices of financial managers to practices aimed at minimizing risk in financial decision-making and strengthening financial resilience to factors beyond utilities' control (e.g., weather, financial markets, and the economy).

One driver of financial challenges is declining average water use and associated declines in revenue. Decreasing demand may be a result of the economic recession (Murphy, 2012) or a permanent downward shift in water use as a result of conservation efforts (Leurig, 2013; Beecher, 2010). In either case, it has exposed the financial vulnerability implicit in water utilities' reliance on volumetric charges for the bulk of their revenue. Recent reports confirm anecdotal evidence from water utilities across the nation that average household water use has declined steadily since 1995 (DeOreo & Mayer, 2012). Four end-use studies conducted since 1995 show that indoor residential water use has fallen by as little as 13.3% to as much as 42.7% for a family living in a high-efficiency new home (DeOreo & Mayer, 2012). In this age of declining water demand, "the conservation conundrum," as

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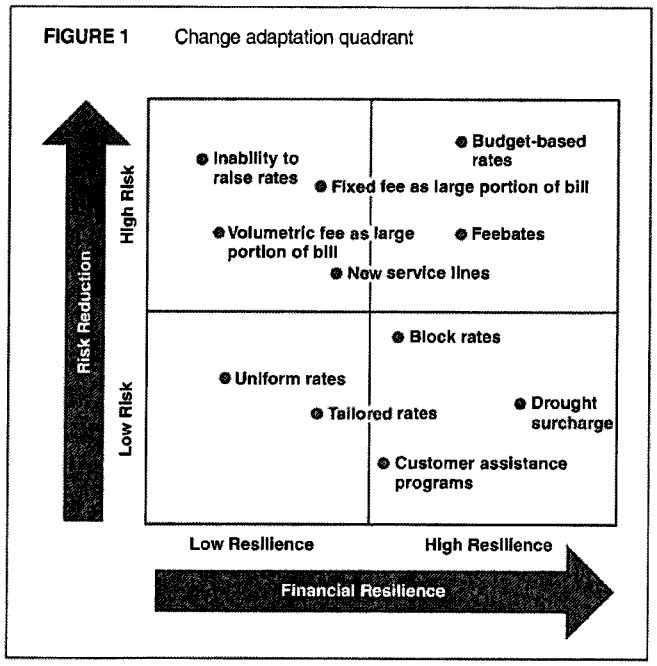

FIGURE 1 Change adaptation quadrant

coined by Beecher (2010), has become a widely recognized issue for water utilities (Bishop & Weber, 1996; Beecher et al, 1994). Whereas price increases were first introduced as a form of demand-side management to induce customers to use less water (Renwick & Green, 2000), utilities are considering different pricing and rate designs to lessen their exposure to financial risks now that demand appears to have decreased.

The extent of declines in demand varies among locations, and the effect on revenue is widespread and can bring positive or negative financial consequences. Studies suggest that the financial consequences of lower demand are determined by the financial strategies implemented by utilities. For example, during the 2011 Texas drought, one small utility saw its water revenue decrease by 40% because of water restrictions, but a larger utility reported a 10% increase in revenue because customers watered heavily on their allotted watering days (Galbraith, 2011). Each utility's policy and rate structure influenced how the same weather event affected revenue.

A few studies estimate the utility revenue reduction (or customer savings) of demand-side management programs. One study equated the demand-reduction effect of a two-day-per-week outdoor watering restriction with the effect of raising a customer's water bill by $81 in the summer (Olmstead et al, 2007). The combined cost savings to customers or revenue loss to utilities from using WaterSense-labeled products that saved 80 bil gal of water in 2010 was $1.3 billion in water and energy bills (USEPA, 2011). Another study forecast a utility's expected revenue losses to be between 4 and 8.5% of total revenue on the basis of simulation models predicting future reservoir storage levels and the probability of enacting staged water restrictions (Zeff & Characklis, 2011). The direction of the revenue impact depends on the degree of the water conserved and associated rate policies.

Paying for capacity expansion and distribution system rehabilitation is a central challenge for water and wastewater utilities in the United States. The US Environmental Protection Agency's (USEPA's) 2009 Drinking Water Infrastructure Needs Survey and Assessment put a $334 billion price tag on the cost of maintaining the United States' existing water and wastewater infrastructure through 2026 (USEPA, 2009). Yet funding options for this scale of investment are limited. The Drinking Water State Revolving Fund (DWSRF) and Clean Water State Revolving Fund (CWSRF) have provided substantial funding for capital investments since they were introduced in 1996, but capitalization funds from the federal government to the states have declined since the $2 billion infusion in the 2009 federal stimulus package. Aside from years 2010 and 2011, which saw an increase because of the federal stimulus, federal outlays for the CWSRF (comparable data for the DWSRF were not available) have declined since 2008 (Table 1) by as much as 36% between fiscal years 2011 and 2012. In North Carolina in 2009, for example, the CWSRF and DWSRF made up only 8.9% of all capital project financing in the state beyond local payments made through utility reserve accounts (Figure 2). The bulk of financing relied on the bond market, with revenue bonds making up 65.1% of project financing in the state (EFC & LGC, 2009). In light of shrinking external funding sources, water and wastewater ratepayers will more than likely cover the costs of these investments through debt service costs included in the rates.

Tightening credit markets and shifts in credit agency funding criteria are indicative of how financial markets affect utilities. As states witnessed cutbacks in federal subsidies for infrastructure, the 2008 credit crisis at the same time hampered municipal water systems' ability to secure short-term debt to fund capital projects (Bridgers et al, 2009). Although interest rates have remained low under Federal Reserve policies, heightened risk aversion by lenders and closer scrutiny of utilities' credit ratings have placed additional pressure on utilities to strengthen their financial standing in order to borrow. Given the amount of capital needed to modernize US utilities' aging infrastructure, the long-term availability of credit remains a pressing issue, especially as federal and state subsidies decrease.

Despite tightening credit markets, however, municipal utilities' credit standings have remained strong. Utilities rely on three primary agencies—Standard & Poor's, Moody's Investors Service, and Fitch Ratings—to provide the credit ratings that influence utilities' access to and the cost of borrowing money. Despite many utilities scrambling to stay financially sound in the midst of revenue shocks, Standard & Poor's and Fitch Ratings both reported a stable outlook for municipal water, wastewater, and drainage utilities in 2012 (Chapman, 2012b; Scott, 2011a). Of the 1,300 ratings issued in 2012 to municipal water, wastewater, and drainage utilities by Standard & Poor's, the most common rating was A+, and ratings on utilities' revenue-secured debt remain high (Chapman, 2012a).

Each ratings agency uses a number of quantitative and qualitative financial health metrics to prepare a utility's financial profile and associated revenue bond rating. In 2012, Fitch Ratings updated the explanation of its 10-point rating criteria, or "10

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TABLE 1 Federal spending for CWSRFs, 2006–2013

Parameter	Fiscal Year							
	2006	2007	2008	2009	2010	2011	2012	2013
Total federal outlay—*$ billions*	1.064	1.421	1.176	0.843	2.058	2.833	1.802	1.457
Change from previous year—%		34	−17	−28	144	38	−36	−19

Source: USEPA, 2011

CWSRFs—Clean Water State Revolving Funds

Cs," by providing in-depth explanations for each of the criteria and the four corresponding credit areas (Scott, 2011b). This report explains in detail each criterion and Fitch Ratings' evaluation of stronger, mid-range, and weaker financial profiles. In addition to hitting different variations of key debt service coverage ratios, Fitch Ratings and Standard & Poor's place high value on utilities whose day-to-day operations are relatively free from political interference (Scott, 2011b) and utilities that display "rate flexibility"; i.e., they are willing and able to increase rates as necessary to cover costs (Dyson & Hannay, 2011). Fitch Ratings favorably views a utility whose fixed portion (base charge) of the water and wastewater bill makes up more than 30% of the total bill. Interestingly, Fitch Ratings' emphasis on the fixed charges to ensure revenue stability contradicts other groups' emphasis on the variable charges to encourage water conservation, such as the California Urban Water Conservation Council's (CUWCC's) recommendation that at least 70% of the monthly bill be composed of variable charges.

Although there is no prescription for a good credit rating, smart rate-setting remains essential. The level, structure, and intent behind the rates that utilities charge have emerged as primary levers for utilities in securing financial resilience. But at what cost? Ratings agencies continue to work toward more transparent criteria in an effort to provide an open-book test to utilities seeking a high ratings grade.

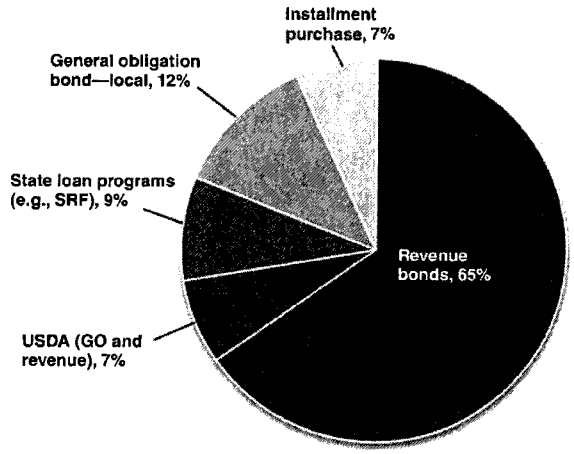
The last external driver of mounting financial pressures covered in this article is planning for and dealing with changing climate regimes. Recent assessments of the projected impacts of climate change on water resources indicate that climate change will result in changes to hydrologic cycles, as projected with increasing certainty by global climate change models (IPCC, 2013). Studies indicate that the costs associated with adapting to climate-induced changes in the hydrologic cycle will be high. California has invested large sums to fund studies of climate change and strategies to mitigate the effect of climate change on the state's water resources (Vicuna & Dracup, 2007). As more regions begin to experience episodes of extreme weather events, the costs of coping with immediate effects and planning for future climate variability will rise.

External financial pressures are forcing utilities to reexamine basic management and planning principles for water resource and financial management. For example, the use of historical hydrologic data to predict future water flows is no longer the best practice because historical flows cannot account for projected changes in weather extremes (Garfin et al, 2013). In addition, forward-looking utilities have multiple rate structures (e.g., seasonal and drought rates) that they are prepared to implement as needed in order to respond to extreme weather events. The status quo is no longer sufficient as a planning paradigm.

INTERNAL UTILITY PRACTICES: INNOVATIONS IN RATES, REVENUE GENERATION, AND PAYMENT POLICIES

As a result of both reactive and proactive strategies, utilities across the United States have adopted various financial structures and mechanisms to address the numerous issues of their communities in a financial, regulatory, and environmental setting that has been referred to as "the new normal" (Donnelly & Christian-Smith, 2013). This section shows how utilities are coping with these new realities by examining the strategies, structures, and mechanisms utilities have adopted. How these strategies fulfill the adaptation goals of building internal financial resilience and minimizing the risk of impacts from external forces is also examined.

FIGURE 2 Capital financing options used by North Carolina utilities in 2009—dollars financed, excluding local payments



Source: Debt data as of June 2009 collected by the North Carolina Local Government Commission and analyzed by the Environmental Finance Center at the University of North Carolina, Chapel Hill

GO—general obligation, SRF—state revolving funds, USDA—US Department of Agriculture

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Water and wastewater rate levels, structures, and composition. To control revenue and financial health, utilities primarily use water and wastewater rates. Utilities are developing innovative pricing strategies to shield them from financial risks, but designing rates to achieve a wide range of objectives remains a challenge. The painful art of setting water and sewer rates (Hughes, 2005) typically takes into account four policy criteria, as identified in AWWA's *M1 Principles of Water Rates, Fees, and Charges* (AWWA, 2012):

- financial sustainability
- social equity
- resource stewardship
- administrative manageability

No rate structure manages to perfectly balance these criteria. Therefore, each utility must take into account its unique financial status, cost structure, customer class, and supply availability when creating an appropriate rate design (Gaur, 2007). Recent innovations in rate design are expanding the portfolio of design levers that utilities can use to meet their objectives. Levers can be rate levels (e.g., total price), structure (e.g., uniform and block rates), and composition (e.g., portion of fixed versus variable rates).

The starting point for coping with financial problems is to adjust rates, primarily through increasing them and more often by adjusting the entire structure of prices customers pay for water and wastewater. However, now that demand appears to have shifted downward, utilities are using pricing and innovative rate designs for other reasons, such as decreasing their exposure to financial risks and achieving revenue stability.

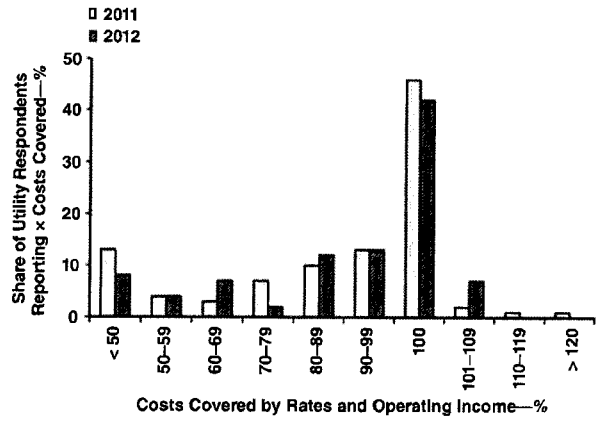
Although utilities may be tempted to temporarily increase rates to cover short-term costs, economic theory suggests that setting strong price signals for customers requires that prices be determined by long-term marginal costs. This means that prices should reflect the incremental cost of producing another unit of water, taking into consideration long-term water resource capital costs and the rising costs associated with water shortages. Recent evidence confirms the danger of not adhering to the marginal-cost rate-setting rule. Results from the 2012 State of the Water Industry Report indicate that US water and wastewater utilities continue to struggle to raise sufficient revenue to cover rising costs, as shown in Figure 3 (Murphy, 2012). Setting prices on the basis of long-term marginal costs will result in a more sustainable water system (Beecher, 1999) and greater ability to use rates to cover costs.

In recent years, alternative rate structures that differ from the common uniform or block rates have been cropping up across the country in response to water utility objectives not met under the classic rate designs. As an example, average wintertime consumption budget-based rates, also known as individualized rates, have been introduced as a strategy to meet efficiency, cost-recovery, and social equity goals (Mayer et al, 2008). Budget-based rates have been implemented in Athens, Ga.; Highlands Ranch, Colo.; and at least 18 other utilities, mostly in the western United States. Under this type of budget-based rate structure, the utility provider establishes individual customer (i.e., household) water allowances and sets water prices for these customized usage blocks. Recent critiques of budget-based rates bring into question how the price signal for conservation works (Beecher, 2012) and also question the fairness to smaller families and newcomers to the community in setting their water budgets (Beecher, 2012). Although some consulting firms and utilities have hailed the advantages of budget-based rates and they are being used by a few utilities, these rates have been criticized for their failure to achieve either the efficiency or the affordability goals of strong rate designs (Beecher, 2012; LaFrance, 2010).

Drought-demand rates, also referred to as drought surcharges, are another rate structure model, often implemented during or soon after a major drought. Research shows that this rate model improves efficiency, provides revenue neutrality, ensures distributional equity, and guarantees the conservation of water during drought and water shortage periods (Smith & Wang, 2008). Initially, drought surcharges were invented in response to an urgent need to reduce demand and increase or maintain revenue during periods of extreme water scarcity. They are now becoming part of water utilities' drought contingency plans in a more formalized manner, such as in the Colorado Water Conservation Board's Municipal Drought Management Plan Guidance Document (AMEC, 2010). However, customers' short-term reactions to increased water charges is not always as swift as utilities may have anticipated. When a surcharge does induce conservation, it may not be by the amount desired by the price (Garrido & Gómez-Ramos, 2009). The use of punitive drought surcharges to create a scarcity price signal and bring in needed revenue can take months because there is a lag before the customers receive, evaluate, and pay the drought surcharge bill.

Similar to budget-based rates, tailored rates (Teodoro, 2002), feebates (Collinge, 1996), and hybrid rate structures are being developed as alternatives to meet the rate design goals of both conservation and cost-of-service recovery. These rate structures are still in the early stages of development.

FIGURE 3 Costs (after capital projects) covered by utility rates and operating income



Source: Adapted from Murphy, 2012

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Tailored rates use a base charge calculated from a customer's average monthly use to cover the utility's fixed supply costs. They also charge "extra capacity unit costs" that are determined by each customer's demand during the peak seasons. Under the tailored rate design, customers' bills are stable throughout the year and will change only when an annual adjustment is made on the basis of the previous year's use. Problems under this plan occur when a customer's use deviates from the previous year's use, as they are paying a rate that corresponds to a one-year lag or occur when new customers establish service. The conservation signal under this plan is also weak because customers know they can use a proscribed amount per month with little immediate incentive to use less.

Feebates are similar to a cooperative dividend model; all customers pay a flat fee for water use and in a later period receive refunds if they use less water, and the utility charges extra fees to water-guzzling customers (Collinge, 1996). This type of structure stretches the water utility into taking on services of a bank, thereby adding significant administrative costs for the utility and also increasing the time between a customer's use and final charge for that water—putting both the water utility and the customer at greater financial risk.

Rate structure designs used by other utility industries include peak-load pricing, time-of-use rates, and charging all customers at the marginal price and refunding customers on the basis of their water use efficiency with part of any "extra revenue" made by the utility at the end of the year—a dividend model (Tiger et al, 2011; Tsagarakis, 2005). Although these alternative rate designs provide a description of the proposed model and a theoretical evaluation of its superiority in terms of one or a set of pricing objectives, little empirical analysis has been conducted in their water utility applications to verify these claims.

Financial risks associated with current pricing models are a result of seasonal revenue fluctuations (revenue instability) as well as a disconnect between utilities' cost structure (high fixed costs) and revenue structure (low fixed revenue). Across the United States, it is estimated that only 20% of total sales revenue comes from the fixed portion of a customer's water bill (Baird, 2010a), contributing to the financial woes of utilities in times of low water use (e.g., rainy seasons or restricted-use periods). Sending a strong conservation signal to customers via high volumetric charges spurs conservation but has introduced a new set of financial problems to utilities.

Neither traditional nor conservation-oriented rates are tied to industry standards that address the question of achieving stable revenue streams, either in short-term periods of shortage (i.e., droughts) or during longer-term declines in demand. Although seemingly at odds with the theory of sending a strong price signal to conserve, decreasing the risk of revenue vulnerability generally requires that a substantial portion of the customer bill be fixed; i.e., it must remain constant from month to month regardless of the customer's use. As such, key decisions about rate structure designs include how large to make the fixed portion of the bill and how to calculate the volumetric charge to motivate conservation. Uniform and increasing-block structures leave much discretion to a utility as to what portion of the bill to set as a fixed monthly fee. Under these rate structures, the higher the portion of the bill that is fixed, the greater the potential for political resistance and social equity concerns as a result of the shifting of higher average prices to low users of water. Recently developed budget-based and tailored rates help stabilize monthly revenue regardless of water demand but are weak in meeting other rate-setting criteria (Beecher, 2012).

In fact, municipal water utilities' long history of recovering fixed costs of infrastructure development through variable rates has recently come under scrutiny by water industry analysts. The general decline of water use per customer has resulted in insufficient revenue to cover costs of operation, maintenance, and debt service to keep water and wastewater systems running (Overcast, 2012; Baird, 2010a). The financial consequences of strong conservation rates achieved with a high variable-cost portion of the bill have only exacerbated revenue problems. Because large users have greater responsiveness to price (more price-elastic demand), they have responded to price increases by curbing excessive water use, further contributing to the revenue decreases (Overcast, 2012). To address this revenue issue, industry leaders have begun looking to similar industries such as electricity, gas, and phone companies for potential new business strategies.

Some water conservation groups have recognized that conservation rates can lead to revenue vulnerability and are encouraging water utilities to build more cost recovery into their volumetric charges. The CUWCC guides a group of 398 member utilities to increase water use efficiency through the implementation of a series of best management practices (BMPs), one of which deems a utility's volumetric rates to be "sufficiently consistent with the definition of conservation pricing" when "the percent of revenue collected through volumetric charges is greater than or equal to 70% of revenue (base and volumetric) collected from all retail customers" (CUWCC BMP 1.4 as amended June 13, 2007).

Although the CUWCC's BMP guideline for rate-setting aims to send a conservation signal, it is similar to credit rating agencies' criteria for revenue stability in that it proffers no formula by which to achieve both revenue stability and conservation. Although each set of guidelines recommends a similar structure, commonly held wisdom in the industry is that every utility is unique and must design a rate structure that works for its set of circumstances. There are no prescribed rules for revenue success, but prudent financial managers are planning for how to mitigate revenue risks resulting from greater water use variability.

Revenue impacts of new service lines. Selling water to customers is the primary source of income for most water utilities. As such, rates and fees from water sales make up the majority of a utility's revenue. As noted previously, decreasing revenue bases and increasing costs have created a gap for some utilities in which revenue is insufficient to cover current and future costs. To help close the revenue gap, utilities are exploring new revenue streams by providing supplemental services. In 2012, a Water Research Foundation report examined a range of such services, provided guidance on potential related issues, and suggested how different supplemental services may achieve utilities' objectives. Examples are antenna leases on water towers, backflow prevention services,

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bill payment systems, bottled water sales, consulting, and education services (Raucher et al, 2012).

Although new services may hold promise for income generation, they do not come without risk. Each supplemental service carries the threat of financial risk as well as reward. In addition, it is necessary that each utility evaluate its administrative capacity to handle expansion in services beyond core lines of selling water and wastewater treatment.

Casting a new financial light on customer assistance programs. Utilities also take on financial risk when customers fail to pay their water bills. Yet the full financial impact of customer assistance programs has not been evaluated because they have been pigeonholed as social programs.

Affordability is an issue for all utilities, particularly those that serve communities with large portions of low- or fixed-income households. There is no single measure or threshold of affordable rates in the sense of setting a target that utility managers should avoid exceeding. This is not to be confused with the 2.5% median-household-income affordability threshold that is used by USEPA solely to assess whether a small water system may apply for a variance for certain regulations (USEPA Science Advisory Board, 2002). All signs point to increasing water and wastewater affordability problems nationwide because the price of water and wastewater is growing faster than the inflation rate (Murphy, 2012), and personal income continues to drop (DeNavas-Walt et al, 2013). To address this issue, water utilities have developed customer assistance programs to ensure that necessary water services remain available to those who cannot afford them. Affordability programs can include fixed or variable discounts and credits that apply to customers who are unable to pay their water bill, as well as lifeline rates that provide a low marginal rate to customers using a small amount of water each month.

Common wisdom says that affordability programs should be taxpayer supported in that they are social-based services, not direct utility services (Hasson, 2002; Baird, 2010b). However, newer perspectives toward affordability programs support the view that they have an indirect impact on revenue and should be incorporated as a direct utility service. The main reason for this is that the financial risk and liability incurred by nonpaying customers outweigh the costs of an affordability program that specifically targets low-income and hardship cases (Baird, 2010b). Providing financial assistance directly benefits a utility's bottom line by minimizing the negative effect of paying collection agencies, uncollectible accounts, and the effect of shutoffs on the remainder of residential customers (Baird, 2010b). A sound affordability program decreases a utility's financial liability and "makes good business sense and strengthens the utility organization in a number of different ways" (WRF & USEPA, 2010). Increased attention to utilities' bottom lines is spurring new interest in how to design and account for customer assistance programs.

Other policies to strengthen utilities' finances. Developments in software design and system modeling are helping utilities quantify future revenue uncertainty. Various coping mechanisms have been developed to help utilities hedge against revenue uncertainties such as building contingency funds, including risk margins in revenue projections, automatic rate adjustments, deferring capital expenses through conservation and supply reduction, and adjusting operation and maintenance expenses (Chesnutt et al, 1995). More utilities, particularly wastewater utilities, are also moving toward on-site energy production. Despite these measures, an inherent revenue–cost tension exists as a result of the industry's capital-intensive nature and reliance on volumetric charges.

THE OTHER SIDE OF THE FINANCIAL COIN: PRODUCTION COSTS

The cost of maintaining and replacing regional and local aging water resource infrastructure is a large financial burden. The large amount of capital needed to address water utilities' aging infrastructure has come to the forefront of local and national policy discussions during the past five years (WUC, 2012; Baird, 2010c; Haarmeyer, 2011; USEPA, 2009; Matichich et al, 2006). In 2009, the American Society of Civil Engineers assigned the nation's water systems a grade of D– on its report card, the lowest grade of any infrastructure category. In 2007, USEPA estimated that approximately $334 billion in infrastructure investment would be needed simply to maintain US water utilities' existing infrastructure through 2026 (USEPA, 2009). A 2012 report by AWWA estimates that projected costs for the sector could exceed $1 trillion by 2035 (WUC, 2012). The capital needs are significant, and no silver-bullet solution exists for the problems utilities face in generating sufficient capital to rehabilitate water systems while also coping with water shortages.

As such, asset management and aging infrastructure replacement remain top priorities for national, state, and local governments. In February 2012, AWWA updated its assessment of the state of the nation's infrastructure needs in a report titled *Buried No Longer: Confronting America's Water Infrastructure Challenge*, which revisits its seminal 2001 report on the same topic and details how communities can resolve local infrastructure issues. In a startling wakeup call to communities rallying against water rate increases, the report states, "In the years ahead, all of us who pay for water service will absorb the cost of this investment, primarily through higher water bills. The amounts will vary depending on community size and geographic region, but in some communities these infrastructure costs alone could triple the size of a typical family's water bills" (WUC, 2012).

Evidence from around the country indicates that water and wastewater utilities are aware of this crossroads in the water utility industry and are rallying support from political leaders and ratepayers to understand the true cost of water and wastewater services. However, the number of utilities whose full costs were covered by rates and operating income dropped from 50% in 2011 to 46% in 2012 (Murphy, 2012). A gap in understanding remains between the public and utility professionals regarding how to pay for high-quality water and wastewater services.

LOOKING FORWARD: WHY CONSERVATION MATTERS

Although no panacea to solve utilities' financial challenges exists, emerging evidence suggests that conservation is critical to minimize risk and build financial resilience. Smart conservation

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policies create a ripple effect of positive benefits for utilities. First, conserving water allows utilities to cut operation and maintenance costs and defer expensive supply expansion projects (Beecher, 1996). If conservation is achieved via a smart rate design that sends conservation signals while also achieving cost recovery, dual objectives can be achieved and can provide stability in sales and revenue. Minimizing costs and stabilizing revenue are thus recognized as strengthening the financial and credit standings of the utility by ratings agencies and potential lenders. This section expands on each step of the conservation–revenue resilience cycle (Figure 4).

One benefit of conserving enough water is the deferral of expensive supply expansion projects, sometimes referred to as avoided costs (Beecher, 1996) or hidden reservoirs (Hoffner, 2008). Avoiding or deferring direct and indirect costs of water and wastewater provision by reducing demand for water can lead to a significant deferral of investment in the millions of dollars. The CUWCC uses avoided costs to evaluate the benefit (or cost) of potential conservation programs, underscoring its theory that improved water-use efficiency can complement or substitute for investments in long-term water supplies and infrastructure (Hunter et al, 2011; Chesnutt & Beecher, 2004; Bishop & Weber, 1996). The way in which water resource planners integrate long-term water use trends and associated cost implications will affect utilities' financial health because expensive raw water requirements and new supply projects may be needlessly pursued (Figure 5; DeOreo & Mayer, 2012b).

As conservation policies go into effect, the seasonal fluctuation of water use falls, resulting in customers' use and associated customer water sales stabilizing year-round. Reducing seasonal use eases the pressure to supply water during peak seasons and also helps achieve revenue stability. The CUWCC's BMP 9 sets a target of reducing water use by 10% of each customer's baseline use for nonresidential customers. The aim of this BMP is to reduce overall demand and thus minimize utilities' revenue vulnerability. Conservation is critical to utilities' adaptive capacity in which they minimize their exposure to the effects of external shocks and also increase their financial resilience by shaving peak use and reducing total demand.

Because of recent water shortage crises around the country and a better understanding of sustainability-related issues, credit rating agencies have recognized conservation as a best practice in water utility policy. Although conservation was once viewed as a credit weakness that would result in decreased revenue, more sophisticated rate structures such as increasing-block tariffs and water budgets build in revenue security throughout demand peaks and valleys.

Credit rating agencies, however, continue to take a mixed stance on how utilities should cope with water shortages, climate change, and the associated greater variability of weather events (rainstorms and droughts). As an example, according to the *Atlanta Journal-Constitution*, local governments in the metropolitan area of Atlanta, Ga., received a report from the Fitch Ratings credit agency warning that their credit scores may be downgraded depending on the outcome of a federal lawsuit over access to drinking water from Lake Lanier. According to the article, Fitch Ratings warned that water will "continue to be a primary rating driver," given "the devastating effect any material reduction would have on the region" (Joyner, 2011). In late spring 2012, the United States Court of Appeals for the 11th Circuit upheld Atlanta's right to draw its drinking water supply from Lake Lanier, thus forestalling its water and credit woes for the near future. Such reports provided a wakeup call—for municipalities and ratings agencies—about the risks associated with water shortages and the consequences of being ill-prepared to deal with changes in supply.

FIGURE 4 The conservation–revenue resilience cycle

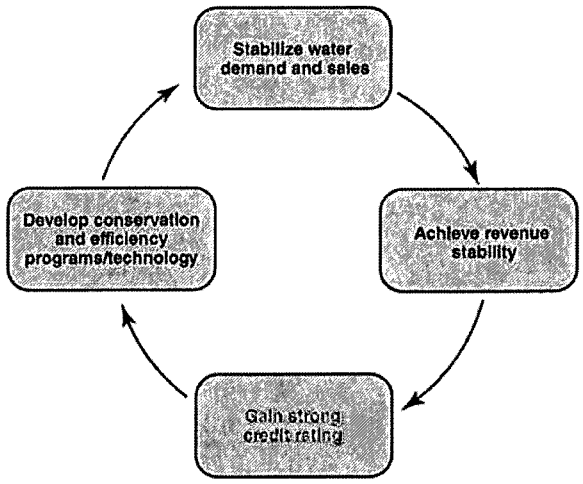
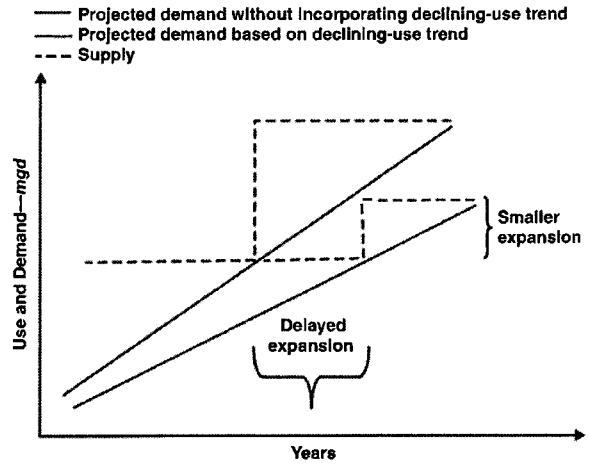


FIGURE 5 Declining use and delayed infrastructure expansion



Source: Adapted from Hunter et al, 2011

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In coping with present and future water shortages, credit rating agencies recognize that although conservation efforts can influence revenue and financial risk profiles (fixed-charge coverage ratio is negatively affected by conservation and wet weather), such efforts are necessary to deal with long-term risks associated with supply shortages and high costs of capital (Chapman, 2012b). In their guidance reports for utilities, credit rating agencies agree that financially prudent utilities will account for the long-term benefits of conservation and long-range planning, including deferred costs of capital via demand reduction (Chapman, 2012b), incremental decreases in operating costs (such as electricity for pumping and water treatment chemicals), and ability to manage risks associated with seasonal water use variability. The gradual downsizing of entire systems via smaller pipes and treatment plants to match smaller capacity needs is considered a positive financial tactic by ratings agencies.

A wave of change to meet financial challenges isn't necessarily surging across the US water industry, but it is reasonable to assert that innovation is in motion just by looking at the amount of resources dedicated to and organizations currently addressing water finance issues. WRF has more than 60 technical reports and cases available on its website under the topic of utility finance and recently funded a project of the University of North Carolina's Environmental Finance Center called Defining a Resilient Business Model for Water Utilities: Addressing Revenue Vulnerability and Variability. In this project, the Environmental Finance Center and Raftelis Financial Consultants are developing alternative business models for water utilities across the United States. The Alliance for Water Efficiency and The Johnson Foundation recently convened the National Water Rates Summit with leading US scholars and utility practitioners, discussing a new framework for understanding the relationship between declining water demand and revenue. In 2012 Ceres and The Johnson Foundation published a report, Financing Sustainable Water Infrastructure, in which they proposed several paths for overcoming the major challenges to financing the nation's aging water infrastructure. With utility partners engaged every step of the way in these projects, an underlying philosophical shift is under way, with on-the-ground application of new models and practices gradually following.

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PEER REVIEW

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ATTACHMENT 9

ARIZONA WATER COMPANY
Authorized Rate of Return (ROR), Actual ROR & Under Recovery

	Authorized ROR	Actual ROR	Under Recovery
1997	10.85%	10.49%	$ (212,833)
1998	10.85%	9.88%	$ (614,234)
1999	10.85%	9.33%	$ (1,014,650)
2000	10.85%	9.80%	$ (756,516)
2001	10.85%	7.74%	$ (2,425,456)
2002	10.48%	9.42%	$ (866,560)
2003	10.48%	8.59%	$ (1,574,782)
2004	9.43%	8.24%	$ (1,067,528)
2005	8.97%	7.06%	$ (2,047,226)
2006	8.97%	5.55%	$ (4,372,385)
2007	8.97%	4.13%	$ (6,888,079)
2008	8.97%	4.61%	$ (6,610,418)
2009	8.97%	5.06%	$ (5,899,628)
2010	8.42%	5.69%	$ (4,013,915)
2011	7.87%	6.47%	$ (2,011,599)
2012	8.08%	7.37%	$ (1,023,783)
2013	8.56%	8.26%	$ (432,583)
2014	8.56%	8.84%	$ 405,789
			$ (41,426,386)

ATTACHMENT 10

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9.2 CAPITAL STRUCTURE AND THE COMPANY COST OF CAPITAL

The cost of capital is a hurdle rate for capital budgeting decisions. It depends on the *business risk* of the firm's investment opportunities. The risk of a common stock reflects the business risk of the real assets held by the firm. But shareholders also bear *financial risk* to the extent that the firm issues debt to finance its real investments. The more a firm relies on debt financing, the riskier its common stock is.

We did not have to worry about this for Eli Lilly, because Lilly had essentially no debt. But Lilly is unusual. Many companies' debt is worth more than their equity.

Borrowing is said to create *financial leverage* or *gearing*. Financial leverage does not affect the risk or the expected return on the firm's assets, but it does push up the risk of the common stock and lead the stockholders to demand a correspondingly higher return.

How Changing Capital Structure Affects Expected Returns

Think again of what the *company* cost of capital is and what it is used for. We *define* it as the opportunity cost of capital for the firm's existing assets; we *use* it to value new assets which have the same risk as the old ones.

If you owned a portfolio of all the firm's securities—100 percent of the debt and 100 percent of the equity—you would own the firm's assets lock, stock, and barrel. You wouldn't share the cash flows with anyone; every dollar of cash the firm paid out would be paid to you.

You can think of the company cost of capital as the expected return on this hypothetical portfolio. To calculate it, you just take a weighted average of the expected returns on the debt and the equity:

$$\text{Company cost of capital} = r_{\text{assets}} = r_{\text{portfolio}}$$

$$= \frac{\text{debt}}{\text{debt + equity}} r_{\text{debt}} + \frac{\text{equity}}{\text{debt + equity}} r_{\text{equity}}$$

For example, suppose that the firm's market value balance sheet is as follows:

Asset value	100	Debt value (D)	40
		Equity value (E)	60
Asset value	100	Firm value (V)	100

Note that the values of debt and equity add up to the firm value ($D + E = V$) and that the firm value equals the asset value. (These figures are *market* values, not *book* values: The market value of the firm's equity is often substantially different from its book value.)

If investors expect a return of 8 percent on the debt and 15 percent on the equity, then the expected return on the assets is

$$r_{\text{assets}} = \frac{D}{V} r_{\text{debt}} + \frac{E}{V} r_{\text{equity}}$$

$$= \left(\frac{40}{100} \times 8\right) + \left(\frac{60}{100} \times 15\right) = 12.2\%$$

If the firm is contemplating investment in a project that has the same risk as the firm's existing business, the opportunity cost of capital for this project is the same as the firm's cost of capital; in other words, it is 12.2 percent.

What would happen if the firm issued an additional 10 of equity and used the cash to repay 10 of its debt? The revised market value balance sheet is

Asset value	100	Debt value (D)	30
		Equity value (E)	70
Asset value	100	Firm value (V)	100

The change in financial structure does not affect the amount or risk of the cash flows on the total package of the debt and the equity. Therefore, if investors require a return of 12.2 percent on the total package before the refinancing, they must require a 12.2 percent return on the firm's assets afterward.

Although the required return on the *package* of the debt and equity is unaffected, the change in financial structure does affect the required return on the individual securities. Since the company has less debt than before, the debtholders are likely to be satisfied with a lower return. We will suppose that the expected return on the debt falls to 7.3 percent. Now you can write down the basic equation for the return on assets

$$r_{\text{assets}} = \frac{D}{V} r_{\text{debt}} + \frac{E}{V} r_{\text{equity}}$$

$$= \left(\frac{30}{100} \times 7.3\right) + \left(\frac{70}{100} \times r_{\text{equity}}\right) = 12.2\%$$

and solve for the return on equity

$$r_{\text{equity}} = 14.3\%$$

Reducing the amount of debt reduced debtholder risk and led to a fall in the return that debtholders required (r_{debt} fell from 8 to 7.3 percent). The lower leverage also made the equity safer and reduced the return that shareholders required (r_{equity} fell from 15 to 14.3 percent). The weighted average return on debt and equity remained at 12.2 percent:

$$r_{\text{assets}} = (.3 \times r_{\text{debt}}) + (.7 \times r_{\text{equity}})$$

$$= (.3 \times 7.3) + (.7 \times 14.3) = 12.2\%$$

Suppose that the company issues enough equity to repay all the debt. In that case all the cash flows will go to the equity holders. The firm cost of capital, r_{assets}, stays at 12.2 percent, and r_{equity} is also 12.2 percent.

How Changing Capital Structure Affects Beta

We have looked at how changes in financial structure affect expected return. Let us now look at the effect on beta.

The stockholders and debtholders both receive a share of the firm's cash flows, and both bear part of the risk. For example, if the firm's assets turn out to be worthless, there will be no cash to pay stockholders *or* debtholders. But debtholders bear much less risk than stockholders. Debt betas of large blue-chip firms are

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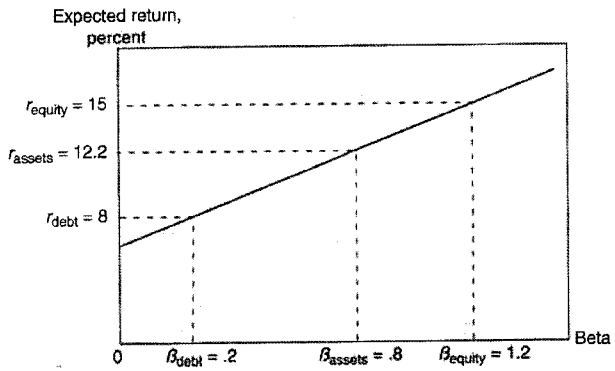

typically close to zero—close enough that for such companies many financial analysts just assume that $\beta_{debt} = 0$.[10]

If you owned a portfolio of all the firm's securities, you wouldn't share the cash flows with anyone. You wouldn't share the risks with anyone either; you would bear them all. Thus the firm's asset beta is equal to the beta of a portfolio of all the firm's debt and its equity.

The beta of this hypothetical portfolio is just a weighted average of the debt and equity betas:

$$\beta_{assets} = \beta_{portfolio} = \frac{D}{V}\beta_{debt} + \frac{E}{V}\beta_{equity}$$

Think back to our example. If the debt before the refinancing has a beta of .2 and the equity has a beta of 1.2, then

$$\beta_{assets} = (.4 \times .2) + (.6 \times 1.2) = .8$$

What happens after the refinancing? The risk of the total package is unaffected, but both the debt and the equity are now less risky. Suppose that debt beta falls to .1. We can work out the new equity beta:

$$\beta_{assets} = \frac{D}{V}\beta_{debt} + \frac{E}{V}\beta_{equity}$$

$$.8 = (.3 \times .1) + (.7 \times \beta_{equity})$$

$$\beta_{equity} = 1.1$$

[10]This assumption should be challenged in periods of volatile interest rates, when prices of long-term corporate and government bonds can fluctuate dramatically. There were such periods in the early 1980s when bond betas were as high as .3 to .4. Recent bond betas have been roughly .2.

Figure 9.5

Expected returns and betas after refinancing.

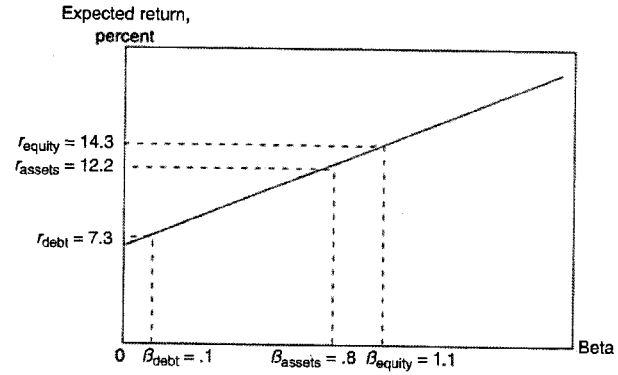

Figure 9.4 shows the expected return and beta of the firm's assets. It also shows how expected return and risk are shared between the debtholders and equity holders before the refinancing. Figure 9.5 shows what happens after the refinancing. Both debt and equity are less risky, and therefore investors are satisfied with a lower expected return. But equity now accounts for a larger proportion of firm value than before. As a result, the weighted average of both the expected return and beta on the two components is unchanged.

Now you can see how to *unlever* betas, that is, how to go from an observed β_{equity} to β_{assets}. You have the equity beta, say, 1.1. You also need the debt beta, say, .1 and the relative market values of debt (D/V) and equity (E/V). If debt accounts for 30 percent of overall value V,

$$\beta_{assets} = (.3 \times .1) + (.7 \times 1.1) = .8$$

This runs the previous example in reverse. Just remember the basic relationship:

$$\beta_{assets} = \beta_{debt}D/V + \beta_{equity}E/V$$

Capital Structure and Discount Rates

The company cost of capital is the opportunity cost of capital for the firm's assets. That's why we write it as r_{assets}. If a firm encounters a project that has the same beta as the firm's overall assets, then r_{assets} is the right discount rate for the project cash flows.

When the firm uses debt financing, the company cost of capital is not the same as r_{equity}, the expected rate of return on the firm's stock; r_{equity} is higher because of financial risk. However, the company cost of capital can be calculated as a weighted average of the returns expected by investors on the various debt and equity securities issued by the firm. You can also calculate the firm's asset beta as a weighted average of the betas of these securities.

JHarris@A...

When the firm changes its mix of debt and equity securities, the risk and expected returns of these securities change. The asset beta and the company cost of capital do not change.

Now, if you think all this is too neat and simple, you're right. The complications are spelled out in great detail in Chapters 17–19. But we must note one complication here: Interest paid on a firm's borrowing can be deducted from taxable income. Thus the after-tax cost of debt is $r_{debt}(1 - T_c)$, where T_c is the marginal corporate tax rate. When companies discount an average-risk project, they do not use the company cost of capital as we have computed it. They use the after-tax cost of debt to compute the after-tax weighted average cost of capital or WACC:

$$\text{WACC} = r_{debt}(1 - T_c)D/V + r_{equity}(E/V)$$

More—lots more—on this in Chapter 19.

9.3 HOW TO ESTIMATE THE COMPANY COST OF CAPITAL—AN EXAMPLE

Suppose that in early 1998 you were asked to estimate the company cost of capital of Pinnacle West Corp. Remember, the company cost of capital is the expected return on a portfolio of all the firm's securities. Thus it can be calculated as a weighted average of the returns on the separate parts.

The Expected Return on Pinnacle West's Common Stock

The tough part of the weighted average is finding the expected rate of return on Pinnacle common stock. In Chapter 4 we used the constant-growth DCF formula to estimate the expected rate of return for Pinnacle. We now try out the capital asset pricing model.

Table 9.2 shows estimates of beta and the standard errors of these estimates for the common stocks of 11 electric utilities. Most of the standard errors are about .2, but they are still large enough to preclude a precise estimate of any particular utility's beta. Our confidence about the average beta of the 11 utilities is somewhat better.

Are these utility stocks really equivalent-risk securities? Judging from Table 9.2, that appears to be a reasonable assumption. Much of the spread of estimated betas could be attributed to random measurement errors. It would be hard to reject the hypothesis that the "true" beta was the same for each of the firms.

You now have two clues about the true beta of Pinnacle: the direct estimate of .43 and the average estimate for the industry of .51.[11] Fortunately, these two pieces of evidence are close, so we will use the industry average of .51. In early 1998 the risk-free rate of interest r_f was about 4.5 percent. Therefore, if you use 8 percent for

[11]Comparing the betas of Pinnacle with those of the other 10 utilities in the sample would be misleading if Pinnacle had a materially higher or lower debt ratio. Fortunately its debt ratio was about average for the sample in Table 9.2.

TABLE 9.2

Betas for 11 large electric utilities, estimated from monthly data, March 1993 to February 1998. The average beta was calculated from the monthly rates of return on a portfolio of the 11 companies.

	BETA	STANDARD ERROR
Boston Edison	0.60	0.19
Central Hudson	0.30	0.18
Consolidated Edison	0.65	0.20
DTE Energy	0.56	0.17
Eastern Utilities Associates	0.66	0.19
GPU Inc.	0.65	0.18
New England Electric System	0.35	0.19
OGE Energy	0.39	0.15
PECO Energy	0.70	0.23
Pinnacle West Corp.	0.43	0.21
PP&L Resources	0.37	0.21
Portfolio Average	0.51	0.15

Source: The Brattle Group, Inc.

the risk premium on the market, you will conclude that the expected return on Pinnacle's stock was about 8.6 percent:[12]

$$r_{equity} = r_f + \beta_{equity}(r_m - r_f)$$
$$= .045 + .51(.08) = .0858, \text{ or about } 8.6\%$$

We have focused on using the capital asset pricing model to estimate the expected return on Pinnacle's common stock. But it would be useful to get a check on this figure. We have already mentioned one possibility, the constant-growth DCF formula. You could also use DCF models with varying future growth rates, or perhaps arbitrage pricing theory (APT). We applied APT to another group of utilities in Section 8.4.

[12]This is really a discount rate for near-term cash flows, since it rests on a risk-free rate measured by the yield on Treasury bills with maturities less than one year. Is this, you may ask, the right discount rate for cash flows from an asset with, say, a 10- or 20-year expected life?

Well, now that you mention it, possibly not. In early 1998 longer-term Treasury bonds yielded about 6 percent, i.e., about 1.5 percent above the Treasury bill rate.

The risk-free rate could be defined as a long-term Treasury bond yield. If you do this, however, you should subtract the risk premium of Treasury bonds over bills, which we gave as 1.8 percent in Table 7.1. This gives a rough-and-ready estimate of the expected yield on short-term Treasury *bills* over the life of the bond:

$$\text{Expected average T-bill rate} = \text{T-bond yield} - \text{premium of bonds over bills}$$
$$= .06 - .018 = .042, \text{ or } 4.2\%$$

The expected average future Treasury bill rate should be used in the CAPM if a discount rate is needed for an extended stream of cash flows. In early 1998 this "long-term r_f" was a bit lower than the Treasury bill rate.

ATTACHMENT 11

PRINCIPLES OF FINANCE

With Corporate Applications

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TABLE 14-1 Breakdown of Principal Sources of Domestic External Long-Term Financing by U.S. Corporations, 1970–1989 (Dollar Amounts in Millions)

Year	Aggregate Domestic External Financing[a]	Percentage Represented by			Percent Change in S&P 500 Index During Year	Moody's Average of Yields on Aa-Rated Corporate Bonds
		Common Stock	*Preferred Stock*[b]	*Debt*[c]		
1970	$ 38,945	18.6%	3.6%	77.8%	0.10%	8.32%
1971	45,084	20.6	8.1	71.3	10.79	7.78
1972	41,957	23.1	8.0	68.9	15.63	7.48
1973	33,390	23.2	10.1	66.7	−17.37	7.66
1974	38,313	10.4	5.9	83.7	−29.72	8.84
1975	53,619	13.8	6.4	79.8	31.55	9.17
1976	53,356	15.6	5.2	79.2	19.15	8.75
1977	53,792	14.6	7.3	78.1	−11.50	8.24
1978	47,230	15.9	6.0	78.1	1.06	8.92
1979	51,102	15.2	7.1	77.7	12.31	9.94
1980	73,694	22.9	4.9	72.2	25.77	12.50
1981	70,441	33.4	2.6	64.0	− 9.73	14.75
1982	84,198	30.2	6.1	63.7	14.76	14.41
1983	119,949	37.0	6.0	57.0	17.27	12.42
1984	132,531	14.0	3.1	82.9	1.40	13.31
1985	201,269	14.4	3.2	82.4	23.93	11.82
1986	381,936	13.2	4.7	82.1	16.84	9.47
1987	367,863	11.8	6.3	81.9	2.03	9.68
1988	385,625	9.3	5.7	85.0	12.40	9.94
1989	325,034	8.0	4.1	87.9	27.25	9.46
Total	$2,599,328	18.3%	5.7%	76.0%		

[a] Aggregate amount raised through the issuance of common stock, nonconvertible preferred stock, nonconvertible debt, and convertible securities.
[b] Includes convertible preferred and preference stock.
[c] Includes convertible debt.

Sources: Federal Reserve Bulletin, Board of Governors of the Federal Reserve System, Washington, D.C., various issues; *Daily Stock Price Record: New York Stock Exchange*, Standard & Poor's Corporation, New York, various issues; *Moody's Industrial Manual*, Moody's Investors Service, Inc., New York, 1987, a31; and *Moody's Bond Record*, Moody's Investors Service, Inc., New York, April 1990.

Table 14-1 shows that debt, common stock, and preferred stock are the principal sources of external long-term financing that corporations used during the period 1970–1989. Over that 20-year period, debt, common, and preferred accounted for 76.0%, 18.3%, and 5.7%, respectively, of the aggregate domestic external financing of U.S. corporations.

DEBT VERSUS EQUITY FINANCING

Table 14-1 reveals that the aggregate sale of common stock is sensitive to stock market conditions. Corporate issuers try to take advantage of rising markets when the demand for common stock is relatively strong. New issue activity tends to increase during periods of rising share prices, such as 1971–1972, 1980–1983, and 1985–1986. Correspondingly, corporations are generally reluctant to sell new issues of common stock when the share price is "low" by historical standards. Thus, common stock new issue activity tends to diminish during periods of depressed or falling share prices, such as 1973–1974.

Similarly, the volume of fixed income security issues (i.e., preferred stock and debt) tends to vary with the level of long-term interest rates. During periods of rising long-term interest rates, such as 1979–1981, corporations tend to favor short-term borrowing in the hope that long-term interest rates will fall. When long-term interest rates do fall, as in 1984–1989, corporations begin to replace this short-term debt.

PUBLIC VERSUS PRIVATE FINANCING

Companies can sell securities to the public through a registered **public offering** or directly to institutional investors through a **private placement**. Securities sold in a public offering must be registered with the Securities and Exchange Commission (SEC) by filing a **registration statement**, which contains a prospectus describing the issuer and the securities. The issuer must distribute the prospectus to potential investors. After registration, the securities can be traded freely by investors.

FEATURES OF PRIVATELY PLACED SECURITIES Privately placed securities are not registered and hence are not freely tradable. Consequently, securities regulations require companies to offer securities privately only to investors sophisticated enough to make an independent determination of their investment merits, such as life insurance companies, property and casualty insurance companies, credit companies, pension funds, and wealthy individuals. During the period 1980–1988, approximately 50% of preferred stock issues and 30% of long-term debt issues, by dollar value, were sold through private placements. With the exception of common stock issued to venture capital investors or investors in leveraged buyouts, virtually all common stock is sold in public offerings.

ADVANTAGES AND DISADVANTAGES OF A PRIVATE PLACEMENT A private placement offers the following advantages in comparison with a public offering:

- *Lower issuance costs* for smaller issues. A private placement avoids the costs of registering the securities, printing prospectuses, and obtaining credit ratings and various other expenses. Also, the private placement agent's fee is generally significantly less than the selling and management portion of the underwriting spread for a comparable public offering, and the fee can be avoided if the issuer negotiates the private placement directly with investors.
- *Issues can be placed more quickly* for firms that do not qualify for what is called **shelf registration**. Shelf registration allows the firm to issue the new securities at any time during the subsequent 2 years after the registration statement becomes effective. Registering securities requires time to prepare the registration statement and have the SEC review it, although the short-form registration statement (a recently approved shortened form available to be used in some cases) and the shelf registration process have greatly expedited the public offering process.

- *Greater flexibility of issue size.* The private market is more receptive to smaller issues; issues of only a few million dollars each are not uncommon. Public debt and preferred stock issues of less than a $50 million principal amount are typically more costly because their small size decreases their liquidity and thus lessens their attractiveness to investors.
- *Greater flexibility of security arrangements* and other terms. Private investors are capable of analyzing complex security arrangements, and it is easier to tailor the terms of an issue to suit both sides of the transaction. It is also easier to obtain lenders' consents to a change in terms should the firm's circumstances change.

A private placement has the following disadvantages relative to a public offering:

- *Higher yield.* To compensate for illiquidity, purchasers of privately placed securities require a yield premium relative to publicly-traded securities. For example, during the period 1961–1977, the average yield on privately placed corporate bonds exceeded the average yield on comparable public issues by approximately 50 basis points (half of 1 percent).[1]
- *More stringent covenants and more restrictive terms.* Because of illiquidity, private purchasers insist on tighter covenant restrictions to compensate for the greater agency costs. Private lenders have insisted on tighter protection against "event risk," the risk that stockholders might initiate certain events, such as a leveraged buyout, that could expropriate bondholder wealth.

In early 1990, the SEC adopted Rule 144A under the Securities Act of 1933, which allows qualified institutional investors (generally those who own and manage $100 million or more of securities) to trade freely with each other in securities that have not been registered with the SEC. Rule 144A is likely to enhance the liquidity of the secondary private placement market and reduce the interest rate penalty that has typically resulted from the higher transaction costs associated with the private securities market.

UNDERWRITTEN VERSUS NONUNDERWRITTEN SALE OF SECURITIES

A company may choose to market its securities itself (as the U.S. government does), but the vast majority employ investment bankers in some capacity because of their expertise and experience. Table 14-2 shows the ranking of the 15 leading securities underwriters in the United States during 1989. Note that the 5 largest firms accounted for more than 60% of *all* underwritten securities offerings in 1989.

INVESTMENT BANKING The **investment banker** serves as an intermediary between the issuer and the purchasers, and typically provides the following services:

- Advice regarding the type and terms of the security to be issued.
- Advice regarding markets: public or private, domestic or international.
- Assistance with preparing the required documentation. Private placements require an **offering memorandum** that describes the proposed terms of the issue and provides information concerning the issuer. Public offerings require the filing of a **registration statement** with the SEC and the distribution of a **preliminary prospectus** (which is filed with the SEC as part of the registration

[1] Zwick (1980).

TABLE 14-2 Leading Managing Underwriters for U.S. Securities Offerings in 1989[a]

Rank	Manager	Amount: Number of Issues	Amount: (Millions of Dollars)	Amount: Percent of Total
1.	Merrill Lynch	428	$45,985	14.9%
2.	Goldman, Sachs	492	42,937	13.9
3.	First Boston	418	37,765	12.2
4.	Salomon Brothers	404	31,805	10.3
5.	Morgan Stanley	293	29,782	9.6
6.	Shearson Lehman Hutton	342	24,745	8.0
7.	Bear, Stearns	424	18,186	5.9
8.	Drexel Burnham Lambert	224	16,805	5.5
9.	Prudential-Bache	349	16,426	5.3
10.	Kidder, Peabody	196	8,799	2.9
11.	Paine Webber	114	4,745	1.5
12.	Donaldson, Lufkin & Jenrette	100	4,448	1.4
13.	UBS Securities	89	2,831	0.9
14.	Smith Barney, Harris Upham	79	2,809	0.9
15.	Dean Witter	24	2,573	0.8
All Others Combined		757	18,711	6.0
	Total	4,733	309,352	100.0%

[a] Full credit is given to the lead managing underwriter.

Source: Investment Dealers' Digest, January 8, 1990, 30.

statement) to prospective buyers during the marketing period and a final **prospectus** to investors to confirm their purchases. Figures 14-1 (a) and (b) show the cover page and the "prospectus summary" page from a typical prospectus. The registration statement and prospectuses contain detailed financial information regarding the issue and the issuer.

- Pricing the new issue.
- In connection with a **purchase-and-sale** offering, the investment bankers purchase the entire issue from the issuer at a fixed price and agree to reoffer the securities to the public at an initial price that represents a fixed **gross underwriting spread** over the price the issuer receives. In an underwritten offering, the securities firms bear the risk that the entire issue may not be saleable at the initial offering price; if it is not, they will sell the securities at the market clearing price and bear the loss.

SYNDICATED OFFERING PROCESS The syndicated offering process involves the formation of an underwriting group, or syndicate, consisting of securities firms who purchase the securities from the issuer and agree to reoffer them to investors. The lead managing underwriter of a syndicated offering assembles a syndicate con-

T AND PREFERRED EQUITY FINANCING

There are five principal classes of long-term corporate debt instruments: unsecured debt, secured debt, income bonds, tax-exempt debt, and convertible debt. Convertible bonds are discussed later in the chapter.

UNSECURED DEBT Unsecured long-term debt consists of notes and debentures. By securities industry convention, the term **notes** is normally used to describe unsecured bonds with an original maturity of 10 years or less; the term **debentures** is normally used when the original maturity exceeds 10 years. Notes and debentures are issued on the strength of the issuer's general credit according to a financial contract (the bond indenture); they are not secured by specific property. If the issuer goes bankrupt, noteholders and debentureholders are classified as general creditors.

Debentures may be issued in different levels of seniority. **Subordinated debentures** rank behind (unsubordinated) debentures in payment of interest and principal and claims on the company's assets in the event of bankruptcy. Because of this subordinated position and its commensurate higher risk, subordinated debentures have a higher required rate of return than senior debt of the same company.

SECURED DEBT There are several types of secured debt: mortgage bonds, collateral trust bonds, equipment trust certificates, and conditional sales contracts are the most common. An issue of **mortgage bonds** is secured by a lien on specific assets of the issuer, which are described in detail in the legal document, called a **mortgage**, that grants the lien. If the issuer defaults in the payment of principal or interest or in the performance of some other provision of the loan contract, lenders (or the trustee acting on their behalf) can seize the assets securing the mortgage bonds and sell them to pay off the debt obligation. If the proceeds are insufficient to satisfy the claim of the mortgage bondholders in full, they become general creditors for the balance of their claim. The extra protection the mortgage provides lowers the risk and hence lowers the required rate of return from that of comparable debentures. But the issuer sacrifices flexibility in selling assets because mortgaged assets can be removed from the asset pool only with mortgage bond holders' permission or if suitable replacement collateral is provided.

COLLATERAL TRUST BONDS These securities are similar to mortgage bonds except that the lien is against securities; as for example, the common shares of one or more of the issuer's subsidiaries, rather than real property like plant and equipment.

EQUIPMENT TRUST CERTIFICATES AND CONDITIONAL SALES CONTRACTS Such securities are frequently issued to finance the purchase of aircraft or railroad rolling stock.[19] These are similar financing mechanisms in which the borrower obtains title to the assets being financed only after the debt has been fully repaid.

INCOME BONDS The issuer of an **income bond** is obligated to pay interest only if it has sufficient income available (hence the security's name). An earnings test is specified in the bond indenture, and interest must be paid if the company has sufficient income according to this test. By contrast, preferred stock dividends are paid at the discretion of the company's board of directors. Thus, investors should prefer

[19] Rice (1981) provides an excellent overview of equipment trust certificates and related methods of financing.

income bonds over preferred stocks, all else equal. But because the contingent nature of interest payments makes the risk of bankruptcy low for income bonds, issuers might find both securities to be of comparable riskiness. Moreover, in the past the fixed formula enabled issuers to deduct interest payments on income bonds for tax purposes, creating a significant cost advantage over preferred stock.[20]

TAX-EXEMPT CORPORATE DEBT Corporations are permitted under the Internal Revenue Code to issue tax-exempt bonds for specified purposes. Congress grants tax-exempt bonding authority from time to time as an incentive to encourage investment in specified types of projects deemed to be in the public interest. The Tax Reform Act of 1986 sharply reduced the list of activities that qualify for tax-exempt corporate debt financing. Activities that still qualified following the Tax Reform Act of 1986 include solid waste disposal facilities and hazardous waste disposal facilities. When a project qualifies for tax-exempt debt financing, holders of the tax-exempt bonds do not have to pay federal income tax on the interest payments they receive, so they are willing to accept a lower interest rate than on taxable debt. This, of course, creates a tax asymmetry. Therefore, as a general rule, if a company plans to construct facilities that qualify for tax-exempt financing, it should use such financing to the maximum extent.

PRINCIPAL FEATURES OF LONG-TERM DEBT

The preceding discussion highlighted the principal differences among the various classes of long-term debt. More important from an analytical standpoint, long-term debt instruments share certain common features:

- A stated **maturity**.
- A stated **principal amount**.
- A stated **coupon rate of interest**.
- A **mandatory redemption** (or sinking fund) **schedule**. Long-term debt issues typically contain a **sinking fund**, which calls for a sequence of mandatory redemption payments (i.e., principal repayments) prior to the maturity date. Bonds are redeemed through the sinking fund at their face amount or through capital market purchases.[21] Long-term debt issues by utility companies represent an important exception; such issues typically have what is called a **bullet maturity**, which calls for a single lump sum repayment at maturity.
- An **optional redemption provision**. Issuers of long-term debt typically retain a call option on the debt. They retain the right to **call** the issue (or some portion of it) for early redemption according to a schedule of optional redemption (strike or call) prices that is specified at the time of issue. This right to redeem bonds is typically limited. Some bonds provide for a period immediately following issuance (e.g., 5 years) during which the bonds are **noncallable**; the issuer cannot

[20] One of the great puzzles in finance was why so many companies issued preferred stock rather than income bonds when income bonds seemed to offer greater advantages for both the issuer and lenders or investors. The issue is now moot. The Internal Revenue Service issued proposed rules for distinguishing debt from equity for tax purposes. Under the proposed rules, income bonds would generally be treated as equity, and "interest" on the income bonds would not be tax-deductible for the corporation. See McConnell and Schlarbaum (1981).

[21] If the bonds are selling at or above par value, the firm will call individual bonds that have been chosen randomly and pay the owner the par value. If the bonds are selling below par value, the firm can repurchase the bonds in the capital market if the sinking fund covenant does not require otherwise. Public debt issues generally give the issuer this option; private debt issues often do not.

call them at any price during this period. Most long-term issues contain a weaker provision; the bonds are only **nonrefundable**. Accordingly, the bonds can be called at the appropriate call premium and redeemed out of excess cash or the proceeds from an equity issue (or, in some cases, out of the proceeds of a junior debt issue), but during the period of nonrefundability the issuer is prohibited from issuing new debt that ranks senior to or on a par with the debt to be redeemed and using the proceeds to refund the outstanding issue. As noted in Chapter 9, the optional redemption provision may be useful in reducing a firm's agency costs, and there is empirical evidence suggesting that this is the case.[22]

PROTECTIVE COVENANTS Debt issues provide for a financial contract that imposes restrictions on the long-term bond issuer that are designed to protect the bondholders. For public debt issues, this contract is called a **bond indenture**. A trustee acts as agent for the bondholders and monitors the issuer's compliance with the provisions of the indenture. For a private issue, it is called a **bond** (or **note**) **agreement**. These contracts specify the maturity, interest rate, and other terms mentioned earlier, and in many cases, include a number of restrictive covenants. These covenants typically specify certain financial tests that if not met limit the borrower's ability to (1) incur additional indebtedness (**debt limitation**), (2) use cash to pay dividends or make share repurchases (**dividend limitation**), (3) mortgage assets (**limitation on liens** and/or a **negative pledge clause**), (4) borrow through one of its subsidiaries (**limitation on subsidiary borrowing**), (5) sell major assets (**limitation on asset dispositions**), (6) merge with or into another company or sell substantially all its assets to another company (**limitation on merger, consolidation, or sale**), and (7) sell assets and lease them back (**limitation on sale-and-leaseback**). For example, a debt limitation covenant might prohibit the borrower from issuing additional long-term debt if (1) the issuer's interest coverage would, as a result of the issue, fall below some specified minimum (a **coverage test**) or (2) the resulting ratio of net tangible assets to long-term debt would fall below a specified minimum (an **asset-coverage test**). As a second example, a dividend limitation typically limits the amount of funds available for cash dividends or share repurchases to a specified sum plus some specified fraction of cumulative earnings (less the cumulative amount already used for this purpose) since the date of issuance of the bonds.[23]

Bond indentures and bond agreements also specify certain **events of default**. If the borrower fails to pay interest or repay principal promptly (subject possibly to a short grace period), defaults on another debt issue, or fails to adhere to one of the covenants (and fails to correct the deficiency when notified to do so by the trustee under the indenture or directly by lenders in the case of privately placed debt), the lenders (or the trustee acting on their behalf) can demand repayment of the debt. Often, however, bondholders will try to negotiate before pursuing default proceedings because generally the bondholders do not really want to take ownership of the firm.

CHOICE OF DEBT MATURITY

A debt repayment schedule that bunches the company's debt repayment obligations within a few brief periods involves greater insolvency risk (i.e., insufficient cash to meet required payments on time) than a debt repayment schedule that spreads these

[22] Thatcher (1985).

[23] See Chapter 9 for a discussion of the use of bond covenants in the financial contracting process.

repayment obligations over a reasonably long period. Also, if the company is rapidly growing and/or changing in significant ways (as in its investment risk), issuing shorter-maturity debt is an alternative to issuing convertible debt because it also provides the firm with the option to renegotiate its debt contract in the future.[24]

SIGNIFICANCE OF INCLUDING A SINKING FUND A sinking fund has two important consequences. First, as noted in Chapter 9, the need to make principal repayments furnishes a monitoring device. Second, a sinking fund reduces the effective life of the debt, thereby reducing the bond's risk in the same way as a shorter maturity. When a debt issue provides for a sinking fund, the issue's maturity overstates the length of the period the original debt remains outstanding. For example, a debt issue that matures in 10 years but involves equal sinking fund payments at the end of years 6 through 10 has what might be thought of as an effective maturity of 8 years. On a time-weighted basis, the debt will be repaid in an average of 8 years. This effective maturity is called **average life**.

SETTING THE COUPON RATE

Most issuers of debt select a coupon rate that will make the bonds worth par. However, at times asymmetric taxes or asymmetric information can make it advantageous either to set the coupon rate below the prevailing market rate or to let the interest rate float according to some specified formula.

DEEP-DISCOUNT BONDS In 1981 and 1982, many corporations issued so-called **deep-discount bonds**, which carried very low interest rates and were sold at prices well below their principal amounts. For example, Du Pont sold $600 million principal amount of 6% Debentures due 2001 at a price of 46.852% ($468.52 per $1,000 bond) on November 19, 1981. Recall that in Chapter 5 we discussed **zero-coupon bonds**, which would be the deepest-discount bonds possible since they make only a single payment at maturity. Among many others, Beatrice Foods sold $250 million principal amount of Zero Coupon Notes due February 9, 1992, at a price of 25.50% on February 2, 1982.

Certain investors, particularly pension funds, found the deep-discount bonds and zero-coupon bonds attractive. The bonds generally have a call price equal to their par value. Unless the bonds have a call price schedule that is well below their par value, it is unlikely that a firm would ever exercise its call option. While a reduced risk of a call benefits the bondholders it is of course at the expense of the issuer's refunding flexibility.

The discount also reduces the lender's reinvestment risk. In the case of a zero-coupon bond, the investor's "income" each period is effectively reinvested at the issue's yield to maturity, regardless of what interest rates are at the time. This immunizes the investor's total return against interest rate movements between the dates of issuance and maturity. The absence of reinvestment risk also enabled certain investors, such as pension funds, to match their investment income against future liabilities more closely than they could with alternative investments.

Issuers also found the deep-discount bonds and zero-coupon bonds attractive because of a tax asymmetry. Until May 1982, issuers were permitted to deduct an equal portion of the discount each period. Thus, interest could be deducted at a faster rate than it accrued, which substantially reduced the effective after-tax cost of the debt. Because most purchasers of zero-coupon bonds were tax-exempt, the manner of amortizing the discount did not affect them.

[24] See Chapter 9 for a discussion of how convertible debt can reduce agency costs.

from the attributes of other products; for example, luxury cars versus compact cars.

With dividend policy, there are natural clienteles for high-cash-dividend stocks and for low-cash-dividend stocks. For example, a pension fund might have a foreseeable future need for cash income to meet its obligations. There is considerable empirical evidence supporting the existence of investor clienteles.[7] For example, we have studied electric utility common stocks and have seen evidence of a clientele effect.[8] Electric utility common stocks are among the highest yielding common stocks; compared to other common stocks, a relatively high proportion of the total return utility common stocks provide investors is in the form of dividends (and a relatively small proportion is in the form of capital gains). These stocks have undoubtedly attracted a natural clientele of investors who look to the dividend stream as a source of regular income. However, shareholders who have a preference for current income could sell shares on a periodic basis to generate income. Therefore, in a perfect market, a preference for current income does not alter the conclusion that dividend policy is irrelevant.

Returning to our perfect market example, the irrelevance of dividend policy does not change when we introduce risk, nor does dividend policy matter when we introduce a shareholder preference for current income. But we will see later that this conclusion does depend on the perfect capital market environment.

17.4 THE TAX DIFFERENTIAL VIEW

In Chapter 11, we noted that the tax laws change with some regularity. As in the case of capital budgeting projects, it is imperative that you know the relevant tax laws with respect to dividends. Within the boundaries of current laws, there may be one or more tax asymmetries, as has been the case at various times in the past.

As we have already pointed out, at the time of this writing, dividends are effectively taxed more heavily than capital gains for individual investors because of the tax-timing option—the ability to postpone the tax liability on capital gains income. In addition, under the previous versions of the Internal Revenue Code, other differentials have also existed. For example, at one time, the first $100 ($200 for a joint return) of individual income from cash dividends was tax-exempt. Also, prior to the Tax Reform Act of 1986, only 40% of the capital gain realized upon the sale of a share of common stock held more than 6 months was subject to tax. The balance was tax-free. Thus, historically, the Internal Revenue Code has imposed a higher marginal tax rate on dividends individuals receive than on the capital gains they realize. This difference in the marginal rate was in addition to the reduction in the *effective* rate caused by the tax-timing option. We note this historical difference for two reasons. First, it illustrates once again the necessity of knowing the current tax laws. Second, there is a good chance that, by the time you read this, some or all of the above capital gains tax differential will have been restored.

Tax-exempt institutions, such as pension funds, do not have a tax bias in favor of capital gains. And the bias is reversed in the case of corporate shareholders. Under the Internal Revenue Code, as modified by the Tax Reform Act of 1986, corporate shareholders pay income tax at a 34% peak marginal rate but are permitted to claim

[7] Elton and Gruber (1970) and Lewellen, Stanley, Lease, and Schlarbaum (1978) found evidence suggesting that higher-payout firms tend to attract less heavily taxed investors and that lower-payout firms tend to attract more heavily taxed investors.

[8] Finnerty (1981).

a 70% dividends received deduction. A fully taxable corporate shareholder would therefore pay tax on dividend income at a rate no greater than 10.2% (= .30 × 34%) because only 30% of the dividends it receives are taxable. In contrast, corporate shareholders pay tax on long-term capital gains at rates up to 34%. Thus corporate investors may prefer dividends over capital gains from a purely tax standpoint.

As with the traditional view, the clientele effect mitigates the tax differential argument in a market that is perfect except for this tax asymmetry. Based on their tax positions, investors will have preference for investing in high- or low-cash-dividend stocks. These preferences create natural tax clienteles for various dividend policies. Firms offer dividend policies that appeal to different tax clienteles. Each tax clientele can invest in the shares of companies whose dividend policies best suit that clientele's tax posture. Of course, as long as there is a sufficient supply of investment opportunities for each group, no premium need be paid by investors to obtain a preferred investment instrument. With no premium, dividend policy would again be irrelevant—in spite of the tax asymmetry.

17.5 INFORMATION CONTENT AND SIGNALING

Dividend changes could have an impact on the price of a company's stock if such changes convey useful information to investors concerning a company's future earnings prospects. For example, suppose that a certain company has changed its dividend rate infrequently, and each time the rate was changed, the company's earnings have changed subsequently in the same direction as the dividend rate. Then investors will interpret future changes in the dividend rate as a signal that management's assessment of the company's earnings prospects has changed. A dividend increase would signal an improvement in the company's minimum sustainable level of earnings, and a dividend decrease would signal a worsening of the company's earnings prospects. As discussed later in the chapter, the empirical evidence supports the importance of dividend changes as a signaling device.

A study by John Lintner, based on interviews with corporate executives, found that financial managers thought their corporations should aim toward some long-term target payout ratio in order to give shareholders a "fair share" of the company's earnings. Lintner developed the following model to explain corporate dividend changes:[9]

$$DPS_1 - DPS_0 = ADJ\,[POR(EPS_1) - DPS_0] \qquad (17.1)$$

According to this model, a company that is currently paying dividends at the rate of DPS_0 per share and has a target payout ratio of POR will adjust (ADJ) its dividend rate, but less than fully, as its earnings per share (EPS) change. If a company always paid out its target ratio of earnings, then its dividends per share in the coming period would be $DPS = POR(EPS_1)$. But Lintner found that corporations "managed" their dividend payments so as to produce a smooth progression in dividends. Accordingly, $ADJ < 1$, so that dividends progress toward the target level over several periods rather than all at once. This, of course, reduces the likelihood that a dividend increase will have to be "rolled back" in the future. Because of this "stickiness," dividend changes serve as a signaling device. A company will not increase its dividend

[9] Lintner (1956).

rate unless it believes the increase is sustainable because of a higher sustainable level of earnings.

If dividend announcements do indeed convey useful information, it is reasonable to expect that the quality of the information these announcements convey would depend on the degree to which dividend changes conform to, or deviate from, an established dividend pattern. Such a pattern would have two important attributes: (1) the amount of each dividend change and (2) the timing of each change. For example, if a company has established a pattern of regular annual increases in its dividend rate and has demonstrated that this pattern of increases is sustainable by keeping its payout ratio relatively stable, any deviation from that pattern (i.e., an increase that differs from the preceding year's increase) would signal to investors a change in the firm's earnings prospects. Moreover, it would signal that a higher sustainable dividend *growth rate*, rather than just a higher sustainable *dividend level*, had been achieved. This argument presumes that insiders (who set the dividend rate) have information that is not available to investors outside the firm, that such information is used to determine future dividend payout streams, and that dividends are "sticky" in the sense that companies exhibit great reluctance to cut the dividend rate.[10]

The above argument also presumes that the structure of incentives is such that, taken in total, it favors accurate signals. As discussed in Chapter 9, the reputation of a firm can play an important role in discouraging false signals. Research demonstrates that such incentive structures are plausible[11] and that dividend changes have a discernible information content.[12]

A pattern consisting of regular annual dividend increases might take on added significance during periods of inflation. During such periods, it is not enough for a company simply to sustain any particular absolute dividend level because inflation would erode the value of the dividend in real terms. Investors might then use the dividend growth rate evident in the historical pattern—provided they believe the pattern is sustainable—to gauge the likelihood that the future rate of dividend growth will at least keep pace with inflation.

Unlike the traditional and tax differential views, the clientele effect does not mitigate the signaling view of dividend policy. Even in a market that is perfect except for information availability (and cost), dividend policy may be a dimension relevant to firm value. Because of the informational content of dividend changes, simply paying out residual cash flow on a year-by-year basis may not be in the shareholders' best interest. Such a policy would lead to a dividend level and a payout ratio that could fluctuate wildly, depending on year-to-year changes in the availability of attractive investment projects. Generally, companies manage their dividend policies so that dividend changes are orderly and consistent with changes in the company's earnings prospects. The next chapter describes an operational approach to dividend policy that is based on this guiding principle.

Our first insight into why dividend policy matters comes when we relax the assumption that information is freely available and costless. If it is costly to gather information, it is possible that ***dividend policy may be the least expensive, and/or most accurate, method of conveying information*** to shareholders. If this is the case, and the empirical evidence presented below supports this view, then dividend policy is an important tool that can be used to benefit a company's shareholders.

[10] Black (1976); Fama, Fisher, Jensen, and Roll (1969); and Friend and Puckett (1964) provide evidence that companies are reluctant to cut the dividend rate. Black's article also provides a useful and interesting summary of the issues surrounding the "informational content of dividend changes."

[11] See, for example, Bhattacharya (1979); Hakansson (1982).

[12] Aharony and Swary (1980); Ang (1987); Charest (1978); Eades (1982); Kalay (1980); Kwan (1981).

TRANSACTION COSTS 17.6

We have pointed out that various investor clienteles will exist when the perfect market assumption is relaxed: some because of taxes and others because of investor cash flow preferences, such as pension fund preference for dividend-paying stocks. While the existence of investor clienteles does not, by itself, cause dividend policy to matter, the story changes somewhat when other market imperfections are considered. Now we introduce transaction costs.

FLOTATION COSTS AND COMMISSION CHARGES

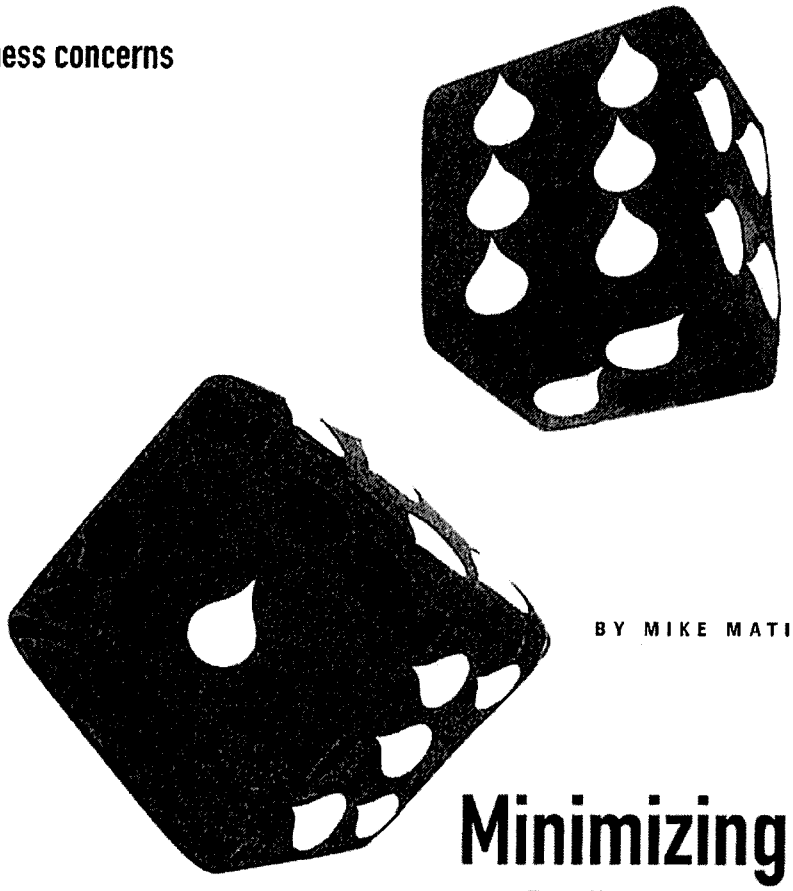
Shareholders who desire a stream of share-related income could sell portions of their holdings and create "homemade" dividends in lieu of the corporation paying a cash dividend. However, they will incur brokerage commissions. Alternatively, if the corporation pays a cash dividend and issues shares to preserve both its capital structure and planned capital investment program, it will incur the costs of floating the new issue. Either way, there will be transaction costs. The existence of brokerage commissions tends to favor dividend payments over share sales for shareholders who prefer current income. However, those same brokerage commissions cause a reverse preference for shareholders who prefer reinvestments, favoring retained earnings over dividends. For the firm, the existence of flotation costs, which are associated with new issues, tends to favor retained earnings over new issues as a means of raising equity capital for capital investment purposes. The questions with respect to transaction costs is Who pays the transaction costs, and how much are they in total?

A shareholder who desires an increased income stream would prefer real cash dividend payments over homemade dividends if the firm can sell new shares more cheaply than the shareholder can sell a few of her own shares. Of course, the reverse preference holds if it is cheaper for shareholders to sell their own shares. In general, brokerage commissions and flotation costs both vary inversely with the size of the transaction. These economies of scale make it cheaper for the company to sell a large block of shares than for individual shareholders to make small odd-lot sales. Consequently, it is generally cheaper for the company to pay dividends than for shareholders to manufacture homemade dividends. Market imperfections, then, rather than a shareholder preference for current income, may explain the existence of certain investor clienteles that prefer high-payout stocks. Regular dividend checks relieve investors of the inconvenience and significant brokerage charges involved in making frequent odd-lot sales.

Two trends have affected the difference between flotation costs and brokerage commissions in recent years. The growth of the discount brokerage industry has reduced brokerage commissions; however, the greatest commission reductions have occurred in connection with larger share transactions (i.e., those involving several hundred shares or more). In addition, the proliferation of new issue dividend reinvestment plans has permitted companies to reduce issuance costs substantially, perhaps to as little as 2% (versus 4% to 5% for normal-size public offerings). Dividend reinvestment plans offer shareholders the option to reinvest their dividends with little or no brokerage commission.[13] This reduces the penalty a high-dividend-payout policy would otherwise impose on shareholders who wish their dividends to be reinvested. However, it does not eliminate the tax bias in favor of capital gains

[13] Dividend reinvestment plans are discussed in Chapter 14.

ATTACHMENT 12



BY MIKE MATICHICH

Minimizing financial risk in today's turbulent economy

A RELATIVELY SMALL NUMBER OF WATER UTILITIES WILL RECEIVE GRANTS AND LOW-INTEREST LOANS THROUGH FEDERAL ECONOMIC STIMULUS FUNDS, BUT MANY MORE WILL NEED CREATIVE SOLUTIONS TO BALANCE THEIR FINANCING NEEDS WITH THEIR CUSTOMERS' DIMINISHED CAPACITY TO PAY.

As the global financial crisis that started in 2008 translates into greater financial uncertainty, most water utilities are facing significantly increased financial challenges. Questions relating to decreased customer usage, hookup fee reductions, and access to reasonable long-term debt loom large. The need to ramp up capital spending to address multiple agendas remains. Regulatory requirements, service to new customers, and repair and replacement of aging assets have not changed. However, at the municipal level competition for limited resources is often intense—and federal funding is less than it was in previous decades. Although a relatively small number of water utilities will receive grants and low-interest loans through economic stimulus funds, many more will need creative solutions that balance utility financing needs with their customers' diminished capacity to pay.

CONTEXT FOR THE UTILITY FINANCIAL CRISIS

Each water utility's financial context is unique. Income levels of residential customers vary. Levels of commercial and industrial development fluctuate. The age, assets, and level of previous invest-

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ment in repair and replacement programs also differ for every system

A utility's financial planning context is also distinctive. The degree to which utilities have relied on municipal borrowing to pay for capital projects has varied. As a result, the amount of outstanding debt and the level of financial reserves differ, which affects a system's access to capital funding through both conventional and unconventional sources.

Despite all these variables, the financial planning context for all water utilities changed dramatically in the fall of 2008. The collapse of world stock markets and the resulting reduction of investments rippled through the global economy. As a result, significant impacts were felt even with municipal bonds and other forms of investment in municipal utilities. For example:

- Some utilities with solid credit ratings that for years had ready access to municipal bonds at interest rates in the 4.0–4.5% range suddenly found themselves unable to issue bonds. Others found they were able to issue bonds, but at interest rates closer to 6% or higher. Figure 1 shows how yields on municipal bonds tracked by The Municipal Bond Buyer have increased since the global financial crisis hit the municipal bond market in fall 2008.
- Traditionally, utility systems with low credit ratings have been able to buy bond insurance to upgrade the credit rating for their bonds and secure lower interest rates. However, many municipal bond insurance providers have left the business or had their credit ratings lowered to the point that the value of insurance they can provide is limited. At the time this article was written, there remained only two major private providers of bond insurance with a credit rating of AAA/Stable.
- Housing market slowdowns and reductions in production by industrial and commercial customers have left many utilities scrambling to maintain balanced budgets. Utilities have searched for ways to immediately reduce operating costs and defer some of their planned capital projects, even during the 2009 fiscal year that may be at the midway point (depending on their fiscal calendars).

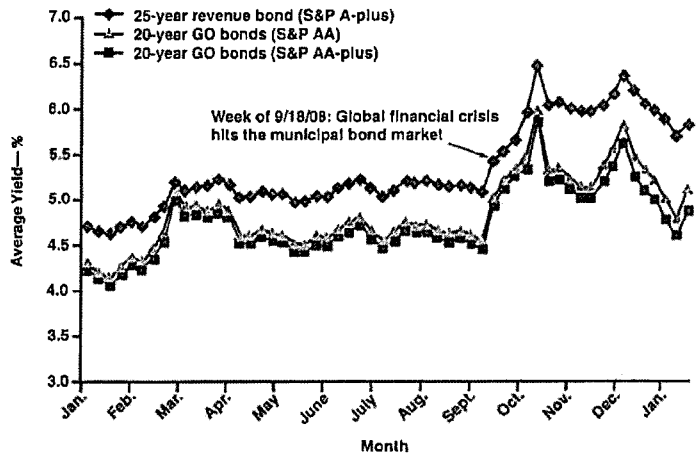
STRATEGIC RESPONSES TAKEN TO MINIMIZE FINANCIAL RISK

There is no magic wand that can be waved to eliminate the greater financial uncertainties (and therefore risk) that water utility systems face in the new economic and financial order of 2009. Fortunately, there are some strategies that utilities can use to reduce their financial risk through both strategic planning and actions. Guidance documents developed by AWWA, the Water Research Foundation, and other water industry associations provide the framework for just such strategic planning and actions. This article provides several examples of proactive planning and implementation activities that utilities can undertake to manage the risks associated with today's financial uncertainties.

Develop enhanced prioritization for capital programs. Faced with uncertain revenues and access to capital markets, many water utilities require enhanced flexibility in their capital planning efforts. This flexibility includes making sound decisions on which projects to defer or cancel if funding levels drop below expected levels. It also involves knowing which projects to advance if revenues become available as the economy recovers and revenues increase or as access to capital markets improves.

Having a defensible, objective process for identifying utility system goals and measuring the contribution of candidate capital projects toward meeting those goals provide a framework for creating real-time adjustments to capital improvement programs (CIPs). When the Water Research Foundation developed the Capital Planning Strategy (CPS) Manual (Beaudet et al, 2001), participating utilities identified the prioritization step as the one most in need of development (Figure 2). The manual identified a systematic process for identifying goals, creating performance measures to identify the contribution of candidate proj-

FIGURE 1 Trends in municipal bond rates—2008–09



Source: Municipal Bond Buyer Index, 2009, www.bondbuyer.com

GO—general obligation, S&P—Standard and Poor's Index

Average yields for bonds tracked by Municipal Bond Buyer

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TABLE 1 Summary of criteria and weightings for Aurora (Colo.) Water projects

Criteria	Weight	Description
Public health and safety	100	Projects that address worker and public health and safety risks
Compliance	90	Projects that promote regulatory and contractual compliance, such as the Safe Drinking Water Act and annexation agreements
System reliability	72	Projects that reduce the risk and consequences of asset failure and address other attributes of asset management, such as redundancy
Community/customer benefit	66	Impacts such as water pressure, taste/odor, and overall customer satisfaction
Sustainability	44	Long-term sustainability, operations and maintenance cost efficiency, and environmental "green" benefits

ects toward meeting those goals, and then using the results of the process to guide near- and long-term CIP plans and budget decisions.

Over the past decade, dozens of utilities have implemented enhanced CIP prioritizations using the CPS Manual or similar approaches, and they tend to be in a better position than utilities that have not done so.

An example is Aurora Water, a utility system that provides water, sewer, and stormwater service to customers in the city of Aurora, Colo. In 2008, a diverse staff team representing all key groups within the utility with an interest in the CIP identified and weighted five key water system goals (Table 1).

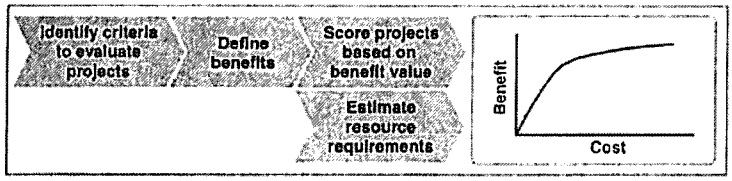
Performance scales, such as the example for compliance shown in Figure 3, were developed for each criterion and documented through more detailed data-collection forms that were completed for 59 candidate water capital projects.

After completion of scoring, summary tables and graphics were developed, such as the one showing contributions by criteria (Figure 4), that demonstrated the relative ranking of the candidate projects. Post-prioritization reviews were conducted to make any adjustments to the project rankings, based on sequencing and timing considerations and other documented factors affecting the urgency of implementing some projects.

Aurora Water is using the enhanced prioritization results to guide both near- and long-term capital planning decisions. The 2008 economic downturn resulted in a loss of water sales and fee revenues because of home foreclosures, decreased water consumption, and general belt-tightening. Halfway through 2008, capital projects in the 2008 fiscal year budget were prioritized to assist in urgent financial management decisions faced by the city. The overall prioritization of projects within the utility's five-year planning window helped guide decision-making about which projects to include and became a key factor in determining the sequencing within the five-year window.

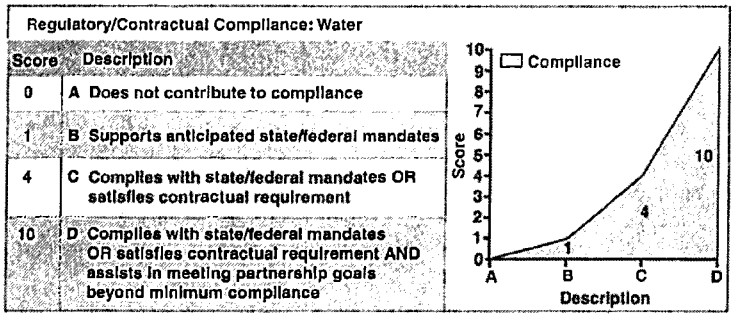
Similar enhanced prioritizations have been used to guide capital budget decisions by utilities ranging in size from the city of Ann Arbor, Mich., to the islandwide water and sewer utility in Puerto Rico.

FIGURE 2 Prioritization model



Source: Capital Planning Strategy Manual; AwwaRF and AWWA, 2001

FIGURE 3 Performance scales



STRATEGIC FINANCIAL PLANNING AND MANAGEMENT

Well-managed water utilities follow systematic approaches in developing their financial and rate plans. Using methods detailed in industry guidance documents such as AWWA Manual M1 (2000) and related finan-

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cial planning documents, utilities have projected changes in customer usage and financial parameters, and have adjusted customer rates regularly to avoid the "rate shock" of large single-year increases.

Sound management dictates that updating cost-of-service analyses should also be done on a regular basis so that customer rates can be validated and be in proximity to the actual cost of providing service. Figure 5 illustrates typical steps in this traditional rate-setting process.

The basic steps in a sound rate-planning process have not changed as a result of the financial crisis. What has changed dramatically is the volatility of the external factors that influence the utility's revenue requirements, such as

- access to borrowed funds;
- interest rates for borrowed funds, where available;
- prices for goods and services (chemicals and fuel); and
- customer demand (for example, potential for substantial fluctuation in use by residential and/or commercial/industrial customers).

For many utilities, developing a sound budget and rate plan now requires consideration of a much wider range of assumptions related to these and other variables. In many cases, evaluating these variations requires more robust rate models that can more efficiently consider differences in these variables to guide rate decisions, the level of affordable capital programming, and other related decisions. The ability to easily include or exclude program elements—as illustrated in Figure 6—and make changes to underlying assumptions such as borrowing rates will be increasingly important to identifying funding and rate strategies that work in today's difficult financial times.

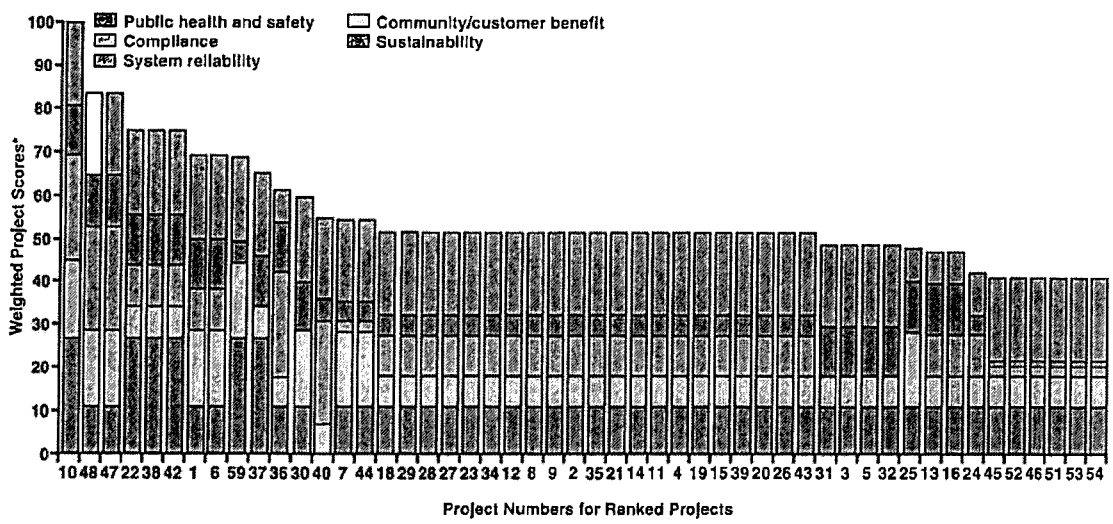
Perhaps even more important will be the process of identifying and efficiently evaluating a range of scenarios appropriate for today's volatile times. Most utilities do some evaluation of alternative assumptions as part of their rate- and budget-setting processes. However, systematic scenario planning has not been widely used in the water industry. By engaging a diverse team within the utility to study the consequences of a realistic range of scenarios based on external circumstances (Table 2), utilities can identify the strategies they would use for each scenario. The process for conducting a scenario-planning exercise, example workshop agendas, suggested participants, and how to use the results are all included in Step 2, Framing the Problem, in the CPS Manual (Beaudet et al, 2000).

By evaluating possible strategies for a range of realistic scenarios, utilities can identify the following key elements:

- **No-brainers.** Strategies, projects, or initiatives common to all scenarios.
- **No ways.** Actions the organization deems unacceptable under any circumstances.
- **Trigger events.** External situations that would cause a utility to change from one strategy or plan to another.
- **No regrets.** Actions that are valuable to some scenarios, not valuable to others, but not damaging to any.
- **Contingent possibilities.** Actions that are valuable only for selected scenarios under certain trigger conditions.

Although no one can predict the future with certainty, a healthy dialogue by a team that represents the

FIGURE 4 Capital prioritization ranking of alternatives by total benefit value



*Maximum score = 100

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FIGURE 5 Traditional rate-setting process

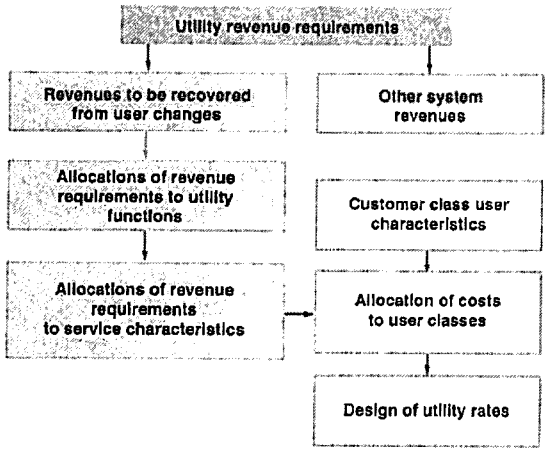
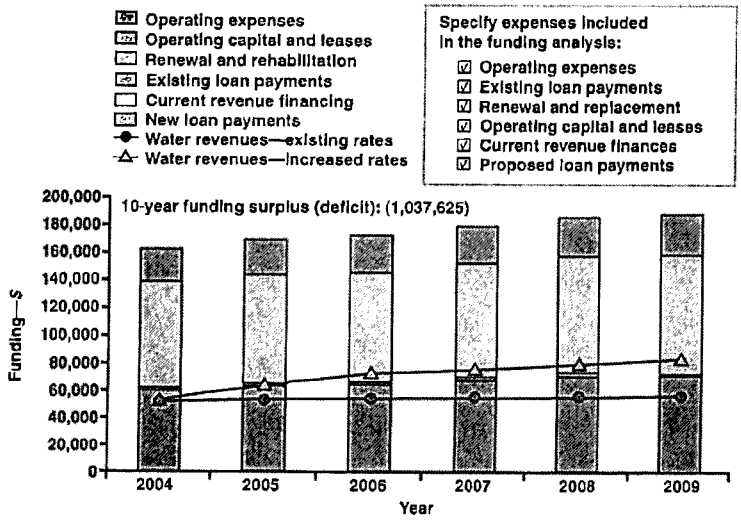


FIGURE 6 Funding (deficit) analysis



utility's diverse interests can result in a more realistic assessment of the likelihood of external factors and the appropriate strategies for action.

Support from utility system customers regarding necessary rate increases is more important than ever in today's financial climate. Affordability analyses must reflect changes to customer income from increased unemployment, underemployment, and other costs. Engaging customers and other stakeholders in the financial planning process should be increased—not reduced—in tight financial times, to increase the likelihood that boards of directors, city councils, and other governing bodies will approve requested adjustments to rates and other revenues.

Avoiding Rate Shock: Making the Case for Water Rates (AWWA, 2004) offers case studies of successful stakeholder engagement and recommended steps for integrating stakeholder outreach with rate study technical analyses, increasing the likelihood of stakeholder support.

Having a sound rate and financial plan is no longer sufficient. In this period of economic turbulence, it is becoming increasingly clear that sound financial management requires diligent attention through financial tracking and management processes. It is more important than ever for utilities to closely track their sales to customers and related revenue effects to avoid possible surprises from reduced water use, reduced fees from sluggish development, or other factors affecting revenue receipts or operating and capital expenditures compared with the financial plan. Figure 7 shows the tracking that the city of Atlanta, Ga., performs on a monthly basis for its water and sewage system revenues so that proactive steps can be taken if significant deviations from planned revenues occur. In Atlanta's case, tracking showed close alignment between projected and actual revenues through December 2008.

OPTIMIZE OPERATIONS AND MAINTENANCE EFFICIENCY

A great deal of the initial attention related to the current financial crisis has focused on utility capital budgets and financial plans. This is not surprising, because the crisis had an immediate and dramatic effect on utilities' access to funding for CIP programs. Trade journals and other media also highlighted the dramatic increases in interest rates for those able to access the municipal bond market.

In developing a strategic response to the financial crisis, the decisions that utility managers make regarding their operating budgets may be equally important in terms of the financial health and overall sustainability of their systems. Faced with operating budget deficits as a result of declining sales or fee revenues, managers may be forced to make near-term reductions in operating expenses. Because economic experts

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vary in their prognosis for how long it will take for the overall economy to return to a more positive track, decisions on what to defer or delete from operating budgets may need to be sustained over a multiyear period.

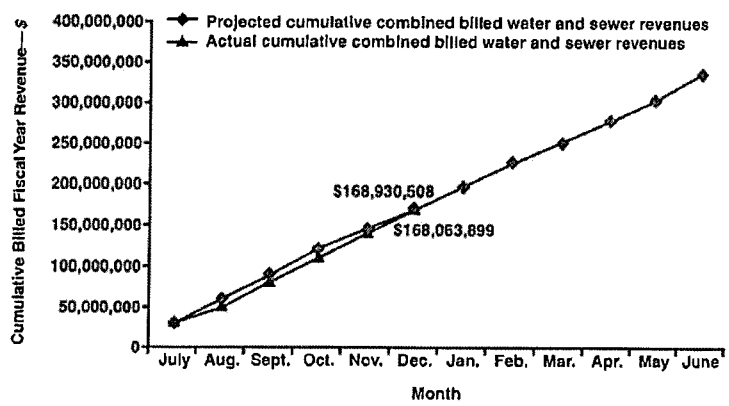
Managers may view themselves as having limited and unfortunate choices. For example, many utilities only recently started more proactive repair and replacement (R&R) of aging system assets. Often, these asset management programs are at least partially funded through operating fund resources. To cancel or slow down these important R&R programs puts utilities back on a path toward greater risk of asset failure as well as long-term greater financial exposure from possible future expenditures for emergency replacement of failing assets. Utility managers may view themselves as being faced with tough decisions regarding whether to defer these R&R programs, deplete operating reserves, or reduce other necessary operating budget activities.

Before possibly identifying and implementing one of these strategies (with resulting negative consequences), it may be worthwhile for utilities to explore whether they can reduce or eliminate the need for such actions through a careful review of opportunities for operational efficiency.

By conducting a process benchmarking study, a utility may find that compared with peer utilities that use the same treatment processes and have similar distribution system profiles, its costs for chemicals, energy, labor, or other driving components of operating costs are higher for reasons that can be adjusted to reduce operating costs.

For example, if a utility's customer service cost per account (as represented by the dashed line in Figure 8) is substantially higher than those for other utilities in its size class and geographic area, there may be protocols used by peer utilities that could reduce costs.

FIGURE 7 Revenue tracking for Atlanta, Ga., through December 2008



INVESTIGATE OPPORTUNITIES FOR OUTSIDE FUNDING/NEW FUNDING

Given the challenges associated with raising rates and fees in a declining economy, it is sensible for utilities to explore opportunities for outside funding or new/creative funding sources. Although the American Recovery and Reinvestment Act of 2009 (the "economic stimulus" bill) has received wide media attention, it will provide funding for only $2 billion of drinking water projects, a small fraction of the total capital needs.

Drinking water utilities requiring funding for their capital programs will probably look elsewhere for financial relief in funding. There are several examples of potential external options that are worth tracking:

Expanded state financial support. With the current fiscal situation, state governments are also financially pressed. However, state credit ratings, backed by the revenue-generating capabilities of property own-

TABLE 2 Determining external drivers and range of scenarios

External Drivers	Scenario: Capital Fantastic	Scenario: Déjà Vu	Scenario: Leaner and Greener
Growth and development	More rapid growth as the economy recovers faster than initially expected	Growth continues at recent levels	Sales decline even faster as economy continues to erode
Degree of regulation	Flexibility in enforcement, more focus on discretionary projects	Status quo level of enforcement	Stricter agency enforcement on mandates, no relief on schedule
Funding	Utility qualifies for federal stimulus plan funding plus ready access to bond market	Traditional sources for funding	No stimulus funds available, problems accessing bond market
Prices	Prices down as contractors scramble for work	Prices stay relatively stable	Major price increases in key materials and supplies, such as chemicals.

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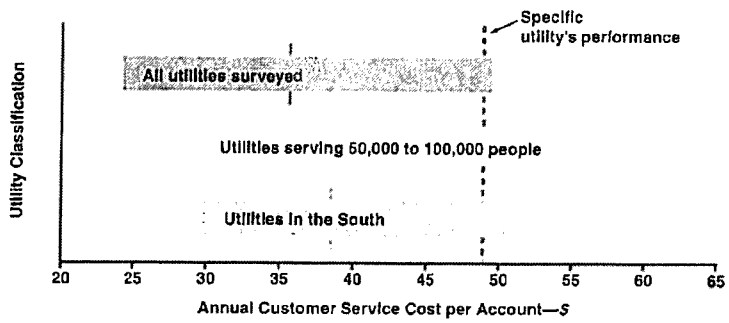
FIGURE 8 Customer service cost



Colored bars indicate a range for a utility classification

ers and businesses/residences within the state's larger jurisdictions, are higher than those of many of the communities within them. As a result, more communities are taking advantage of state-pooled bond programs that use the state's credit rating, along with local credit ratings, to secure funding for capital programs. In addition, in light of limited federal funding through the stimulus program, some states provide additional access to state-revolving fund loan and grant programs for infrastructure projects.

Federal legislative relief. Several forms of federal legislative relief are under consideration.

- Representative Barney Frank (D-MA) and other members of Congress continue to advocate for additional financial help for municipal entities (including utility systems) that are experiencing challenges in accessing the municipal bond market. Representative Frank is developing legislation to allow the Treasury Department to purchase municipal bonds or to provide credit enhancement (such as guarantees for municipal entities) that could be purchased under a Federal Reserve System program.
- Congressman Bill Pascrell (D-NJ) and others in Congress are developing legislation that would make it easier to use private activity bonds (PABs) to finance water infrastructure projects. PABs are a form of tax-exempt financing for a government entity such as a municipality that wants to partner with a private party to meet a public need, as defined by law. Congress has capped the amount of PABs that each state can issue. Removing the volume caps would increase the likelihood that PABs could be used as a source of financing for more water infrastructure projects.

Other private equity investment/participation. Beyond PABs, there are other forms of private equity investment that may fill gaps in availability of municipal bonds for some utilities. More widespread use of various public private partnerships—such as asset transfers or private financing for projects by development groups able to provide financing as part of the project package—might be explored where there are critical infrastructure needs but no conventional municipal financing available.

STRATEGIC, CREATIVE, FLEXIBLE RESPONSES CRITICAL TO SUCCESS

In these changed financial times, utilities need to be more nimble than ever to survive and thrive. Customers and other stakeholders will continue to expect quality service, but will be looking for even greater documentation of the need for rate increases requested by utility staff. The ability to document and justify rate and fees increases to support priority capital programs and operating activities aligning with a utility's mission and vision will be more important than ever over the next several years.

ACKNOWLEDGMENT

For their contributions to this article, the author thanks *The Bond Buyer*, for permission to use bond yield information; Larry Catalano, director of the Capital Program Division at Aurora Water, Colo., for permission to include the capital improvement program prioritization case study; Robert J. Hunter, commissioner of watershed management for the city of Atlanta, Ga., for permission to include the example of financial tracking; and numerous water industry managers and finance professionals who have provided insights regarding their strategies for addressing the changed financial circumstances.

ABOUT THE AUTHOR

Mike Matichich is the global technology leader for Financial Services in the Water Industry for CH2M HILL, 901 New York Ave., NW, Ste. 5100 West, Washington, DC 20001; Michael.Matichich@ch2m.com. He has led strategic financial planning, rate studies, CIP planning and prioritization studies, and management consulting studies, for water, sewer, and stormwater utilities for more than 20 years.

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The Bond Buyer, 2009. Municipal Bond Buyer, Weekly Market Statistics, Bond Buyer Indexes, 2009. www.bondbuyer.com.

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ATTACHMENT 13

ARIZONA WATER COMPANY'S RESPONSES TO
RESIDENTIAL UTILITY CONSUMER OFFICE'S
FOURTH SET OF DATA REQUESTS
WESTERN GROUP RATE APPLICATION
DOCKET NO. W-01445A-15-0277
January 19, 2016

Company Response Number: RUCO 4.05

Q. **<u>San Gabriel Valley Water Company – Long-Term Debt</u> – Admit that on November 1, 2011, Arizona Water Company's affiliate, San Gabriel Valley Water Company, availed itself of the opportunity to reduce its embedded cost of debt by issuing $30,000,000 of 10-year term, non-amortizing mortgage bonds at an interest rate of 3.75% per annum (See attached Schedule A-24, "Account 210 – Bonds," as filed in San Gabriel Valley Water Company's 2014 Annual Report with the CPUC).**

A. San Gabriel Valley Water Company issued the referenced bonds for the purpose of repaying $30,000,000 in short-term debt issued under a line of credit to finance the construction of utility plant. The applicable interest rate on San Gabriel Valley Water Company's line of credit was, and remains, lower than 3.75%. Therefore, Arizona Water Company cannot "admit" that San Gabriel Valley Water Company "availed itself of the opportunity to reduce its embedded cost of debt…"

Response provided by: Joel M. Reiker
Title: Vice President – Rates and Revenues
Address: 3805 N. Black Canyon Highway
Phoenix, AZ 85015

ATTACHMENT 14

ARIZONA WATER COMPANY'S RESPONSES TO
RESIDENTIAL UTILITY CONSUMER OFFICE'S
FOURTH SET OF DATA REQUESTS
WESTERN GROUP RATE APPLICATION
DOCKET NO. W-01445A-15-0277
January 19, 2016

Company Response Number: RUCO 4.13

Q. **<u>Capital Structure Rebalancing</u> – In view of (i) the significant increase to AWC's equity component over the 6-year period, December 31, 2008- December 31, 2014 (as discussed in RUCO 4.11), (ii) the total dividend distributions made by AWC over the 6-year period, 2009-2014 (as presented in RUCO 4.12), (iii) the prevailing low interest rate environment of the last seven years, and (iv) the Company having been placed on official notice, in Decision No. 73736, that the Company's 6.82 percent cost of long-term debt seemed "high considering the current market," please respond to the following:**

1) **Indicate to what extent, if any, the Company considered effectuating a rebalancing of AWC's capital structure, wherein the Company would seek Commission authorization to issue new low cost debt, the proceeds of which would then be used to purchase (i.e., replace) equity so as to reflect a higher amount of debt in the capital structure;**
2) **To the extent the Company has considered a rebalancing of AWC's capital structure as a financial/capital budgeting alternative, but elected not to pursue that course of action, provide a detailed explanation as to all reasons why the Company decided against rebalancing AWC's capital structure; and**
3) **Admit that other water/wastewater utilities subject to the Commission's regulation have availed themselves of the opportunity to rebalance their capital structures in order to replace high cost equity with low cost debt (See *Pima Utility Company*, Docket No. W-02199A-11-0403; and *Liberty Utilities Corp. (Black Mountain Sewer)* Docket No. SW-02361A-15-0206).**

A.
1) Arizona Water Company has not considered issuing debt for the sole purpose of "purchasing" equity, as its capital structure is already balanced. However, Arizona Water Company has explored the option of redeeming currently outstanding general mortgage bonds. (*See* Arizona Water Company's response to RUCO data request 4.06, part 3.)
2) Arizona Water Company has not considered issuing debt for the sole purpose of "purchasing" equity, as its capital structure is already balanced.
3) No. Arizona Water Company does not have the information or data necessary to acknowledge what "other water/wastewater utilities subject to the Commission's regulation have availed themselves of..." Notwithstanding this, Arizona Water Company will accept RUCO's assertion regarding Pima Utility Company and Liberty Utilities Corp.

Response provided by: Joel M. Reiker
Title: Vice President – Rates and Revenues
Address: 3805 N. Black Canyon Highway
Phoenix, AZ 85015

ATTACHMENT 15

William A. Mundell
Chairman
Jim Irvin
Commissioner
Marc Spitzer
Commissioner

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AZ CORP COMMISSION
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Arizona Corporation Commission
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FEB 16 2001

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BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY, AN ARIZONA CORPORATION, FOR AN ORDER AUTHORIZING THE ISSUANCE AND SALE OF $25,000,000 OF ADDITIONAL GENERAL MORTGAGE BONDS IN MORE THAN ONE FINANCING	DOCKET NO. W-01445A-00-0749 CERTIFICATION OF PUBLICATION

The Commission's Staff has requested that Arizona Water Company (the "Company") provide public notice of its application for approval of financing as filed herein.

IT IS HEREBY CERTIFIED that the Company published notice of its application in this matter in the newspapers and counties and on the dates set forth below. The newspapers are of general circulation in the counties shown.

1.	The Arizona Daily Star	February 2, 2001	Pima
2.	Tuscon Citizen	February 2, 2001	Pima
3.	The Arizona Republic	January 31, 2001	Maricopa

Affidavits of publication of the notice and/or tear sheets showing proof of publication are marked "Exhibit A" and attached hereto and by reference made a part of the original of this Certification.

RESPECTFULLY SUBMITTED this 16th day of February, 2001.

ARIZONA WATER COMPANY

By: R. W. Geake
R.W. Geake
Vice President & General Counsel

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RWG:JRC | 08:59 2/16/01

Original and ten (10) copies of the foregoing filed this 16th day of February, 2001 with:

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

A copy of the foregoing was mailed this 16th day of February, 2001 to:

Lyn Farmer
Chief Administrative Law Judge
Hearing Division
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007

Deborah Scott
Director, Utilities Division
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007

By: Robert W. Geake

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RWG:JRC | 08:59 2/16/01

EXHIBIT A

STAR PUBLISHING COMPANY

Tucson, Arizona

STATE OF ARIZONA)
COUNTY OF PIMA)

Janice Anderson, being first duly sworn deposes and says: that she is the Legal Advertising Representative of the **STAR PUBLISHING COMPANY**, a corporation organized and existing under the laws of the State of Arizona, and that the said **STAR PUBLISHING COMPANY** prints and publishes The Arizona Daily Star, a daily newspaper printed and published in the City of Tucson, Pima County, State of Arizona, and having a general circulation in said City, County, State and elsewhere, and that the attached

Legal Notice

was printed and published correctly in the entire issue of the said The Arizona Daily Star on each of the following dates, to-wit:

February 2, 2001

Janice Anderson

Subscribed and sworn to before me this 7th day of February, 2001

Carla Gamez
Notary Public

OFFICIAL SEAL
CARLA D. GAMEZ
NOTARY PUBLIC - ARIZONA
PIMA COUNTY
My Comm. Expires 06/20/04

My commission expires

TNI AD NO. 183653

LEGAL NOTICE
PUBLIC NOTICE OF AN APPLICATION FOR AN ORDER AUTHORIZING ARIZONA WATER COMPANY TO SELL BONDS

Arizona Water Company ("Applicant") has filed an Application with the Arizona Corporation Commission (the "Commission") for an order authorizing Applicant to issue and sell one or more additional series of its General Mortgage Bonds in an aggregate principal amount not to exceed $25,000,000. The Applicant proposes to issue the first additional series of bonds on or before June 30, 2001 in an amount not to exceed $15,000,000 at a negotiated rate not to exceed 8.625%. The Application is available for inspection during regular business hours at the office of the Commission in Phoenix, Arizona, and at Applicant's offices throughout Arizona.

Intervention shall be permitted to any person entitled by law to intervene and having a direct substantial interest in this matter. Persons desiring to intervene must file a written Motion to Intervene with the Commission which must be served upon Applicant and which, at a minimum, shall contain the following information.

1. The name, address, and telephone of the proposed intervenor and of any person upon whom service of documents is to be made if different than the intervenor.
2. A short statement of the proposed intervenor's interest in the proceeding. (e.g., a customer of Applicant, a stockholder of Applicant, etc.)
3. A statement certifying that a copy of the Motion to Intervene has been mailed to Applicant.

The granting of Motions to Intervene shall be governed by A.A.C. R14-3-105, except that all Motions to Intervene must be filed on, or before, the 15th day after publication of this notice.

Publish February 2, 2001
Arizona Daily Star; Tucson Citizen

EXHIBIT A

AFFIDAVIT OF PUBLICATION

PUBLIC NOTICE OF AN APPLICATION FOR AN ORDER AUTHORIZING ARIZONA WATER COMPANY TO SELL BONDS

Arizona Water Company ("Applicant") has filed an Application with the Arizona Corporation Commission ("the Commission") for an order authorizing Applicant to issue and sell one or more additional series of its General Mortgage Bonds in an aggregate principal amount not to exceed $30,000,000. The Applicant proposes to issue the first additional series of bonds on or before June 30, 2001 in an amount not to exceed $15,000,000 at a negotiated rate not to exceed 8.625%. The Application is available for inspection during regular business hours at the office of the Commission in Phoenix, Arizona, and at Applicant's offices throughout Arizona.

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1. The name, address, and telephone of the proposed intervenor and of any person upon whom service of documents is to be made if different than the intervenor.
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The granting of Motions to Intervene shall be governed by A.A.C. R14-3-105, except that all Motions to Intervene must be filed on or before the 15th day after publication of this notice.

01091-January 31, 2001

THE ARIZONA REPUBLIC

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

TOM BIANCO, being first duly sworn, upon oath deposes and says: That he is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

The Arizona Republic

January 31, 2001

Sworn to before me this
1st day of
February A.D. 2001

OFFICIAL SEAL
GLORIA SALDIVAR
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My Comm. Expires Dec. 1, 2003

Notary Public

EXHIBIT A

CITIZEN PUBLISHING COMPANY

Tucson, Arizona

STATE OF ARIZONA)
COUNTY OF PIMA)

Janice Anderson, being first duly sworn deposes and says: that she is the Legal Advertising Representative of the **CITIZEN PUBLISHING COMPANY**, a corporation organized and existing under the laws of the State of Arizona, and that the said **CITIZEN PUBLISHING COMPANY** prints and publishes the Tucson Citizen, a daily newspaper printed and published in the City of Tucson, Pima County, State of Arizona, and having a general circulation in said City, County, State and elsewhere, and that the attached

Legal Notice

was printed and published correctly in the entire issue of the said Tucson Citizen on each of the following dates, to-wit:

February 2, 2001

Janice Anderson

Subscribed and sworn to before me this 7th day of February, 2001

Carla Gamez
Notary Public

OFFICIAL SEAL
CARLA D. GAMEZ
NOTARY PUBLIC - ARIZONA
PIMA COUNTY
My Comm. Expires 06/30/04

My commission expires _____

TNI AD NO. 183657

LEGAL NOTICE
PUBLIC NOTICE OF AN APPLICATION FOR AN ORDER AUTHORIZING ARIZONA WATER COMPANY TO SELL BONDS

Arizona Water Company ("Applicant") has filed an Application with the Arizona Corporation Commission (the "Commission") for an order authorizing Applicant to issue and sell one or more additional series of its General Mortgage Bonds in an aggregate principal amount not to exceed $25,000,000. The Applicant proposes to issue the first additional series of bonds on or before June 30, 2001 in an amount not to exceed $15,000,000 at a negotiated rate not to exceed 8.625%. The Application is available for inspection during regular business hours at the office of the Commission in Phoenix, Arizona, and at Applicant's offices throughout Arizona.

Intervention shall be permitted to any person entitled by law to intervene and having a direct substantial interest in this matter. Persons desiring to intervene must file a written Motion to Intervene with the Commission which must be served upon Applicant and which, at a minimum, shall contain the following information.

1. The name, address, and telephone of the proposed intervenor and of any person upon whom service of documents is to be made if different than the intervenor.
2. A short statement of the proposed intervenor's interest in the proceeding. (e.g., a customer of Applicant, a stockholder of Applicant, etc.)
3. A statement certifying that a copy of the Motion to Intervene has been mailed to Applicant.

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Publish February 2, 2001
Arizona Daily Star; Tucson Citizen

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ARIZONA WATER COMPANY
PHOENIX - ACCOUNTING

ORIGINAL

Jeff Hatch-Miller
Commissioner-Chairman
Marc Spitzer
Commissioner
William A. Mundell
Commissioner
Mike Gleason
Commissioner
Kristin K. Mayes
Commissioner

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BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY, AN ARIZONA CORPORATION, FOR AN ORDER AUTHORIZING THE ISSUANCE AND SALE OF $25,000,000 OF ADDITIONAL GENERAL MORTGAGE BONDS IN ONE OR MORE FINANCINGS.	W-01445A-05-0886 CERTIFICATION OF PUBLICATION

The Commission's Staff has requested that the Company provide public notice of its application for approval of financing as filed herein.

IT IS HEREBY CERTIFIED that the Company published notice of its application in this matter in the newspapers and counties on the dates set forth below. The newspapers are of general circulation in the counties shown.

1.	The Arizona Daily Star	January 10, 2006	Pima
2.	The Arizona Republic	January 10, 2006	Maricopa

Affidavits of publication of the notice and/or tear sheets showing proof of publication are marked "Exhibit A" and attached hereto and by reference made a part of the original of this Certification.

RESPECTFULLY SUBMITTED this 9th day of February, 2006.

ARIZONA WATER COMPANY

By: Robert W. Geake

R.W. Geake
Vice President & General Counsel

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Original and thirteen (13) copies delivered this 9th February, 2006, to:

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

A copy of the foregoing was mailed this 9th day of February, 2006, to:

Hearing Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

By: Robert W. Geake

AFFIDAVIT OF PUBLICATION

EXHIBIT "A"

THE ARIZONA REPUBLIC

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

Diana Chavez, being first duly sworn, upon oath deposes and says: That she is a legal advertising representative of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

The Arizona Republic

January 10, 2006

PUBLIC NOTICE OF AN APPLICATION FOR AN ORDER AUTHORIZING ARIZONA WATER COMPANY TO SELL BONDS

Arizona Water Company ("Applicant") has filed an Application with the Arizona Corporation Commission (the "Commission") for an order authorizing Applicant to issue and sell one or more additional series of its General Mortgage Bonds in an aggregate principal amount not to exceed $25,000,000. The Applicant also seeks authorization to determine the precise amount and timing of the issuance and sale of each additional series of General Mortgage Bonds. The Applicant expects to issue the first series of bonds on or before July 31, 2006 at a negotiated rate of no more than 200 basis points over the 30-year Treasury Rate. The Application is available for inspection during regular business hours at the office of the Commission in Phoenix, Arizona, and at Applicant's offices throughout Arizona.

Intervention shall be permitted to any person entitled by law to intervene and having a direct substantial interest in this matter. Persons desiring to intervene must file a written Motion to Intervene with the Commission which must be served upon Applicant and which, at a minimum, shall contain the following information:

1. The name, address, and telephone of the proposed intervenor and of any person upon whom service of documents is to be made if different than the intervenor.
2. A short statement of the proposed intervenor's interest in the proceeding, (e.g., a customer of Applicant, a stockholder of Applicant, etc.)
3. A statement certifying that a copy of the Motion to Intervene has been mailed to Applicant.

The granting of Motions to Intervene shall be governed by A.A.C. R14-3-105, except that all Motions to Intervene must be filed on, or before, the 15th day after publication of this notice.

060L3-January 10, 2006

Sworn to before me this
10TH day of
January A.D. 2006

OFFICIAL SEAL
MARILYN GREENWOOD
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My Comm. Expires May 23, 2007

Notary Public

EXHIBIT "A"

STAR PUBLISHING COMPANY

Tucson, Arizona

STATE OF ARIZONA)
COUNTY OF PIMA)

Cezar Duron, being first duly sworn deposes and says: that he is the Legal Advertising Representative of the **STAR PUBLISHING COMPANY,** a corporation organized and existing under the laws of the State of Arizona, and that the said **STAR PUBLISHING COMPANY** prints and publishes The Arizona Daily Star, a daily newspaper printed and published in the City of Tucson, Pima County, State of Arizona, and having a general circulation in said City, County, State and elsewhere, and that the attached

Legal Notice

was printed and published correctly in the entire issue of the said The Arizona Daily Star on each of the following dates, to-wit: January 10, 2006.

Subscribed and sworn to before me this 2 day of February, 2006

Silvia H. Valdez
Notary Public

SILVIA H VALDEZ
Notary Public - Arizona
Pima County
Expires 12/15/09

My commission expires _____

TNI AD NO. 4423817

PUBLIC NOTICE OF AN APPLICATION FOR AN ORDER AUTHORIZING ARIZONA WATER COMPANY TO SELL BONDS

Arizona Water Company ("Applicant") has filed an Application with the Arizona Corporation Commission (the "Commission") for an order authorizing Applicant to issue and sell one or more additional series of its General Mortgage Bonds in an aggregate principal amount not to exceed $25,000,000. The Applicant also seeks authorization to determine the precise amount and timing of the issuance and sale of each additional series of General Mortgage Bonds. The Applicant expects to issue the first series of bonds on or before July 31, 2006 at a negotiated rate of no more than 200 basis points over the 30-year Treasury Rate. The Application is available for inspection during regular business hours at the office of the Commission in Phoenix, Arizona, and at Applicant's offices throughout Arizona.

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1. The name, address, and telephone of the proposed intervenor and of any person upon whom service of documents is to be made if different than the intervenor.
2. A short statement of the proposed intervenor's interest in the proceeding (e.g., a customer of Applicant, a stockholder of Applicant, etc.).
3. A statement certifying that a copy of the Motion to Intervene has been mailed to Applicant.

The granting of Motions to Intervene shall be governed by A.A.C. R14-3-105, except that all Motions to Intervene must be filed on, or before, the 15th day after publication of this notice.

Publish January 10, 2006
The Arizona Daily Star
Tucson Citizen

ORIGINAL

BEFORE THE ARIZONA CORPORATION COMMISSION

RECEIVED

2008 JAN 22 A 9:54

AZ CORP COMMISSION
DOCKET CONTROL

040

COMMISSIONERS

MIKE GLEASON, Chairman
WILLIAM A. MUNDELL
JEFF HATCH-MILLER
KRISTIN K. MAYES
GARY PIERCE

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY, AN ARIZONA CORPORATION, FOR AN ORDER AUTHORIZING THE ISSUANCE AND SALE OF $35,000,000 OF ADDITIONAL GENERAL MORTGAGE BONDS IN ONE OR MORE FINANCINGS.	DOCKET NO. W-01445A-07-0703 CERTIFICATION OF PUBLICATION

The Commission's Staff has requested that Arizona Water Company (the "Company") provide public notice of its application for approval of financing as filed herein.

IT IS HEREBY CERTIFIED that the Company published notice of its application in this matter in the newspapers and counties and on the dates set forth below. The newspapers are of general circulation in the counties shown.

1.	The Arizona Daily Star	January 10, 2008	Pima
2.	The Arizona Republic	January 9, 2008	Maricopa

Affidavits of publication of the notice and/or tear sheets showing proof of publication are marked Exhibit A and attached hereto and by reference made a part of the original of this Certification.

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Arizona Corporation Commission
DOCKETED
JAN 22 2008
DOCKETED BY nr

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RWG:LAR | 15:46 1/21/08

RESPECTFULLY SUBMITTED this 22nd day of January, 2008.

ARIZONA WATER COMPANY

By: Robert W. Geake

Robert W. Geake
Vice President and General Counsel
ARIZONA WATER COMPANY
Post Office Box 29006
Phoenix, AZ 85038-9006

Original and thirteen (13) copies of the foregoing filed this 22nd day of January, 2008:

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

A copy of the foregoing application mailed this 22nd day of January, 2007 to:

Ernest G. Johnson
Director
Utilities Division
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007

Lyn Farmer
Chief Administrative Law Judge
Hearing Division
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007

By: Robert W. Geake

EXHIBIT A

TUCSON'S NEWSPAPERS

Tucson, Arizona

STATE OF ARIZONA)
COUNTY OF PIMA)

Debbie Capanear, being first duly sworn deposes and says: that she is the Legal Advertising Representative of the **TUCSON'S NEWSPAPERS COMPANY,** a corporation organized and existing under the laws of the State of Arizona, and that the said **TUCSON'S NEWSPAPERS PUBLISHING COMPANY** prints and publishes the Arizona Daily Star and Tucson Citizen, daily newspapers printed and published in the City of Tucson, Pima County, State of Arizona, and having a general circulation in said City, County, State and elsewhere, and that the attached

Legal Notice

was printed and published correctly in the entire issue of the said Arizona Daily Star and Tucson Citizen on each of the following dates, to-wit:

Jan. 10, 2008

Debbie Capanear

Subscribed and sworn to before me this 17 day of Jan., 2008

Silvia H Valdez
Notary Public

SILVIA H VALDEZ
Notary Public - Arizona
Pima County
Expires 12/15/09

My commission expires _____

TNI AD NO. 6027006

PUBLIC NOTICE OF AN APPLICATION FOR AN ORDER AUTHORIZING ARIZONA WATER COMPANY TO SELL BONDS

Arizona Water Company ("Applicant") has filed an Application with the Arizona Corporation Commission (the "Commission") for an order authorizing Applicant to issue and sell one or more additional series of its General Mortgage Bonds in an aggregate principal amount not to exceed $35,000,000. The Application is available for inspection during regular business hours at the office of the Commission in Phoenix, Arizona, and at Applicant's Phoenix office.

Intervention shall be permitted to any person entitled by law to intervene and having a direct substantial interest in this matter. Persons desiring to intervene must file a written Motion to Intervene with the Commission which must be served upon Applicant and which, at a minimum, shall contain the following information.

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3. A statement certifying that a copy of the Motion to Intervene has been mailed to Applicant.

The granting of Motions to Intervene shall be governed by A.A.C. R14-3-105, except that all Motions to Intervene must be filed on or before the 15th day after publication of this Notice.

Publish January 10, 2008
Arizona Daily Star
Tucson Citizen

EXHIBIT A

AFFIDAVIT OF PUBLICATION

THE ARIZONA REPUBLIC

PUBLIC NOTICE OF AN APPLICATION FOR AN ORDER AUTHORIZING ARIZONA WATER COMPANY TO SELL BONDS

Arizona Water Company ("Applicant") has filed an Application with the Arizona Corporation Commission (the "Commission") for an order authorizing Applicant to issue and sell one or more additional series of its General Mortgage Bonds in an aggregate principal amount not to exceed $35,000,000. The Application is available for inspection during regular business hours at the office of the Commission in Phoenix, Arizona, and at Applicant's Phoenix office.

Intervention shall be permitted to any person entitled by law to intervene and having a direct, substantial interest in this matter. Persons desiring to intervene must file a written Motion to Intervene with the Commission which must be served upon Applicant and which, at a minimum, shall contain the following information.

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2. A short statement of the proposed intervenor's interest in the proceeding (e.g., a customer of Applicant, a stockholder of Applicant, etc.).
3. A statement certifying that a copy of the Motion to Intervene has been mailed to Applicant.

The granting of Motions to Intervene shall be governed by A.A.C. R14-3-105, except that all Motions to Intervene must be filed on or before the 15th day after publication of this Notice.

Published: January 9, 2008

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

Mark Gilmore, being first duly sworn, upon oath deposes and says: That he is a legal advertising representative of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

The Arizona Republic

January 9, 2008

Mark Gilmore

Sworn to before me this
9TH day of
January A.D. 2008

MARILYN GREENWOOD
Notary Public - Arizona
Maricopa County
My Comm. Expires May 23, 2011

Marilyn Greenwood
Notary Public

ATTACHMENT 16

McGraw-Hill/Irwin Series in Finance, Insurance, and Real Estate

n A. Ross, Franco Modigliani Professor of Finance and Economics, Sloan School of Management, Massachusetts Institute of ology, Consulting Editor

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Smith
The Modern Theory of Corporate Finance
Second Edition

White
Financial Analysis with an Electronic Calculator
Fifth Edition

Investments

Bodie, Kane, and Marcus
Essentials of Investments
Fifth Edition

Bodie, Kane, and Marcus
Investments
Sixth Edition

Cohen, Zinbarg, and Zeikel
Investment Analysis and Portfolio Management
Fifth Edition

Corrado and Jordan
Fundamentals of Investments: Valuation and Management
Third Edition

Farrell
Portfolio Management: Theory and Applications
Second Edition

Hirt and Block
Fundamentals of Investment Management
Eighth Edition

Financial Institutions and Markets

Cornett and Saunders
Fundamentals of Financial Institutions Management

Rose and Hudgins
Bank Management and Financial Services
Sixth Edition

Rose and Marquis
Money and Capital Markets: Financial Institutions and Instruments in a Global Marketplace
Ninth Edition

Santomero and Babbel
Financial Markets, Instruments, and Institutions
Second Edition

Saunders and Cornett
Financial Institutions Management: A Risk Management Approach
Fifth Edition

Saunders and Cornett
Financial Markets and Institutions: A Modern Perspective
Second Edition

International Finance

Beim and Calomiris
Emerging Financial Markets

Eun and Resnick
International Financial Management
Third Edition

Kuemmerle
Case Studies in International Entrepreneurship: Managing and Financing Ventures in the Global Economy
First Edition

Levich
International Financial Markets: Prices and Policies
Second Edition

Real Estate

Brueggeman and Fisher
Real Estate Finance and Investments
Twelfth Edition

Corgel, Ling and Smith
Real Estate Perspectives: An Introduction to Real Estate
Fourth Edition

Ling and Archer
Real Estate Principles: A Value Approach
First Edition

Financial Planning and Insurance

Allen, Melone, Rosenbloom, and Mahoney
Pension Planning: Pension, Profit-Sharing, and Other Deferred Compensation Plans
Ninth Edition

Crawford
Life and Health Insurance Law
Eighth Edition (LOMA)

Harrington and Niehaus
Risk Management and Insurance
Second Edition

Hirsch
Casualty Claim Practice
Sixth Edition

Kapoor, Dlabay, and Hughes
Focus on Personal Finance: An active approach to help you develop successful financial skills
First Edition

Kapoor, Dlabay, and Hughes
Personal Finance
Seventh Edition

Williams, Smith, and Young
Risk Management and Insurance
Eighth Edition

PRINCIPLES OF CORPORATE FINANCE

EIGHTH EDITION

RICHARD A. BREALEY
Professor of Finance
London Business School

STEWART C. MYERS
Gordon Y Billard Professor of Finance
Sloan School of Management
Massachusetts Institute of Technology

FRANKLIN ALLEN
Nippon Life Professor of Finance
The Wharton School
University of Pennsylvania

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Milan Montreal New Delhi Santiago Seoul Singapore Sydney Taipei Toronto

Using the DCF Model to Set Gas and Electricity Prices

The prices charged by local electric and gas utilities are regulated by state commissions. The regulators try to keep consumer prices down but are supposed to allow the utilities to earn a fair rate of return. But what is fair? It is usually interpreted as r, the market capitalization rate for the firm's common stock. That is, the fair rate of return on equity for a public utility ought to be the rate offered by securities that have the same risk as the utility's common stock.[4]

Small variations in estimates of this return can have a substantial effect on the prices charged to the customers and on the firm's profits. So both utilities and regulators devote considerable resources to estimating r. They call r **the cost of equity capital.** Utilities are mature, stable companies which ought to offer tailor-made cases for application of the constant-growth DCF formula.[5]

Suppose you wished to estimate the cost of equity for Cascade Natural Gas, a local natural gas distribution company. Its stock was selling for $22.35 per share at the start of 2004. Dividend payments for the next year were expected to be $1.03 a share. Thus it was a simple matter to calculate the first half of the DCF formula:

$$\text{Dividend yield} = \frac{\text{DIV}_1}{P_0} = \frac{1.03}{22.35} = .046, \text{ or } 4.6\%$$

The hard part is estimating g, the expected rate of dividend growth. One option is to consult the views of security analysts who study the prospects for each company. Analysts are rarely prepared to stick their necks out by forecasting dividends to kingdom come, but they often forecast growth rates over the next five years, and these estimates may provide an indication of the expected long-run growth path. In the case of Cascade, analysts in 2004 were forecasting an annual growth of 5.7 percent.[6] This, together with the dividend yield, gave an estimate of the cost of equity capital:

$$r = \frac{\text{DIV}_1}{P_0} + g = .046 + .057 = .103, \text{ or } 10.3\%$$

An alternative approach to estimating long-run growth starts with the **payout ratio,** the ratio of dividends to earnings per share (EPS). For Cascade, this was forecasted at 66 percent. In other words, each year the company was plowing back into the business about 44 percent of earnings per share:

$$\text{Plowback ratio} = 1 - \text{payout ratio} = 1 - \frac{\text{DIV}}{\text{EPS}} = 1 - .66 = .44$$

[4]This is the accepted interpretation of the U.S. Supreme Court's directive in 1944 that "the returns to the equity owner [of a regulated business] should be commensurate with returns on investments in other enterprises having corresponding risks." *Federal Power Commission v. Hope Natural Gas Company,* 302 U.S. 591 at 603.

[5]There are many exceptions to this statement. For example, Pacific Gas & Electric (PG&E), which serves northern California, used to be a mature, stable company until the California energy crisis of 2000 sent wholesale electric prices sky-high. PG&E was not allowed to pass these price increases on to retail customers. The company lost more than $3.5 billion in 2000 and was forced to declare bankruptcy in 2001. PG&E emerged from bankruptcy in 2004, but we may have to wait a while before it is again a suitable subject for the constant-growth DCF formula.

[6]In this calculation we're assuming that earnings and dividends are forecasted to grow forever at the same rate g. We'll show how to relax this assumption later in this chapter. The growth rate was based on the average earnings growth forecasted by Value Line and IBES. IBES compiles and averages forecasts made by security analysts. Value Line publishes its own analysts' forecasts.

Also, Cascade's ratio of earnings per share to book equity per share was about 12 percent. This is its **return on equity,** or **ROE:**

$$\text{Return on equity} = \text{ROE} = \frac{\text{EPS}}{\text{book equity per share}} = .12$$

If Cascade earns 12 percent of book equity and reinvests 44 percent of income, then book equity will increase by $.44 \times .12 = .053$ or 5.3 percent. Earnings and dividends per share will also increase by 5.3 percent:

$$\text{Dividend growth rate} = g = \text{plowback ratio} \times \text{ROE} = .44 \times .12 = .053$$

That gives a second estimate of the market capitalization rate:

$$r = \frac{\text{DIV}_1}{P_0} + g = .046 + .053 = .099, \text{ or } 9.9\%$$

Although this estimate of the market capitalization rate for Cascade stock seems reasonable enough, there are obvious dangers in analyzing any single firm's stock with the constant-growth DCF formula. First, the underlying assumption of regular future growth is at best an approximation. Second, even if it is an acceptable approximation, errors inevitably creep into the estimate of g. Our two methods for calculating the cost of equity gave similar answers. That was a lucky chance; different methods can sometimes give very different answers.

Remember, Cascade's cost of equity is not its personal property. In well-functioning capital markets investors capitalize the dividends of all securities in Cascade's risk class at exactly the same rate. But any estimate of r for a single common stock is "noisy" and subject to error. Good practice does not put too much weight on single-company cost-of-equity estimates. It collects samples of similar companies, estimates r for each, and takes an average. The average gives a more reliable benchmark for decision making.

Table 4.2 shows DCF cost-of-equity estimates for Cascade and seven other gas distribution companies. These are all stable, mature companies for which the constant-growth DCF formula *ought* to work. Notice the variation in the cost-of-equity estimates. Some of the variation may reflect differences in the risk, but some is just noise. The average estimate is 10.2 percent.

Table 4.3 gives another example of DCF cost-of-equity estimates, this time for U.S. railroads in 2002.

Of course, you are not restricted to analyzing expected returns for particular industries; you can also use the DCF formula to estimate the expected return for the entire stock market. For example, Figure 4.2 shows the results of an exercise by Marston and Harris, which used analysts' forecasts of five-year earnings growth to produce DCF estimates of the average cost of equity for companies in the Standard & Poor's Index. You can see that as interest rates fell between 1982 and 1998, the estimated cost of equity fell from nearly 20 percent to just under 15 percent. The margin between the cost of equity and the rate of interest was much more stable and averaged 9.3 percent over the 17-year period.

Estimates of this kind are only as good as the long-term forecasts on which they are based. For example, several studies have observed that security analysts are subject to behavioral biases and their forecasts tend to be over-optimistic.[7] If so, such DCF estimates of the cost of equity should be regarded as upper estimates of the true figure.

[7]See, for example, A. Dugar and S. Nathan, "The Effect of Investment Banking Relationships on Financial Analysts' Earnings Investment Recommendations," *Contemporary Accounting Research* 12 (1995), pp. 131–160.

that these shares are repurchased at a price that makes the bidder happy to leave the target alone. This price does not always make the target's shareholders happy, as we point out in Chapter 32.

16.3 HOW DO COMPANIES DECIDE ON THE PAYOUT?

In the mid-1950s John Lintner held a classic series of interviews with corporate managers about their payout policies.[6] His conclusions can be summarized in four stylized facts:[7]

1. Firms have long-run target dividend payout ratios. Mature companies with stable businesses generally pay out a high proportion of earnings; growth companies have low payouts (if they pay any dividends at all).
2. Managers focus more on dividend changes than on absolute levels. Thus paying a $2.00 dividend is an important financial decision if last year's dividend was $1.00, but no big deal if last year's dividend was $2.00.
3. Dividend changes follow shifts in long-run sustainable earnings. Managers "smooth" dividends. Transitory earnings changes are unlikely to affect dividend payouts.
4. Managers are reluctant to make dividend changes that may have to be reversed. They are particularly worried about having to rescind a dividend increase.

When Lintner conducted his interviews, dividends were effectively the only means of distributing cash. More recent work on payout policy since the dramatic increase in repurchases suggests a fifth stylized fact.[8]

5. Firms repurchase stock when they have accumulated a large amount of unwanted cash or wish to change their capital structure by replacing equity with debt.

While stock repurchases are like bumper dividends, they do not typically *substitute* for dividends. Many companies that repurchase stock are mature, profitable companies that also pay dividends. Consider the case of U.S. banks. In 1997 large bank holding companies paid out just under 40 percent of their earnings as dividends. There were few profitable investment opportunities for the remaining income, but the banks did not want to commit themselves in the long run to any larger dividend payments. They therefore returned the cash to shareholders not by upping the dividend rate, but by repurchasing $16 billion of stock.[9]

[6]See J. Lintner, "Distribution of Incomes of Corporations among Dividends, Retained Earnings, and Taxes," *American Economic Review* 46 (May 1956), pp. 97–113; and, for example, E. F. Fama and H. Babiak, "Dividend Policy: An Empirical Analysis," *Journal of the American Statistical Association* 63 (December 1968), pp. 1132–1161.

[7]The stylized facts are given by T. A. Marsh and R. C. Merton, "Dividend Behavior for the Aggregate Stock Market," *Journal of Business* 60 (January 1987), pp. 1–40. See especially pp. 5–6. We have paraphrased and embellished.

[8]See M. Jagannathan, C. P. Stephens, and M. S. Weisbach, "Financial Flexibility and the Choice between Dividends and Stock Repurchases," *Journal of Financial Economics* 57 (September 2000), pp. 355–384.

[9]B. Hirtle, "Bank Holding Company Capital Ratios and Shareholder Payouts," *Federal Reserve Bank of New York: Current Issues in Economics and Finance* 4 (September 1998), pp. 1–6 (www.ny.frb.org/research/current_issues/ci4-9.pdf).

Given these differences in the way that dividends and repurchases are used, it is not surprising to find that repurchases are much more volatile than dividends. Repurchases generally mushroom during boom times as firms accumulate excess cash and wither in recessions. You can see this from Figure 16.1, which shows that repurchases roughly halved during the early 1990s and then again between 2000 and 2002.

In recent years a number of countries, such as Japan and Sweden, have allowed repurchases for the first time.[10] Some countries, however, continue to ban them entirely or to tax them as dividends. In these countries firms that have amassed large amounts of cash may be tempted to invest it at very low rates of return rather than hand it back to shareholders, who could reinvest it in firms that are short of cash.

16.4 THE INFORMATION IN DIVIDENDS AND STOCK REPURCHASES

In some countries you cannot rely on the information that companies provide. Passion for secrecy and a tendency to construct multilayered corporate organizations produce asset and earnings figures that are next to meaningless. Some people say that, thanks to creative accounting, the situation is little better for some companies in the United States.

How does an investor in such a world separate marginally profitable firms from the real money makers? One clue is dividends. Investors can't read managers' minds, but they can learn from managers' actions. They know that a firm which reports good earnings and pays a generous dividend is putting its money where its mouth is. We can understand, therefore, why investors would value the information content of dividends and would refuse to believe a firm's reported earnings unless they were backed up by an appropriate dividend policy.

Of course, firms can cheat in the short run by overstating earnings and scraping up cash to pay a generous dividend. But it is hard to cheat in the long run, for a firm that is not making enough money will not have enough cash to pay out. If a firm chooses a high dividend payout without the cash flow to back it up, that firm will ultimately have to reduce its investment plans or turn to investors for additional debt or equity financing. All of these consequences are costly. Therefore, most managers don't increase dividends until they are confident that sufficient cash will flow in to pay them.

Researchers, who have attempted to measure the information in dividend changes, have come up with mixed evidence. Some have found that dividend changes have little or no ability to predict future earnings. However, Healy and Palepu, who focus on companies that paid a dividend for the first time, find that on average earnings jumped 43 percent in the year a dividend was paid. If managers thought that this was a temporary windfall, they might have been cautious about committing themselves to paying out cash. But it looks as if these managers had good reason to be confident about prospects, for earnings continued to rise in the following years.[11]

[10]Repurchases have been permitted in Japan since 1995 and in Sweden since 2000.

[11]See P. Healy and K. Palepu, "Earnings Information Conveyed by Dividend Initiations and Omissions," *Journal of Financial Economics* 21 (1988), pp. 149–175. For an example of a study which finds no information in the announcement, see G. Grullon, R. Michaely, and B. Swaminathan, "Are Dividend Changes a Sign of Firm Maturity?" *Journal of Business*, 75 (July 2002), pp. 387–424.

provides an additional hurdle that the firm must keep jumping. If it cannot pay the cash into the sinking fund, the lenders can demand their money back. That is why long-dated, lower-quality issues involve larger sinking funds. Higher-quality bonds generally have a lighter sinking fund requirement if they have one at all.

Unfortunately, a sinking fund is a weak test of solvency if the firm is allowed to repurchase bonds in the market. Since the *market* value of the debt declines as the firm approaches financial distress, the sinking fund becomes a hurdle that gets progressively lower as the hurdler gets weaker.

Call Provisions

Corporate bonds occasionally include a call option that allows the company to pay back the debt early. Sometimes you come across bonds that give the *investor* the repayment option. Retractable (or puttable) bonds give investors the right to demand early repayment; extendible bonds give them the option to extend the bond's life.

For some companies callable bonds offer a natural form of insurance. For example, Fannie Mae and Freddie Mac are federal agencies that offer fixed-rate mortgages to home buyers. When interest rates fall, home owners are likely to repay their fixed-rate mortgage and take out a new mortgage at the lower interest rate. This can severely dent the income of the two agencies. Therefore, to protect themselves against the effect of falling interest rates, they issue large quantities of long-term callable debt. When interest rates fall, the agencies can reduce their funding costs by calling their bonds and replacing them with new bonds at a lower rate. Ideally, the fall in bond interest payments should exactly offset the reduction in mortgage income.

These days, issues of straight bonds by industrial companies are much less likely to include a call provision. However, J.C. Penney has the option to call back its entire bond issue. Bonds may provide a period of call protection during which the bond either cannot be called at all, or cannot be called and replaced with new debt with a lower interest rate.

How does a company know when to call its bonds? The answer is simple: Other things equal, if it wishes to maximize the value of its stock, it must minimize the value of its bonds. Therefore, a company should never call the bonds if their market value is less than the call price, for that would just be giving a present to the bondholders. Equally, a company *should* call the bond if it is worth *more* than the call price.

Of course, investors take the call option into account when they buy or sell the bond. They know that the company will call the bond as soon as it is worth more than the call price, so no investor will be willing to pay more than the call price for the bond. The market price of the bond may, therefore, reach the call price, but it will not rise above it. This gives the company the following rule for calling its bonds: *Call the bond when, and only when, the market price reaches the call price.*[23]

[23]See M. J. Brennan and E. S. Schwartz, "Savings Bonds, Retractable Bonds, and Callable Bonds," *Journal of Financial Economics* 5 (1997), pp. 67–88. Of course, this assumes that the bond is correctly priced, that investors are behaving rationally, and that investors expect the *firm* to behave rationally. Also we ignore some complications. First, you may not wish to call a bond if you are prevented by a nonrefunding clause from issuing new debt. Second, the call premium is a tax-deductible expense for the company but is taxed as a capital gain to the bondholder. Third, there are other possible tax consequences to both the company and the investor from replacing a low-coupon bond with a higher-coupon bond. Fourth, there are costs and delays to calling and reissuing debt.

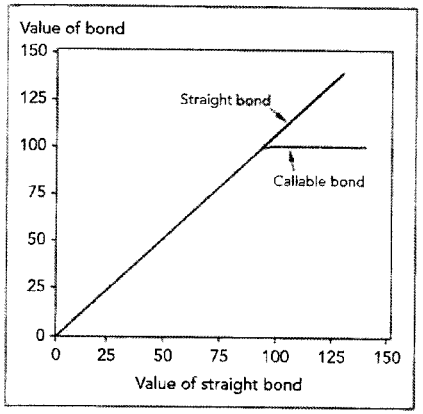

FIGURE 25.2

Relationship between the value of a callable bond and that of a straight (noncallable) bond. Assumptions: (1) Both bonds have an 8 percent coupon and a five-year maturity; (2) the callable bond may be called at face value any time before maturity; (3) the short-term interest rate follows a random walk, and the expected returns on bonds of all maturities are equal.

Source: M. J. Brennan and E. S. Schwartz, "Savings Bonds, Retractable Bonds, and Callable Bonds," *Journal of Financial Economics* 5 (1977), pp. 67–88.

If we know how bond prices behave over time, we can modify the basic option-valuation model of Chapter 21 to find the value of the callable bond, *given* that investors know that the company will call the issue as soon as the market price reaches the call price. For example, look at Figure 25.2. It illustrates the relationship between the value of a straight 8 percent five-year bond and the value of a comparable callable bond. Suppose that the value of the straight bond is very low. In this case there is little likelihood that the company will ever wish to call its bonds. (Remember that it will call the bonds only when their price equals the call price.) Therefore the value of the callable bond will be almost identical to the value of the straight bond. Now suppose that the straight bond is worth exactly 100. In this case there is a good chance that at some time the company will wish to call its bonds. Therefore the value of our callable bond will be slightly less than that of the straight bond. If interest rates decline further, the price of the straight bond will continue to rise, but nobody will ever pay more than the call price for the callable bond.

A call provision is not a free lunch. It provides the issuer with a valuable option, but that is recognized in a lower issue price. So why do companies bother with a call provision? One reason is that bond indentures often place a number of restrictions on what the company can do. Companies are happy to agree to these restrictions as long as they know that they can escape from them if the restrictions prove too inhibiting. The call provision provides the escape route.

We mentioned earlier that some bonds also provide the investor with an option to demand early repayment. *Puttable* bonds exist largely because bond indentures cannot anticipate every action the company may take that could harm the bondholder. If the value of the bonds is reduced, the put option allows the bondholders to demand repayment.

Puttable loans can sometimes get their issuers into BIG trouble. During the 1990s many loans to Asian companies gave their lenders a repayment option. Consequently, when the Asian crisis struck in 1997, these companies were faced by a flood of lenders demanding their money back.

ATTACHMENT 17

Utilities: It takes a litter

John Waggoner, USA TODAY 7 a.m. EST December 12, 2014

Utilities stocks are the fluffy puppies of the stock market. They are solid, stable businesses – hey, who doesn't love electricity? – and they dole out nice little dividend treats on a regular basis.

Utilities are so mild-mannered that they were long called "widow and orphan stocks" because brokers could sell them to widows and orphans without getting sent to the Security and Exchange Commission's doghouse. They were that sweet and adorable.

By and large, they still are. But if you're retired, or nearing retirement, you need to choose your utilities stocks and funds carefully. If you're really smart, you'll use utilities as one of a litter of income-producing investments.

Utilities come in many breeds, although electric utilities are what most people think of when the sector comes up. But most utility mutual funds include telephone, water and pipeline companies in the mix.

The stocks have long been popular with retirees and other income-oriented investors. Electric utilities tend to be well-regulated and well-managed and pay out much of their profits in dividends. The Dow Jones Utility index yields about 3.4%. Duke Energy (ticker: DUK), the largest diversified utility in the Standard & Poor's 500 stock index, has a dividend yield of 3.83%, which looks pretty good when compared with the 10-year Treasury note, which yields a miserly 2.18%.

Of course, a Patagonian Hellhound looks good when compared with a 2.18% yield. After all, the consumer price index, the government's main gauge of inflation, has risen 1.7% in the 12 months that ended in October. Utility yields are higher than many competitors, but they're still low on an absolute basis.

If you choose to invest in a utilities fund, rather than an individual stock, you probably won't get a yield remotely near 3.4%, because funds typically take their expenses from the dividends they receive. Prudential Jennison Utility B, for example, has a 1.41% dividend yield, according to Morningstar, the Chicago investment trackers. Wells Fargo Utility and Telecommunications A has a 1.59% dividend yield.

If you're taking withdrawals from your utility fund, you may find that they aren't necessarily a safe harbor. We had Morningstar look at what would happen to an investor who invested $100,000 in a utility fund in January 2000 and took an initial annual withdrawal of 5%, or $5,000. (That's 416.67 a month). Each year, our hypothetical investor gave herself a 3% raise to account for inflation.

Her results would have varied wildly, depending on the fund she chose. Had she invested in Prudential Jennison Utility B – the fund with aforementioned low yield – she'd have $210,367 in her account, even after withdrawals.

But she would have run out of money in three out of the 14 funds Morningstar examined. Had she invested in Fidelity Advisor Utilities A (FUGAX), she would have run out of money in August 2011. Two other funds would have run out of money: Fidelity Select Utilities Portfolio (FSUTX) and Fidelity Telecom and Utilities (FIUIX).

Several others would have been terminally depleted. Rydex Utilities (RYAUX) would have left her with about $18,500. American Century Utilities (BULIX) would have left her with about $36,000.

Naturally, any hypothetical has caveats. January 2000 was about the worst time to buy any stock fund: It was the eve of the tremendously destructive bear market of 2000-2002, followed by the even more destructive bear market of 2007-2009.

Not all utilities funds are geared toward retirees. Fidelity Advisor Utilities' prospectus states that it seeks capital gains, not income. It, like many of the Fidelity sector funds, is geared toward an investor who wants price appreciation, not cash dividends. (This is why you should always read your prospectus.)

Clearly, it's not a good idea to buy anything on the eve of a massive bear market, even normally docile utilities stocks. This year, the average utility fund has gained 13.5%, vs. 11.6% for the S&P 500 with dividends reinvested. In utility land, that's a very, very good year.

Much of that goodness comes from the boom in energy, particularly natural gas. In a way, utilities are an energy play: As energy prices fall, so do expenses for utilities. Moreover, there's a huge demand for natural gas pipelines and infrastructure. "We have been more positive on infrastructure side, more cautious on generation side," says William Ferer, president of Reaves Asset Management.

Reaves Utilities and Energy Infrastructure (RSRFX) has nearly 25% of its assets in energy. Though that's a big bet, other utilities funds are betting on energy as well. Franklin Utilities (FKUTX), this year's top-performing utility fund, has 10.6% of its assets in energy, according to Morningstar. ICON Utilities (ICTUX) has 8.42% of its assets in energy.

For many funds, investments in energy master limited partnerships, which typically own and operate natural gas pipelines, is a logical step. The MLPs throw off good dividends, and they are just one step removed from generating electricity. As coal power goes offline, many utilities are converting to gas or building gas-fired generators.

Anyone who has lived through the past week knows energy prices can be volatile. Derrek Rollingson, manager of ICON Utilities, says the sector is slightly undervalued, but after this year's runup, you need to be fairly selective. "At the beginning of the year, you could have used a dartboard to pick them," he says.

If you're investing in utilities for income, you should look for funds that keep expenses low. The less you give to your fund, the more you'll have for you and your dog. Vanguard Utilities ETF (XLU) charges just 0.12% a year – or $12 a year for a $10,000 investment. Yield: 3.10%. Utilities Select Sector SPDR charges 0.15%, or $15 a year, and yields 3.24%.

If you're an income investor, the days when you could put your money into utilities and spend the rest of your time romping with Rover are gone. Make sure you have a diversified income portfolio: dividend-paying stocks, convertible bonds, cash and others. You want your back yard to go to the dogs – not your retirement income.

ATTACHMENT 18

TENTH EDITION

Contemporary Financial Management

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retained earnings available for reinvestment and requires the use of more external equity funds to finance growth. Raising external equity funds in the capital markets subjects the company to the scrutiny of regulators (such as the SEC) and potential investors, thereby serving as a monitoring function of managerial performance.

Conclusions Regarding Dividend Relevance The empirical evidence as to whether dividend policy affects firm valuation is mixed. Some studies have found that, because of tax effects, investors require higher pretax returns on high-dividend payout stocks than on low-dividend payout stocks.[18] Other studies have found that share prices are unaffected by dividend payout policy.[19]

Many practitioners believe that dividends are important, both for their informational content and because external equity capital is more expensive than retained equity.[20] Thus, when establishing an optimal dividend policy, a firm should consider shareholder preferences along with investment opportunities and the relative cost of retained equity versus externally raised equity.

Dividend Policies

The previous sections examined a number of practical considerations that influence a firm's board of directors in determining an "optimal" dividend policy. In this section, several alternative dividend strategies are discussed.

Passive Residual Policy

passive residual policy

The **passive residual policy** suggests that a firm should retain its earnings as long as it has investment opportunities that promise higher rates of return than the required rate. For example, assume that a firm's shareholders could invest their dividends in stocks of similar risk with an expected rate of return (dividends plus capital gains) of 18 percent. This 18 percent figure, then, would constitute the required rate of return on the firm's retained earnings.[21] As long as the firm can invest these earnings to earn this required rate or more, it should not pay dividends (according to the passive residual policy) because such payments would require either that the firm forgo some acceptable investment opportunities or raise necessary equity capital in the more expensive external capital markets.

Interpreted literally, the residual theory implies that dividend payments will vary from year to year, depending on available investment opportunities. There is strong evidence, however, that most firms try to maintain a rather stable dividend payment record over time. Of course, this does not mean that firms ignore the principles of the residual theory in making their dividend decisions because dividends can be smoothed out from year to year in two ways.[22] First, a firm can choose to retain a larger percentage of earnings during years when funding needs are large. If the firm continues to grow, it can manage to do this without reduc-

[18] See Robert H. Litzenberger and Krishna Ramaswamy, "The Effect of Personal Taxes and Dividends on Capital Asset Prices: Theory and Empirical Evidence," *Journal of Financial Economics* (June 1979): 163–196; Litzenberger and Ramaswamy, "Dividends, Short-Selling Restrictions, Tax Induced Investor Clienteles and Market Equilibrium," *Journal of Finance* (May 1980); and Litzenberger and Ramaswamy, "The Effects of Dividends on Common Stock Prices: Tax Effects or Information Effects?" *Journal of Finance* (May 1982): 429–444.

[19] See Fischer Black and Myron Scholes, "The Effects of Dividend Yield and Dividend Policy on Common Stock Prices and Returns," *Journal of Financial Economics* (May 1974): 1–22; and Merton H. Miller and Myron S. Scholes, "Dividends and Taxes: Some Empirical Evidence," *Journal of Political Economy* (December 1983): 1118–1141.

[20] For a survey of chief financial officers' attitudes on dividend policy, see H. Kent Baker, Gail E. Farrelly, and Richard B. Edelman, "A Survey of Management Views on Dividend Policy," *Financial Management* (Autumn 1985): 78–84.

[21] This is the rate of return that must be earned on the equity-financed portion of new investments. To earn this return on equity, new investments must earn an overall rate of return equal to the weighted cost of capital—reflecting the fact that all investments are made with a mix of debt and equity funds in the proportions of the target capital structure.

[22] Robert C. Higgins, "The Corporate Dividend-Saving Decision," *Journal of Financial and Quantitative Analysis* (March 1972): 1531–1538, provides empirical support for the view that each period's dividends are a function of longer-term trends.

ing the dollar amount of the dividend. Second, a firm can borrow the funds it needs, temporarily raise its debt-to-equity ratio, and avoid a dividend cut in this way. Because issue costs are lower for large offerings of long-term debt, long-term debt capital tends to be raised in large, lumpy sums. If many good investment opportunities are available to a firm during a particular year, this type of borrowing is preferable to cutting back on dividends. The firm will need to retain earnings in future years to bring its debt-to-equity ratio back in line. A firm that has many good investment opportunities for a number of years may eventually be forced to cut its dividend and/or sell new equity shares to meet financing requirements and maintain an optimal capital structure.

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Keyword: residual dividend policy, stable dollar dividend policy

The residual theory also suggests that "growth" firms will normally have lower dividend payout ratios than firms in mature, low-growth industries. As shown earlier in Table 15.3, companies with low growth rates (such as Consolidated Edison and Cascade National Gas) tend to have rather high payout ratios, whereas firms with high growth rates (such as Dell and Target) tend to have rather low payout ratios.

Stable Dollar Dividend Policy

Evidence indicates that most firms—and stockholders—prefer reasonably stable dividend policies. This stability is characterized by a rather strong reluctance to reduce the dollar amount of dividends from one period to the next. Similarly, increases in the dollar dividend rate normally are not made until the firm's management is satisfied that future earnings will be high enough to justify the larger dividend. Thus, although dividend rates tend to follow increases in earnings, they also tend to lag behind them to a certain degree.

Figure 15.1 on page 530 illustrates the relationship between corporate dividends and profits since 1960. It is apparent from this chart that aggregate dividend payments fluctuate much less than corporate earnings. There has been a strong upward trend in the amount of dividends paid, with very few years showing significant reductions. This is in sharp contrast to the more erratic record of corporate earnings.

More specifically, Figure 15.2 on page 531 shows the dividend and earnings history of Kerr-McGee Corporation (oil and gas exploration and production and specialty chemicals). Although there has been an upward trend in dividends over time, dividend increases tend to lag earnings increases. Annual dividend payments are also more stable than earnings figures. Note, for instance, the dramatic growth in earnings in 1996, yet dividends were increased only by $0.09 per share. Also, despite a significant earnings decline in 1992, the dividend rate was actually increased by $0.04 per share. In 2002, the company experienced a loss per share of $4.74, yet continued to pay its $1.80 dividend.

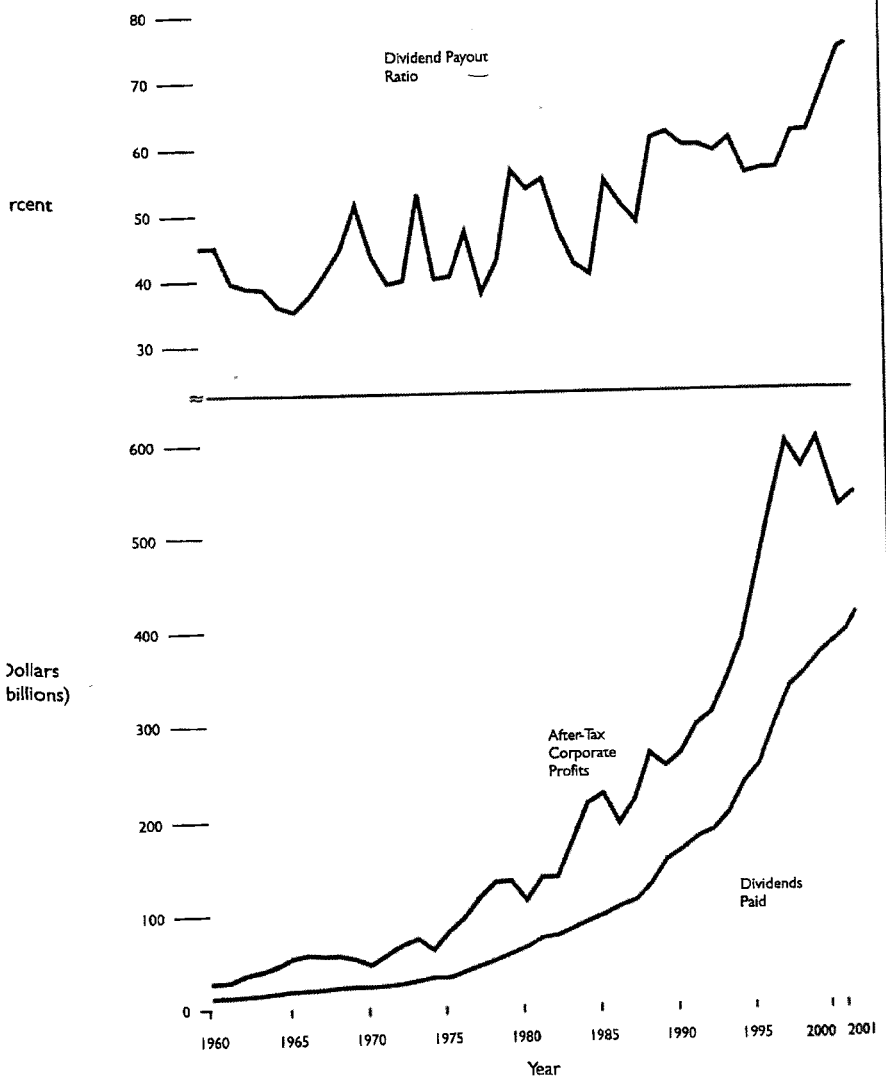
Investors prefer stable dividends for a variety of reasons. For instance, many investors feel that dividend changes possess *informational content*; they equate changes in a firm's dividend levels with profitability. A cut in dividends may be interpreted as a signal that the firm's long-run profit potential has declined. Similarly, a dividend increase is seen as a verification of the expectation that future profits will increase.[23]

In addition, many shareholders need and depend on a constant stream of dividends for their cash income requirements. Although they can sell off some of their shares as an alternative source of current income, associated transaction costs and odd-lot charges make this an imperfect substitute for steady dividend income.

Some managers feel that a stable and growing dividend policy tends to reduce investor uncertainty concerning future dividend streams. They believe investors will pay a higher price for the stock of a firm that pays stable dividends, thereby reducing the firm's cost of equity.

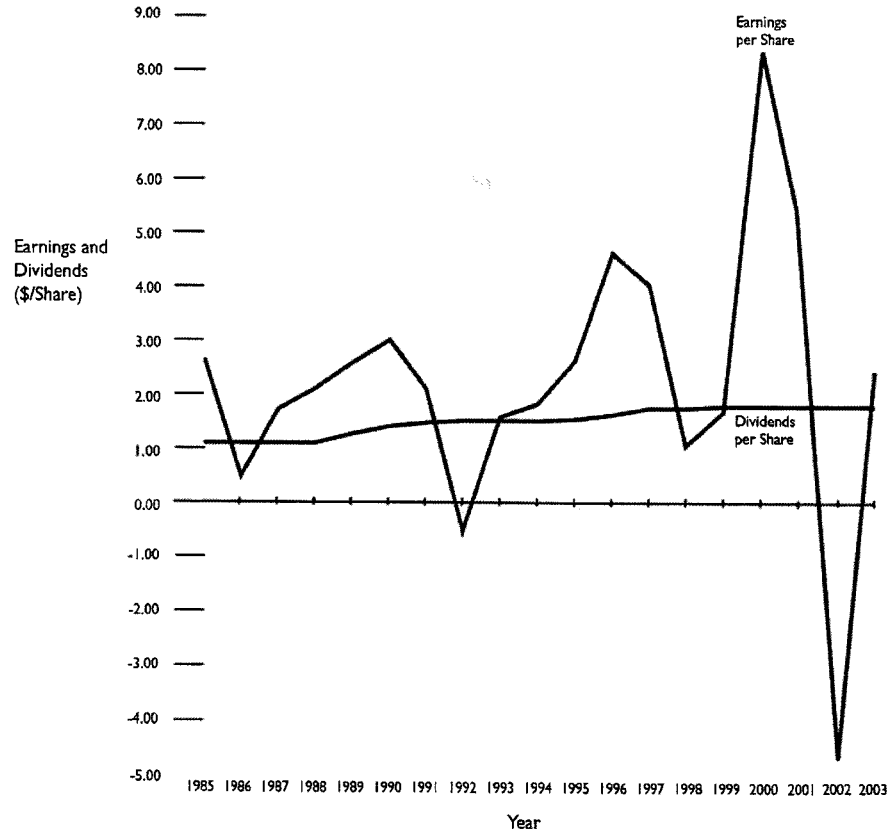
[23] Sometimes, however, an increase in a firm's dividend payout ratio may be interpreted to mean the firm no longer has a large number of high-return investment opportunities available to it.

gure 15.1 Historic Pattern of Profits and Dividends for U.S. Corporations



urce: *Economic Report of the President, 2003*: Table B-90: 381.

Figure 15.2 Dividends and Earnings per Share for Kerr-McGee Corporation



Source: *Value Line Investment Survey* (New York: Value Line, Inc., March 19, 2004).

And, finally, stable dividends are legally desirable. Many regulated financial institutions—such as bank trust departments, pension funds, and insurance companies—are limited as to the types of common stock they are allowed to own. To qualify for inclusion in these "legal lists," a firm must have a record of continuous and stable dividends. The failure to pay a dividend or the reduction of a dividend amount can result in removal from these lists. This, in turn, reduces the potential market for the firm's shares and may lead to price declines. As shown in Figure 15.2, Kerr-McGee maintained its per share dividend during the 1998–1999 period and in 2002, even though its earnings per share were less than this amount in each of those years.

ATTACHMENT 19

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Table 7.8 Earnings changes for InfoSoft and for S&P 500[a]

Period	InfoSoft	S&P 500	Period	InfoSoft	S&P 500
1992:Q1	7.50%	−1.30%	1995: Q2	24.10%	8.50%
1992:Q2	8.30	2.20	1995: Q3	17.50	6.00
1992:Q3	8.80	2.50	1995: Q4	16.00	5.00
1992:Q4	7.90	3.00	1996: Q1	27.00	8.10
1993:Q1	14.30	3.60	1996: Q2	21.30	7.00
1993:Q2	16.50	5.10	1996: Q3	22.50	7.20
1993:Q3	17.10	5.50	1996: Q4	20.00	6.00
1993:Q4	13.50	6.20	1997: Q1	17.10	5.80
1994:Q1	11.50	4.30	1997: Q2	22.20	8.00
1994:Q2	12.30	4.70	1997: Q3	17.80	6.10
1994:Q3	13.00	4.50	1997: Q4	14.50	4.50
1994:Q4	11.10	4.20	1998: Q1	8.50	1.30
1995:Q1	18.60	7.10	1998: Q2	3.50	−0.50

[a] *Earnings changes are over same quarter of previous year.*

Dataset

***spearn.xls* has earnings changes, by year, for the S&P 500 going back to 1960.**

Regressing the changes in earnings at InfoSoft against changes in profits for the S&P 500 yields the following:

InfoSoft Earnings Change = 0.05 + 2.15 (S&P 500 Earnings Change)

Based on this regression, the beta for InfoSoft is 2.15. In calculating this beta, we used net income to arrive at an equity beta. Using operating earnings for both the firm and the S&P 500 should yield the equivalent of an unlevered beta.

Market, Bottom-up, and Accounting Betas: Which One Do We Use? For most publicly traded firms, betas can be estimated using accounting or market data or the bottom-up approach. Since the betas will almost never be the same using these different approaches, the question is, which one do we use? We would almost never use accounting betas, for all the reasons specified above. We are almost as reluctant to use historical market betas for individual firms because of the standard errors in beta estimates, the failures of the local indices (as is the case with most emerging market companies), and the inability of these regressions to reflect the effects of major changes in the business mix and financial risk at the firm (as in the Boeing example). In our view, bottom-up betas provide the best beta estimates because

- they allow us to consider changes in business and financial mix, even before they occur,
- they use average betas across large numbers of firms, which tend to be less noisy than individual firm betas, and
- they allow us to calculate betas by area of business for a firm, which is useful both in the context of investment analysis and valuation.

In summary, we use the bottom-up estimates of equity betas of 1.014 for Boeing, 1.49 for InfoSoft, and 0.87 for The Home Depot.

Estimating the Cost of Equity

Having estimated the riskless rate, the risk premium(s), and the beta(s), we can now estimate the expected return from investing in equity at any firm. In the CAPM, this expected return can be written as:

$$\text{Expected Return} = \text{Riskless Rate} + \text{Beta} \times \text{Expected Risk Premium}$$

where the riskless rate would be the rate on a long-term government bond; the beta would be either the historical, fundamental, or accounting betas described above, and the risk premium would be either the historical premium or an implied premium.

In the arbitrage pricing and multifactor model, the expected return would be written as follows:

$$\text{Expected Return} = \text{Riskless Rate} + \sum_{j=1}^{j=N} \beta_j\,(\text{Risk Premium}_j)$$

where the riskless rate is the long-term government bond rate, β_j is the beta relative to factor j, estimated using historical data or fundamentals, and Risk Premium$_j$ is the risk premium relative to factor j, estimated using historical data.

The expected return on an equity investment in a firm, given its risk, has strong implications for both equity investors in the firm and the managers of the firm. For equity investors, it is the rate they need to earn to be compensated for the risk they have taken in investing in the equity of the firm. If, after analyzing an investment, they conclude that they cannot make this return, they will not buy this investment. Alternatively, if they decide they can make a higher return, they will make the investment. For managers in the firm, the return investors need to make so that they can break even on their equity investments becomes the return they have to try to deliver to keep these investors from becoming restive and rebellious. Thus, it becomes the rate they have to beat in terms of returns on their equity investments in projects. In other words, this is the cost of equity to the firm.

In Practice 7.7: Estimating the Cost of Equity

In the following analysis, we estimate the cost of equity for Boeing, InfoSoft, and The Home Depot, using the CAPM. In doing so, we use the fundamental betas because they best reflect the true riskiness of these firms. Table 7.9 summarizes these estimates.

Table 7.9 Cost of Equity Calculations

	Boeing	The Home Depot	InfoSoft
Bottom-up Unlevered Beta	0.88	0.86	1.43
Bottom-up Beta	1.014	0.869	1.489
Riskless Rate	5.00%	5.00%	5.00%
Risk Premium	5.50%	5.50%	5.50%
Cost of Equity	10.58%	9.78%	13.19%

Note that the riskless rate and risk premium are the same for each of the firms. The only input that varies across firms is the beta.

Risk, Cost of Equity, and Private Firms

Implicit in the use of beta as a measure of risk is the assumption that the marginal investor in equity is a well-diversified investor. Although this is a defensible assumption when analyzing publicly traded firms, it becomes much more difficult to sustain for private firms. The owner of a private firm generally invests the bulk of his or her wealth in the business. Consequently, he or she cares about the total risk in the business rather than just the market risk. Thus, for a business like InfoSoft, the beta we have estimated of 1.49 (leading to a cost of equity of 13.19%) will understate the risk perceived by the owner.

There are three ways to estimate the cost of equity for a private firm, with undiversified owners:

1. Assume that the business is run with the near-term objective of selling to a large publicly traded firm or making an initial public offering. In such a case, it is reasonable to use the market beta and cost of equity that comes from it.
2. Add a premium to the cost of equity to reflect the higher risk created by the owner's inability to diversify. (This may help explain the high returns some venture capitalists demand on their equity investments in fledgling businesses.)
3. Adjust the beta to reflect total risk rather than market risk. This adjustment is a relatively simple one, since the R^2 squared of the regression measures the proportion of the risk that is market risk.

$$\text{Total Beta} = \frac{\text{Market Beta}}{\sqrt{\text{R squared}}}$$

In the InfoSoft case, where the market beta is 1.49 and the average R squared of the comparable publicly traded firms is 16%, this would lead to a total beta estimate of 3.725, resulting in a cost of equity of 25.49%.

CT 7.2: If private business have higher costs of equity than otherwise similar publicly traded business, what are the implications for competition between the two? How can a private business survive this competition?

From Cost of Equity to Cost of Capital

Although equity is an important and indispensable ingredient of the financing mix for every business, it is but one ingredient. Most businesses finance some or much of their operations using debt or some security that is a combination of equity and debt. The costs of these sources of financing are generally very different from the cost of equity, and the cost of financing for a firm should reflect their costs as well, in proportion to their use in the financing mix. Intuitively, the *cost of capital* is the weighted average of the costs of the different components of financing — including debt, equity, and hybrid securities — used by a firm to fund its financial requirements. In this section, we examine the process of estimating the costs of financing other than equity and the weights for computing the cost of capital.

Calculating the Cost of Debt

The *cost of debt* measures the current cost to the firm of borrowing funds to finance projects. In general terms, it is determined by the following variables:

1. *The current level of interest rates:* As the level of interest rates increases, the cost of debt for firms will also increase.
2. *The default risk of the company:* As the default risk of a firm increases, the cost of borrowing money will also increase.
3. *The tax advantage associated with debt:* Since interest is tax deductible, the after-tax cost of debt is a function of the tax rate. The tax benefit that accrues from paying interest makes the after-tax cost of debt lower than the pre-tax cost. Furthermore, this benefit increases as the tax rate increases.

$$\text{After-tax cost of debt} = \text{Pre-tax cost of debt } (1 - \text{tax rate})$$

The simplest scenario for estimating the cost of debt occurs when a firm has long-term bonds outstanding that are widely traded. The market price of the bond, in conjunction with its coupon and maturity, can serve to compute a yield we use as the cost of debt. For instance, this approach works for a firm like AT&T that has dozens of outstanding bonds that are liquid and trade frequently.

Many firms have bonds outstanding that do not trade on a regular basis. Since these firms are usually rated, we can estimate their costs of debt by using their ratings and associated default spreads. Thus, Boeing with an AA rating can be expected to have a cost of debt approximately 0.50% higher than the treasury bond rate, since this is the spread typically paid by AA rated firms.

Some companies choose not to get rated. Many smaller firms and most private businesses fall into this category. Although ratings agencies have sprung up in many emerging markets, there are still a number of markets where companies are not rated on the basis of default risk. When no rating is available to estimate the cost of debt, there are two alternatives:

1. *Evaluate Recent Borrowing History:* Many firms that are not rated still borrow money from banks and other financial institutions. By looking at the most recent borrowings made by a firm, we can get a sense of the types of default spreads being charged the firm and use these spreads to come up with a cost of debt.
2. *Estimate a synthetic rating:* An alternative is to play the role of ratings agency and assign a rating to a firm based on its financial ratios; this rating is called a **synthetic rating.** To make this assessment, we begin with rated firms and examine the financial characteristics shared by firms within each ratings class. To illustrate, Table 7.10 lists the range of interest coverage ratios for small manufacturing firms in each S&P ratings class.[24]

Table 7.10 Interest Coverage Ratios and Ratings

Interest Coverage Ratio	Rating
>12.5	AAA
9.50–12.50	AA
7.50–9.50	A+
6.00–7.50	A
4.50–6.00	A–
3.50–4.50	BBB
3.00–3.50	BB
2.50–3.00	B+
2.00–2.50	B
1.50–2.00	B–
1.25–1.50	CCC
0.80–1.25	CC
0.50–0.80	C
<0.65	D

Source: Compustat.

[24] This table was developed in early 1999 by listing all rated firms with market capitalization lower than $2 billion, together with their interest coverage ratios, and then sorting firms based on their bond ratings. The ranges were adjusted to eliminate outliers and to prevent overlapping ranges.

Types of Dividends There are several ways to classify dividends. First, dividends can be paid in cash or as additional stock. **Stock dividends** increase the number of shares outstanding and generally reduce the price per share. Second, the dividend can be a **regular dividend,** which is paid at regular intervals (quarterly, semiannually, or annually), or a **special dividend,** which is paid in addition to the regular dividend. Most U.S. firms pay regular dividends every quarter; special dividends are paid at irregular intervals. Finally, firms sometimes pay dividends that are in excess of the retained earnings they show on their books. These are called **liquidating dividends** and are viewed by the Internal Revenue Service as return on capital rather than ordinary income. Consequently, they can have different tax consequences for investors.

Measures of Dividend Policy

We generally measure the dividends paid by a firm using one of two measures. The first is the **dividend yield,** which relates the dividend paid to the price of the stock:

$$\text{Dividend Yield} = \frac{\text{Annual Dividends per share}}{\text{Price per share}}$$

The dividend yield is significant because it provides a measure of that component of the total return that comes from dividends, with the balance coming from price appreciation.

$$\text{Expected Return on Stock} = \text{Dividend Yield} + \text{Price Appreciation}$$

Some investors also use the dividend yield as a measure of risk and as an investment screen; that is, they invest in stocks with high dividend yields. Studies indicate that stocks with high dividend yields earn excess returns, after adjusting for market performance and risk.

Figure 21.2 tracks dividend yields on stocks on the major exchanges in April 1999. Notice the wide differences in dividend yields of stocks on the exchange, with a large

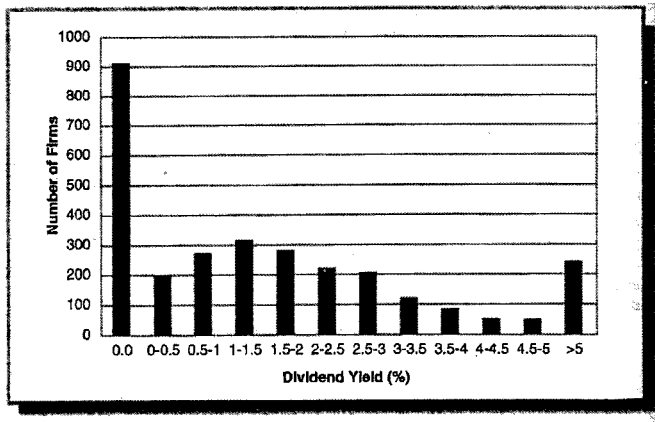


Figure 21.2 Dividend Yields: U.S. Companies, April 1999. *Source:* Based on Value Line Data on Companies in June 1999

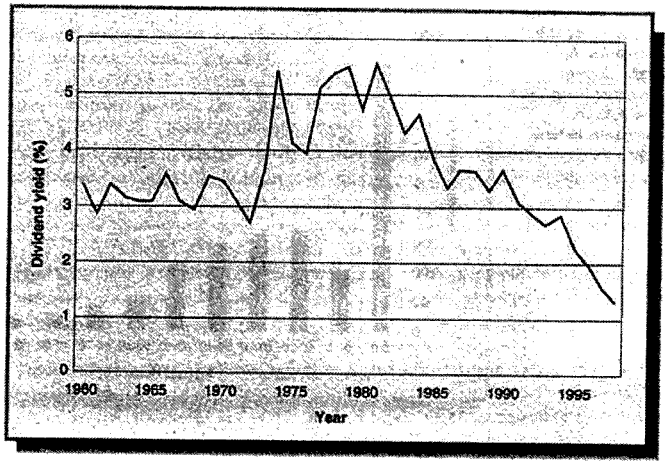


Figure 21.3 Dividend Yield on S&P 500 stocks, 1960–1998. Estimated using data from 1960 to 1998. *Source:* Bloomberg

subset of stocks paying no dividends at all. The median dividend yield among dividend paying stocks is 1.44%, and the average dividend yield of 1.32% is low by historical standards, as evidenced by Figure 21.3, which plots average dividend yields by year from 1960 to 1998 for U.S. stocks.

The second widely used measure of dividend policy is the **dividend payout ratio,** which relates dividends paid to the earnings of the firm.

$$\text{Dividend Payout Ratio} = \frac{\text{Dividends}}{\text{Earnings}}$$

The payout ratio is used in a number of different settings. It is used in valuation as a way of estimating dividends in future periods, since most analysts estimate growth in earnings rather than dividends. Second, the retention ratio — the proportion of the earnings reinvested in the firm (Retention Ratio = 1 – Dividend Payout Ratio) — is useful in estimating future growth in earnings; firms with high retention ratios (low payout ratios) generally have higher growth rates in earnings than do firms with lower retention ratios (higher payout ratios). Third, the dividend payout ratio tends to follow the life cycle of the firm, starting at zero when the firm is in high growth and gradually increasing as the firm matures and its growth prospects decrease. Figure 21.4 graphs the dividend payout ratios of U.S. firms in April 1999. Payout ratios greater than 100% indicate that firms paid out more than their earnings as dividends. The median dividend payout ratio in April 1999 among dividend paying stocks was 21.05%, while the average payout ratio was 26.99%. Again, a large proportion of stocks pay no dividend.

Dataset

divUS.xls summarizes dividend yields and payout ratios for U.S. companies from 1960 to the present.

Empirical Evidence on Dividend Policy

We observe several interesting patterns when we look at the dividend policies of firms in the United States in the last 50 years. First, dividends tend to lag behind earnings;

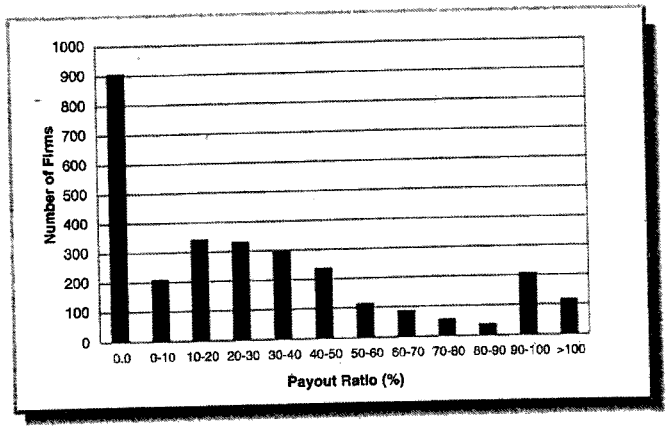


Figure 21.4 Dividend Payout Ratios: U.S. Companies, April 1999. *Source:* Estimated Using Value Line Data on Companies in June 1999

that is, increases in earnings are followed by increases in dividends, and decreases in earnings sometimes by dividend cuts. Second, dividends are "sticky" because firms are typically reluctant to change dividends; in particular, firms avoid cutting dividends even when earnings drop. Third, dividends tend to follow a much smoother path than do earnings. Finally, there are distinct differences in dividend policy over the life cycle of a firm, resulting from changes in growth rates, cash flows, and project availability.

CF

Dividends Tend to Follow Earnings It should not come as a surprise that earnings and dividends are positively correlated over time because dividends are paid out of earnings. Figure 21.5 shows the movement in both cumulative earnings and

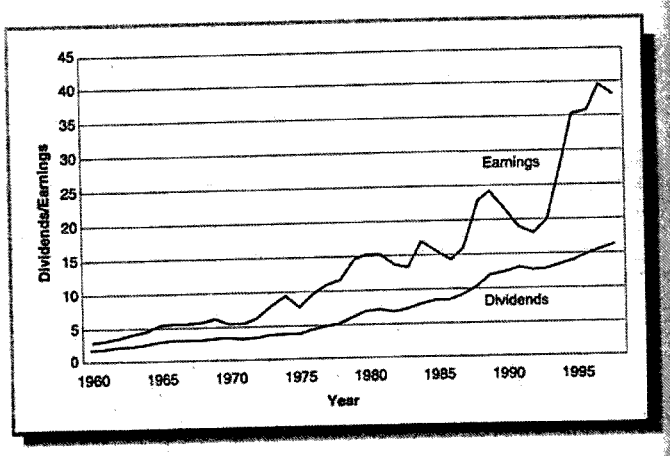


Figure 21.5 Dividends and Earnings at U.S. Firms, 1960–1998. *Source:* Estimated from Compustat Annual Database

dividends at U.S. firms between 1960 and 1998. Notice two trends in this graph. First, dividend changes trail earnings changes over time. Second, the dividend series is much smoother than the earnings series.

In the 1950s, John Lintner (1956) studied the way firms set dividends and noted three consistent patterns. First, firms set target dividend payout ratios by deciding on the fraction of earnings they are willing to pay out as dividends in the long term. Second, they change dividends to match long-term and sustainable shifts in earnings, but they increase dividends only if they feel they can maintain these higher dividends. Because firms avoid cutting dividends, dividends lag earnings. Finally, managers are much more concerned about changes in dividends than about levels of dividends.

Fama and Babiak (1968) identified a lag between earnings and dividends by regressing changes in dividends against changes in earnings in both current and prior periods. They confirmed Lintner's findings that dividend changes tend to follow earnings changes.

Dividends Are Sticky Firms generally do not change their dollar dividends frequently. This reluctance to change dividends, which results in "sticky dividends," is rooted in several factors. One is the firm's concern about its capability to maintain higher dividends in future periods. Another is the negative market view of dividend decreases and the consequent drop in the stock price. Figure 21.6 provides a summary of the percentages of all U.S. firms that increased, decreased, or left their annual dividends per share unchanged from 1989 to 1998. As you can see, in most years the number of firms that do not change their dollar dividends far exceeds the number that do. Among the firms that change dividends, a much higher percentage, on average, increase dividends than decrease them.

Dividends Follow a Smoother Path Than Earnings As a result of the reluctance of firms to raise dividends until they feel they can maintain higher dividends and to cut dividends unless they absolutely have to, dividends follow a much smoother path than earnings. This view that dividends are not as volatile as earnings on a year-

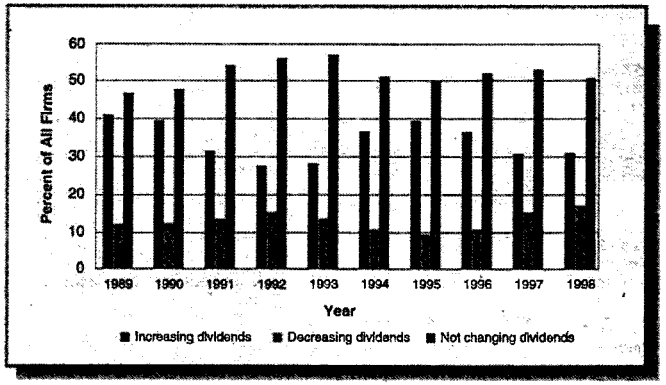


Figure 21.6 Dividend Changes, 1989–1998. *Source:* Estimated Using Compustat Annual Database

to-year basis is supported by a couple of empirical facts. First, the variability in historical dividends is significantly lower than the variability in historical earnings. Using annual data on aggregate earnings and dividends from 1960 to 1998, for instance, the standard deviation of dividends is 4%, while the standard deviation in earnings is about 14%. Second, the standard deviation in earnings yields (Earnings/Price) across companies is 18.57%, which is significantly higher than the standard deviation in dividend yields, which is only 3.15%. In other words, the variation in earnings yields across firms is much greater than the variation in dividend yields.

A Firm's Dividend Policy Tends to Follow the Life Cycle of the Firm In Chapters 17 and 18, we introduced the link between a firm's place in the life cycle and its financing mix and choices. In particular, we noted five stages in the growth life cycle: start-up, rapid expansion, high growth, mature growth, and decline. In this section, we examine the link between a firm's place in the life cycle and its dividend policy. Not surprisingly, firms generally adopt dividend policies that best fit where they are currently in their life cycles. For instance, high-growth firms with great investment opportunities do not usually pay dividends, whereas stable firms with larger cash flows and fewer projects tend to pay more of their earnings out as dividends. Figure 21.7 looks at the typical path that dividend payout follows over a firm's life cycle.

Figure 21.7 Life Cycle Analysis of Dividend Policy

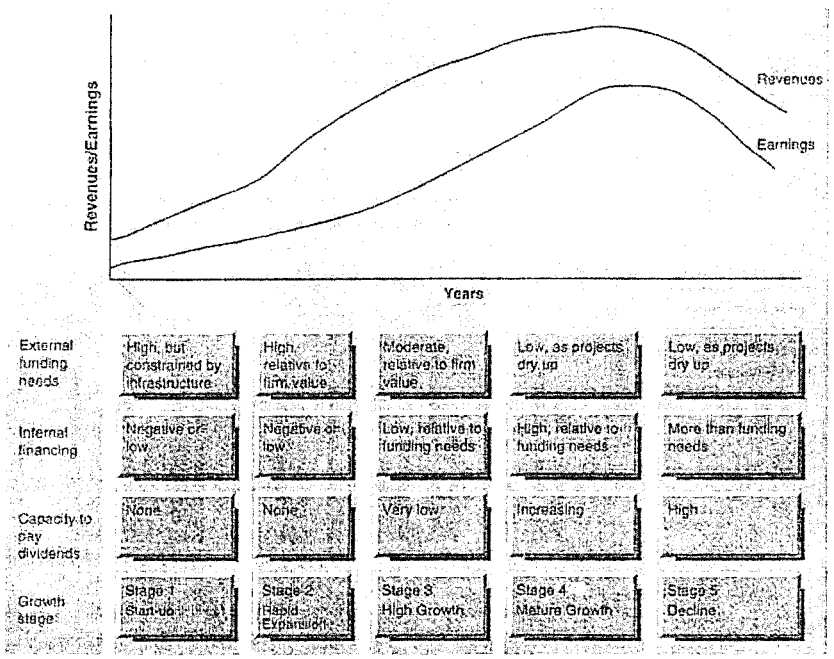
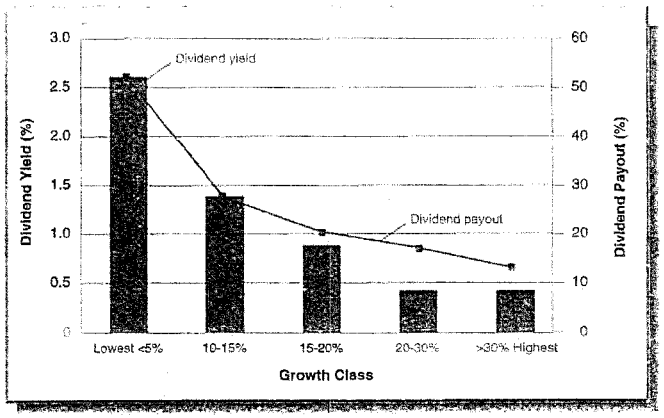


Figure 21.8 Dividend Yields and Payout Ratios: NYSE Growth Class, April 1999
Source: Value Line Database



This intuitive relationship between dividend policy and growth is emphasized when we examine the relationship between a firm's payout ratio and its expected growth rate. For instance, we classified firms on the New York Stock Exchange in April 1999 into five classes, based on expected growth rates in earnings per share, and we estimated the dividend payout ratios and dividend yields for each class. These are reported in Figure 21.8. The firms with the highest expected growth rates pay the lowest dividends, as a percentage of both earnings (payout ratio) and price (dividend yield).[1]

✔ ***CC 21.2:* Assume that you are studying a growth firm in which the growth rates have begun to decline. If the firm does not start paying dividends, what would you expect to happen to the firm's cash reserves?**

Dividend Policy Varies across Countries Figures 21.5 to 21.8 show several trends and patterns in dividend policies at U.S. companies. They share some common features with firms in other countries, but there are some differences too. As in the United States, dividends in other countries are sticky and follow earnings. However, there are differences in the magnitude of dividend payout ratios across countries. Figure 21.9 shows the proportion of earnings paid out in dividends in the G-7 countries in 1982–1984 and again in 1989–1991. These differences can be attributed to:

1. *Differences in Stage of Growth.* Just as higher growth companies tend to pay out less of their earnings in dividends (see Figure 21.8), countries with higher growth pay out less in dividends. For instance, Japan had much higher expected growth in 1982–1984 than the other G-7 countries and paid out a much smaller percentage of its earnings as dividends.
2. *Differences in Tax Treatment:* Unlike the United States, where dividends are double taxed, some countries provide at least partial protection against the double

[1] These are growth rates projected by Value Line for firms in April 1999.

ATTACHMENT 20

ARIZONA WATER COMPANY
Actual Earned ROE 2005 - 2014

	Common Equity	Net Income	Earned ROE
2005	$69,050,659	$6,102,184	8.8%
2006	$71,388,102	$6,465,743	9.1%
2007	$71,015,718	$3,880,116	5.5%
2008	$69,671,689	$2,943,571	4.2%
2009	$68,285,255	$2,901,166	4.2%
2010	$77,975,338	$3,755,683	4.8%
2011	$78,221,193	$4,911,455	6.3%
2012	$77,478,161	$6,336,368	8.2%
2013	$83,284,615	$8,239,154	9.9%
2014	$86,959,196	$8,669,581	10.0%

ATTACHMENT 21

SECOND EDITION

Fundamentals of Investments

Gordon J. Alexander
University of Minnesota

William F. Sharpe
Stanford University

Jeffery V. Bailey
Richards & Tierney, Inc.

Prentice Hall, Englewood Cliffs, New Jersey

consumption an amount equal to $.01(E_0 - I_0)$. Furthermore, the stockholder will be able to spend on consumption an amount equal to $.01(E_t - I_t)$ in any future year t. Discounting these expected amounts by a (constant) rate k reveals that the value of 1% of the current shares outstanding will be:

$$.01V = \frac{.01(E_0 - I_0)}{(1+k)^0} + \frac{.01(E_1 - I_1)}{(1+k)^1} + \frac{.01(E_2 - I_2)}{(1+k)^2} + \ldots$$

Multiplying both sides of this equation by 100 results in the following expression for the total market value of all shares outstanding:

$$V = \frac{(E_0 - I_0)}{(1+k)^0} + \frac{(E_1 - I_1)}{(1+k)^1} + \frac{(E_2 - I_2)}{(1+k)^2} + \ldots \qquad (16.7)$$

Equation (16.7) shows that the aggregate market value of equity is equal to the present value of expected earnings net of investment. Note how the size of the dividends does not enter into the formula. This indicates that the market value of the stock is independent of the dividend decision made by the firm. Instead, the market value of the firm is related to the earnings prospects of the firm, along with the required amounts of new investment needed to produce those earnings.[3]

Dividend Discount Models There is nothing inconsistent between the dividend discount models presented in Chapter 15 and the irrelevancy of the dividend decision. The dividend discount models indicated that the value of one share of common stock was equal to the present value of all the dividends expected in the future. The dividend irrelevancy argument suggests that if the firm decides to increase its current dividend, then new shares will need to be sold. This, in turn, suggests that future dividends will be smaller since the aggregate amount of dividends will have to be divided among an increased number of shares outstanding. Ultimately, the current stockholders will be neither better off nor worse off, since the increased current dividend will be exactly offset by the decreased future dividends. Conversely, if the firm decides to decrease its current dividend, then shares will be repurchased and future dividends will be increased due to the fewer shares outstanding. Ultimately, the decreased current dividend will be exactly offset by the increased future dividends, again leaving current stockholders neither better off nor worse off.

An Example All this can be illustrated with the earlier example of the Plum Company. Since Plum currently has reported earnings of $5,000 and investments totaling $3,000, if dividends amounting to $2,000 were paid, then the

[3]It has been argued that if the tax rate on dividends is greater than the tax rate on capital gains, then stockholders will earn more on an after-tax basis if the firm has a relatively low payout ratio. An additional benefit to stockholders if the firm has a low payout ratio is that capital gains taxes are paid only when the stock is sold, and can therefore be deferred. Thus, it appears that stockholders will be better off if the firm has a relatively low payout ratio. However, currently the tax rate on dividends is equal to or only slightly higher than the tax rate on capital gains, diminishing the validity of the argument. For a more detailed discussion of the issue, along with the relevant citations, see pp. 128–35 of Gordon J. Alexander and Jack Clark Francis, *Portfolio Analysis* (Englewood Cliffs, N.J.: Prentice Hall, 1986). Also see James S. Ang, David W. Blackwell, and William L. Megginson, "The Effect of Taxes on the Relative Valuation of Dividends and Capital Gains: Evidence from Dual-Class British Investment Trusts," *Journal of Finance*, 46, no. 1 (March 1991):383–99.

stockholder owning 1% of the firm would receive cash amounting to .01 × $2,000 = $20.

Alternatively, if dividends amounting to $3,000 were paid, then Plum would have to raise $1,000 from the sale of new common stock. The stockholder would receive .01 × $3,000 = $30 in dividends, but would have to pay .01 × $1,000 = $10 to purchase 1% of the new stock, thereby maintaining his or her 1% position of ownership. Consequently, the net cash flow to the stockholder would be $30 − $10 = $20, the same amount as in the previous situation.

Lastly, if dividends amounting to $1,000 were paid, then Plum would have cash amounting to $1,000 to use to repurchase common stock. The stockholder, desirous of maintaining a 1% position, would thus sell shares amounting to .01 × $1,000 = $10. As a result, the stockholder would have a cash inflow totaling $10 + $10 = $20, again the same amount as in the two previous situations.

Under all three situations, the 1% stockholder would receive the same cash flow at the present time ($20), and have the same claim on the future earnings of Plum. That is, in all three cases, the stockholder would still own 1% of Plum and would therefore receive the same amount of dividends in the future. Accordingly, the 1% stockholder (and all the others) will be neither better off nor worse off if Plum pays a dividend amounting to $1,000, $2,000, or $3,000. In summary, the dividend decision is a nonevent—whatever the level of dividends, current stockholders will be neither better off nor worse off. This result is sometimes referred to as the "dividend irrelevancy theorem."

DETERMINANTS OF DIVIDENDS

Few firms attempt to maintain a constant ratio of dividends to current earnings, since doing so would result in a fluctuating dollar amount of dividends. The reason the dividends would fluctuate is that earnings on a year-to-year basis are likely to be quite variable. Instead, firms attempt to maintain a desired ratio of dividends to earnings over some relatively long period, meaning that there is a target payout ratio of dividends to long-run or sustainable earnings. As a result, dividends are usually kept at a constant dollar amount and are increased only when management is confident that it will be relatively easy to keep paying this increased amount in the future.[4] Nonetheless, larger earnings are likely to be accompanied by some sort of increase in dividends, as Table 16-1 shows.

The first two lines of Table 16-1 indicate that of the firms examined, 59.3% of the time their earnings rose and the remainder of the time (40.7% = 100% − 59.3%) their earnings fell. The majority of the time when current earnings rose, firms increased their current dividends. However, whenever current earnings fell, firms would increase their current dividends as frequently as they would decrease their current dividends (note that, roughly speaking, 42.8% ≈ 39.5%).

The next two lines of the table suggest that firms are more likely to increase current dividends if they have had two consecutive years of ris-

[4]In addition to a regular dividend, sometimes a firm will declare a "special" or "extra" dividend, usually at year-end. By calling it a special dividend, the firm is conveying a message to its stockholders that such a dividend is a one-time event.

TABLE 16-1 Dividend and Earnings Changes for 392 Major Industrial Firms, 1946–1964

EARNINGS CHANGES			PERCENT OF CASES IN WHICH FIRMS		
Current Year	Previous Year	Percent of Cases	Increased Dividends	Did Not Change Dividends	Decreased Dividends
+		59.3%	65.8%	13.9%	20.3%
−		40.7	42.8	17.9	39.5
+	+	33.4	74.8	11.4	13.8
+	−	25.9	54.1	17.2	28.7
−	+	24.7	49.7	16.9	33.4
−	−	16.0	31.8	19.4	48.8

Source: Eugene F. Fama and Harvey Babiak, "Dividend Policy: An Empirical Analysis," Journal of the American Statistical Association, 63, no. 324 (December 1968): p. 1134.

ing earnings than if they have had falling and then rising earnings (74.8% > 54.1%). The last two lines of the table suggest that firms are more likely to decrease current dividends if they have had two consecutive years of falling earnings than if they have had rising and then falling earnings (48.8% > 33.4%). Overall, the table shows that firms in general are more likely to increase dividends than to decrease them.

The Lintner Model A formal representation of the kind of behavior implied by a constant long-run target payout ratio begins by assuming that the goal of the firm is to pay out p^* (for example, $p^* = 60\%$) of long-run earnings. If this target ratio were maintained every year, total dividends paid in year t would be:

$$D_t^* = p^* E_t \tag{16.8}$$

where D_t^* denotes the target amount for dividends to be paid in year t and E_t is the amount of earnings in year t. The difference between target dividends in year t and the previous year's actual dividends is determined by subtracting D_{t-1} from both sides of equation (16.8), resulting in:

$$D_t^* - D_{t-1} = p^* E_t - D_{t-1}. \tag{16.9}$$

While firms would like to change their dividends from D_{t-1} to D_t^*, few (if any) firms would actually change their dividends by this amount. Instead, the actual change in dividends will be a proportion of the desired change:

$$D_t - D_{t-1} = a(D_t^* - D_{t-1}) \tag{16.10}$$

where a is a "speed of adjustment" coefficient, a number between zero and one.

For example, if a firm has just earned \$5 million (E_t = \$5 million) and has a target payout ratio of 60%, then it would like to pay dividends amounting to .6 × \$5 million = \$3 million. Assuming it paid dividends of \$2 million last year, this represents an increase of \$3 million − \$2 million = \$1 million. However, if $a = 50\%$, then the firm will actually increase the dividends by .5 × \$1 million = \$500,000. Thus, actual dividends will be equal to \$2.5 million = \$2 million + \$500,000, an amount equal to last year's dividends plus the change in dividends from last year to this year.

This model can be summarized by substituting $p^* E_t$ for D_t^* in equation (16.10) and then solving the resulting expression for D_t:

$$D_t = ap^* E_t + (1 - a)D_{t-1}. \tag{16.11}$$

Equation (16.11) indicates that the amount of current dividends is based on the amount of current earnings and the amount of the previous year's dividends.[5] In the previous example, $a = 50\%$, $p^* = 60\%$, E_t = \$5 million, and D_{t-1} = \$2 million. Thus, actual dividends D_t would be equal to [.5 × .6 × \$5 million] + [(1 − .5) × \$2 million] = \$2.5 million.

By subtracting D_{t-1} from both sides of equation (16.11), it can be seen that the change in dividends is equal to:

$$D_t - D_{t-1} = ap^* E_t - aD_{t-1}. \tag{16.12}$$

When written in this form, the model suggests that the size of the *change* in dividends will be positively related to the current amount of earnings (since ap^* is a positive number) and negatively related to the amount of the previous period's dividends (since $-aD_{t-1}$ is a negative number). Thus, the larger current earnings are, the larger the change in dividends, but the larger the previous period's dividends, the smaller the change in dividends.

Test Results Statistical analysis has been used to see how well this model describes the way a sample of firms set the amount of their dividends. Table 16-2 summarizes some of the values obtained in one such study. The average

[5] Looking backwards in time, it can be shown that current dividends D_t are a linear function of past earnings E_{t-1}, E_{t-2}, E_{t-3}, and so on. More specifically, it can be shown that:

$$D_t = ap^*[(1 - a)^0 E_t + (1 - a)^1 E_{t-1} + (1 - a)^2 E_{t-2} + (1 - a)^3 E_{t-3} + \ldots].$$

Since the quantity $(1 - a)$ is a positive fraction (for example, 1/3), when it is raised to a power it becomes smaller in value, with larger powers resulting in values closer to zero. Thus, current dividends depend more on recent past earnings than on distant past earnings, and the equation can be approximated by using an arbitrary number of past earnings (the accuracy of the approximation depends on the number used).

TABLE 16-2 Target Payout Ratios and Speed of Dividend Adjustment Factors for 298 Firms, 1946–1968

SPEED OF ADJUSTMENT COEFFICIENT		TARGET PAYOUT RATIO		PERCENT OF VARIANCE EXPLAINED	
Value	Percent of Firms with Smaller Value	Value	Percent of Firms with Smaller Value	Value	Percent of Firms with Smaller Value
.104	10%	.401	10%	11%	10%
.182	30	.525	30	32	30
.251	50	.584	50	42	50
.339	70	.660	70	54	70
.470	90	.779	90	72	90
average .269		average .591		average 42	

Source: Eugene F. Fama, "The Empirical Relationship Between the Dividend and Investment Decisions of Firms," American Economic Review, 64, no. 3 (June 1974): p. 310.

firm had a target payout ratio of 59.1% and adjusted dividends by 26.9% of the way toward its target each year. However, most firms' dividends varied substantially from the pattern implied by their targets and adjustment factors. Somewhat less than half (42%) of the annual variance in the typical firm's dividends could be explained in this manner. This means that the model, while having explained a portion of the changes in dividends that have occurred, has left a substantial portion unexplained.

THE INFORMATION CONTENT OF DIVIDENDS

asymmetric information

It is reasonable to believe that management has more information about the future earnings of the firm than does the public (which includes its own stockholders). This situation of **asymmetric information** suggests that management will seek to convey their information to the public if they have an incentive to do so. Assuming that they have such an incentive, one way of doing so is by announcing a change in the amount of the firm's dividends. When used in this manner, dividend announcements are said to be a signaling device.[6]

Signaling

A relatively simple view of dividend changes is that an announced increase in dividends is a signal that management has increased its assessment of the future earnings for the firm. The announced increase in dividends is therefore "good news" and will, in turn, cause investors to raise their expectations regarding the future earnings of the firm. Conversely, an announced decrease in dividends is a signal that management has decreased its assessment of the future earnings for the firm. The announced decrease in dividends is therefore "bad news" and will, in turn, cause investors to lower their expectations regarding the future earnings of the firm. An implication is that an announced increase in dividends will cause the firm's stock price to rise, and an announced decreased will cause it to fall.

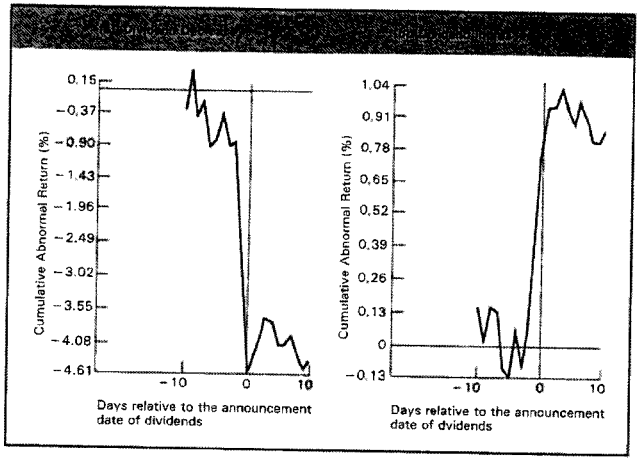
This simple model of dividend changes can be thought of as a special case of the model given in equation (16.12), where the speed of adjustment, a, is zero. With this model, the expected change in dividends, $D_t - D_{t-1}$, is zero, suggesting that a simple increase in dividends will be viewed as good news. Conversely, a simple decrease in dividends will be viewed as bad news.

One way of testing to see if dividend changes do indeed convey information to the public is to see how stock prices react to announcements of changes in dividends. However, care must be exercised in conducting such a study because the firm's announcement of dividends is often made at the same time that the firm announces its earnings. Thus, if such announcements are made at the same time, any price change in the firm's common stock may be attributable to either (or both) announcements. One study attempted to avoid this problem of contamination by only looking at cases where the

[6]Other signaling devices include changes in the firm's capital structure (for example, announcing an issuance of debt with the proceeds being used to repurchase stock). It has been argued that in order for the signal to be useful to the public, (1) management must have an incentive to send a truthful signal; (2) the signal cannot be imitated by competitors in different financial positions; and (3) there cannot be a cheaper means of conveying the same information. See Stephen A. Ross, "The Determination of Financial Structure: The Incentive Signalling Approach," *Bell Journal of Economics*, 8, no. 1 (Spring 1977): 23–40.

FIGURE 16-2
Cumulative Abnormal Returns Starting Ten Days Before a Dividend Announcement

Source: Joseph Aharony and Itzhak Swary, "Quarterly Dividend and Earnings Announcements and Stockholders' Returns: An Empirical Analysis," *Journal of Finance*, 35, no. 1 (March 1980): p. 8.



announcement of earnings was at least eleven trading days apart from the announcement of dividends. Figure 16-2 provides an illustration of the average abnormal return associated with a firm's dividend announcement for those firms that announced their dividends eleven or more days after they announced their earnings (similar results were obtained when the authors examined those cases where dividend announcements preceded earnings announcements).

In those cases where firms announced an increase in their dividends, there is a significant positive reaction in their stock prices. Conversely, in those cases where firms announced a decrease in their dividends, there is a significant negative reaction in their stock prices. These findings strongly support the **information content of dividends hypothesis**, where dividend announcements are asserted to contain inside information about the firm's future prospects.

information content of dividends hypothesis

It should be noted that there is nothing inconsistent with dividends being used as a signal and with the dividend irrelevancy argument of Miller and Modigliani that was made earlier. In particular, stockholders will be neither better nor worse off if the *level* of dividends, relative to earnings, is high or low. *Changes* in dividends may, however, be important because they convey information to the public about the future earnings prospects for the firm.

Dividend Initiations and Omissions

One study looked at the relationship between dividend changes and past, current, and future changes in earnings.[7] Specifically, it focused on the most dramatic dividend announcements possible—dividend initiations and omissions—since the information being conveyed in these announcements is clearly unambiguous.

That is, if the information content of dividends hypothesis is correct, then firms that start to pay dividends for the first time in at least ten years must be signaling that they believe that earnings have recently increased to a permanently higher level, and that earnings may increase even more in the near future. The question to be addressed is this: Have firms actually experienced notably higher earnings around the time of such initiations and afterwards?

Conversely, firms that have paid dividends for at least ten years and that suddenly stop paying any dividends must believe that their earnings have recently decreased to a permanently lower level, and that earnings may decrease even more in the future. For them the question is this: Have firms actually experienced notably lower earnings around the time of such omissions and afterwards?

The answer that was found supported the information content of dividends hypothesis. Specifically, the study found that earnings tended to increase for at least one year leading up to dividend initiations and to decrease for up to two years leading up to dividend omissions. Furthermore, earnings continued to increase for at least one year after initiations and to decrease for one year after omissions, and such changes appear to be permanent. Interestingly, the larger the change in the firm's stock price when the dividend initiation or omission is announced, the larger the change in the firm's earnings in both the year of the announcement and the year thereafter. Thus, it seems that dividends do indeed convey information about earnings.

ACCOUNTING EARNINGS VERSUS ECONOMIC EARNINGS

Since the prediction of earnings is of critical importance in security analysis and investment research, a review of what is known about earnings and the relationship between earnings and security prices is essential. At a fundamental level, consideration of the concept of "earnings" itself is needed. Specifically, just what is meant by "earnings" to those who produce the figures, and how does this affect the valuation process?

Accounting Earnings

A firm's accountants operate under constraints and guidelines imposed by regulatory authorities and professional organizations such as the Securities and Exchange Commission (SEC) and the Financial Accounting Standards Board (FASB). In cooperation with management, the accountants produce, on a quarterly basis, a set of financial statements for the firm that ends with a figure for the firm's **accounting earnings** (also known as the firm's reported

accounting earnings

[7]Paul M. Healy and Krishna G. Palepu, "Earnings Information Conveyed by Dividend Initiations and Omissions," *Journal of Financial Economics*, 21, no. 2 (September 1988): 149–75.

earnings). In a broad sense, such earnings represent the difference between revenues and costs, including the costs associated with nonequity sources of funds (such as debt). This difference, the "total earnings available for common stock," is divided by the number of shares outstanding to calculate **earnings per share** (EPS). It may also be divided by the book value per share to calculate the **return on equity** (ROE).

earnings per share

return on equity

A basic principle of accounting makes the book value of a firm's equity at the end of a period (such as a quarter or year) equal to (1) its value at the end of the previous period plus (2) the portion of accounting earnings for the period that is retained by the firm (here it is assumed that there has been no change in the number of shares outstanding during the period). Letting B_t denote the book value of the equity of the firm at the end of period t, E_t^a denote the accounting earnings for period t, and D_t denote the dividends paid during period t, this relationship can be expressed algebraically as:

$$B_t = B_{t-1} + E_t^a - D_t. \tag{16.13}$$

From equation (16.13), it can be seen that accounting earnings equals the change in book value of equity plus dividends paid:

$$E_t^a = B_t - B_{t-1} + D_t. \tag{16.14}$$

Economic Earnings

Economic earnings (E_t^e) may be defined as the amount that would be obtained in equation (16.14) if the change in the book value of the firm equaled the change in the **economic value of the firm:**

economic earnings

economic value of the firm

$$E_t^e = V_t - V_{t-1} + D_t. \tag{16.15}$$

Here the change in the economic value of the firm during period t, $V_t - V_{t-1}$, is defined as the change in the market value of the firm's common stock (assuming that there is no change in the market value of the other securities of the firm).[8]

It is easy to show that reported book values and market values (that is, economic values) of stocks are often considerably different. Figure 16-3 shows the ratio of (1) the year-end market price per share for Standard & Poor's Industrial Stock Index, to (2) the corresponding year-end book value per share. It can be seen that the ratio is typically greater than 1.0 and has fluctuated considerably from year to year.

Figure 16-4 plots book values (horizontal axis) and market values (vertical axis) for the stocks in the Dow Jones Industrial Average. If investors viewed market and book values as nearly equivalent, the points would plot along a 45-degree line (that is, a line with a slope of one) that emanates from the origin. However, as the extensive scatter of the points indicates, market values diverge from book values by different amounts for different stocks.

[8]Sir John R. Hicks, winner in 1972 of the Nobel Award in Economics, defined the weekly economic income of an individual as "the maximum value which he can consume during a week and still be as well off at the end of the week as he was at the beginning" (*Value and Capital*, London: Oxford University Press, 1946, p. 172). The definition of the economic earnings of a firm that is given in equation (16.15) can be viewed as an extension of Hicks' definition for an individual.

ATTACHMENT 22

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Computation of Working Cash Requirement

Pinal Valley

Line No.		[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]
		Company - As Filed						RUCO					
		Adjusted Results - As Filed	Revenue Lag Days	Expense Lag Days	Net Lag Days [B - C]	Lead / Lag Factor [D ÷ 365]	Working Cash Requirement [A X E]	Adjusted Results - RUCO	Revenue Lag Days	Expense Lag Days	Net Lag Days [H - I]	Lead / Lag Factor [J ÷ 365]	Working Cash Requirement [G X K]
1													
2													
3	Operating Expenses												
4	Purchased Power	$ 2,071,310	29.50	30.87	(1.37)	(0.0038)	$ (7,775)	$ 2,071,310	29.50	30.87	(1.37)	(0.0038)	$ (7,775)
5	Payroll	3,869,443	29.50	14.00	15.50	0.0425	164,319	3,869,443	29.50	14.00	15.50	0.0425	164,319
6	Purchased Water	715,000	29.50	(57.84)	87.34	0.2393	171,091	715,000	29.50	(57.84)	87.34	0.2393	171,091
7	Chemicals	407,363	29.50	(18.11)	47.61	0.1304	53,136	407,363	29.50	(18.11)	47.61	0.1304	53,136
8	Property & Liability Insurance	215,569	29.50	(45.27)	74.77	0.2048	44,159	215,569	29.50	(45.27)	74.77	0.2048	44,159
9	Worker's Compensation Insurance	56,136	29.50	(46.50)	76.00	0.2082	11,689	56,136	29.50	(46.50)	76.00	0.2082	11,689
10	Medical, Vision, Dental, LTD & Life Insurance	868,512	29.50	(8.92)	38.42	0.1053	91,420	868,512	29.50	(8.92)	38.42	0.1053	91,420
11	Other O&M (Excluding Rate Case Expense)	1,999,287	29.50	(9.27)	38.77	0.1062	212,363	1,743,495	29.50	(9.27)	38.77	0.1062	185,193
12	Federal Income Taxes	1,839,977	29.50	37.00	(7.50)	(0.0205)	(37,808)	1,386,365	29.50	37.00	(7.50)	(0.0205)	(28,487)
13	State Income Taxes	313,163	29.50	37.00	(7.50)	(0.0205)	(6,435)	210,094	29.50	37.00	(7.50)	(0.0205)	(4,317)
14	FICA Taxes	267,606	29.50	14.00	15.50	0.0425	11,364	267,606	29.50	14.00	15.50	0.0425	11,364
15	FUTA & SUTA Taxes	3,202	29.50	83.10	(53.60)	(0.1468)	(470)	3,202	29.50	83.10	(53.60)	(0.1468)	(470)
16	Property Taxes	1,062,879	29.50	212.00	(182.50)	(0.5000)	(531,439)	1,025,917	29.50	212.00	(182.50)	(0.5000)	(512,958)
17	Registration, Svc. Contracts, & Misc. Fees	86,918	29.50	(98.83)	128.33	0.3516	30,559	86,918	29.50	(98.83)	128.33	0.3516	30,559
18	Retirement Annuities (401k)	296,049	29.50	34.72	(5.22)	(0.0143)	(4,234)	296,049	29.50	34.72	(5.22)	(0.0143)	(4,234)
19													
20													
21	Total	$ 14,072,414					$ 201,938	$ 13,222,979					$ 204,688
22													
23													
24	Interest Expense							1,762,861 [1]	29.50	90.83	(61.33)	(0.1680)	(296,223)
25													
26	Total (RUCO Recommended)							$ 14,985,840					$ (91,536)
27													
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Western Group - RUCO

Total Western Group Rate Base - RUCO	$61,693,224
Debt Ratio - RUCO	46.31%
Debt Portion of Rate Base - RUCO	$28,568,874
Total Interest Expense Included in Lead/Lag - RUCO	1,937,395
Cost of Debt Reflected in Working Cash - RUCO	6.78%

[1] RUCO uses a ficticious 5.43% cost of debt to calculate revenue requirement, but uses a 6.8% cost of debt [($1,762,861 ÷ $56,001,472) ÷ 46.31%] to calculate working cash.

White Tank

Line No.		[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]
		Company - As Filed						RUCO					
		Adjusted Results - As Filed	Revenue Lag Days[1]	Expense Lag Days[2]	Net Lag Days [B - C]	Lead / Lag Factor [D ÷ 365]	Working Cash Requirement [A X E]	Adjusted Results - RUCO	Revenue Lag Days[1]	Expense Lag Days[2]	Net Lag Days [H - I]	Lead / Lag Factor [J ÷ 365]	Working Cash Requirement [G X K]
3	Operating Expenses												
4	Purchased Power	$ 286,661	20.77	30.87	(10.10)	(0.0277)	$ (7,932)	$ 286,661	20.77	30.87	(10.10)	(0.0277)	$ (7,932)
5	Payroll	476,932	20.77	14.00	6.77	0.0185	8,846	476,932	20.77	14.00	6.77	0.0185	8,846
6	Purchased Water	-	20.77	41.88	(21.11)	(0.0578)	-	-	20.77	41.88	(21.11)	(0.0578)	-
7	Chemicals	47,058	20.77	(18.11)	38.88	0.1065	5,013	47,058	20.77	(18.11)	38.88	0.1065	5,013
8	Property & Liability Insurance	25,736	20.77	(45.27)	66.04	0.1809	4,656	25,736	20.77	(45.27)	66.04	0.1809	4,656
9	Worker's Compensation Insurance	4,335	20.77	(46.50)	67.27	0.1843	799	4,335	20.77	(46.50)	67.27	0.1843	799
10	Medical, Vision, Dental, LTD & Life Insurance	67,130	20.77	(8.92)	29.69	0.0813	5,460	67,130	20.77	(8.92)	29.69	0.0813	5,460
11	Other O&M (Excluding Rate Case Expense)	354,699	20.77	(9.27)	30.04	0.0823	29,192	295,644 [1]	20.77	(9.27)	30.04	0.0823	24,332
12	Federal Income Taxes	153,203	20.77	37.00	(16.23)	(0.0445)	(6,812)	117,235	20.77	37.00	(16.23)	(0.0445)	(5,213)
13	State Income Taxes	26,075	20.77	37.00	(16.23)	(0.0445)	(1,159)	17,766	20.77	37.00	(16.23)	(0.0445)	(790)
14	FICA Taxes	28,684	20.77	14.00	6.77	0.0185	532	28,684	20.77	14.00	6.77	0.0185	532
15	FUTA & SUTA Taxes	319	20.77	83.10	(62.33)	(0.1708)	(54)	319	20.77	83.10	(62.33)	(0.1708)	(54)
16	Property Taxes	118,521	20.77	212.00	(191.23)	(0.5239)	(62,095)	116,010	20.77	212.00	(191.23)	(0.5239)	(60,780)
17	Registration, Svc. Contracts, & Misc. Fees	10,342	20.77	(98.83)	119.60	0.3277	3,389	10,342	20.77	(98.83)	119.60	0.3277	3,389
18	Retirement Annuities (401k)	22,863	20.77	34.72	(13.95)	(0.0382)	(874)	22,863	20.77	34.72	(13.95)	(0.0382)	(874)
21	Total	$ 1,622,559					$ (21,040)	$ 1,516,715					$ (22,616)
24	Interest Expense							146,782 [2]	20.77	90.83	(70.06)	(0.1920)	(28,175)
26	Total (RUCO Recommended)							$ 1,663,497	$ 119,074				$ (50,791)

[1]Does not tie to JAC-7. Should be $295,883.

[2]RUCO uses a ficticious 5.43% cost of debt to calculate revenue requirement, but uses a 6.7% cost of debt [($146,782 ÷ $4,737,183) ÷ 46.31%] to calculate working cash.

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Computation of Working Cash Requirement

Ajo

Line No.		[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]
		Company - As Filed						RUCO					
		Adjusted Results - As Filed	Revenue Lag Days[1]	Expense Lag Days[2]	Net Lag Days [B - C]	Lead / Lag Factor [D ÷ 365]	Working Cash Requirement [A X E]	Adjusted Results - RUCO	Revenue Lag Days[1]	Expense Lag Days[2]	Net Lag Days [H - I]	Lead / Lag Factor [J ÷ 365]	Working Cash Requirement [G X K]
3	Operating Expenses												
4	Purchased Power	$ 4,903	28.91	30.87	(1.96)	(0.0054)	$ (26)	$ 4,903	28.91	30.87	(1.96)	(0.0054)	$ (26)
5	Payroll	118,010	28.91	14.00	14.91	0.0408	4,821	118,010	28.91	14.00	14.91	0.0408	4,821
6	Purchased Water	117,312	28.91	35.95	(7.04)	(0.0193)	(2,263)	117,312	28.91	38.97 [1]	(10.06)	(0.0276)	(3,233)
7	Chemicals	502	28.91	(18.11)	47.02	0.1288	65	502	28.91	(18.11)	47.02	0.1288	65
8	Property & Liability Insurance	4,679	28.91	(45.27)	74.18	0.2032	951	4,679	28.91	(45.27)	74.18	0.2032	951
9	Worker's Compensation Insurance	1,568	28.91	(46.50)	75.41	0.2066	324	1,568	28.91	(46.50)	75.41	0.2066	324
10	Medical, Vision, Dental, LTD & Life Insurance	24,173	28.91	(8.92)	37.83	0.1036	2,505	24,173	28.91	(8.92)	37.83	0.1036	2,505
11	Other O&M (Excluding Rate Case Expense)	36,170	28.91	(9.27)	38.18	0.1046	3,784	17,602	28.91	(9.27)	38.18	0.1046	1,841
12	Federal Income Taxes	28,967	28.91	37.00	(8.09)	(0.0222)	(642)	8,619	28.91	37.00	(8.09)	(0.0222)	(191)
13	State Income Taxes	4,930	28.91	37.00	(8.09)	(0.0222)	(109)	3,787	28.91	37.00	(8.09)	(0.0222)	(84)
14	FICA Taxes	8,841	28.91	14.00	14.91	0.0408	361	8,841	28.91	14.00	14.91	0.0408	361
15	FUTA & SUTA Taxes	99	28.91	83.10	(54.19)	(0.1485)	(15)	99	28.91	83.10	(54.19)	(0.1485)	(15)
16	Property Taxes	21,529	28.91	212.00	(183.09)	(0.5016)	(10,799)	20,524	28.91	212.00	(183.09)	(0.5016)	(10,295)
17	Registration, Svc. Contracts, & Misc. Fees	1,893	28.91	(98.83)	127.74	0.3500	663	1,893	28.91	(98.83)	127.74	0.3500	663
18	Retirement Annuities (401k)	8,270	28.91	34.72	(5.81)	(0.0159)	(132)	8,270	28.91	34.72	(5.81)	(0.0159)	(132)
21	Total	$ 381,845					$ (513)	$ 340,781					$ (2,446)
24	Interest Expense							27,752 [1]	28.91	90.83	(61.92)	(0.1697)	(4,708)
26	Total (RUCO Recommended)							$ 368,533					$ (7,154)

[1]Incorrect Purchased Water Lag Days - Actual Purchased Water Lag Days is 35.95.

[1]RUCO uses a ficticious 5.43% cost of debt to calculate revenue requirement, but uses a 6.3% cost of debt [($27,752 ÷ $954,567) ÷ 46.31%] to calculate working cash.

ATTACHMENT 23

DeOreo & Mayer | http://dx.doi.org/10.5942/jawwa.2012.104.0080
Journal - American Water Works Association
PEER-REVIEWED

Insights into declining single-family residential water demands

WILLIAM B. DEOREO[1] AND PETER W. MAYER[1]

[1]Aquacraft Inc. Water Engineering and Management

Water use, especially indoor use, in single-family residences has declined since 1995 and is expected to continue to do so as new technologies enter the market. This conclusion is unavoidable when empirical data from residential end use studies dating back to 1995 are compared. Furthermore, the observed declines in indoor use are not related to economic conditions—the bulk of the data used for the analysis were taken before the 2008 recession. This article presents key data and findings from a 16-year data collection effort and closely examines changes in water use over that time as well as the potential for additional residential demand reductions in the future. The demand data presented here show patterns in single-family indoor and outdoor demands and provide a basis for future water supply planning and conservation program design.

KEYWORDS: *end uses, models of residential water demand, residential, trends in residential water demands, water demands, water use*

This article summarizes end-use data from a series of single-family residential studies over time and compares indoor and outdoor water use in order to demonstrate how water use is changing and what these trends suggest for water planning. Utilities need to know how low household and per capita water demands are likely to fall and what factors affect these demands. The data offer some reliable relationships on the question of future water demands.

Water use in single-family residences has declined since 1995, and this trend is expected to continue as new technologies enter the market. These declines are not a result of the 2008 recession—the majority of the data were collected before the last quarter of 2008 when the recession began. The data show clear decreases in household and per capita indoor water use over time, and additional indoor demand reductions are likely as high-efficiency fixtures and appliances further saturate the market. Key findings of the analysis are summarized here.

- Indoor water use for a family of three was observed to decrease from 187 gpd per household in the Residential End Uses of Water Study (REUWS; Mayer et al, 1999) to 162 gpd per household in the California Single-family Water Use Efficiency Study (CSFWUES; DeOreo et al, 2011) and to 132 gpd per household in the New Single Family Home Study (NSFHS) prepared for the US Environmental Protection Agency (USEPA; DeOreo, 2011a). The end-use data for these studies were collected in 1996, 2007, and 2006, respectively.
- Data collected in 2002 and 2006 reported indoor water use for a family of three in two sets of homes that were modified by retrofits or by design to use less water dropped to 117 and 107 gpd per household, respectively (DeOreo, 2011a; Aquacraft, 2005).
- In the above referenced studies, the greatest reductions at the end-use level were seen in the toilet and clothes washer categories. Water use in other indoor categories was more variable (DeOreo, 2011a; DeOreo et al, 2011).
- Water use in categories such as leakage and excess irrigation tend to be skewed by a small number of homes with large use in these categories. Skewed use raises the average for the group as a whole, whereas most households used significantly less than the average.
- Finding ways of targeting and reducing excess use in these skewed end-use categories remains an important challenge for demand-management efforts (Aquacraft, 2011a, 2011b).
- Trends observed in the data strongly suggest that typical indoor household water use will decrease further in the coming years barring wholesale abandonment of the efficiency improvements developed over the past decade (Aquacraft, 2011a, 2011b).

These findings have important implications for water supply planning. If future demands are based on historic consumption patterns rather than new lower-demand patterns, raw water requirements will be overestimated and expensive, and potentially environmentally damaging new supply projects could be developed needlessly. Reduced residential indoor and outdoor demand is the payoff for years of water conservation efforts made by water utilities, conservation professionals, policymakers, and others. Unless these water demand reductions are accepted as permanent by water planners, the reductions will not have the benefits intended by the programs from which they arose.

FOUR KEY END-USE STUDIES

Since 1995 a methodology developed by the authors—flow trace analysis—and the analytic software they created have been used in major residential end-use studies. Data for this article were drawn from four key end-use studies (REUWS, USEPA Combined Retrofit Report [Aquacraft, 2005], NSFHS, and CSFWUES) conducted by the authors. These four studies provide water use information from five groups of homes based on the period from which they were sampled or types of fixtures and appliances in the home.

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REUWS. Conducted for the Water Research Foundation, this baseline study (Mayer et al, 1999) collected water use data from 1,188 single-family homes served by 12 water agencies in the United States and Canada. These served by provide information on water use patterns circa 1996–97. Most of the homes in this study were constructed before implementation of the Energy Policy Act of 1992 (USDOE, 1992) and relatively few had installed newer, more water-efficient fixtures and appliances.

USEPA Combined Retrofit Report. This report (Aquacraft, 2005) measured indoor water use in 100 homes spread across three utilities before and after a high-efficiency fixture and appliance retrofit. Before the retrofit, the water use in these homes was similar to what was found in the 1999 REUWS. After the retrofit, indoor water use in these homes was reduced by more than 30%. The data for this study were collected between 2000 and 2002.

NSFHS. DeOreo (2011a) measured water use patterns in two groups: a randomly selected sample of 240 "standard" new homes drawn from nine participating utilities and a group of 36 new homes built to the WaterSense new home specification. This study comprised the following two groups.

- Standard new home group: Approximately 240 homes built after Jan. 1, 2001, were selected at random from nine water agencies in Arizona, California, Colorado, Florida, Nevada, Oregon, and Utah. These homes represent water use in new homes built to Energy Policy Act of 1992 standards or better. The data for the standard new homes were collected between 2006 and 2008.
- High-efficiency new home group: Water use patterns at 36 new homes built to meet the WaterSense new home specification (as of 2009), with the addition of a high-efficiency Energy Star–rated clothes washer, were studied in 2008 and 2009 (DeOreo et al, 2011). This sample is the most water-efficient group of homes the authors have studied to date.

CSFWUES. For this study (DeOreo et al, 2011), 780 single-family homes were chosen at random from the general population in 10 water agencies throughout California. These homes represent a snapshot of water use in existing homes circa 2007, approximately 10 years after the REUWS.

RESEARCH APPROACH

Each of the four end-use studies in this article focused on different groups of single-family homes but used similar research methods. Readers wanting a more detailed description of the methodology are referred to the study reports themselves, which also include discussion of accuracy and verification of the flow trace analysis as a method of disaggregating single-family water use into end uses.

- Each participating water agency provided one year of historic monthly or bimonthly billed consumption data from a random sample of single-family customers in its service areas. The annual water use of each sample was compared against the average annual use of the population from which each sample was drawn to verify that the samples were representative of their respective populations.
- A detailed mail survey was sent to each household in every sample to collect demographic, physical, and economic data for modeling and statistical analysis.
- A sample of homes was drawn from the survey respondents for more detailed analysis including flow recording by data loggers, disaggregation of water use into end uses, and landscape analysis.
- A database was prepared that included the annual and disaggregated water use for each study home, survey information, and weather data.

In these studies, water use was disaggregated into the following end-use categories: toilets, clothes washers, dishwashers, showers, baths, miscellaneous faucets, irrigation, leaks, and special uses such as evaporative coolers, water treatment, and pools. The flow trace analysis technique used for the disaggregation has been described in detail in previous studies (Mayer et al, 1999; Lewis, 1998; DeOreo et al, 1996a, 1996b); a detailed explanation and validation of the technique is beyond the scope of this article.

The analytic database developed for each study enabled a variety of computations and analyses to be completed. Water use event data can be summarized by any of the available parameters such as the average daily use by end-use category. The event data for individual fixtures were analyzed to determine number of uses, average volume per use, and percent of uses that are equal to or less than a specified benchmark value.

In these studies, flow trace data were typically limited to a single two-week period. Outdoor use from manual or automatic irrigation occurring during the logging period was identified and analyzed with respect to the use patterns during the logging period. Because of the high variability of outdoor use over the course of a year, a limited two-week snapshot cannot be used to estimate annual outdoor use. Therefore outdoor use was usually estimated for each household by taking the total annual water use from the billing data and subtracting the projected annual indoor use as determined from the two-week flow monitoring period. In some cases, billed consumption data were used to estimate indoor use using a minimum month or average winter consumption method, which was then subtracted from annual use to obtain an estimate for annual outdoor use.

By combining the datasets developed for each of these four end-use studies, the authors were afforded a unique and powerful tool for examining changes in both indoor and outdoor residential water use over the past 15 years. With these data, it was also possible to determine the percent of homes meeting specified efficiency benchmarks for end uses such as toilet flushing and automatic clothes washing. Outdoor use efficiency was characterized by comparing the depth of irrigation water applied to each landscape against the theoretical irrigation demands calculated for each landscape using locally obtained evapotranspiration (ET) and precipitation data. Outdoor use tends to be more variable and unpredictable, but there are good relationships between outdoor water use and a few key parameters that will allow conservation planners to design better programs for managing these demands and reducing excess irrigation.

INDOOR USE

The analyses of the end-use studies are provided in the study reports. The results from the studies are compared here to show how the study groups' water use has changed and

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which factors best explain their use. The analysis shows that indoor water use is measurably reduced on both a household and a per capita basis in the newer and more efficient homes. The results also show that older homes can be brought to a similar high-efficiency level through basic fixture and appliance retrofits and management of leaks.

Average daily indoor use. There have been significant reductions in residential indoor water use since the data for the 1999 REUWS were collected. The household data shown in Figure 1 indicate a trend in decreased household water use as consumption patterns from standard housing stock in the 1990s are compared with the standard new homes, retrofit homes, and the high-efficiency new homes. The household data from the CSFWUES, which shows a random sample of existing homes sampled around 2007, does not show a significant decrease in water use at the household level. However, as explained in subsequent sections and shown in Figure 2, when corrected for the number of occupants in the homes, there has been a significant reduction in per capita use.

Figure 2 shows the trend for reduced water use on both a household and per capita level by normalizing the water use in each study group for a family of three. In the REUWS (standard housing stock from the 1990s), a family of three used an average of 187 gpd per household for indoor purposes. A family of three in California in 2007 used an average of 162 gpd per household indoors—a 13.3% reduction from the use information reported in the REUWS. A family of three in a typical new home built after 2001 used an average of 132 gpd per household indoors—a 29.4% reduction from the data collected for the REUWS. A family of three in an older home that was retrofitted with water-efficient fixtures and appliances used an average of 117 gpd per household indoors—a 37.4% reduction from the REUWS. Most efficient of all, a family of three in a new home built to WaterSense specifications and with an Energy Star–rated clothes washer used an average of just 107 gpd per household indoors—a 42.7% reduction from the REUWS. This result shows the clear trend toward water efficiency in indoor use and suggests that further reductions in indoor use are likely as older toilets and clothes washers are replaced in the future.

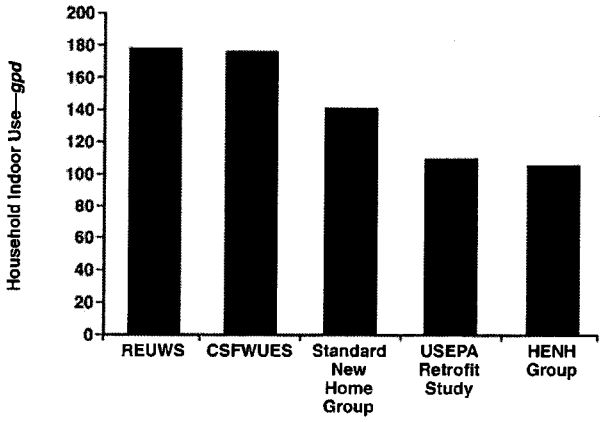
Comparison by end use. Indoor water use was disaggregated into individual categories and summarized by average daily gallons of use per household. The average daily per household water use from the four key studies is shown in Figure 3. These data show a dramatic reduction in household use in two major end-use categories: toilets and clothes washers.

Although the existing homes studied in the 1999 REUWS and the 2011 CSFWUES averaged more than 40 gpd for toilet flushing, retrofit homes equipped with a mixture of 1.6- and 1.28-gpf toilets averaged 20.3 gpd for flushing. The high-efficiency homes, built to the WaterSense new home specification and equipped exclusively with 1.28-gpf toilets, averaged 16.2 gpd for flushing.

The pattern for clothes washers was similar: the existing homes averaged around 35 gpd for clothes washing. The high-efficiency new homes used just under 12 gpd for clothes washing. These homes were equipped with clothes washers rated at tier 3 by the Consortium for Energy Efficiency.

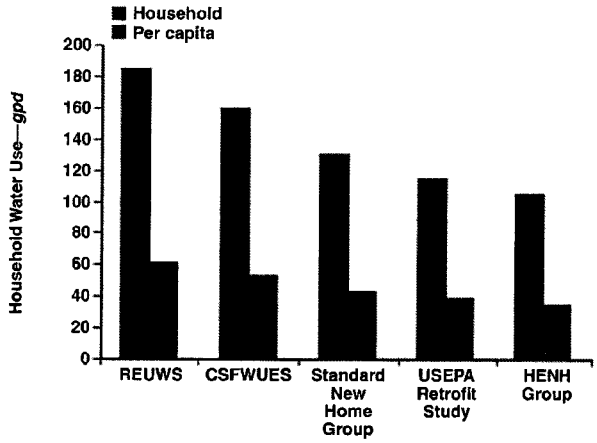
Water use for showers did not show a consistent decline. The existing homes from the REUWS and CSFWUES used an average of around 33 gpd for showering, whereas the two groups

FIGURE 1 Comparison of actual average daily per household indoor use from five groups of homes



CSFWUES—California Single-family Water Use Efficiency Study, HENH group—high-efficiency new home group, REUWS—Residential End Uses of Water Study, USEPA—US Environmental Protection Agency

FIGURE 2 Comparison of per household and per capita water use normalized for a family of three



CSFWUES—California Single-family Water Use Efficiency Study, HENH group—high-efficiency new home group, REUWS—Residential End Uses of Water Study, USEPA—US Environmental Protection Agency

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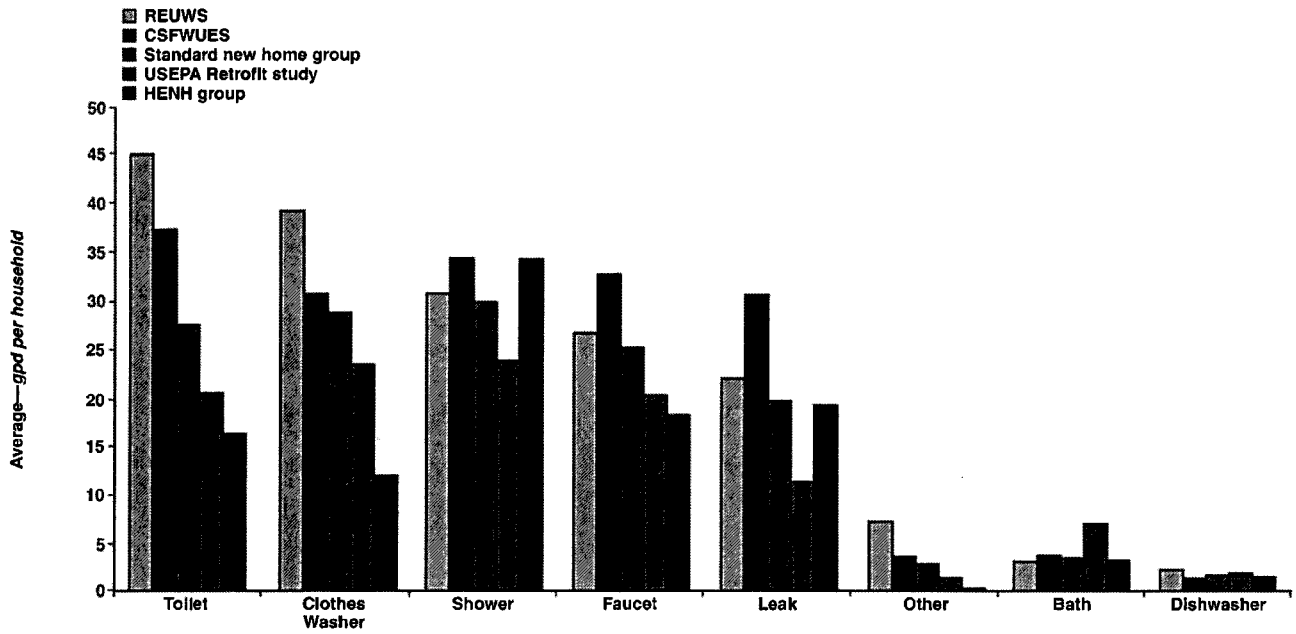
FIGURE 3 Comparison of end uses of water by study group



CSFWUES—California Single-family Water Use Efficiency Study, HENH group—high-efficiency new home group, REUWS—Residential End Uses of Water Study, USEPA—US Environmental Protection Agency

of high-efficiency homes from the USEPA Combined Retrofit Report and the NSFHS averaged 29 gpd. The lowest shower use was seen in the USEPA Retrofit Study homes, which averaged 24 gpd. Ironically, the high-efficiency new homes used more than 34 gpd, which spoiled the downward trend. Even though the shower flow rates in the new high-efficiency homes were lower than the other groups, the homes had more showers per day and longer shower durations, which masked the effects of the lower flow rates. Essentially, shower use was considered to remain flat across the study groups, even though the data from the USEPA Combined Retrofit Report suggest that lower shower use is possible.

Faucet use did appear to decrease. The existing homes averaged 30 gpd, whereas faucet use in the high-efficiency homes averaged 19 gpd. Leakage volumes also dropped. The existing homes averaged 26 gpd for events that were classified as leaks, whereas the high-efficiency homes averaged 15 gpd. Events classified under the "other" category were also lower in the high-efficiency homes, whereas bathtub and dishwasher use remained essentially unchanged. Additional details of interest on individual end uses are given in the following section.

Changes in toilet flush volume. The volume of water used to flush a toilet has been reduced significantly over the past 15 years and is likely to decrease further as more 1.28-gpf high-efficiency toilets (HETs) are installed. In 1999, the average flush volume was measured to be 3.48 gpf in the REUWS (Mayer et al, 1999). In the 2011 CSF study, the average flush volume was measured to be 2.8 gpf. Standard new homes in the 2011 NSFHS had an average flush volume of 2.1 gpf. The group of homes built to meet the WaterSense new home specification (high-efficiency new home group) had an average flush volume of just 1.4 gpf.

One of the most interesting results from the data analysis was the shift in the distribution of toilet flush volumes. Figure 4 shows the relative frequencies of all the toilet flushes recorded in the REUWS, the standard new home group, and the combined high-efficiency new home group homes from the USEPA Retrofit and USEPA Combined Retrofit Report studies. The volume pattern is broadly distributed around 3.5 gpf in the REUWS group and contains a significant number of flushes at 6.75 gpf or more. In the standard new home group, the mean has shifted downward to less than 2 gpf and the distribution is much more tightly grouped, but there are still flushes at 3.5 gpf or more, which is somewhat surprising because these were all homes in which the expectation was to find 1.6-gpf or better toilets. Finally, the high-efficiency homes, in which only HET models were installed, had flushes grouped around 1.25 gpf and had relatively few flushes at more than 2 gpf.

Changes in clothes washer use. Clothes washers have become dramatically more efficient over the past 15 years. In the REUWS, the average clothes washer load consumed 41 gal per load (gpl). In the high-efficiency homes, this had dropped by 63% to 15 gpl. At the same time, the number of loads per day dropped by 20%,

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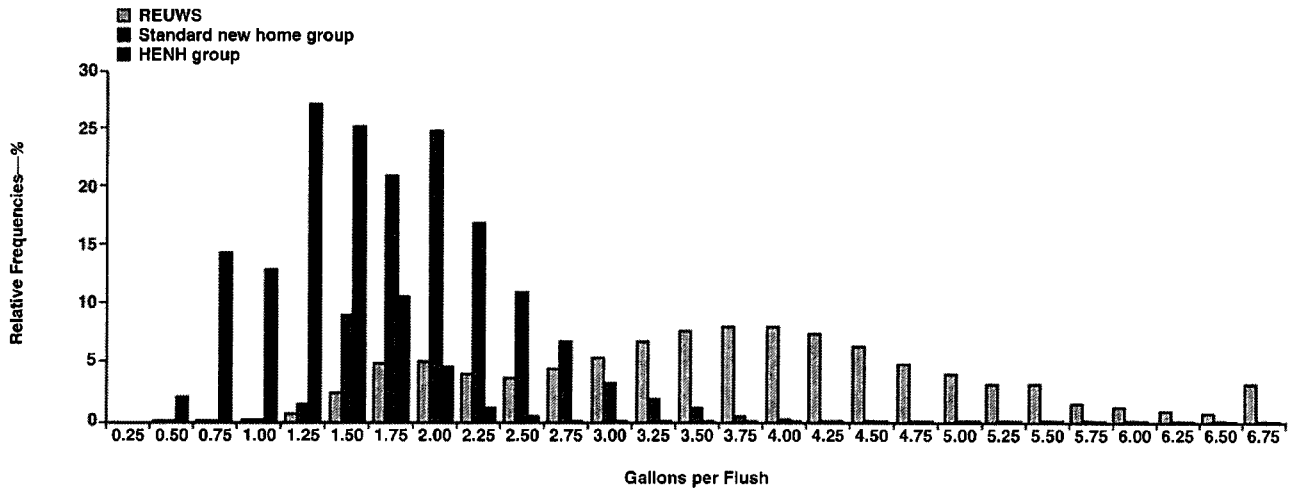
FIGURE 4 Changes in distributions of toilet flush volume



HENH group—high-efficiency new home group, REUWS—Residential End Uses of Water Study

resulting in the decrease in household use for clothes washing shown in Figure 3.

Shower use comparison. Shower use has tended to remain relatively stable over time. Shower use comparisons are shown in Table 1. The number of showers per household per day has stayed between 1.9 and 2.1; the shower duration is between 8.2 and 9.6 minutes in all four studies. Although shower flow rates were reduced in the new high-efficiency homes, significant reductions in shower volumes were not observed because the average duration increased enough to maintain the average shower volume of around 16 gal. This explains why there is no clear downward trend in shower use. It appears that, at least in these samples, simply reducing the flow rate in showerheads is not sufficient by itself to cause a reduction in shower volume.

Faucet use comparison. Faucet use has decreased in both the new and the high-efficiency homes (Table 2), but research results indicate that this is primarily because people in the high-efficiency homes used the faucet less frequently. Many of the faucet parameters shown in Table 2 were similar across the four studies. Of interest was that in the CSF study statistical analysis showed that the presence of both dishwashers and garbage disposals was associated with lower faucet use.

Leak effects. Leakage data can be misleading. Leakage is one of several categories of water use that tend to be skewed by a relatively small number of homes with high leakage rates. These high-leakage accounts, although small in number, have a disproportionate effect on the average of the group as a whole. For example, the leakage data from the CSFWUES group were used to create Figures 5 and 6. Figure 5 shows the percentage of the study homes that fall into the various daily leakage bins ranging from 10 to > 200 gpd per household. From this figure, the homes in the upper bins appear fairly insignificant with only 7% of the houses leaking at greater than 100 gpd and only 4% leaking at more than 150 gpd.

If the data are expressed in terms of the percentage of the total leakage volume accounted for by the houses in each bin, a different picture emerges. Figure 6 shows that the 7% of homes with leakage greater than 100 gpd actually account for 44% of the

TABLE 1 Shower data comparisons

Parameter	REUWS	CSFWUES	Standard New Home Group	HENH Group
Average minutes	8.2	8.7	8.2	9.6
Average showers/day	2.1	2.0	1.9	2.1
Average flow	2.2	2.2	2.0	1.6
Average volume	17.2	18.2	15.9	15.9

CSFWUES—California Single-family Water Use Efficiency Study, HENH—high-efficiency new home group, REUWS—Residential End Uses of Water Study

TABLE 2 Faucet data

Parameter	REUWS	CSFWUES	Standard New Home Group	HENH Group
Average uses per day	41	57	48	33
Average gallons per use	0.65	0.60	0.53	0.60
Average peak flow—*gpm*	1.28	1.1	1.1	1.0
Average duration—*min*	0.59	0.62	0.58	0.68

CSFWUES—California Single-family Water Use Efficiency Study, HENH—high-efficiency new home group, REUWS—Residential End Uses of Water Study

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FIGURE 5 Distribution of percentage of California Single-family Water Use Efficiency Study houses into leakage bins

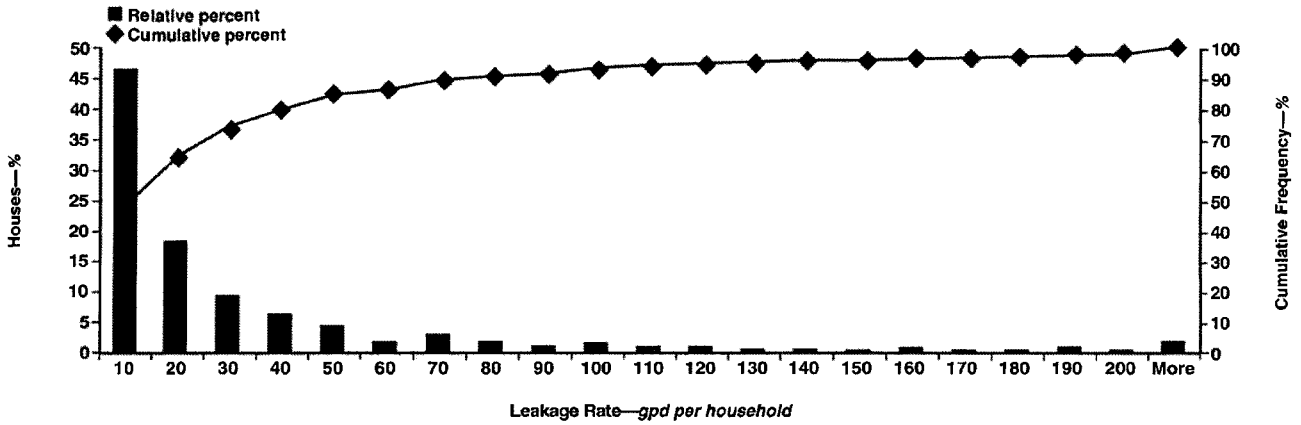
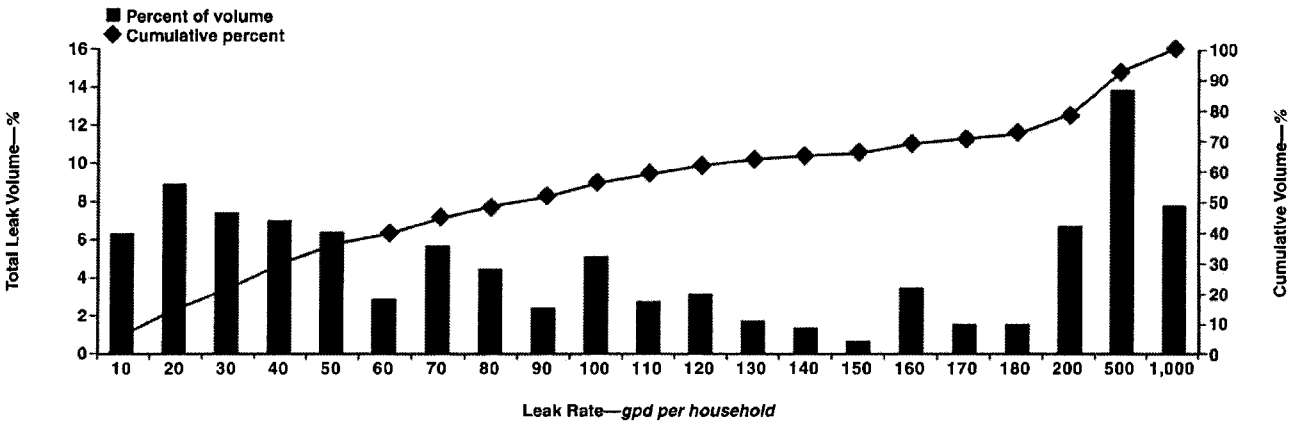


FIGURE 6 Distribution of percent of total leakage by leak bins for California Single-family Water Use Efficiency Study



total leakage volume of the entire group. Likewise, the 4% of homes that have leakage greater than 150 gpd account for 35% of the total leakage of the group. This result is not unusual. The average leakage for the CSFWUES group was approximately 30 gpd per household, but the median rate was only 11 gpd per household. Most of the houses had leakage of 10 gpd per household or less, and the few houses with very large leaks almost tripled the overall average.

This result suggests that leakage-reduction efforts should not be targeted at the general population but at the houses in the top 10% of the group, which in this case would be houses with leakage rates of 80 gpd or more. These top 10% of the houses account for 50% of the total leakage.

Household efficiency criteria. To judge the relative water efficiency level of the homes in these studies, the authors determined the percentage of homes in each study that met specific criteria for average toilet flush volume and average clothes washer load volume that indicate whether the house was equipped with high-efficiency devices. The criterion used for toilets was that the house had to have an average flush volume of 2.0 gpf or less to be considered meeting the high-efficiency criteria for toilet flushing. The value used for clothes washers was that the average gallons per load for the house had to be less than 30 gpl, which constituted a high-efficiency machine for the study period. Figure 7 shows the progression of homes meeting the toilet and clothes washer criteria. In the REUWS, only 10% of the homes met the 2.0-gpf toilet criteria and only 3% met the 30-gpl clothes washer criteria. Ten years later, 30% of homes in the CSFWUES met the toilet and clothes washer criteria. Not surprisingly, virtually all of the retrofit homes and new homes built to the WaterSense specification, here combined for convenience, met the toilet and clothes washer efficiency criteria. In addition, fewer than half of the standard new homes met thses criteria.

Unexpectedly high flush volumes in some new homes. An unexpected finding from the NSFHS houses built since 2001 was that a number of these new homes had toilet flush volumes that exceeded 1.6 gpf. In some cases, the flush volume in these homes

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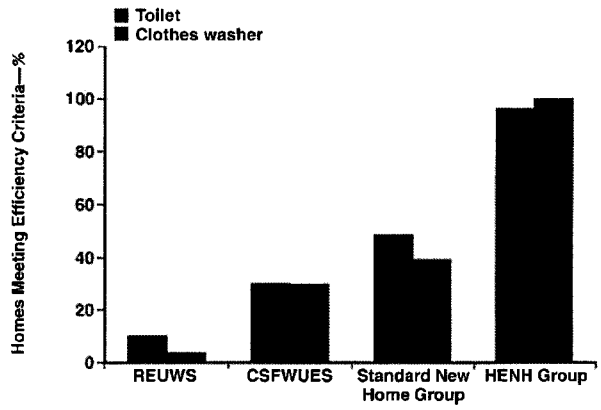
was substantially higher than 1.6 gpf. Because of the provision of the Energy Policy Act of 1992, standard new homes built after 2001 should all have been equipped with 1.6-gpf toilets or better, yet the data showed that fewer than half of the homes had average flush volumes of 2 gpf or less.

During the data logging study of the NSFHS group, 41,957 flushes were recorded. The distribution of the flush volumes for the new homes is shown in Figure 8. Approximately 40% of the flushes are ≤ 1.6 gpf, and 60% of the flushes are > 1.6 gpf. Flush volumes were recorded at up to 6 gpf because some homes were equipped with non–ultra-low-flush (ULF) toilets and many ULF design toilets installed in the homes are actually flushing at volumes greater than 1.6 gal. The researchers were not able to inspect the individual toilets to determine the cause of the overflushing, but it is likely that this is the result of both poor adjustments by the installers and toilets that do not meet the 1.6-gpf specification.

Per capita use relationships. As part of the modeling effort, total household water use (in gallons per day per household) was generally used as the dependent variable; a range of variables were tested for their ability to predict indoor use. In many cases, the number of people in the house was the only continuous independent variable that proved significant in predicting indoor water use. In all four end-use studies discussed here, the relationship between household use and number of residents was nonlinear and followed a power curve relationship. The other relationship that was observed was that the newer and more-efficient homes had curves that were generally below the curves of the older and less-efficient homes.

The actual relationships between household indoor use and number of residents for the five study groups are shown in Table 3 and Figure 9. As household populations increase, water use does not increase in direct proportion but follows a power curve relationship that has an exponent < 1.0. The data group themselves as a family of curves, with the REUWS homes having the highest daily use, followed by those in the CSFWUES, the standard new home group, the USEPA Combined Retrofit Report, and the high-efficiency new home group.

FIGURE 7 Comparison of percentages of households meeting toilet and clothes washer efficiency criteria



CSFWUES—California Single-family Water Use Efficiency Study, HENH group—high-efficiency new home group, REUWS—Residential End Uses of Water Study

The implication of the nonlinear relationship between household use and the number of residents is that water planners should use caution when using per capita demand values for planning. Also, when setting water budgets, the temptation to increase budgets directly in proportion to the number of residents should be resisted because doing so could create excessive budgets for larger households.

Factors that affect indoor water use. A wide range of continuous and conditional variables were tested with respect to their

FIGURE 8 Distribution of toilet flush volumes in standard new homes built after 2001

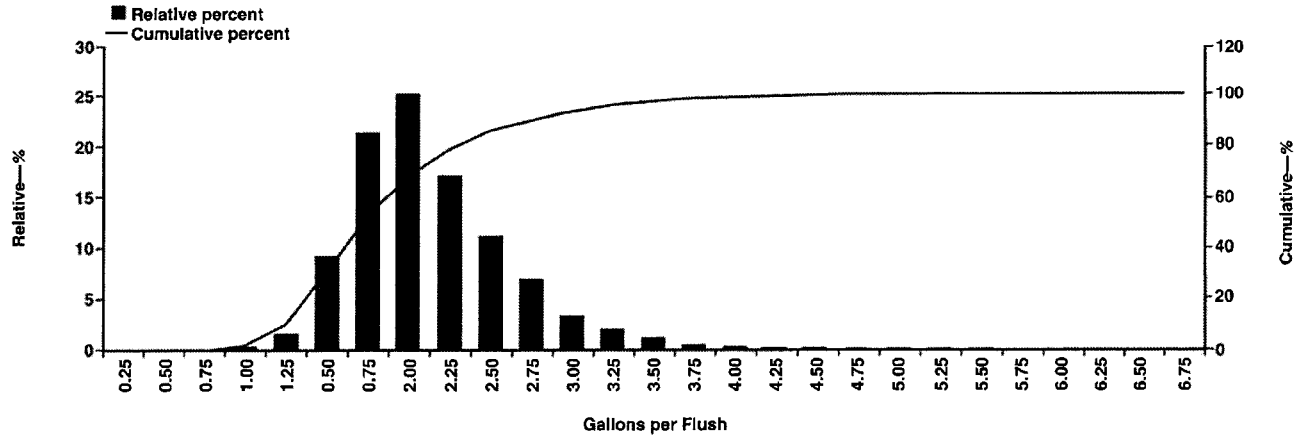


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TABLE 3 Indoor household demands normalized for a family of three people

Parameter	REUWS (Built < 1995)	CSFWUES	Standard New Home Group (Built > 2001)	USEPA Retrofit Study	HENH Group
Number of households	1,188	728	302	96	25
Mean±95% CI—*gpd per household*	177±5.5	186±10.2	140±10.0	107±10.3	105±28
Median—*gpd per household*	160	165	125	100	90
Per capita relationship—*gpd per household*	87.41 × 0.69%	72.67 × 0.73%	66.30 × 0.63%	50.21 × 0.77%	59.58 × 0.53%
Household use for family of three people—*gpd per household*	187	162	132	117	107
Projected per capita use for family of three people—*gpcd*	62.18	53.9	44.15	39.0	35.6

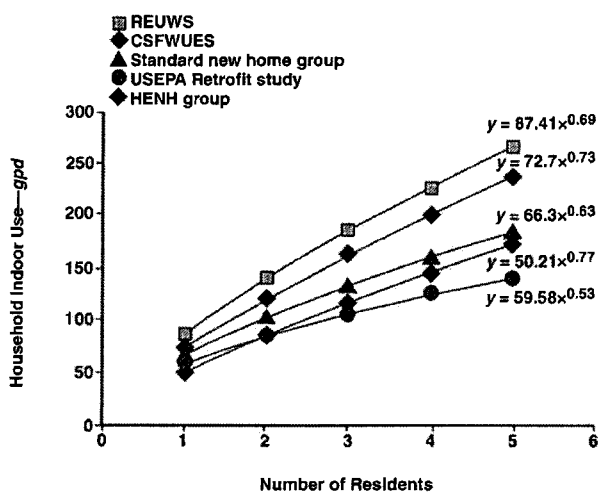
CI—confidence interval, CSFWUES—California Single-family Water Use Efficiency Study, HENH—high-efficiency new home group, REUWS—Residential End Uses of Water Study, USEPA—US Environmental Protection Agency

value for predicting indoor water use. The only continuous variable that was found to be statistically significant across all studies was the number of people in the home. These relationships are shown in Table 3. Others, such as the household income, age of the home, value of the home, number of bedrooms, or number of bathrooms, were not found to be significant. The living area of the home was found to be significant for some data sets, but to a smaller extent than the number of residents.

Analysis of variance was conducted on a range of conditional variables to see whether they affected the household water use. Several of these proved to be significant.

- The presence of a leak of more than 100 gpd on the flow trace was positively correlated with household use and increased the average daily indoor use by 223 gpd.

FIGURE 9 Per capita use relationships in five study groups



CSFWUES—California Single-family Water Use Efficiency Study, HENH group—high-efficiency new home group, REUWS—Residential End Uses of Water Study, USEPA—US Environmental Protection Agency

- The presence of a nonadult living in the home was negatively correlated with water use and decreased household water use by 42 gpd.
- The presence of high-efficiency (ULF or HET) toilets in the home was negatively correlated and reduced household water use by 22 gpd.
- The presence of a high-efficiency clothes washer was negatively correlated and reduced average indoor water use by 17 gpd.
- The presence of a dishwasher and a garbage disposal was linked to decreased faucet use.

OUTDOOR USE

It was not possible to demonstrate clear trends in outdoor water use from the four studies used for this analysis. The quality of the data for the analyses varied, and the only study groups that the authors felt to be comparable were the CSFWUES and the standard new home group. These two study groups provide a contemporaneous comparison for the period around 2007 of existing and new homes. In addition, the data from these studies showed consistent relationships between key parameters and outdoor use that can be used to make models of outdoor use from which projections can be made on how varying these parameters might affect outdoor use.

Comparison of outdoor parameters. The most important outdoor parameters for the study groups are shown in Table 4. These results show a relatively high degree of consistency between the existing and new homes for the key parameters shown. All of the variations between the new and existing homes are 15% or less—and most of them are less than 10%.

Lot sizes and irrigated areas in the new home sample are approximately 10% larger, but the outdoor use was 15% less in the new homes. The average application for both groups was close to 57 in. compared with similar reference ET values of 43 in. Both groups of homes were applying, on average, 30–36% more than the ET requirement. When the excess use was determined for the lots that were overirrigating, this value averaged close to 30,000 gal/year/lot for the entire group and approximately twice this amount on the overirrigating lots. At the same time, if the algebraic average of excess and deficit irrigation

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TABLE 4 Comparison of outdoor use parameters

Parameter	CSFWUES	Standard New Home Group	Ratio of Standard New Home Group to CSFWUES
Average lot size—*sq ft*	9,179	10,146	1.11
Irrigated area—*sq ft*	3,387	3,714	1.10
Outdoor use—*gal/year*	93,400	78,000	0.85
Average application—*in.*	57	56	0.98
Average reference evapotranspiration	42	43	1.02
Average application ratio	1.36	1.30	0.96
Average excess application—*gal/year for overirrigators*	29,400	30,000	1.02
Net application for all homes—*gal/year*	6,500	7,300	1.12

CSFWUES—California Single-family Water Use Efficiency Study

applications was calculated, this averaged between 6,500 and 7,300 gal/lot. The value of 30,000 gal/year represents the amount of water that could be saved if all of the excess irrigation could be eliminated on the lots where it was occurring, while leaving the deficit irrigators alone. The values between 6,500 and 7,300 gal/lot represent the amount of water that could be saved if everyone's irrigation were brought precisely to the ET-based theoretical irrigation requirement.

Outdoor water use relationships. The models of outdoor use were similar for both the standard new home and high-efficiency new home groups. For illustration purposes, the analysis of the outdoor use data for the CSFWUES sample is shown in Eq 1, which provided the best fit for predicting outdoor water use in the CSF study.

$$\text{Outdoor Water Use} = 1.6207 \times 10^{-4} \times \text{NetET}_o^{1.66} \times \text{IrrArea}^{0.682} \times \text{Inc}^{0.125} \times \text{LRatio}^{0.506} \times \text{Pool} \times \text{Excess} \times \text{Sprinkler} + C_f \quad (1)$$

See Table 5 for definitions of all factors in Eq 1.

Outdoor use is most strongly affected by ET, irrigated area, and the water use intensity of the landscape as measured by the landscape ratio—which is the ratio of the actual irrigation requirement of the lot to the requirement based on a total turf landscape, whether a pool is present on the landscape, whether excess irrigation is occurring on the lot, and whether there is an automatic irrigation system present.

One of the key factors for predicting outdoor water use is whether the customer is overirrigating. Homes that overirrigate tend to have much larger outdoor use volumes. The situation with overirrigation is similar to that of leakage—a small number of homes influence the overall average far out of proportion to their numbers. Only a small number of homes were applying large volumes of excess irrigation: > 60% of the homes were applying 20,000 gal or less of excess water and only 8% of the homes were applying more than 100,000 gal of excess irrigation water (DeOreo et al, 2011). If, however, the percentage of excess irrigation water associated with the various bins of excess use (Figure 10) is investigated, this 8% accounts for 38% of the total excess irrigation (DeOreo et al, 2011).

The outdoor use model suggests that if the rate of overirrigation could be reduced from 50 to 25% of the households in California, the average outdoor use for all irrigating homes would decrease by approximately 25,000 gal/year, a savings of 29% in outdoor use. This would represent a total savings for the state of more than 630,000 acre-feet of raw water from simply reducing the percentage of homes that are overirrigating.

TABLE 5 Factors of interest for outdoor water use

Parameter	Description
Outdoor water use	The dependent variable (per 1,000 gal)
Net evapotranspiration (NetET_o)	Reference evapotranspiration—effective precipitation (in.)
Irrigated area (IrrArea)	Total irrigated area on lot (sq ft)
Income (Inc)	Household income (in $1,000s)
Landscape ratio (LRatio)	The ratio of the theoretical irrigation requirement to the reference requirement for the lot. This is a measure of the water requirements of the landscape relative to cool season turf (the reference crop).
Pool	Correction factor pool; multiply by 1.38 × percent of population with pools + percent without pools
Excess irrigation (Excess)	Correction factor for overirrigation; multiply by 3.13 × percent of homes that are overirrigating + percent that are not
Sprinkler	Correction factor for automatic sprinkler system; multiply by 1.21 × percent of homes with automatic sprinkler systems + percent without
C_f	Correction factor = −9,100 gal

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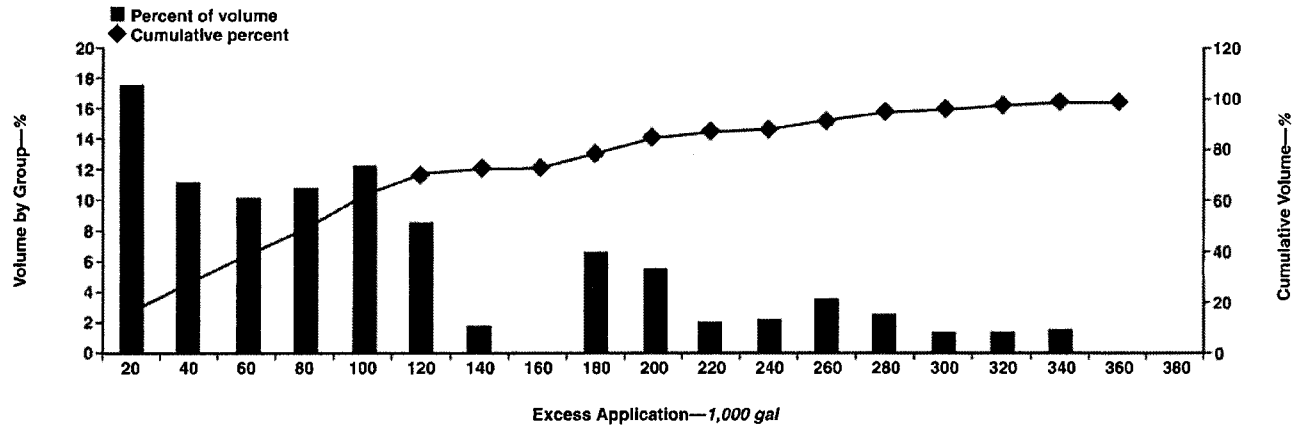
FIGURE 10 Percent of volume of total excess use from California Single Family Water Use Efficiency Study homes



Additional outdoor savings can be achieved by reducing the irrigated areas and water requirements of the selected plant material or by prohibiting swimming pools, but all of these measures have effects on the quality of life. By comparison, the elimination of excess application seems like a fairly nonintrusive measure.

Although indoor use has been shown to be unaffected by household income, outdoor use is related to income. Consequently, it could be expected that during an economic downturn there would be a reduction in outdoor water use, which would add to declines in single-family water use from indoor efficiencies during times of economic downturn.

CONCLUSIONS

The results from four residential water use studies and five study groups summarized in this report lead to several important conclusions. There is a clear trend toward lower single-family indoor water use from both the household and the per capita perspective. Results from the CSFWUES show that existing homes sampled 10 years after the REUWS are using less indoor water. This demonstrates that water conservation efforts are bearing fruit and demand reductions are occurring. As time goes on, it is safe to assume that more homes will be retrofit with high-efficiency fixtures and appliances and that household water use in the existing customer pool will continue to decrease both on a per capita and a household basis. Water efficiency provisions are built into national building codes and the national Energy Policy Act of 1992. The effect of these provisions is measurable, as shown by the results of this analysis. Water planners should incorporate these changes in demand into future demand projections or run the risk of significantly overestimating future residential demands.

At the same time, the data from the two comparable outdoor studies show a remarkable degree of similarity in outdoor use between existing California homes and new homes across the country. They also show a similar set of factors affecting outdoor use and that the key of these is whether the home is overirrigating. Elimination of excess irrigation where it is occurring (while allowing the deficit irrigators to continue their practice) is the key to achieving outdoor water conservation that has minimal effects on quality of life.

The indoor end uses where the greatest decrease has been measured are toilets and clothes washers. This makes sense because toilets and clothes washers have been the target of the most intense design and manufacturing upgrades for the past 15 years. What were once specialized "water-conserving" devices are now common to the market. In contrast to toilets and clothes washers, water use for showering has stayed relatively constant in spite of concerted efforts to reduce shower flow rates.

Beyond fixture and appliance efficiency improvements, a key objective for future water conservation efforts should be to decrease the number of homes with significant leaks. Most large-volume leaks are caused by constant flows. These types of flows can be detected with smart water meters or automatic meter infrastructure (AMI) capable of detecting constant flows. Utilities equipped with AMI and automatic meter reading systems have used this capability to issue leak alerts to customers with ongoing continuous flows. This is a powerful targeting tool. If AMI is not a viable option, there are devices on the market that can detect constant flows, turn off the water, and alert the homeowner of the situation. These are the types of devices that could help reduce leakage and could be included in specifications for building codes or voluntary "green" building standards.

Dealing with leaks is important if the savings from future retrofits are to be fully realized. For example, as shown in Figure 3, the savings in water use associated with toilets and clothes washers in the California homes was approximately 17 gpd per household, but there also was a 9-gpd per household increase (from REUWS) in leakage that prevented the savings from fully showing on the bottom line of total daily indoor use.

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The data on toilet flush volumes, shown in Figures 4 and 8, indicate that there may be problems with some off-the-shelf ULF design toilets that cause their flush volume to exceed the 1.6-gpf design. This could be the result of problems with installation or manufacturing. The 1.28-gpf HETs show a much closer flush volume distribution and much less excess flush volume than their 1.6-gpf counterparts. This is likely the result of increased third-party testing of toilets required by the WaterSense program.

Over time, the percent of households that can be classified as "high efficiency" with respect to toilet and clothes washer use has increased significantly. During the 10 years between the REUWS and the CSFWUES, the household efficiency rates for these devices have increased by a factor of 3 for toilets and a factor of 10 for clothes washers. However, the data for the standard new homes suggest a decrease in these rates of penetration because only about half of the new homes met the study criteria of 2.0-gpf average flush volume and a third met the 30-gpl clothes washer criteria. If a utility wants all new homes to meet these basic efficiency criteria, it is probably necessary to specify HETs (or WaterSense–labeled toilets) and Consortium for Energy Efficiency tier 3 clothes washers as the standards for new construction.

This research has found a nonlinear relationship between household domestic water use and the number of residents in the home. As the number of people in a home increases, water use does not increase proportionally. There are efficiencies associated with living in larger groups—each additional person in a home has a smaller effect on household water use. Because of this finding, water planners must use discretion when applying per capita demands to estimate household or population demands.

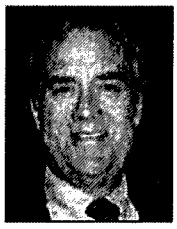
The relationships developed in these studies show that there are clear distinctions in household water use versus residents for the various groups. When these relationships are used to normalize the demands on the basis of the same number of residents, the demand patterns can be compared properly. Figures 2 and 9 show this dramatically and represent the key result for indoor use—agencies should be planning for per capita demands of around 40 gpcd or less for a family of three and household uses of 120 gphd or 44,000 gal/year or less for indoor use by the average home. Just as the mileage standards for automobiles are increasing in response to higher gas prices and oil shortages, the water use standards for households are, or should be, increasing as well.

The declines in indoor water use identified in this article were not an artifact of the economic recession of 2008–10. Most of the data on which these studies have been based were collected before the start of the recession. Outdoor water use, however, would be expected to decline during recessions as incomes fall because outdoor use is dependent on household income.

The results on outdoor use show that a key to outdoor water conservation is preventing excess irrigation. The results show that the majority of homes are irrigating at or below what appears to be a reasonable amount for their landscape and area, but the small number of homes that overirrigate raise the average for the group. The small numbers of homes that grossly overirrigate have a disproportionate effect on outdoor use, raising the averages further. Finding ways to target the water use in these homes, perhaps by use of water budgets linked to steeply inclining block rates, is an important goal of demand management efforts. Once excess irrigation is eliminated, then modest decreases in irrigated areas and shifting to less water-intensive plant materials can optimize outdoor use.

Overall, the results from the studies of single-family water use discussed in this article show that great strides have been made in reducing residential water demands and that there are also substantial opportunities for water savings remaining. The improved designs of household fixtures and appliances have made it possible to consider household demands of 40 gpcd (or 120 gphd for a family of three) a reasonable target. Better technologies for identifying leaks and preventing overirrigation of landscapes make it possible to envision significant demand reductions in these difficult categories. Finding better ways of providing customers with real-time information on their water use, along with reasonable budgets, can make allies of customers in a community-based effort of water conservation. Reduced residential demand is a cornerstone of future urban water resource management. Great progress has been made in the past 15 years, and the industry appears poised to realize further demand reductions in the future.

ABOUT THE AUTHORS



William B. DeOreo (to whom correspondence should be addressed) is president of Aquacraft Inc., 2709 Pine St., Boulder, CO 80302; bill@aquacraft.com. His work has focused on issues related to water demand analyses, demand forecasting, and water conservation planning. He and his business partner and coauthor have developed the flow trace analysis technique for disaggregating residential water use into end uses for more than 15 years. By combining the results of end-use analyses with data from surveys and other sources, DeOreo has been able to show which factors best explain residential water use and show how both household and per capita demands have dropped in response to new technologies and changes in climate. Peter W. Mayer is vice-president of Aquacraft Inc.

PEER REVIEW

Date of submission: 08/27/2011
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ATTACHMENT 24

ARIZONA WATER COMPANY'S RESPONSES TO
ARIZONA CORPORATION COMMISSION
STAFF'S SECOND SET OF DATA REQUESTS TO
ARIZONA WATER COMPANY
DOCKET NO. W-01445A-15-0277
October 23, 2015

Arizona Water Company Response Number: BAB 2.13

Q. <u>Declining usage revenue adjustment</u> – Please provide the available year to date (2015) customer counts and total sales by month.

A. Please see the Excel file \BAB 2.13 - Declining Usage Revenue Adjustment.xlsx\ provided on the enclosed CD.

Response provided by:	Jamie R. Moe
Title:	Manager – Rates & Regulation
Address:	3805 North Black Canyon Highway Phoenix, AZ 85015

ARIZONA WATER COMPANY

Test Year Ended December 31, 2014

Staff Data Request BAB 2.13 - Declining Usage Revenue Adjustment

	2015								
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Pinal Valley									
Customer Count									
Residential	26,370	26,359	26,412	26,448	26,484	26,519	26,619	26,597	26,596
Commercial	2,035	2,020	2,019	2,023	2,055	2,048	2,065	2,046	2,035
Industrial	24	24	24	24	24	24	24	24	23
Other	454	453	452	452	455	453	457	460	467
Total	28,883	28,856	28,907	28,947	29,018	29,044	29,165	29,127	29,121
Total Sales (M Gallons)									
Residential	189,280	178,762	176,639	218,079	243,447	240,199	298,004	277,969	260,023
Commercial	74,331	64,844	67,995	91,604	138,435	126,548	167,394	166,576	153,577
Industrial	40,758	42,337	41,451	42,399	46,484	27,531	36,843	33,587	28,900
Other	9,757	3,293	3,799	4,926	10,564	5,598	5,816	5,771	5,434
Total	314,127	289,235	289,884	357,008	438,930	399,876	508,055	483,903	447,933
White Tank									
Customer Count									
Residential	2,291	2,303	2,314	2,337	2,347	2,373	2,395	2,396	2,403
Commercial	58	56	58	58	58	59	58	58	58
Industrial	1	1	1	1	1	1	1	1	1
Other	11	11	12	13	15	17	15	15	19
Total	2,361	2,371	2,385	2,409	2,421	2,450	2,469	2,470	2,481
Total Sales (M Gallons)									
Residential	19,374	19,684	19,706	24,142	26,865	30,979	33,986	34,231	33,738
Commercial	3,828	5,061	3,770	4,865	6,135	6,358	7,495	8,561	10,063
Industrial	24	25	35	41	72	130	106	141	119
Other	42	75	26	523	153	95	32	383	247
Total	23,268	24,845	23,538	29,571	33,225	37,563	41,618	43,316	44,167
Ajo									
Customer Count									
Residential	577	584	583	592	584	587	585	581	579
Commercial	70	73	72	72	72	71	71	71	71
Industrial	-	-	-	-	-	-	-	-	-
Other	5	5	5	5	5	5	5	5	5
Total	652	662	660	669	661	663	661	657	655
Total Sales (M Gallons)									
Residential	2,383	2,125	1,899	2,512	2,127	2,726	2,624	2,844	2,164
Commercial	764	1,052	924	1,033	865	1,017	980	1,096	851
Industrial	-	-	-	-	-	-	-	-	-
Other	3	3	10	2	10	2	7	2	3
Total	3,150	3,181	2,832	3,546	3,002	3,745	3,611	3,942	3,018

ATTACHMENT 25

Why we could see an oil price shock in 2016

James Stafford, Oilprice.com *3:02 p.m. EDT March 27, 2016*

(Photo: J Pat Carter, Getty Images)

The depletion of old oil wells is expected to surpass new sources of supply in 2016, as the ongoing oil price slump puts a long list of oil projects on the shelf.

Bloomberg (http://www.bloomberg.com/news/articles/2016-03-22/drillers-can-t-replace-lost-output-as-100-oil-inheritance-spent) flagged new data from the Norwegian consultancy firm Rystad Energy, which predicts that legacy production will tip the supply balance into the negative in 2016 for the first time in years.

The production from an average conventional oil field typically ramps up in the early years, plateaus and then enters a period of decline. Depletion rates vary wildly from field to field, but a rule of thumb for conventional oil fields – which make up the bulk of total global supply – is that they decline (http://www.reuters.com/article/oil-production-kemp-idUSL5N11L26U20150915) something like 6 percent per year on average. Again, those depletion rates can differ depending on location, levels of investment, etc., but one thing that is clear is that the oil industry needs to bring new oil fields online every year in order to merely keep production flat.

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OILPRICE

Oil See-saws On Brussels Bombings, OPEC Freeze Rumors | OilPrice.com

(http://oilprice.com/Energy/Energy-General/Oil-See-saws-On-Brussels-Bombings-OPEC-Freeze-Rumors.html)

Rystad Energy estimates that the crash in oil prices has cut into upstream investment so severely that natural depletion rates will overwhelm the paltry new sources of supply in 2016. Existing fields will lose about 3.3 million barrels per day (mb/d) in production this year, while new fields brought online will only add 3 mb/d. This does not take into account rising oil demand, which will soak up most of the excess supply by the end of the year.

But the 3 mb/d of new supply in 2016 will mostly come from large offshore projects that were planned years ago, investments that were made before oil prices started crashing. The EIA (https://www.eia.gov/todayinenergy/detail.cfm?id=25012) sees four offshore projects starting up in 2016 – projects from Shell, Noble Energy, Anadarko, and Freeport McMoran – plus two more in 2017. The industry completed eight projects in the Gulf in 2015. U.S. Gulf of Mexico production will climb from 1.63 mb/d in 2016 to 1.91 mb/d by the end of 2017.

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Oil Prices Struggle To Move Beyond $40 | OilPrice.com

(http://oilprice.com/Energy/Energy-General/Oil-Prices-Struggle-To-Move-Beyond-40.html)

However, outside of these large-scale multiyear offshore projects, the queue of new oil fields is starting to be cleared out. By 2017, the supply/depletion balance will go deeper into negative territory. Depletion will exceed new sources of production by around 1.2 mb/d before widening even further in 2018 and 2019.

A few months ago, Wood Mackenzie estimated that around $380 billion (http://oilprice.com/Energy/Oil-Prices/Only-Recession-Can-Prevent-An-Oil-Price-Spike.html) in planned oil projects had been put on ice due to the crash in oil prices. Wood Mackenzie says that between 2007 and 2013, the oil industry greenlighted about 40 large oil projects on average each year. That figure plunged to fewer than 10 in 2015.

The coming supply crunch stands in sharp contrast to the short-term picture. The EIA reported (http://ir.eia.gov/wpsr/wpsrsummary.pdf) on March 23 that crude oil storage levels once again increased, surging by 9.4 million barrels last week to break yet another record. Total inventories in the U.S. now stand at 532.5 million barrels. Record high storage levels, which continue to climb, are signs of short-term oversupply. The IEA expects supply to continue to outstrip demand by about 1.5 mb/d until later this year. Oil storage levels will have to fall (http://oilprice.com/Energy/Energy-General/Oil-Wont-Stage-A-Serious-Rebound-Until-This-Happens.html) to more normal levels before oil prices can rise substantially.

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Russia Under Threat From U.S. Natural Gas | OilPrice.com

(http://oilprice.com/Energy/Energy-General/Russia-Under-Threat-From-US-Natural-Gas.html)

But the Rystad Energy figures show that the supply-demand balance could quickly swing back in the other direction as upstream investment has screeched to a halt. As soon as later this year, or perhaps in 2017, demand could catch up to supply. Inventories will begin falling quickly and prices will start to rise. However, since supply is inelastic in the short run, the industry may struggle to satisfy demand at stable prices. The oil markets have always suffered from booms and busts, and this is just more of the same. The current bust is sowing the seeds of the next boom.

Of course, U.S. shale has demonstrated its ability to ramp up quickly, and those short lead times could allow new supply (http://oilprice.com/Energy/Oil-Prices/The-Current-Oil-Price-Rally-Is-Reaching-Its-Limits.html) to come online as prices rise. But it remains to be seen if U.S. shale, more or less on its own in the short run, can meet rising demand in 2017 and 2018 as conventional oil drilling remains on the sidelines.

OilPrice.com (http://oilprice.com/)is a USA TODAY content partner offering oil and energy news and commentary. Its content is produced independently of USA TODAY.

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ATTACHMENT 26

ARIZONA WATER COMPANY
Test Year Ending December 31, 2014
Life Insurance Premium Summary

-Life insurance premiums are charged to the Phoenix office and spread to water systems based on the annual Payroll Factor
-Class 1 monthly volume: 2x annual salary (rounded up to the next 1,000), must be employed 5 years or longer
-Class 2 monthly volume: 1x annual salary (rounded up to the next 1,000), employed less than 5 years
- Retiree monthly volume - $2,500 coverage per retiree

T.Y. 2014 Actual Life Insurance

Account	Segment1	Segment2	Segment3	Date	Vendor	Invoice	Doc. (File) No.	Class 1 Lives	Class 1 Vol.	Class 1 Rate/$1000	Class 2 Lives	Class 2 Vol.	Class 2 Rate/$1000	Retiree Lives	Retiree Vol.	Retiree Rate/$1000	Total Invoice	Amount to O&M	% To Capital
300-92610-0000	300	92610	0000	1/1/2014	AETNA	14010104	95893	139	16,745,000	0.20	34	1,712,000	0.20	6	15,000	0.20	$ 3,694.40	$ 3,141	15.0%
300-92610-0000	300	92610	0000	2/1/2014	AETNA	14020104	97289	139	16,745,000	0.20	34	1,712,000	0.20	6	15,000	0.20	3,694.40	3,125	15.4%
300-92610-0000	300	92610	0000	3/1/2014	AETNA	14030104	98302	139	16,745,000	0.20	34	1,712,000	0.20	6	15,000	0.20	3,694.40	3,101	16.1%
300-92610-0000	300	92610	0000	4/1/2014	AETNA	14040104	99582	139	16,745,000	0.20	34	1,712,000	0.20	6	15,000	0.20	3,694.40	3,123	15.5%
300-92610-0000	300	92610	0000	5/1/2014	AETNA	14050104	101241	137	16,553,000	0.20	35	1,761,000	0.20	6	15,000	0.20	3,665.80	3,077	16.1%
300-92610-0000	300	92610	0000	6/1/2014	AETNA	14060104	102895	135	16,363,000	0.20	36	1,798,000	0.20	6	15,000	0.20	3,635.20	3,020	16.9%
300-92610-0000	300	92610	0000	7/1/2014	AETNA	14070104	104007	134	16,260,000	0.20	35	1,754,000	0.20	6	15,000	0.20	3,605.80	2,659	26.3%
300-92610-0000	300	92610	0000	8/1/2014	AETNA	14080104	105781	133	16,124,000	0.20	36	1,791,000	0.20	6	15,000	0.20	3,586.00	2,750	23.3%
300-92610-0000	300	92610	0000	9/1/2014	AETNA	14090104	107363	132	16,023,000	0.20	36	1,791,000	0.20	6	15,000	0.20	3,565.80	2,642	25.9%
300-92610-0000	300	92610	0000	10/1/2014	AETNA	14100104	108576	131	15,927,000	0.20	36	1,791,000	0.20	6	15,000	0.20	3,546.60	2,630	25.8%
300-92610-0000	300	92610	0000	11/1/2014	AETNA	14110104	110259	130	15,826,000	0.20	36	1,791,000	0.20	6	15,000	0.20	3,526.40	2,564	27.3%
300-92610-0000	300	92610	0000	12/1/2014	AETNA	14120104	111308	130	15,826,000	0.20	38	1,857,000	0.20	6	15,000	0.20	3,539.60	2,511	29.1%
																	$ 43,449	$ 34,342	21.0%
						Billing Determinants & Premium		149	19,669,000	0.20	46	2,207,000	0.20	6	15,000	0.20		$ 4,337	
																X 12 Months:		$ 52,039	
																% to O&M		79.0%	
																Pro Forma Amount to O&M		$ 41,132	
																Increase / (Decrease) - O&M		$ 6,790	

Allocated Increase / (Decrease)

Location	2014 Payroll Factor	Pro Forma Life Ins. Total	Pro Forma Life Ins. - O&M	Increase / (Decrease) - O&M	Allocated Increase / (Decrease)
Superstition	0.2761	$ 14,368	$ 11,357		$ 1,875
Cochise	0.0959	4,991	3,945		651
San Manuel	0.0198	1,030	814		134
Falcon Valley	0.0255	1,327	1,049		173
Winkelman	0.0021	109	86		14
Pinal Valley	0.3043	15,836	12,517		2,066
White Tank	0.0235	1,223	967		160
Ajo	0.0085	442	350		58
Navajo	0.1020	5,308	4,195		693
Verde Valley	0.1423	7,405	5,853		966
	1.0000	$ 52,039	$ 41,132	$ 6,790	$ 6,790

ATTACHMENT 27

Forecasting Urban Water Demand

R. Bruce Billings
Department of Economics
University of Arizona
Tucson, Arizona

and

C. Vaughan Jones
Economic Data Resources
Boulder, Colorado

1996

American Water Works Association
Denver, Colorado

water demand include Kindler and Russell 1984; Jones et al. 1984; Boland et al. 1983; Grima 1972; and Linaweaver, Geyer, and Wolff 1966. The emphasis in this book is on applications, rather than theory, and the text is supported by a series of examples presented on the accompanying data diskette.

Technical terms are explained when first introduced. Many important statistical and econometric terms also are defined in the glossary.

The book is designed for engineers and planners with forecasting responsibilities in water utilities. It also should be valuable as a supplemental exposition for water resource analysts, as an addition to community library holdings on municipal planning issues, and as a window into applied work for engineering, planning, and community design students.

Why Forecast?

Virtually all decisions are based on forecasts or predictions about the future. Many times, these forecasts exist only in the mind of the decision maker and reflect a belief that the future will be similar to the past. Although this "same-as-always" forecast is often correct, it is inflexible in the face of changing conditions, such as a large price increase or a drought, and will periodically result in expensive policy blunders.

Many factors influence water use, including the weather, over which utility operators have no influence; population and industrial location, over which they have some limited influence; and price and conservation programs, which are determined or at least strongly influenced by utility officials. Both revenue and sales volume can also be changed somewhat by changes in internal utility operating procedures.

All of these factors signal the value of a carefully executed forecasting program for the water utility.

A successful forecasting process serves management by providing organized information about the past and its implications for the future. One benefit of formal methods is that they encourage the forecaster to make the assumptions of the model explicit, so that the assumptions can be examined. The forecaster also must collect and analyze historic data, thereby avoiding errors based on unsupported beliefs about the past. Careful analysis and forecasts of urban water demand, for example, can improve the timing of expensive system expansions, often saving an urban water utility many times the cost of the forecast.

Urban water demand forecasts are necessary in some cases to meet regulatory requirements. Many states now require that water utilities submit water conservation or efficiency plans. In some instances, targets are prescribed, e.g., "For 1995 attain an average annual water use of less than 160 gal per capita per day (gpcd)." Failure to meet such targets can mean fines and penalties. Under these circumstances, careful inclusion of weather impacts in the demand forecast is critical. Statistical models can also capture the specific effects of various conservation measures, such as installation of water-efficient appliances and plumbing fixtures, lawn size restrictions, and free distribution of water-saving devices.

ATTACHMENT 28

ARIZONA WATER COMPANY
Test Year Ending December 31, 2014
Insurance Premium Summary

AWC - Rebuttal

Location	[A] Pro Forma Medical, Vision, Dental, LTD, Life - Total	[B] Pro Forma Workers' Compensation -Total	[C] Pro Forma Property & Liabillity - Total	[D] Pro Forma Medical, Vision, Dental, LTD, Life - O&M	[E] Pro Forma Workers' Compensation - O&M	[F] Pro Forma Property & Liabillity - O&M
Superstition	$ 786,950	$ 50,863	$ 236,845	$ 619,837	$ 40,138	$ 230,038
Cochise	272,209	17,667	63,727	214,409	13,942	61,924
San Manuel	56,254	3,648	13,546	44,309	2,878	13,388
Falcon Valley	72,475	4,698	21,981	57,086	3,707	21,320
Winkelman	5,965	387	1,534	4,698	305	1,504
Pinal Valley	868,371	56,058	282,595	683,962	44,238	274,654
White Tank	67,119	4,329	33,738	52,865	3,416	32,941
Ajo	24,169	1,566	6,134	19,037	1,236	6,015
Navajo	290,866	18,790	79,573	229,098	14,828	78,298
Verde Valley	404,549	26,214	112,288	318,646	20,687	107,424
	$ 2,848,928	$ 184,220	$ 851,959	$ 2,243,947	$ 145,376	$ 827,507

Location	[G] SS	[H] P	[I] WT	[J] TD	[K] CA	[L] AG	[M] Total
	Increase / (Decrease) - Medical, Vision, Dental, LTD, Life, Workers' Comp, and Property & Liability - O&M						
Superstition	$ 204	$ 3,253	$ 706	$ 7,213	$ 2,884	233,855	$ 248,116
Cochise	100	551	393	2,402	450	74,366	78,261
San Manuel	56	248	61	423	124	15,502	16,413
Falcon Valley	90	254	87	712	188	21,579	22,909
Winkelman	6	17	6	51	20	1,678	1,777
Pinal Valley	77	4,244	1,126	9,488	2,408	265,352	282,694
White Tank	48	783	91	858	364	24,713	26,857
Ajo	2	61	85	187	66	6,768	7,167
Navajo	77	580	229	2,964	1,239	83,679	88,767
Verde Valley	99	1,490	752	3,063	730	116,869	123,003
	758	11,479	3,535	27,361	8,471	844,360	895,965
							895,965

AWC - As Filed

Location	Pro Forma Medical, Vision, Dental, LTD, Life - Total	Pro Forma Workers' Compensation -Total	Pro Forma Property & Liabillity - Total	Pro Forma Medical, Vision, Dental, LTD, Life - O&M	Pro Forma Workers' Compensation - O&M	Pro Forma Property & Liabillity - O&M
Superstition	$ 787,078	$ 50,934	$ 180,670	$ 619,938	$ 40,194	$ 175,478
Cochise	272,253	17,691	48,612	214,444	13,961	47,237
San Manuel	56,264	3,653	10,333	44,317	2,882	10,213
Falcon Valley	72,487	4,704	16,767	57,095	3,712	16,264
Winkelman	5,966	387	1,170	4,699	306	1,147
Pinal Valley	868,512	56,136	215,569	684,074	44,299	209,512
White Tank	67,130	4,335	25,736	52,874	3,421	25,128
Ajo	24,173	1,568	4,679	19,040	1,237	4,588
Navajo	290,914	18,817	60,700	229,136	14,849	59,727
Verde Valley	404,615	26,251	85,656	318,698	20,716	81,945
	$ 2,849,391	$ 184,476	$ 649,891	$ 2,244,313	$ 145,578	$ 631,238

Location	SS	P	WT	TD	CA	AG	Total
	Increase / (Decrease) - Medical, Vision, Dental, LTD, Life, Workers' Comp, and Property & Liability - O&M						
Superstition	$ 73	$ 1,168	$ 254	$ 2,589	$ 1,035	188,594	$ 193,712
Cochise	36	198	141	862	161	62,231	63,629
San Manuel	20	89	22	152	45	12,922	13,249
Falcon Valley	32	91	31	256	67	17,389	17,867
Winkelman	2	6	2	18	7	1,386	1,422
Pinal Valley	28	1,523	404	3,405	864	211,500	217,724
White Tank	17	281	33	308	131	18,288	19,057
Ajo	1	22	30	67	24	5,602	5,745
Navajo	28	208	82	1,064	445	68,428	70,255
Verde Valley	36	535	270	1,099	262	95,403	97,605
	272	4,120	1,269	9,820	3,040	681,743	700,265

Increase / (Decrease) - Rebuttal

Location	SS	P	WT	TD	CA	AG	Total
	Increase / (Decrease) - Medical, Vision, Dental, LTD, Life, Workers' Comp, and Property & Liability - O&M						
Superstition	$ 131	$ 2,086	$ 453	$ 4,624	$ 1,849	$ 45,261	$ 54,404
Cochise	64	353	252	1,540	288	12,135	14,633
San Manuel	36	159	39	271	80	2,580	3,164
Falcon Valley	58	163	56	457	120	4,189	5,042
Winkelman	4	11	4	33	13	292	356
Pinal Valley	49	2,720	722	6,083	1,543	53,852	64,970
White Tank	31	502	58	550	233	6,425	7,800
Ajo	1	39	54	120	42	1,166	1,422
Navajo	49	372	147	1,900	794	15,250	18,513
Verde Valley	63	955	482	1,964	468	21,466	25,398
	486	7,359	2,267	17,541	5,431	162,616	195,700

$74,192

ARIZONA WATER COMPANY
Test Year Ending December 31, 2014
Property & Liability Insurance Summary

-Property & Liability insurance is charged to Prepaid Insurance (Acct. 16610) and spread to Property Insurance (Acct. 92400), Umbrella (Injuries & Damages - Acct. 92500), and Vehicle & Equipment Expense Clearing (Accts. 18410 & 18420). Vehicle Expense Clearing is charged to O&M and capital based on direct labor hours charged. Equipment Clearing is charged to O&M and capital based on direct equipment hours used.
- Administrative & General Expenses charged to the Phoenix office are spread to each system using the 3-factor formula

T.Y. 2014 Prepaid Insurance - Actual

	Prepaid Insurance 16610	Amortization of Prepaid Insurance: Property Insurance 92400	Injuries & Damages 92500	Vehicle Clearing 18410	Equipment Clearing 18420	Checksum
Jan	(41,366)	4,211	28,290	7,535	1,330	0
Feb	(41,366)	4,211	28,290	7,535	1,330	-
Mar	(40,581)	5,703	26,106	7,456	1,316	-
Apr	(40,581)	5,703	26,106	7,456	1,316	-
May	(40,581)	5,703	26,106	7,456	1,316	-
Jun	(40,581)	5,703	26,106	7,456	1,316	-
Jul	(40,580)	5,703	26,106	7,456	1,316	(0)
Aug	(40,581)	5,703	26,106	7,456	1,316	(0)
Sep	(40,581)	5,703	26,106	7,456	1,316	-
Oct	(40,581)	5,703	26,106	7,456	1,316	-
Nov	(40,581)	5,703	26,106	7,456	1,316	(0)
Dec	(40,581)	5,703	26,106	7,456	1,316	-
	$ (488,537)	$ 65,455	$ 317,638	$ 89,627	$ 15,817	$ (0)

Pro Forma 2014 Prepaid Insurance

	Prepaid Insurance 16610	Amortization of Prepaid Insurance: Property Insurance 92400	Injuries & Damages 92500	Vehicle Clearing 18410	Equipment Clearing 18420	Checksum
Jan	$ (70,997)	$ 8,317	$ 48,733	$ 11,855	$ 2,092	$ -
Feb	(70,997)	8,317	48,733	11,855	2,092	-
Mar	(70,997)	8,317	48,733	11,855	2,092	-
Apr	(70,997)	8,317	48,733	11,855	2,092	-
May	(70,997)	8,317	48,733	11,855	2,092	-
Jun	(70,997)	8,317	48,733	11,855	2,092	-
Jul	(70,997)	8,317	48,733	11,855	2,092	-
Aug	(70,997)	8,317	48,733	11,855	2,092	-
Sep	(70,997)	8,317	48,733	11,855	2,092	-
Oct	(70,997)	8,317	48,733	11,855	2,092	-
Nov	(70,997)	8,317	48,733	11,855	2,092	-
Dec	(70,997)	8,317	48,733	11,855	2,092	-
	$ (851,959)	$ 99,798	$ 584,799	$ 142,258	$ 25,104	$ -

New Policy Effective March 2016

New Policy Period:	3/01/2016 to 2/28/2017
Vendor:	Edgewood Partners Insurance
Invoice Date:	3/15/2016
Total Inoice:	$ 851,959.00 ←
Amt. to 92400:	99,798.17
Amt. to 92500:	584,798.84
Amt. to 18410:	142,257.69
Amt. to 18420:	25,104.30

Increase / (Decrease) in Property & Liability Insurance

	Prepaid Insurance 16610	Property Insurance 92400	Injuries & Damages 92500	Vehicle Clearing 18410	Equipment Clearing 18420	Checksum
Totals	$ (363,422)	$ 34,343	$ 267,161	$ 52,630	$ 9,288	$ 0

Pro Forma Property & Liability Insurance

Location	2014 3-factor Ratio	CAP	SS	P	WT	TD	CA	AG	Total
Superstition	0.2780	$ 6,807	$ 553	$ 8,793	$ 1,909	$ 19,497	$ 7,794	$ 191,492	$ 236,845
Cochise	0.0748	1,803	271	1,490	1,061	6,492	1,216	51,394	63,727
San Manuel	0.0159	158	151	669	166	1,142	336	10,924	13,546
Falcon Valley	0.0258	660	243	686	236	1,925	508	17,724	21,981
Winkelman	0.0018	29	16	45	16	138	53	1,236	1,534
Pinal Valley	0.3317	7,940	207	11,470	3,043	25,646	6,507	227,781	282,595
White Tank	0.0396	797	129	2,117	247	2,320	983	27,146	33,738
Ajo	0.0072	119	4	164	229	505	177	4,936	6,134
Navajo	0.0934	1,275	208	1,566	620	8,012	3,349	64,544	79,573
Verde Valley	0.1318	4,864	268	4,027	2,031	8,280	1,974	90,844	112,288
	1.000	24,452.26	2,048.60	31,027.76	9,556.30	73,956.85	22,897.31	688,019.92	851,959.00

Increase / (Decrease) - Property & Liability Insurance

Location	CAP	SS	P	WT	TD	CA	AG	Total
Superstition	$ 2,518	$ 204	$ 3,253	$ 706	$ 7,213	$ 2,884	$ 84,252	$ 101,031
Cochise	667	100	551	393	2,402	450	22,621	27,184
San Manuel	59	56	248	61	423	124	4,808	5,778
Falcon Valley	244	90	254	87	712	188	7,801	9,376
Winkelman	11	6	17	6	51	20	544	654
Pinal Valley	2,938	77	4,244	1,126	9,488	2,408	100,268	120,547
White Tank	295	48	783	91	858	364	11,953	14,392
Ajo	44	2	61	85	187	66	2,173	2,617
Navajo	472	77	580	229	2,964	1,239	28,383	33,944
Verde Valley	1,800	99	1,490	752	3,063	730	39,966	47,899
	9,046.49	757.91	11,479.20	3,535.50	27,361.48	8,471.21	302,770.38	363,422.17

Edgewood Partners Ins. Center

EPIC - Trust * PO Box 511389 * Los Angeles, CA 90051-7944

Named Insured: Arizona Water Company
Address: P.O. Box 29006
Phoenix AZ 85038

Invoice Date: 03/15/2016

Invoice #: 158457AWC
Bill-to Code: SANGABRI
Client Code: SANGABRI
Inv. Order #: 10*217752

Amount Remitted: $

Please return this portion with your payment.

Make checks payable to: Edgewood Partners Insurance Center

Effective	Expires	Coverage Description	Amount
03/01/2016	03/01/2017	Allied World Assurance Co., Package Includes, EPL, Wrongful Acts, 51051718-5101618 Auto Allied World Assurance Co., 1st Excess, 51071718 Berkley National Ins. Co., 2nd Excess, CEX0960209900 Cyber Liability, Philadelphia Ins. Co, PHSD1123722	$851,959
		Invoice #: 158457AWC **Amount Due:**	$851,959

ATTACHMENT 29

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Cost of Service Summary - RUCO Proposed Rates

Line No.		Western Group [A] Adjstd' w/ Increase - RUCO	[B] Residential	[C] Commercial	[D] Industrial	[E] Large Industrial	[F] Other	[G] Direct Private Fire
1								
2	Operating Revenues							
3	Water Revenues (Sch. H-1)	$ 24,067,441	$ 15,621,163	$ 6,836,510	$ 233,462	$ 895,484	$ 306,313	$ 174,510
4	Miscellaneous Revenues[1] (Sch. H-1)	509,842	328,721	146,089	5,127	19,580	6,527	3,798
5	Total Operating Revenues[2]	$ 24,577,283	$ 15,949,883	$ 6,982,598	$ 238,589	$ 915,064	$ 312,840	$ 178,308
6								
7	Operating Expenses							
8	Operations & Maintenance Expense	12,274,101	8,320,420	3,123,142	106,131	560,120	111,456	52,832
9	Depreciation & Amortization Expense	4,688,772	3,233,465	1,225,209	35,315	84,086	39,096	71,601
10	Income Taxes	1,745,794	941,758	652,328	25,486	67,620	47,695	10,907
11	Property Taxes	1,162,450	752,746	331,318	11,407	43,678	14,794	8,507
12	Other Taxes	186,987	126,350	47,871	1,635	8,620	1,698	814
13	Total Operating Expenses	$ 20,058,104	$ 13,374,739	$ 5,379,869	$ 179,973	$ 764,124	$ 214,738	$ 144,662
14								
15	Taxable Income	4,713,683	2,542,768	1,761,300	68,813	182,576	128,777	29,450
16								
17	Net Operating Income	$ 4,519,179	$ 2,575,145	$ 1,602,730	$ 58,615	$ 150,940	$ 98,103	$ 33,646
18								
19	Interest Expense	1,551,290	974,135	493,758	15,289	35,984	17,021	15,103
20								
21								
22	Rate Base	$ 61,693,224	$ 38,740,375	$ 19,636,258	$ 608,012	$ 1,431,044	$ 676,894	$ 600,641
23								
24	Rate of Return[3] (Ln. 17 ÷ Ln. 22)	7.33%	6.65%	8.16%	9.64%	10.55%	14.49%	5.60%
25								
26	Increase in Gross Revenues	$ 3,194,659	$ 2,058,308	$ 875,991	$ 72,649	$ 82,368	$ 54,824	$ 50,518
27								
28	% Increase in Gross Revenues	14.9%	14.8%	14.3%	43.8%	9.9%	21.2%	39.5%
29								
30								
31	% of Revenues Generated from Fixed Charge	42%	49%	31%	18%	11%	47%	100%
32	% of Revenues Generated from Commodity Charge	58%	51%	69%	82%	89%	53%	0%
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50 [1]Allocated to customer classes based on
51 percentage of total water revenues.
52 [2]Operating Revenues & Income Taxes are derived from the
53 recommended rate design and billing determinants.
54 [3]Rate of return at proposed rates includes
55 the effect of any proposed rate consolidation.

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Cost of Service Summary - RUCO Proposed Rates

Line No.		[A] Adjstd' w/ Increase - RUCO	[B] Residential	[C] Commercial	[D] Industrial	[E] Large Industrial	[F] Other	[G] Direct Private Fire
				Pinal Valley				
1								
2	Operating Revenues							
3	Water Revenues (Sch. H-1)	$ 20,996,512	$ 13,222,700	$ 6,226,847	$ 233,462	$ 877,407	$ 265,786	$ 170,310
4	Miscellaneous Revenues[1] (Sch. H-1)	461,120	290,393	136,752	5,127	19,269	5,837	3,740
5	Total Operating Revenues[2]	$ 21,457,632	$ 13,513,094	$ 6,363,599	$ 238,589	$ 896,677	$ 271,623	$ 174,050
6								
7	Operating Expenses							
8	Operations & Maintenance Expense	10,721,291	7,070,530	2,833,016	106,131	557,771	102,628	51,215
9	Depreciation & Amortization Expense	3,845,644	2,576,767	1,048,284	35,315	82,203	34,362	68,712
10	Income Taxes	1,597,894	834,648	625,296	25,622	62,980	38,442	10,905
11	Property Taxes	1,025,917	646,078	304,252	11,407	42,871	12,987	8,322
12	Other Taxes	165,120	108,894	43,632	1,635	8,590	1,581	789
13	Total Operating Expenses	$ 17,355,865	$ 11,236,918	$ 4,854,480	$ 180,109	$ 754,416	$ 189,999	$ 139,942
14								
15	Taxable Income	4,291,491	2,241,629	1,679,369	68,813	169,147	103,245	29,288
16								
17	Net Operating Income	$ 4,101,767	$ 2,276,176	$ 1,509,119	$ 58,480	$ 142,261	$ 81,624	$ 34,108
18								
19	Interest Expense	1,408,169	869,195	455,046	15,289	36,094	16,821	15,725
20								
21								
22	Rate Base	$ 56,001,473	$ 34,566,994	$ 18,096,724	$ 608,012	$ 1,435,404	$ 668,960	$ 625,380
23								
24	Rate of Return[3] (Ln. 17 ÷ Ln. 22)	7.32%	6.58%	8.34%	9.62%	9.91%	12.20%	5.45%
25								
26	Increase in Gross Revenues	$ 2,865,837	$ 1,800,319	$ 813,087	$ 72,649	$ 80,284	$ 50,193	$ 49,306
27								
28	% Increase in Gross Revenues	15.4%	15.4%	14.6%	43.8%	9.8%	22.7%	39.5%
29								
30								
31	% of Revenues Generated from Fixed Charge	42%	49%	32%	18%	9%	44%	100%
32	% of Revenues Generated from Commodity Charge	58%	51%	68%	82%	91%	56%	0%
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50	[1]Allocated to customer classes based on							
51	percentage of total water revenues.							
52	[2]Operating Revenues & Income Taxes are derived from the							
53	recommended rate design and billing determinants.							
54	[3]Rate of return at proposed rates includes							
55	the effect of any proposed rate consolidation.							

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Cost of Service Summary - RUCO Proposed Rates

Line No.		[A] Adjstd' w/ Increase - RUCO	[B] Residential	[C] Commercial	White Tank [D] Industrial	[E] Large Industrial	[F] Other	[G] Direct Private Fire
1								
2	Operating Revenues							
3	Water Revenues (Sch. H-1)	$ 2,600,558	$ 2,063,602	$ 476,425	$ -	$ 18,077	$ 39,933	$ 2,520
4	Miscellaneous Revenues[1] (Sch. H-1)	44,621	35,407	8,175	-	310	685	43
5	Total Operating Revenues[2]	$ 2,645,178	$ 2,099,010	$ 484,600	$ -	$ 18,387	$ 40,618	$ 2,563
6								
7	Operating Expenses							
8	Operations & Maintenance Expense	1,253,899	1,026,663	215,872	-	2,350	7,981	1,034
9	Depreciation & Amortization Expense	776,992	607,256	161,415	-	1,883	4,483	1,956
10	Income Taxes	135,351	101,581	18,861	-	5,000	9,761	148
11	Property Taxes	116,010	92,056	21,253	-	806	1,781	112
12	Other Taxes	15,646	12,810	2,694	-	29	100	13
13	Total Operating Expenses	$ 2,297,898	$ 1,840,367	$ 420,095	$ -	$ 10,068	$ 24,106	$ 3,262
14								
15	Taxable Income	363,514	272,819	50,655	-	13,429	26,215	396
16								
17	Net Operating Income	$ 347,281	$ 258,643	$ 64,505	$ -	$ 8,319	$ 16,513	$ (699)
18								
19	Interest Expense	119,118	87,405	32,711	-	(110)	59	(948)
20								
21								
22	Rate Base	$ 4,737,183	$ 3,476,022	$ 1,300,884	$ -	$ (4,360)	$ 2,341	$ (37,704)
23								
24	Rate of Return[3] (Ln. 17 ÷ Ln. 22)	7.33%	7.44%	4.96%	0.00%	-190.80%	705.40%	1.85%
25								
26	Increase in Gross Revenues	$ 299,821	$ 237,610	$ 54,795	$ -	$ 2,085	$ 4,602	$ 728
27								
28	% Increase in Gross Revenues	12.8%	12.8%	12.7%	0.0%	12.8%	12.8%	39.7%
29								
30								
31	% of Revenues Generated from Fixed Charge	42%	47%	18%	0%	87%	68%	100%
32	% of Revenues Generated from Commodity Charge	58%	53%	82%	0%	13%	32%	0%
33								
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36								
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49								
50	[1]Allocated to customer classes based on							
51	percentage of total water revenues.							
52	[2]Operating Revenues & Income Taxes are derived from the							
53	recommended rate design and billing determinants.							
54	[3]Rate of return at proposed rates includes							
55	the effect of any proposed rate consolidation.							

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Cost of Service Summary - RUCO Proposed Rates

Line No.		[A] Adjstd' w/ Increase - RUCO	[B] Residential	[C] Commercial	Ajo [D] Industrial	[E] Large Industrial	[F] Other	[G] Direct Private Fire
1								
2	Operating Revenues							
3	Water Revenues (Sch. H-1)	$ 470,372	$ 334,860	$ 133,238	$ -	$ -	$ 594	$ 1,680
4	Miscellaneous Revenues[1] (Sch. H-1)	4,101	2,920	1,162	-	-	5	15
5	Total Operating Revenues[2]	$ 474,473	$ 337,780	$ 134,399	$ -	$ -	$ 599	$ 1,695
6								
7	Operating Expenses							
8	Operations & Maintenance Expense	298,911	223,227	74,254	-	-	847	584
9	Depreciation & Amortization Expense	66,136	49,442	15,510	-	-	251	933
10	Income Taxes	12,494	6,030	6,659	-	-	(145)	(50)
11	Property Taxes	20,524	14,611	5,814	-	-	26	73
12	Other Taxes	6,221	4,646	1,545	-	-	18	12
13	Total Operating Expenses	$ 404,286	$ 297,955	$ 103,782	$ -	$ -	$ 996	$ 1,553
14								
15	Taxable Income	58,678	28,320	31,276	-	-	(683)	(234)
16								
17	Net Operating Income	$ 70,187	$ 39,825	$ 30,617	$ -	$ -	$ (397)	$ 142
18								
19	Interest Expense	24,003	17,535	6,001	-	-	141	326
20								
21								
22	Rate Base	$ 954,568	$ 697,359	$ 238,650	$ -	$ -	$ 5,594	$ 12,965
23								
24	Rate of Return[3] (Ln. 17 ÷ Ln. 22)	7.35%	5.71%	12.83%	0.00%	0.00%	-7.10%	1.09%
25								
26	Increase in Gross Revenues	$ 29,001	$ 20,379	$ 8,109	$ -	$ -	$ 29	$ 483
27								
28	% Increase in Gross Revenues	6.5%	6.4%	6.4%	0.0%	0.0%	5.2%	39.9%
29								
30								
31	% of Revenues Generated from Fixed Charge	49%	56%	32%	0%	0%	1%	100%
32	% of Revenues Generated from Commodity Charge	51%	44%	68%	0%	0%	99%	0%
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50	[1]Allocated to customer classes based on							
51	percentage of total water revenues.							
52	[2]Operating Revenues & Income Taxes are derived from the							
53	recommended rate design and billing determinants.							
54	[3]Rate of return at proposed rates includes							
55	the effect of any proposed rate consolidation.							

ATTACHMENT 30

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Detail Analysis of Revenue by Class -
With 15% Rate Reduction for Abbott

Western Group - With 15% Rate Reduction for Abbott Laboratories

Line No.	Detail Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Company - As Filed: Increase [F - E]	[H] %	[I] Company - Rebuttal: Proposed Rates	[J] Company - Rebuttal: Amount [I - E]	[K] %
1												
2	Residential 5/8 x 3/4 -inch	28,065	7,956	$ 11,518,790	$ (94,383)	$ 11,424,407	$ 14,416,795	$ 2,992,388	26.19%	$ 14,500,310	$ 3,075,904	26.92%
3	Residential 1-inch	914	14,468	974,198	(715)	973,483	1,275,196	301,714	30.99%	1,283,038	309,556	31.80%
4	Residential 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Residential 2-inch	55	179,925	424,390	(7,945)	416,445	566,999	150,554	36.15%	572,145	155,700	37.39%
6	Residential 3-inch	9	547,345	196,224	(3,454)	192,770	262,626	69,856	36.24%	264,995	72,225	37.47%
7	Residential 4-inch	6	730,636	174,978	(2,995)	171,983	236,846	64,863	37.71%	238,927	66,943	38.92%
8	Residential 6-inch	8	646,961	220,807	(2,950)	217,857	310,717	92,859	42.62%	312,880	95,023	43.62%
9	Residential 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
10	Residential 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
11	Commercial 5/8 x 3/4 -inch	963	6,976	422,262	101	422,363	571,893	149,530	35.40%	575,261	152,898	36.20%
12	Commercial 1-inch	554	25,187	787,743	(2,611)	785,132	1,038,600	253,468	32.28%	1,046,540	261,407	33.29%
13	Commercial 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
14	Commercial 2-inch	560	108,268	3,007,434	(2,489)	3,004,945	4,013,646	1,008,701	33.57%	4,045,528	1,040,584	34.63%
15	Commercial 3-inch	37	196,898	351,065	3,351	354,416	476,767	122,351	34.52%	480,160	125,744	35.48%
16	Commercial 4-inch	24	733,268	730,234	2,425	732,660	959,281	226,621	30.93%	967,499	234,839	32.05%
17	Commercial 6-inch	15	827,973	542,261	-	542,261	723,012	180,751	33.33%	728,263	186,002	34.30%
18	Commercial 8-inch	1	2,974,873	108,006	9,819	117,825	152,382	34,557	29.33%	153,736	35,911	30.48%
19	Commercial 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
20	Industrial 5/8 x 3/4 -inch	3	21,125	2,187	-	2,187	3,161	974	44.54%	3,182	995	45.48%
21	Industrial 1-inch	5	106,372	17,560	-	17,560	21,206	3,646	20.76%	21,378	3,818	21.74%
22	Industrial 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
23	Industrial 2-inch	7	139,819	34,648	-	34,648	53,512	18,864	54.44%	53,832	19,185	55.37%
24	Industrial 3-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
25	Industrial 4-inch	4	918,070	107,429	-	107,429	139,488	32,058	29.84%	140,578	33,149	30.86%
26	Industrial 6-inch	4	1,784,984	165,762	-	165,762	220,596	54,834	33.08%	222,745	56,983	34.38%
27	Industrial 8-inch	1	2,158,523	60,134	-	60,134	85,506	25,372	42.19%	86,264	26,130	43.45%
28	Abbott Laboratories	1	31,002,167	586,240	-	586,240	672,045	85,805	14.64%	498,034	(88,207)	-15.05%
29	Private Fire Serivce	416	-	124,650	-	124,650	174,510	49,860	40.00%	174,510	49,860	40.00%
30	Other Water Revenues											
31	Public Fire Hydrant	-	-	-	-	-	-	-	0.00%	-	-	0.00%
32	Coin Machine	2	41	13,968	-	13,968	14,570	602	4.31%	14,732	764	5.47%
33	Construction 5/8 x 3/4 -inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
34	Construction 1-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
35	Construction 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
36	Construction 2-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
37	Construction 3-Inch	34	71,380	189,121	-	189,121	257,724	68,604	36.27%	258,886	69,765	36.89%
38	Construction 4-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
39	Construction 6-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
40	Construction 8-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
41	Construction 10-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
42	Sales for Resale 5/8 x 3/4-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
43	Sales for Resale 1-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
44	Sales for Resale ½-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
45	Sales for Resale 2-Inch	3	379,606	25,790	-	25,790	37,116	11,326	43.92%	37,431	11,641	45.14%
46	Sales for Resale 3-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
47	Sales for Resale 4-Inch	1	976,083	22,955	-	22,955	33,141	10,186	44.37%	33,411	10,456	45.55%
48	Sales for Resale 6-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
49	Sales for Resale 8-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
50	Sales for Resale 10-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
51												
52	Totals	31,691	13,634	$ 20,808,837	$ (101,846)	$ 20,706,991	$ 26,717,335	$ 6,010,344	29.03%	$ 26,714,266	$ 6,007,275	29.01%
53												
54												
55												

Supporting Schedules:

N:\RATES\2015_Rate_Case\Schedules\2015 WG Rate Case Model REBUTTAL FINAL 2016.04.07 w_ABBOTT 15% DISCOUNT\H2
Processing Date: 4/11/2016 8:16 AM

Recap Schedules:
H-1 Rebuttal

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Summary Analysis of Revenue by Class
With 15% Rate Reduction for Abbott

Western Group - With 15% Rate Reduction for Abbott Laboratories

Line No.	Summary Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	Water Revenues Per Bill Count: [C] Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	Company - As Filed: [F] Proposed Rates	[G] Increase [F - E]	[H] %	Company - Rebuttal: [I] Proposed Rates	[J] Amount [I - E]	[K] %
1												
2	Total Residential	29,058	8,980	$ 13,509,387	$ (112,442)	$ 13,396,945	$ 17,069,179	$ 3,672,234	27.41%	$ 17,172,294	$ 3,775,350	28.18%
3	Total Commercial	2,153	56,264	5,949,006	10,596	5,959,602	7,935,581	1,975,979	33.16%	7,996,988	2,037,386	34.19%
4	Total Industrial	19	264,100	161,824	-	161,824	217,366	55,542	34.32%	218,971	57,147	35.31%
5	Total Large Industrial	5	1,868,709	225,896	-	225,896	306,103	80,206	35.51%	309,009	83,113	36.79%
6	Abbott Laboratories	1	31,002,167	586,240	-	586,240	672,045	85,805	14.64%	498,034	(88,207)	-15.05%
7	Total Private Fire	416	-	124,650	-	124,650	174,510	49,860	40.00%	174,510	49,860	40.00%
8	Total Other Water Revenues	40	18,195,489	251,834	-	251,834	342,551	90,717	36.02%	344,460	92,626	36.78%
9												
10	Totals	31,691	13,634	$ 20,808,837	$ (101,846)	$ 20,706,991	$ 26,717,335	$ 6,010,343	29.03%	$ 26,714,266	$ 6,007,275	29.01%
11												
12	Miscellaneous Revenues			1,032,757	(522,915)	509,842	509,842	-	0.00%	509,842	-	0.00%
13	Total Revenue Generated						$ 27,227,177			$ 27,224,108		
14												
15	Target Rev. Rqmt. (Sch. C-1)						27,227,177			27,224,107		
16	Difference						$ 0			$ 1		
17												
18	Less: Consolidated Revenue Adj.						-			-		
19	Over/(Short)						$ 0			$ 1		
20	%						0.00%			0.00%		
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ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Detail Analysis of Revenue by Class -
With 15% Rate Reduction for Abbott

Exhibit
Schedule H-2 Rebuttal
Page 3 of 8
Witness: Reiker

Pinal Valley - With 15% Rate Reduction for Abbott Laboratories

Line No.	Detail Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Increase [F - E]	[H] %	[I] Company - Rebuttal: Proposed Rates	[J] Amount [I - E]	[K] %
1												
2	Residential 5/8 x 3/4 -inch	25,719	7,781	$ 9,927,216	$ (80,652)	$ 9,846,563	$ 12,491,248	$ 2,644,684	26.86%	$ 12,551,202	$ 2,704,639	27.47%
3	Residential 1-inch	439	20,927	488,330	(4,443)	483,886	650,173	166,286	34.36%	653,967	170,080	35.15%
4	Residential 1 ½ -inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Residential 2-inch	54	173,712	392,272	(6,910)	385,363	527,172	141,809	36.80%	531,529	146,166	37.93%
6	Residential 3-inch	9	547,345	196,224	(3,454)	192,770	262,626	69,856	36.24%	264,995	72,225	37.47%
7	Residential 4-inch	6	730,636	174,978	(2,995)	171,983	236,846	64,863	37.71%	238,927	66,943	38.92%
8	Residential 6-inch	8	646,961	220,807	(2,950)	217,857	310,717	92,859	42.62%	312,880	95,023	43.62%
9	Residential 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
10	Residential 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
11	Commercial 5/8 x 3/4 -inch	902	6,950	374,025	(61)	373,964	511,451	137,488	36.76%	513,991	140,027	37.44%
12	Commercial 1-inch	513	24,434	655,888	(640)	655,248	876,238	220,990	33.73%	881,429	226,181	34.52%
13	Commercial 1 ½ -inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
14	Commercial 2-inch	537	103,546	2,668,415	(2,489)	2,665,926	3,577,684	911,758	34.20%	3,601,847	935,921	35.11%
15	Commercial 3-inch	35	196,297	321,612	3,351	324,964	437,544	112,581	34.64%	440,387	115,423	35.52%
16	Commercial 4-inch	24	733,268	730,234	2,425	732,660	959,281	226,621	30.93%	967,499	234,839	32.05%
17	Commercial 6-inch	15	827,973	542,261	-	542,261	723,012	180,751	33.33%	728,263	186,002	34.30%
18	Commercial 8-inch	1	2,974,873	108,006	9,819	117,825	152,382	34,557	29.33%	153,736	35,911	30.48%
19	Commercial 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
20	Industrial 5/8 x 3/4 -inch	3	21,125	2,187		2,187	3,161	974	44.54%	3,182	995	45.48%
21	Industrial 1-inch	5	106,372	17,560		17,560	21,206	3,646	20.76%	21,378	3,818	21.74%
22	Industrial 1 ½ -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
23	Industrial 2-inch	7	139,819	34,648		34,648	53,512	18,864	54.44%	53,832	19,185	55.37%
24	Industrial 3-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
25	Industrial 4-inch	4	918,070	107,429		107,429	139,488	32,058	29.84%	140,578	33,149	30.86%
26	Industrial 6-inch	3	2,411,927	149,770		149,770	197,039	47,269	31.56%	199,188	49,418	33.00%
27	Industrial 8-inch	1	2,158,523	60,134		60,134	85,506	25,372	42.19%	86,264	26,130	43.45%
28	**Abbott Laboratories**	1	31,002,167	586,240		586,240	672,045	85,805	14.64%	498,034	(88,207)	-15.05%
29	Private Fire Serivce	406	-	121,650		121,650	170,310	48,660	40.00%	170,310	48,660	40.00%
30	Other Water Revenues											
31	Public Fire Hydrant	-	-	-		-	-	-	0.00%	-	-	0.00%
32	Coin Machine	1	41	13,403		13,403	13,978	574	4.28%	14,125	722	5.38%
33	Construction 5/8 x 3/4 -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
34	Construction 1-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
35	Construction 1 ½ -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
36	Construction 2-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
37	Construction 3-Inch	28	74,983	153,790		153,790	218,065	64,275	41.79%	218,935	65,145	42.36%
38	Construction 4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
39	Construction 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
40	Construction 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
41	Construction 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
42	Sales for Resale 5/8 x 3/4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
43	Sales for Resale 1-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
44	Sales for Resale ½ -Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
45	Sales for Resale 2-Inch	3	379,606	25,790		25,790	37,116	11,326	43.92%	37,431	11,641	45.14%
46	Sales for Resale 3-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
47	Sales for Resale 4-Inch	1	976,083	22,955		22,955	33,141	10,186	44.37%	33,411	10,456	45.55%
48	Sales for Resale 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
49	Sales for Resale 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
50	Sales for Resale 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
51												
52	Totals	28,723	13,810	$ 18,095,825	$ (88,999)	$ 18,006,827	$ 23,360,941	$ 5,354,114	29.73%	$ 23,317,320	$ 5,310,493	29.49%
53												
54												
55												

Supporting Schedules:

N:\RATES\2015_Rate_Case\Schedules\2015 WG Rate Case Model REBUTTAL FINAL 2016.04.07 w_ABBOTT 15% DISCOUNT\H2
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Recap Schedules:
H-1 Rebuttal

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Summary Analysis of Revenue by Class
With 15% Rate Reduction for Abbott

Pinal Valley - With 15% Rate Reduction for Abbott Laboratories

Line No.	Summary Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Increase [F - E]	[H] %	[I] Company - Rebuttal: Proposed Rates	[J] Amount [I - E]	[K] %
1												
2	Total Residential	26,235	8,888	$ 11,399,827	$ (101,404)	$ 11,298,423	$ 14,478,782	$ 3,180,359	28.15%	$ 14,553,499	$ 3,255,076	28.81%
3	Total Commercial	2,026	56,190	5,400,441	12,405	5,412,847	7,237,593	1,824,746	33.71%	7,287,152	1,874,306	34.63%
4	Total Industrial	19	264,100	161,824	-	161,824	217,366	55,542	34.32%	218,971	57,147	35.31%
5	Total Large Industrial	4	2,340,313	209,904	-	209,904	282,545	72,641	34.61%	285,452	75,548	35.99%
6	Abbott Laboratories	1	31,002,167	586,240	-	586,240	672,045	85,805	14.64%	498,034	(88,207)	-15.05%
7	Total Private Fire	406	-	121,650	-	121,650	170,310	48,660	40.00%	170,310	48,660	40.00%
8	Total Other Water Revenues	33	141,960	215,938	-	215,938	302,299	86,361	39.99%	303,902	87,964	40.74%
9												
10	Totals	28,723	13,810	$ 18,095,825	$ (88,999)	$ 18,006,827	$ 23,360,941	$ 5,354,114	29.73%	$ 23,317,320	$ 5,310,493	29.49%
11												
12	Miscellaneous Revenues			984,035	(522,915)	461,120	461,120	-	0.00%	461,120	-	0.00%
13	Total Revenue Generated						$ 23,822,061			$ 23,778,440		
14												
15	Target Rev. Rqmt. (Sch. C-1)						23,822,061			23,778,440		
16	Difference						$ 0			$ 0		
17												
18	Less: Consolidated Revenue Adj.						-			-		
19	Over/(Short)						$ 0			$ 0		
20	%						0.00%			0.00%		
21												
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ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Detail Analysis of Revenue by Class -
With 15% Rate Reduction for Abbott

White Tank

Line No.	Detail Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed Proposed Rates	[G] Company - As Filed Increase [F - E]	[H] %	[I] Company - Rebuttal Proposed Rates	[J] Company - Rebuttal Amount [I - E]	[K] %
				Water Revenues Per Bill Count								
1												
2	Residential 5/8 x 3/4 -inch	1,784	11,733	$ 1,287,322	$ (6,833)	$ 1,280,490	$ 1,566,212	$ 285,723	22.31%	$ 1,585,690	$ 305,201	23.83%
3	Residential 1-inch	467	8,588	476,133	3,891	480,023	614,097	134,074	27.93%	618,065	138,041	28.76%
4	Residential 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Residential 2-inch	1	515,983	32,118	(1,035)	31,082	39,826	8,744	28.13%	40,616	9,533	30.67%
6	Residential 3-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
7	Residential 4-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
8	Residential 6-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
9	Residential 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
10	Residential 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
11	Commercial 5/8 x 3/4 -inch	14	15,673	15,249	-	15,249	18,982	3,733	24.48%	19,262	4,013	26.31%
12	Commercial 1-inch	22	39,650	62,072	(1,971)	60,100	76,378	16,277	27.08%	77,538	17,438	29.01%
13	Commercial 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
14	Commercial 2-inch	19	256,775	316,825	-	316,825	407,834	91,009	28.73%	415,183	98,358	31.04%
15	Commercial 3-inch	2	207,288	29,452	-	29,452	39,223	9,770	33.17%	39,773	10,321	35.04%
16	Commercial 4-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
17	Commercial 6-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
18	Commercial 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
19	Commercial 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
20	Industrial 5/8 x 3/4 -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
21	Industrial 1-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
22	Industrial 1 ½-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
23	Industrial 2-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
24	Industrial 3-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
25	Industrial 4-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
26	Industrial 6-inch	1	60,892	15,992		15,992	23,557	7,565	47.31%	23,557	7,565	47.31%
27	Industrial 8-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
28	Abbott Laboratories	-	-	-		-	-	-	0.00%	-	-	0.00%
29	Private Fire Serivce	6	-	1,800		1,800	2,520	720	40.00%	2,520	720	40.00%
30	Other Water Revenues											
31	Public Fire Hydrant	-	-	-		-	-	-	0.00%	-	-	0.00%
32	Coin Machine	-	-	-		-	-	-	0.00%	-	-	0.00%
33	Construction 5/8 x 3/4 -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
34	Construction 1-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
35	Construction 1 ½-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
36	Construction 2-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
37	Construction 3-Inch	5	52,591	35,331		35,331	39,659	4,328	12.25%	39,951	4,620	13.08%
38	Construction 4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
39	Construction 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
40	Construction 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
41	Construction 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
42	Sales for Resale 5/8 x 3/4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
43	Sales for Resale 1-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
44	Sales for Resale ½-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
45	Sales for Resale 2-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
46	Sales for Resale 3-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
47	Sales for Resale 4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
48	Sales for Resale 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
49	Sales for Resale 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
50	Sales for Resale 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
51												
52	Totals	2,321	13,864	$ 2,272,294	$ (5,949)	$ 2,266,346	$ 2,828,289	$ 561,944	24.80%	$ 2,862,156	$ 595,810	26.29%
53												
54												
55												

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Summary Analysis of Revenue by Class
With 15% Rate Reduction for Abbott

White Tank

Line No.	Summary Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Increase [F - E]	[H] %	[I] Company - Rebuttal: Proposed Rates	[J] Amount [I - E]	[K] %
1												
2	Total Residential	2,252	11,305	$ 1,795,573	$ (3,977)	$ 1,791,595	$ 2,220,136	$ 428,541	23.92%	$ 2,244,371	$ 452,776	25.27%
3	Total Commercial	57	112,337	423,599	(1,971)	421,627	542,416	120,789	28.65%	551,757	130,129	30.86%
4	Total Industrial	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Total Large Industrial	1	60,892	15,992	-	15,992	23,557	7,565	47.31%	23,557	7,565	47.31%
6	Abbott Laboratories	-	-	-	-	-	-	-	0.00%	-	-	0.00%
7	Total Private Fire	6	-	1,800	-	1,800	2,520	720	40.00%	2,520	720	40.00%
8	Total Other Water Revenues	5	52,591	35,331	-	35,331	39,659	4,328	12.25%	39,951	4,620	13.08%
9												
10	Totals	2,321	13,864	$ 2,272,294	$ (5,949)	$ 2,266,346	$ 2,828,289	$ 561,944	24.80%	$ 2,862,156	$ 595,810	26.29%
11												
12	Miscellaneous Revenues			44,621	-	44,621	44,621	-	0.00%	44,621	-	0.00%
13	Total Revenue Generated						$ 2,872,910			$ 2,906,777		
14												
15	Target Rev. Rqmt. (Sch. C-1)						2,872,910			2,906,776		
16	Difference						$ 0			$ 0		
17												
18	Less: Consolidated Revenue Adj.						-			-		
19	Over/(Short)						$ 0			$ 0		
20	%						0.00%			0.00%		
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ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Detail Analysis of Revenue by Class -
With 15% Rate Reduction for Abbott

Ajo

Line No.	Detail Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Increase [F - E]	[H] %	[I] Company - Rebuttal: Proposed Rates	[J] Amount [I - E]	[K] %
1												
2	Residential 5/8 x 3/4 -inch	562	3,991	$ 304,252	$ (6,898)	$ 297,354	$ 359,334	$ 61,981	20.84%	$ 363,418	$ 66,064	22.22%
3	Residential 1-inch	9	4,493	9,736	(162)	9,573	10,926	1,353	14.13%	11,007	1,434	14.98%
4	Residential 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Residential 2-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
6	Residential 3-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
7	Residential 4-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
8	Residential 6-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
9	Residential 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
10	Residential 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
11	Commercial 5/8 x 3/4 -inch	47	4,878	32,988	162	33,150	41,460	8,309	25.07%	42,008	8,858	26.72%
12	Commercial 1-inch	20	28,759	69,784	-	69,784	85,984	16,200	23.22%	87,572	17,788	25.49%
13	Commercial 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
14	Commercial 2-inch	4	36,363	22,194	-	22,194	28,128	5,934	26.74%	28,499	6,305	28.41%
15	Commercial 3-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
16	Commercial 4-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
17	Commercial 6-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
18	Commercial 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
19	Commercial 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
20	Industrial 5/8 x 3/4 -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
21	Industrial 1-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
22	Industrial 1 ½-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
23	Industrial 2-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
24	Industrial 3-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
25	Industrial 4-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
26	Industrial 6-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
27	Industrial 8-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
28	Abbott Laboratories	-	-	-		-	-	-	0.00%	-	-	0.00%
29	Private Fire Serivce	4	-	1,200		1,200	1,680	480	40.00%	1,680	480	40.00%
30	Other Water Revenues											
31	Public Fire Hydrant	-	-	-		-	-	-	0.00%	-	-	0.00%
32	Coin Machine	1	1	564		564	592	28	4.94%	607	42	7.46%
33	Construction 5/8 x 3/4 -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
34	Construction 1-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
35	Construction 1 ½-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
36	Construction 2-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
37	Construction 3-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
38	Construction 4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
39	Construction 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
40	Construction 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
41	Construction 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
42	Sales for Resale 5/8 x 3/4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
43	Sales for Resale 1-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
44	Sales for Resale ½-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
45	Sales for Resale 2-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
46	Sales for Resale 3-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
47	Sales for Resale 4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
48	Sales for Resale 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
49	Sales for Resale 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
50	Sales for Resale 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
51												
52	Totals	647	5,009	$ 440,718	$ (6,898)	$ 433,819	$ 528,105	$ 94,286	21.73%	$ 534,790	$ 100,971	23.27%
53												
54												
55												

Supporting Schedules:

N:\RATES\2015_Rate_Case\Schedules\2015 WG Rate Case Model REBUTTAL FINAL 2016.04.07 w_ABBOTT 15% DISCOUNT\H2
Processing Date: 4/11/2016 8:16 AM

Recap Schedules:
H-1 Rebuttal

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Summary Analysis of Revenue by Class
With 15% Rate Reduction for Abbott

Ajo

Line No.	Summary Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Increase [F - E]	[H] %	[I] Company - Rebuttal: Proposed Rates	[J] Amount [I - E]	[K] %
1												
2	Total Residential	571	3,999	$ 313,987	$ (7,060)	$ 306,927	$ 370,261	$ 63,334	20.63%	$ 374,425	$ 67,498	21.99%
3	Total Commercial	71	13,408	124,966	162	125,128	155,572	30,444	24.33%	158,079	32,951	26.33%
4	Total Industrial	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Total Large Industrial	-	-	-	-	-	-	-	0.00%	-	-	0.00%
6	Abbott Laboratories	-	-	-	-	-	-	-	0.00%	-	-	0.00%
7	Total Private Fire	4	-	1,200	-	1,200	1,680	480	40.00%	1,680	480	40.00%
8	Total Other Water Revenues	1	7,150	564	-	564	592	28	4.94%	607	42	7.46%
9												
10	Totals	647	5,009	$ 440,718	$ (6,898)	$ 433,819	$ 528,105	$ 94,286	21.73%	$ 534,790	$ 100,971	23.27%
11												
12	Miscellaneous Revenues			4,101	-	4,101	4,101	-	0.00%	4,101	-	0.00%
13	Total Revenue Generated						$ 532,206			$ 538,892		
14												
15	Target Rev. Rqmt. (Sch. C-1)						532,206			538,891		
16	Difference						$ 0			$ 0		
17												
18	Less: Consolidated Revenue Adj.						-			-		
19	Over/(Short)						$ 0			$ 0		
20	%						0.00%			0.00%		
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Pinal Valley - With 15% Rate Reduction for Abbott Laboratories

Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2	Residential 5/8 x 3/4 -inch	$ 16.00	$ 22.00	$ 6.00	Tier One	3	2	$ 1.1879	$ 1.5406	$ 0.3527
3					Tier Two	10	7	2.1026	2.2122	0.1096
4					Tier Three	99,999	18	3.2590	2.8837	(0.3753)
5					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
6										
7	Residential 3/4-inch	n/a	$ 33.00	n/a	Tier One	n/a	4	n/a	$ 1.5406	n/a
8					Tier Two	n/a	10	n/a	2.2122	n/a
9					Tier Three	n/a	18	n/a	2.8837	n/a
10					Tier Four	n/a	99,999	n/a	4.2268	n/a
11										
12	Residential 1-inch	$ 40.00	$ 55.00	$ 15.00	Tier One	25	5	$ 2.1026	$ 2.2122	$ 0.1096
13					Tier Two	99,999	18	3.2590	2.8837	(0.3753)
14					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
15					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
16										
17	Residential 1½-inch	$ 80.00	$ 110.00	$ 30.00	Tier One	55	10	$ 2.1026	$ 2.2122	$ 0.1096
18					Tier Two	99,999	35	3.2590	2.8837	(0.3753)
19					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
20					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
21										
22	Residential 2-inch	$ 128.00	$ 176.00	$ 48.00	Tier One	95	16	$ 2.1026	$ 2.2122	$ 0.1096
23					Tier Two	99,999	56	3.2590	2.8837	(0.3753)
24					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
25					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
26										
27	Residential 3-inch	$ 256.00	$ 352.00	$ 96.00	Tier One	195	32	$ 2.1026	$ 2.2122	$ 0.1096
28					Tier Two	99,999	112	3.2590	2.8837	(0.3753)
29					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
30					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
31										
32	Residential 4-inch	$ 400.00	$ 550.00	$ 150.00	Tier One	315	50	$ 2.1026	$ 2.2122	$ 0.1096
33					Tier Two	99,999	175	3.2590	2.8837	(0.3753)
34					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
35					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
36										
37	Residential 6-inch	$ 800.00	$ 1,100.00	$ 300.00	Tier One	650	100	$ 2.1026	$ 2.2122	$ 0.1096
38					Tier Two	99,999	350	3.2590	2.8837	(0.3753)
39					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
40					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
41										
42	Residential 8-inch	$ 1,280.00	$ 1,760.00	$ 480.00	Tier One	1,000	160	$ 2.1026	$ 2.2122	$ 0.1096
43					Tier Two	99,999	560	3.2590	2.8837	(0.3753)
44					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
45					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
46										
47	Residential 10-inch	$ 1,840.00	$ 2,530.00	$ 690.00	Tier One	1,475	230	$ 2.1026	$ 2.2122	$ 0.1096
48					Tier Two	99,999	805	3.2590	2.8837	(0.3753)
49					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
50					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

Pinal Valley - With 15% Rate Reduction for Abbott Laboratories

Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2	Commercial 5/8 x 3/4 -inch	$ 16.00	$ 25.00	$ 9.00	Tier One	10	3	$ 2.1026	$ 2.2122	$ 0.1096
3					Tier Two	99,999	15	3.2590	2.8837	(0.3753)
4					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
5					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
6										
7	Commercial 3/4-inch	n/a	$ 37.50	n/a	Tier One	n/a	5	n/a	$ 2.2122	n/a
8					Tier Two	n/a	20	n/a	2.8837	n/a
9					Tier Three	n/a	99,999	n/a	4.2268	n/a
10					Tier Four	n/a	99,999	n/a	4.2268	n/a
11										
12	Commercial 1-inch	$ 40.00	$ 62.50	$ 22.50	Tier One	25	8	$ 2.1026	$ 2.2122	$ 0.1096
13					Tier Two	99,999	38	3.2590	2.8837	(0.3753)
14					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
15					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
16										
17	Commercial 1½-inch	$ 80.00	$ 125.00	$ 45.00	Tier One	55	15	$ 2.1026	$ 2.2122	$ 0.1096
18					Tier Two	99,999	75	3.2590	2.8837	(0.3753)
19					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
20					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
21										
22	Commercial 2-inch	$ 128.00	$ 200.00	$ 72.00	Tier One	95	24	$ 2.1026	$ 2.2122	$ 0.1096
23					Tier Two	99,999	120	3.2590	2.8837	(0.3753)
24					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
25					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
26										
27	Commercial 3-inch	$ 256.00	$ 400.00	$ 144.00	Tier One	195	48	$ 2.1026	$ 2.2122	$ 0.1096
28					Tier Two	99,999	240	3.2590	2.8837	(0.3753)
29					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
30					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
31										
32	Commercial 4-inch	$ 400.00	$ 625.00	$ 225.00	Tier One	315	75	$ 2.1026	$ 2.2122	$ 0.1096
33					Tier Two	99,999	375	3.2590	2.8837	(0.3753)
34					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
35					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
36										
37	Commercial 6-inch	$ 800.00	$ 1,250.00	$ 450.00	Tier One	650	150	$ 2.1026	$ 2.2122	$ 0.1096
38					Tier Two	99,999	750	3.2590	2.8837	(0.3753)
39					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
40					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
41										
42	Commercial 8-inch	$ 1,280.00	$ 2,000.00	$ 720.00	Tier One	1,000	240	$ 2.1026	$ 2.2122	$ 0.1096
43					Tier Two	99,999	1,200	3.2590	2.8837	(0.3753)
44					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
45					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
46										
47	Commercial 10-inch	$ 1,840.00	$ 2,875.00	$ 1,035.00	Tier One	1,475	345	$ 2.1026	$ 2.2122	$ 0.1096
48					Tier Two	99,999	1,725	3.2590	2.8837	(0.3753)
49					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
50					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules
With 15% Rate Reduction for Abbott

Pinal Valley - With 15% Rate Reduction for Abbott Laboratories

Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2	Industrial 5/8 x 3/4 -inch	$ 16.00	$ 35.00	$ 19.00	Tier One	10	99,999	$ 1.5500	$ 2.5270	$ 0.9770
3					Tier Two	99,999	99,999	2.4800	2.5270	0.0470
4					Tier Three	99,999	99,999	2.4800	2.5270	0.0470
5					Tier Four	99,999	99,999	2.4800	2.5270	0.0470
6										
7	Industrial 3/4-inch	n/a	$ 52.50	n/a	Tier One	n/a	99,999	n/a	$ 2.5270	n/a
8					Tier Two	n/a	99,999	n/a	2.5270	n/a
9					Tier Three	n/a	99,999	n/a	2.5270	n/a
10					Tier Four	n/a	99,999	n/a	2.5270	n/a
11										
12	Industrial 1-inch	$ 40.00	$ 87.50	$ 47.50	Tier One	25	99,999	$ 1.5500	$ 2.5270	$ 0.9770
13					Tier Two	99,999	99,999	2.4800	2.5270	0.0470
14					Tier Three	99,999	99,999	2.4800	2.5270	0.0470
15					Tier Four	99,999	99,999	2.4800	2.5270	0.0470
16										
17	Industrial 1¼-inch	$ 80.00	$ 175.00	$ 95.00	Tier One	55	99,999	$ 1.5500	$ 2.5270	$ 0.9770
18					Tier Two	99,999	99,999	2.4800	2.5270	0.0470
19					Tier Three	99,999	99,999	2.4800	2.5270	0.0470
20					Tier Four	99,999	99,999	2.4800	2.5270	0.0470
21										
22	Industrial 2-inch	$ 128.00	$ 280.00	$ 152.00	Tier One	95	99,999	$ 1.5500	$ 2.5270	$ 0.9770
23					Tier Two	99,999	99,999	2.4800	2.5270	0.0470
24					Tier Three	99,999	99,999	2.4800	2.5270	0.0470
25					Tier Four	99,999	99,999	2.4800	2.5270	0.0470
26										
27	Industrial 3-inch	$ 256.00	$ 560.00	$ 304.00	Tier One	195	99,999	$ 1.5500	$ 2.5270	$ 0.9770
28					Tier Two	99,999	99,999	2.4800	2.5270	0.0470
29					Tier Three	99,999	99,999	2.4800	2.5270	0.0470
30					Tier Four	99,999	99,999	2.4800	2.5270	0.0470
31										
32	Industrial 4-inch	$ 400.00	$ 875.00	$ 475.00	Tier One	315	99,999	$ 1.5500	$ 2.5270	$ 0.9770
33					Tier Two	99,999	99,999	2.4800	2.5270	0.0470
34					Tier Three	99,999	99,999	2.4800	2.5270	0.0470
35					Tier Four	99,999	99,999	2.4800	2.5270	0.0470
36										
37	Industrial 6-inch	$ 800.00	$ 1,750.00	$ 950.00	Tier One	99,999	99,999	$ 1.5500	$ 1.7770	$ 0.2270
38					Tier Two	99,999	99,999	1.5500	1.7770	0.2270
39					Tier Three	99,999	99,999	1.5500	1.7770	0.2270
40					Tier Four	99,999	99,999	1.5500	1.7770	0.2270
41										
42	Industrial 8-inch	$ 1,280.00	$ 2,800.00	$ 1,520.00	Tier One	99,999	99,999	$ 1.5500	$ 1.7770	$ 0.2270
43					Tier Two	99,999	99,999	1.5500	1.7770	0.2270
44					Tier Three	99,999	99,999	1.5500	1.7770	0.2270
45					Tier Four	99,999	99,999	1.5500	1.7770	0.2270
46										
47	**Abbott Laboratories**	$ 800.00	$ 1,200.00	$ 400.00	Tier One	99,999	99,999	$ 1.5500	$ 1.3000	$ (0.2500)
48					Tier Two	99,999	99,999	1.5500	1.3000	(0.2500)
49					Tier Three	99,999	99,999	1.5500	1.3000	(0.2500)
50					Tier Four	99,999	99,999	1.5500	1.3000	(0.2500)
51										
52	Private Fire Service (all connection sizes)	$ 25.00	$ 35.00	$ 10.00	n/a	n/a	n/a	n/a	n/a	n/a
53	Public Fire Hydrant	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules
With 15% Rate Reduction for Abbott

Pinal Valley - With 15% Rate Reduction for Abbott Laboratories

Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2										
3	Coin Machine (No. of Gallons / $0.25)	n/a	n/a	n/a	n/a	n/a	n/a	109	103	5.11%
4										
5	Construction 5/8 x 3/4-inch	n/a	$ 25.00	n/a	Tier One	n/a	3	n/a	$ 2.2122	n/a
6					Tier Two	n/a	15	n/a	2.8837	n/a
7					Tier Three	n/a	99,999	n/a	4.2268	n/a
8					Tier Four	n/a	99,999	n/a	4.2268	n/a
9										
10	Construction 3/4-inch	n/a	$ 37.50	n/a	Tier One	n/a	5	n/a	$ 2.2122	n/a
11					Tier Two	n/a	20	n/a	2.8837	n/a
12					Tier Three	n/a	99,999	n/a	4.2268	n/a
13					Tier Four	n/a	99,999	n/a	4.2268	n/a
14										
15	Construction 1-inch	n/a	$ 62.50	n/a	Tier One	n/a	8	n/a	$ 2.2122	n/a
16					Tier Two	n/a	38	n/a	2.8837	n/a
17					Tier Three	n/a	99,999	n/a	4.2268	n/a
18					Tier Four	n/a	99,999	n/a	4.2268	n/a
19										
20	Construction ½-inch	n/a	$ 125.00	n/a	Tier One	n/a	15	n/a	$ 2.2122	n/a
21					Tier Two	n/a	75	n/a	2.8837	n/a
22					Tier Three	n/a	99,999	n/a	4.2268	n/a
23					Tier Four	n/a	99,999	n/a	4.2268	n/a
24										
25	Construction 2-Inch	$ 128.00	$ 200.00	$ 72.00	Tier One	95	24	$ 2.1026	$ 2.2122	$ 0.1096
26					Tier Two	99,999	120	3.2590	2.8837	(0.3753)
27					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
28					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
29										
30	Construction 3-Inch	$ 256.00	$ 400.00	$ 144.00	Tier One	195	48	$ 2.1026	$ 2.2122	$ 0.1096
31					Tier Two	99,999	240	3.2590	2.8837	(0.3753)
32					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
33					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
34										
35	Construction 4-Inch	$ 400.00	$ 625.00	$ 225.00	Tier One	315	75	$ 2.1026	$ 2.2122	$ 0.1096
36					Tier Two	99,999	375	3.2590	2.8837	(0.3753)
37					Tier Three	99,999	99,999	3.2590	4.2268	0.9678
38					Tier Four	99,999	99,999	3.2590	4.2268	0.9678
39										
40	Construction 6-Inch	n/a	$ 1,250.00	n/a	Tier One	n/a	150	n/a	$ 2.2122	n/a
41					Tier Two	n/a	750	n/a	2.8837	n/a
42					Tier Three	n/a	99,999	n/a	4.2268	n/a
43					Tier Four	n/a	99,999	n/a	4.2268	n/a
44										
45	Construction 8-Inch	n/a	$ 2,000.00	n/a	Tier One	n/a	240	n/a	$ 2.2122	n/a
46					Tier Two	n/a	1,200	n/a	2.8837	n/a
47					Tier Three	n/a	99,999	n/a	4.2268	n/a
48					Tier Four	n/a	99,999	n/a	4.2268	n/a
49										
50	Construction 10-Inch	n/a	$ 2,875.00	n/a	Tier One	n/a	345	n/a	$ 2.2122	n/a
51					Tier Two	n/a	1,725	n/a	2.8837	n/a
52					Tier Three	n/a	99,999	n/a	4.2268	n/a
53					Tier Four	n/a	99,999	n/a	4.2268	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules
With 15% Rate Reduction for Abbott

Pinal Valley - With 15% Rate Reduction for Abbott Laboratories

Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2										
3	Sales for Resale 5/8-Inch	$ 16.00	$ 25.00	$ 9.00	Tier One	99,999	99,999	$ 1.5500	$ 2.2122	$ 0.6622
4					Tier Two	99,999	99,999	1.5500	2.2122	0.6622
5					Tier Three	99,999	99,999	1.5500	2.2122	0.6622
6					Tier Four	99,999	99,999	1.5500	2.2122	0.6622
7										
8	Sales for Resale 3/4-Inch	n/a	$ 37.50	n/a	Tier One	n/a	99,999	n/a	$ 2.2122	n/a
9					Tier Two	n/a	99,999	n/a	2.2122	n/a
10					Tier Three	n/a	99,999	n/a	2.2122	n/a
11					Tier Four	n/a	99,999	n/a	2.2122	n/a
12										
13	Sales for Resale 1-Inch	$ 40.00	$ 62.50	$ 22.50	Tier One	99,999	99,999	$ 1.5500	$ 2.2122	$ 0.6622
14					Tier Two	99,999	99,999	1.5500	2.2122	0.6622
15					Tier Three	99,999	99,999	1.5500	2.2122	0.6622
16					Tier Four	99,999	99,999	1.5500	2.2122	0.6622
17										
18	Sales for Resale ½-Inch	$ 80.00	$ 125.00	$ 45.00	Tier One	99,999	99,999	$ 1.5500	$ 2.2122	$ 0.6622
19					Tier Two	99,999	99,999	1.5500	2.2122	0.6622
20					Tier Three	99,999	99,999	1.5500	2.2122	0.6622
21					Tier Four	99,999	99,999	1.5500	2.2122	0.6622
22										
23	Sales for Resale 2-Inch	$ 128.00	$ 200.00	$ 72.00	Tier One	99,999	99,999	$ 1.5500	$ 2.2122	$ 0.6622
24					Tier Two	99,999	99,999	1.5500	2.2122	0.6622
25					Tier Three	99,999	99,999	1.5500	2.2122	0.6622
26					Tier Four	99,999	99,999	1.5500	2.2122	0.6622
27										
28	Sales for Resale 3-Inch	$ 256.00	$ 400.00	$ 144.00	Tier One	99,999	99,999	$ 1.5500	$ 2.2122	$ 0.6622
29					Tier Two	99,999	99,999	1.5500	2.2122	0.6622
30					Tier Three	99,999	99,999	1.5500	2.2122	0.6622
31					Tier Four	99,999	99,999	1.5500	2.2122	0.6622
32										
33	Sales for Resale 4-Inch	$ 400.00	$ 625.00	$ 225.00	Tier One	99,999	99,999	$ 1.5500	$ 2.2122	$ 0.6622
34					Tier Two	99,999	99,999	1.5500	2.2122	0.6622
35					Tier Three	99,999	99,999	1.5500	2.2122	0.6622
36					Tier Four	99,999	99,999	1.5500	2.2122	0.6622
37										
38	Sales for Resale 6-Inch	$ 800.00	$ 1,250.00	$ 450.00	Tier One	99,999	99,999	$ 1.5500	$ 2.2122	$ 0.6622
39					Tier Two	99,999	99,999	1.5500	2.2122	0.6622
40					Tier Three	99,999	99,999	1.5500	2.2122	0.6622
41					Tier Four	99,999	99,999	1.5500	2.2122	0.6622
42										
43	Sales for Resale 8-Inch	$ 1,280.00	$ 2,000.00	$ 720.00	Tier One	99,999	99,999	$ 1.5500	$ 2.2122	$ 0.6622
44					Tier Two	99,999	99,999	1.5500	2.2122	0.6622
45					Tier Three	99,999	99,999	1.5500	2.2122	0.6622
46					Tier Four	99,999	99,999	1.5500	2.2122	0.6622
47										
48	Sales for Resale 10-Inch	$ 1,840.00	$ 2,875.00	$ 1,035.00	Tier One	99,999	99,999	$ 1.5500	$ 2.2122	$ 0.6622
49					Tier Two	99,999	99,999	1.5500	2.2122	0.6622
50					Tier Three	99,999	99,999	1.5500	2.2122	0.6622
51					Tier Four	99,999	99,999	1.5500	2.2122	0.6622
52										
53										
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

White Tank

Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2	Residential 5/8 x 3/4 -inch	$ 23.00	$ 30.00	$ 7.00	Tier One	5	3	$ 1.8000	$ 2.3012	$ 0.5012
3					Tier Two	15	10	3.0000	3.3771	0.3771
4					Tier Three	99,999	30	5.1664	4.4531	(0.7133)
5					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
6										
7	Residential 3/4-inch	n/a	$ 45.00	n/a	Tier One	n/a	5	n/a	$ 2.3012	n/a
8					Tier Two	n/a	15	n/a	3.3771	n/a
9					Tier Three	n/a	30	n/a	4.4531	n/a
10					Tier Four	n/a	99,999	n/a	6.6049	n/a
11										
12	Residential 1-inch	$ 57.50	$ 75.00	$ 17.50	Tier One	25	8	$ 3.0000	$ 3.3771	$ 0.3771
13					Tier Two	99,999	20	5.1664	4.4531	(0.7133)
14					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
15					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
16										
17	Residential 1½-inch	$ 115.00	$ 150.00	$ 35.00	Tier One	50	15	$ 3.0000	$ 3.3771	$ 0.3771
18					Tier Two	99,999	35	5.1664	4.4531	(0.7133)
19					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
20					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
21										
22	Residential 2-inch	$ 184.00	$ 240.00	$ 56.00	Tier One	80	24	$ 3.0000	$ 3.3771	$ 0.3771
23					Tier Two	99,999	60	5.1664	4.4531	(0.7133)
24					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
25					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
26										
27	Residential 3-inch	$ 368.00	$ 480.00	$ 112.00	Tier One	160	48	$ 3.0000	$ 3.3771	$ 0.3771
28					Tier Two	99,999	120	5.1664	4.4531	(0.7133)
29					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
30					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
31										
32	Residential 4-inch	$ 575.00	$ 750.00	$ 175.00	Tier One	250	75	$ 3.0000	$ 3.3771	$ 0.3771
33					Tier Two	99,999	200	5.1664	4.4531	(0.7133)
34					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
35					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
36										
37	Residential 6-inch	$ 1,150.00	$ 1,500.00	$ 350.00	Tier One	500	150	$ 3.0000	$ 3.3771	$ 0.3771
38					Tier Two	99,999	425	5.1664	4.4531	(0.7133)
39					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
40					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
41										
42	Residential 8-inch	$ 1,840.00	$ 2,400.00	$ 560.00	Tier One	800	240	$ 3.0000	$ 3.3771	$ 0.3771
43					Tier Two	99,999	800	5.1664	4.4531	(0.7133)
44					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
45					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
46										
47	Residential 10-inch	$ 2,645.00	$ 3,450.00	$ 805.00	Tier One	1,150	345	$ 3.0000	$ 3.3771	$ 0.3771
48					Tier Two	99,999	1,150	5.1664	4.4531	(0.7133)
49					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
50					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules

White Tank

Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D]	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2	Commercial 5/8 x 3/4 -inch	$ 23.00	$ 35.00	$ 12.00	Tier One	10	5	$ 3.0000	$ 3.3771	$ 0.3771
3					Tier Two	99,999	20	5.1664	4.4531	(0.7133)
4					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
5					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
6										
7	Commercial 3/4-inch	n/a	$ 52.50	n/a	Tier One	n/a	8	n/a	$ 3.3771	n/a
8					Tier Two	n/a	25	n/a	4.4531	n/a
9					Tier Three	n/a	99,999	n/a	6.6049	n/a
10					Tier Four	n/a	99,999	n/a	6.6049	n/a
11										
12	Commercial 1-inch	$ 57.50	$ 87.50	$ 30.00	Tier One	20	13	$ 3.0000	$ 3.3771	$ 0.3771
13					Tier Two	99,999	35	5.1664	4.4531	(0.7133)
14					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
15					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
16										
17	Commercial 1½-inch	$ 115.00	$ 175.00	$ 60.00	Tier One	45	25	$ 3.0000	$ 3.3771	$ 0.3771
18					Tier Two	99,999	50	5.1664	4.4531	(0.7133)
19					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
20					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
21										
22	Commercial 2-inch	$ 184.00	$ 280.00	$ 96.00	Tier One	75	40	$ 3.0000	$ 3.3771	$ 0.3771
23					Tier Two	99,999	75	5.1664	4.4531	(0.7133)
24					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
25					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
26										
27	Commercial 3-inch	$ 368.00	$ 560.00	$ 192.00	Tier One	155	80	$ 3.0000	$ 3.3771	$ 0.3771
28					Tier Two	99,999	150	5.1664	4.4531	(0.7133)
29					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
30					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
31										
32	Commercial 4-inch	$ 575.00	$ 875.00	$ 300.00	Tier One	245	125	$ 3.0000	$ 3.3771	$ 0.3771
33					Tier Two	99,999	240	5.1664	4.4531	(0.7133)
34					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
35					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
36										
37	Commercial 6-inch	$ 1,150.00	$ 1,750.00	$ 600.00	Tier One	500	250	$ 3.0000	$ 3.3771	$ 0.3771
38					Tier Two	99,999	1,000	5.1664	4.4531	(0.7133)
39					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
40					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
41										
42	Commercial 8-inch	$ 1,840.00	$ 2,800.00	$ 960.00	Tier One	800	400	$ 3.0000	$ 3.3771	$ 0.3771
43					Tier Two	99,999	1,600	5.1664	4.4531	(0.7133)
44					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
45					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
46										
47	Commercial 10-inch	$ 2,645.00	$ 4,025.00	$ 1,380.00	Tier One	1,150	575	$ 3.0000	$ 3.3771	$ 0.3771
48					Tier Two	99,999	2,300	5.1664	4.4531	(0.7133)
49					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
50					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules

		White Tank								
		[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]
		Basic Service Charge			Tier Breakover (M Gals)			Volumetric Charge (/M Gal)		
Line No.	Class of Service	Present Rate	Proposed Rate - Rebuttal	Change		Present	Proposed - Rebuttal	Present Rate	Proposed Rate - Rebuttal	Change
1										
2	Industrial 5/8 x 3/4 -inch	$ 23.00	$ 35.00	$ 12.00	Tier One	10	99,999	$ 3.0000	$ 4.4531	$ 1.4531
3					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
4					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
5					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
6										
7	Industrial 3/4-inch	n/a	$ 52.50	n/a	Tier One	n/a	99,999	n/a	$ 4.4531	n/a
8					Tier Two	n/a	99,999	n/a	4.4531	n/a
9					Tier Three	n/a	99,999	n/a	4.4531	n/a
10					Tier Four	n/a	99,999	n/a	4.4531	n/a
11										
12	Industrial 1-inch	$ 57.50	$ 87.50	$ 30.00	Tier One	20	99,999	$ 3.0000	$ 4.4531	$ 1.4531
13					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
14					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
15					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
16										
17	Industrial 1½-inch	$ 115.00	$ 175.00	$ 60.00	Tier One	45	99,999	$ 3.0000	$ 4.4531	$ 1.4531
18					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
19					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
20					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
21										
22	Industrial 2-inch	$ 184.00	$ 280.00	$ 96.00	Tier One	75	99,999	$ 3.0000	$ 4.4531	$ 1.4531
23					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
24					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
25					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
26										
27	Industrial 3-inch	$ 368.00	$ 560.00	$ 192.00	Tier One	155	99,999	$ 3.0000	$ 4.4531	$ 1.4531
28					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
29					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
30					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
31										
32	Industrial 4-inch	$ 575.00	$ 875.00	$ 300.00	Tier One	245	99,999	$ 3.0000	$ 4.4531	$ 1.4531
33					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
34					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
35					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
36										
37	Industrial 6-inch	$ 1,150.00	$ 1,750.00	$ 600.00	Tier One	99,999	99,999	$ 3.0000	$ 3.5000	$ 0.5000
38					Tier Two	99,999	99,999	3.0000	3.5000	0.5000
39					Tier Three	99,999	99,999	3.0000	3.5000	0.5000
40					Tier Four	99,999	99,999	3.0000	3.5000	0.5000
41										
42	Industrial 8-inch	$ 1,840.00	$ 2,800.00	$ 960.00	Tier One	99,999	99,999	$ 3.0000	$ 3.5000	$ 0.5000
43					Tier Two	99,999	99,999	3.0000	3.5000	0.5000
44					Tier Three	99,999	99,999	3.0000	3.5000	0.5000
45					Tier Four	99,999	99,999	3.0000	3.5000	0.5000
46										
47	Industrial 10-inch	$ 2,645.00	$ 4,025.00	$ 1,380.00	Tier One	99,999	99,999	$ 3.0000	$ 3.5000	$ 0.5000
48					Tier Two	99,999	99,999	3.0000	3.5000	0.5000
49					Tier Three	99,999	99,999	3.0000	3.5000	0.5000
50					Tier Four	99,999	99,999	3.0000	3.5000	0.5000
51										
52	Private Fire Service (all connection sizes)	$ 25.00	$ 35.00	$ 10.00	n/a	n/a	n/a	n/a	n/a	n/a
53	Public Fire Hydrant	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules

White Tank

Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2										
3	Coin Machine (No. of Gallons / $0.25)	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a
4										
5	Construction 5/8 x 3/4-inch	n/a	$ 25.00	n/a	Tier One	n/a	5	n/a	$ 3.3771	n/a
6					Tier Two	n/a	20	n/a	4.4531	n/a
7					Tier Three	n/a	99,999	n/a	6.6049	n/a
8					Tier Four	n/a	99,999	n/a	6.6049	n/a
9										
10	Construction 3/4-inch	n/a	$ 37.50	n/a	Tier One	n/a	8	n/a	$ 3.3771	n/a
11					Tier Two	n/a	25	n/a	4.4531	n/a
12					Tier Three	n/a	99,999	n/a	6.6049	n/a
13					Tier Four	n/a	99,999	n/a	6.6049	n/a
14										
15	Construction 1-inch	n/a	$ 62.50	n/a	Tier One	n/a	13	n/a	$ 3.3771	n/a
16					Tier Two	n/a	35	n/a	4.4531	n/a
17					Tier Three	n/a	99,999	n/a	6.6049	n/a
18					Tier Four	n/a	99,999	n/a	6.6049	n/a
19										
20	Construction ½-inch	n/a	$ 125.00	n/a	Tier One	n/a	25	n/a	$ 3.3771	n/a
21					Tier Two	n/a	50	n/a	4.4531	n/a
22					Tier Three	n/a	99,999	n/a	6.6049	n/a
23					Tier Four	n/a	99,999	n/a	6.6049	n/a
24										
25	Construction 2-Inch	$ 184.00	$ 200.00	$ 16.00	Tier One	75	40	$ 3.0000	$ 3.3771	$ 0.3771
26					Tier Two	99,999	75	5.1664	4.4531	(0.7133)
27					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
28					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
29										
30	Construction 3-Inch	$ 368.00	$ 400.00	$ 32.00	Tier One	155	80	$ 3.0000	$ 3.3771	$ 0.3771
31					Tier Two	99,999	150	5.1664	4.4531	(0.7133)
32					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
33					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
34										
35	Construction 4-Inch	$ 575.00	$ 625.00	$ 50.00	Tier One	245	125	$ 3.0000	$ 3.3771	$ 0.3771
36					Tier Two	99,999	240	5.1664	4.4531	(0.7133)
37					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
38					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
39										
40	Construction 6-Inch	n/a	$ 1,250.00	n/a	Tier One	n/a	250	n/a	$ 3.3771	n/a
41					Tier Two	n/a	1,000	n/a	4.4531	n/a
42					Tier Three	n/a	99,999	n/a	6.6049	n/a
43					Tier Four	n/a	99,999	n/a	6.6049	n/a
44										
45	Construction 8-Inch	n/a	$ 2,000.00	n/a	Tier One	n/a	400	n/a	$ 3.3771	n/a
46					Tier Two	n/a	1,600	n/a	4.4531	n/a
47					Tier Three	n/a	99,999	n/a	6.6049	n/a
48					Tier Four	n/a	99,999	n/a	6.6049	n/a
49										
50	Construction 10-Inch	n/a	$ 2,875.00	n/a	Tier One	n/a	575	n/a	$ 3.3771	n/a
51					Tier Two	n/a	2,300	n/a	4.4531	n/a
52					Tier Three	n/a	99,999	n/a	6.6049	n/a
53					Tier Four	n/a	99,999	n/a	6.6049	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules

White Tank

Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2										
3	Sales for Resale 5/8-Inch	$ 23.00	$ 25.00	$ 2.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
4					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
5					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
6					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
7										
8	Sales for Resale 3/4-Inch	n/a	$ 37.50	n/a	Tier One	n/a	99,999	n/a	$ 3.3771	n/a
9					Tier Two	n/a	99,999	n/a	3.3771	n/a
10					Tier Three	n/a	99,999	n/a	3.3771	n/a
11					Tier Four	n/a	99,999	n/a	3.3771	n/a
12										
13	Sales for Resale 1-Inch	$ 57.50	$ 62.50	$ 5.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
14					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
15					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
16					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
17										
18	Sales for Resale ½-Inch	$ 115.00	$ 125.00	$ 10.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
19					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
20					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
21					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
22										
23	Sales for Resale 2-Inch	$ 184.00	$ 200.00	$ 16.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
24					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
25					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
26					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
27										
28	Sales for Resale 3-Inch	$ 368.00	$ 400.00	$ 32.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
29					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
30					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
31					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
32										
33	Sales for Resale 4-Inch	$ 575.00	$ 625.00	$ 50.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
34					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
35					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
36					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
37										
38	Sales for Resale 6-Inch	$ 1,150.00	$ 1,250.00	$ 100.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
39					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
40					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
41					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
42										
43	Sales for Resale 8-Inch	$ 1,840.00	$ 2,000.00	$ 160.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
44					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
45					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
46					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
47										
48	Sales for Resale 10-Inch	$ 2,645.00	$ 2,875.00	$ 230.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
49					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
50					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
51					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
52										
53										
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

Ajo

Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2	Residential 5/8 x 3/4 -inch	$ 25.00	$ 28.00	$ 3.00	Tier One	3	2	$ 3.3617	$ 4.5063	$ 1.1446
3					Tier Two	10	5	5.9502	6.4705	0.5203
4					Tier Three	99,999	10	9.2228	8.4347	(0.7881)
5					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
6										
7	Residential 3/4-inch	n/a	$ 42.00	n/a	Tier One	n/a	3	n/a	$ 4.5063	n/a
8					Tier Two	n/a	7	n/a	6.4705	n/a
9					Tier Three	n/a	11	n/a	8.4347	n/a
10					Tier Four	n/a	99,999	n/a	12.3630	n/a
11										
12	Residential 1-inch	$ 62.50	$ 70.00	$ 7.50	Tier One	15	5	$ 5.9502	$ 6.4705	$ 0.5203
13					Tier Two	99,999	13	9.2228	8.4347	(0.7881)
14					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
15					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
16										
17	Residential 1½-inch	$ 125.00	$ 140.00	$ 15.00	Tier One	30	10	$ 5.9502	$ 6.4705	$ 0.5203
18					Tier Two	99,999	25	9.2228	8.4347	(0.7881)
19					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
20					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
21										
22	Residential 2-inch	$ 200.00	$ 224.00	$ 24.00	Tier One	50	16	$ 5.9502	$ 6.4705	$ 0.5203
23					Tier Two	99,999	40	9.2228	8.4347	(0.7881)
24					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
25					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
26										
27	Residential 3-inch	$ 400.00	$ 448.00	$ 48.00	Tier One	100	32	$ 5.9502	$ 6.4705	$ 0.5203
28					Tier Two	99,999	80	9.2228	8.4347	(0.7881)
29					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
30					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
31										
32	Residential 4-inch	$ 625.00	$ 700.00	$ 75.00	Tier One	150	50	$ 5.9502	$ 6.4705	$ 0.5203
33					Tier Two	99,999	125	9.2228	8.4347	(0.7881)
34					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
35					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
36										
37	Residential 6-inch	$ 1,250.00	$ 1,400.00	$ 150.00	Tier One	330	100	$ 5.9502	$ 6.4705	$ 0.5203
38					Tier Two	99,999	250	9.2228	8.4347	(0.7881)
39					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
40					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
41										
42	Residential 8-inch	$ 2,000.00	$ 2,240.00	$ 240.00	Tier One	525	160	$ 5.9502	$ 6.4705	$ 0.5203
43					Tier Two	99,999	400	9.2228	8.4347	(0.7881)
44					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
45					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
46										
47	Residential 10-inch	$ 2,875.00	$ 3,220.00	$ 345.00	Tier One	775	230	$ 5.9502	$ 6.4705	$ 0.5203
48					Tier Two	99,999	575	9.2228	8.4347	(0.7881)
49					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
50					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules

Ajo

Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2	Commercial 5/8 x 3/4 -inch	$ 25.00	$ 33.00	$ 8.00	Tier One	10	2	$ 5.9502	$ 6.4705	$ 0.5203
3					Tier Two	99,999	18	9.2228	8.4347	(0.7881)
4					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
5					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
6										
7	Commercial 3/4-inch	n/a	$ 49.50	n/a	Tier One	n/a	3	n/a	$ 6.4705	n/a
8					Tier Two	n/a	20	n/a	8.4347	n/a
9					Tier Three	n/a	99,999	n/a	12.3630	n/a
10					Tier Four	n/a	99,999	n/a	12.3630	n/a
11										
12	Commercial 1-inch	$ 62.50	$ 82.50	$ 20.00	Tier One	15	5	$ 5.9502	$ 6.4705	$ 0.5203
13					Tier Two	99,999	25	9.2228	8.4347	(0.7881)
14					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
15					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
16										
17	Commercial 1½-inch	$ 125.00	$ 165.00	$ 40.00	Tier One	30	10	$ 5.9502	$ 6.4705	$ 0.5203
18					Tier Two	99,999	40	9.2228	8.4347	(0.7881)
19					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
20					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
21										
22	Commercial 2-inch	$ 200.00	$ 264.00	$ 64.00	Tier One	50	16	$ 5.9502	$ 6.4705	$ 0.5203
23					Tier Two	99,999	60	9.2228	8.4347	(0.7881)
24					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
25					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
26										
27	Commercial 3-inch	$ 400.00	$ 528.00	$ 128.00	Tier One	100	32	$ 5.9502	$ 6.4705	$ 0.5203
28					Tier Two	99,999	120	9.2228	8.4347	(0.7881)
29					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
30					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
31										
32	Commercial 4-inch	$ 625.00	$ 825.00	$ 200.00	Tier One	150	50	$ 5.9502	$ 6.4705	$ 0.5203
33					Tier Two	99,999	185	9.2228	8.4347	(0.7881)
34					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
35					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
36										
37	Commercial 6-inch	$ 1,250.00	$ 1,650.00	$ 400.00	Tier One	330	100	$ 5.9502	$ 6.4705	$ 0.5203
38					Tier Two	99,999	300	9.2228	8.4347	(0.7881)
39					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
40					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
41										
42	Commercial 8-inch	$ 2,000.00	$ 2,640.00	$ 640.00	Tier One	525	160	$ 5.9502	$ 6.4705	$ 0.5203
43					Tier Two	99,999	500	9.2228	8.4347	(0.7881)
44					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
45					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
46										
47	Commercial 10-inch	$ 2,875.00	$ 3,795.00	$ 920.00	Tier One	775	230	$ 5.9502	$ 6.4705	$ 0.5203
48					Tier Two	99,999	750	9.2228	8.4347	(0.7881)
49					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
50					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules

Ajo

Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2	Industrial 5/8 x 3/4 -inch	$ 25.00	$ 35.00	$ 10.00	Tier One	10	99,999	$ 5.9502	$ 8.4347	$ 2.4845
3					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
4					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
5					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
6										
7	Industrial 3/4-inch	n/a	$ 52.50	n/a	Tier One	n/a	99,999	n/a	$ 8.4347	n/a
8					Tier Two	n/a	99,999	n/a	8.4347	n/a
9					Tier Three	n/a	99,999	n/a	8.4347	n/a
10					Tier Four	n/a	99,999	n/a	8.4347	n/a
11										
12	Industrial 1-inch	$ 62.50	$ 87.50	$ 25.00	Tier One	15	99,999	$ 5.9502	$ 8.4347	$ 2.4845
13					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
14					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
15					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
16										
17	Industrial 1½-inch	$ 125.00	$ 175.00	$ 50.00	Tier One	30	99,999	$ 5.9502	$ 8.4347	$ 2.4845
18					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
19					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
20					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
21										
22	Industrial 2-inch	$ 200.00	$ 280.00	$ 80.00	Tier One	50	99,999	$ 5.9502	$ 8.4347	$ 2.4845
23					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
24					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
25					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
26										
27	Industrial 3-inch	$ 400.00	$ 560.00	$ 160.00	Tier One	100	99,999	$ 5.9502	$ 8.4347	$ 2.4845
28					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
29					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
30					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
31										
32	Industrial 4-inch	$ 625.00	$ 875.00	$ 250.00	Tier One	150	99,999	$ 5.9502	$ 8.4347	$ 2.4845
33					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
34					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
35					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
36										
37	Industrial 6-inch	$ 1,250.00	$ 1,750.00	$ 500.00	Tier One	99,999	99,999	$ 5.9502	$ 2.2500	$ (3.7002)
38					Tier Two	99,999	99,999	5.9502	2.2500	(3.7002)
39					Tier Three	99,999	99,999	5.9502	2.2500	(3.7002)
40					Tier Four	99,999	99,999	5.9502	2.2500	(3.7002)
41										
42	Industrial 8-inch	$ 2,000.00	$ 2,800.00	$ 800.00	Tier One	99,999	99,999	$ 5.9502	$ 2.2500	$ (3.7002)
43					Tier Two	99,999	99,999	5.9502	2.2500	(3.7002)
44					Tier Three	99,999	99,999	5.9502	2.2500	(3.7002)
45					Tier Four	99,999	99,999	5.9502	2.2500	(3.7002)
46										
47	Industrial 10-inch	$ 2,875.00	$ 4,025.00	$ 1,150.00	Tier One	99,999	99,999	$ 5.9502	$ 2.2500	$ (3.7002)
48					Tier Two	99,999	99,999	5.9502	2.2500	(3.7002)
49					Tier Three	99,999	99,999	5.9502	2.2500	(3.7002)
50					Tier Four	99,999	99,999	5.9502	2.2500	(3.7002)
51										
52	Private Fire Service (all connection sizes)	$ 25.00	$ 35.00	$ 10.00	n/a	n/a	n/a	n/a	n/a	n/a
53	Public Fire Hydrant	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

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Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2										
3	Coin Machine (No. of Gallons / $0.25)	n/a	n/a	n/a	n/a	n/a	n/a	38	35	6.94%
4										
5	Construction 5/8 x 3/4-inch	n/a	$ 33.00	n/a	Tier One	n/a	2	n/a	$ 6.4705	n/a
6					Tier Two	n/a	18	n/a	8.4347	n/a
7					Tier Three	n/a	99,999	n/a	12.3630	n/a
8					Tier Four	n/a	99,999	n/a	12.3630	n/a
9										
10	Construction 3/4-inch	n/a	$ 49.50	n/a	Tier One	n/a	3	n/a	$ 6.4705	n/a
11					Tier Two	n/a	20	n/a	8.4347	n/a
12					Tier Three	n/a	99,999	n/a	12.3630	n/a
13					Tier Four	n/a	99,999	n/a	12.3630	n/a
14										
15	Construction 1-inch	n/a	$ 82.50	n/a	Tier One	n/a	5	n/a	$ 6.4705	n/a
16					Tier Two	n/a	25	n/a	8.4347	n/a
17					Tier Three	n/a	99,999	n/a	12.3630	n/a
18					Tier Four	n/a	99,999	n/a	12.3630	n/a
19										
20	Construction ½-inch	n/a	$ 165.00	n/a	Tier One	n/a	10	n/a	$ 6.4705	n/a
21					Tier Two	n/a	40	n/a	8.4347	n/a
22					Tier Three	n/a	99,999	n/a	12.3630	n/a
23					Tier Four	n/a	99,999	n/a	12.3630	n/a
24										
25	Construction 2-Inch	$ 200.00	$ 264.00	$ 64.00	Tier One	50	16	$ 5.9502	$ 6.4705	$ 0.5203
26					Tier Two	99,999	60	9.2228	8.4347	(0.7881)
27					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
28					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
29										
30	Construction 3-Inch	$ 400.00	$ 528.00	$ 128.00	Tier One	100	32	$ 5.9502	$ 6.4705	$ 0.5203
31					Tier Two	99,999	120	9.2228	8.4347	(0.7881)
32					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
33					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
34										
35	Construction 4-Inch	$ 625.00	$ 825.00	$ 200.00	Tier One	150	50	$ 5.9502	$ 6.4705	$ 0.5203
36					Tier Two	99,999	185	9.2228	8.4347	(0.7881)
37					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
38					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
39										
40	Construction 6-Inch	n/a	$ 1,650.00	n/a	Tier One	n/a	100	n/a	$ 6.4705	n/a
41					Tier Two	n/a	300	n/a	8.4347	n/a
42					Tier Three	n/a	99,999	n/a	12.3630	n/a
43					Tier Four	n/a	99,999	n/a	12.3630	n/a
44										
45	Construction 8-Inch	n/a	$ 2,640.00	n/a	Tier One	n/a	160	n/a	$ 6.4705	n/a
46					Tier Two	n/a	500	n/a	8.4347	n/a
47					Tier Three	n/a	99,999	n/a	12.3630	n/a
48					Tier Four	n/a	99,999	n/a	12.3630	n/a
49										
50	Construction 10-Inch	n/a	$ 3,795.00	n/a	Tier One	n/a	230	n/a	$ 6.4705	n/a
51					Tier Two	n/a	750	n/a	8.4347	n/a
52					Tier Three	n/a	99,999	n/a	12.3630	n/a
53					Tier Four	n/a	99,999	n/a	12.3630	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules

Line No.	Class of Service	Ajo [A] Basic Service Charge Present Rate	[B] Proposed Rate - Rebuttal	[C] Change	[D] Tier Breakover (M Gals)	[E] Present	[F] Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Proposed Rate - Rebuttal	[I] Change
1										
2										
3	Sales for Resale 5/8-Inch	$ 25.00	$ 33.00	$ 8.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
4					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
5					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
6					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
7										
8	Sales for Resale 3/4-Inch	n/a	$ 49.50	n/a	Tier One	n/a	99,999	n/a	$ 6.4705	n/a
9					Tier Two	n/a	99,999	n/a	6.4705	n/a
10					Tier Three	n/a	99,999	n/a	6.4705	n/a
11					Tier Four	n/a	99,999	n/a	6.4705	n/a
12										
13	Sales for Resale 1-Inch	$ 62.50	$ 82.50	$ 20.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
14					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
15					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
16					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
17										
18	Sales for Resale 1½-Inch	$ 125.00	$ 165.00	$ 40.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
19					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
20					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
21					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
22										
23	Sales for Resale 2-Inch	$ 200.00	$ 264.00	$ 64.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
24					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
25					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
26					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
27										
28	Sales for Resale 3-Inch	$ 400.00	$ 528.00	$ 128.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
29					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
30					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
31					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
32										
33	Sales for Resale 4-Inch	$ 625.00	$ 825.00	$ 200.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
34					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
35					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
36					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
37										
38	Sales for Resale 6-Inch	$ 1,250.00	$ 1,650.00	$ 400.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
39					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
40					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
41					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
42										
43	Sales for Resale 8-Inch	$ 2,000.00	$ 2,640.00	$ 640.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
44					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
45					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
46					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
47										
48	Sales for Resale 10-Inch	$ 2,875.00	$ 3,795.00	$ 920.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
49					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
50					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
51					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
52										
53										
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

Western Group

Line No.	Service Charges	[A] Current Rate	[B] Proposed Rate - Rebuttal
2	Establishment	$32.00	$32.00
4	Guarantee Deposit	Residential - maximum: Two(2) times average customer class bill. Non-Residential-maximum: Two and one-half (21/2) times that customers estimated maximum monthly bill.	Residential - maximum: Two(2) times average customer class bill. Non-Residential-maximum: Two and one-half (21/2) times that customers estimated maximum monthly bill.
8	Reconnection for Delinquency	$32.00, each time customer is disconnected.	$32.00, each time customer is disconnected.
13	Re-Establishment	Eight (8) times the customer's monthly minimum charge, or payment of the minimums since disconnection, whichever is less.	Eight (8) times the customer's monthly minimum charge, or payment of the minimums since disconnection, whichever is less.
16	After Hours Service Charge	$35.00, each service call-out after regular working hours, on Saturdays, Sundays or holidays.	$35.00, each service call-out after regular working hours, on Saturdays, Sundays or holidays.
20	Returned Payment	$25.00, each returned payment for insufficient funds.	$25.00, each returned payment for insufficient funds.
24	Meter Re-read	All Meter Re-Reads - $25.00	All Meter Re-Reads - $25.00
27	Meter Test	No charge for the first test; for the second test for the same customer within any twelve (12) month period, $25.00, or actual time and material whichever is greater.	No charge for the first test; for the second test for the same customer within any twelve (12) month period, $25.00, or actual time and material whichever is greater.

Service Line and Meter Installation

Meter Size	Service Line[1]	Meter	Total[1]	Service Line[1]	Meter	Total[1]
5/8 x 3/4-inch	$ 445.00	$ 155.00	$ 600.00	$ 565.00	Actual Cost	Varies
3/4-inch	n/a	n/a	n/a	565.00	Actual Cost	Varies
1-inch	495.00	315.00	810.00	629.00	Actual Cost	Varies
1 ½-inch	n/a	n/a	n/a	699.00	Actual Cost	Varies
2-inch turbine	830.00	1,045.00	1,875.00	1,054.00	Actual Cost	Varies
2-inch compound	830.00	1,890.00	2,720.00	1,054.00	Actual Cost	Varies
3-inch turbine	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
3-inch compound	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
4-inch turbine	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
4-inch compound	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
6-inch turbine	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
6-inch compound	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
8-inch turbine	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
8-inch compound	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
10-inch turbine	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
10-inch compound	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost

[1]Actual cost of service line if boring under roadway is required.

[1]Actual cost of service line if boring under, or cutting roadway/sidewalk is required.

53	Late Charge	1.5 percent after 15 days.

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Typical Bill Analysis -
With 15% Rate Reduction for Abbott

Pinal Valley - With 15% Rate Reduction for Abbott

Line No.		[A] Base Rates	[B] Adjusters & Surcharges (ACRM/SIB)	[C] Monthly Usage (M Gal)	[D] Typical Bill Present Rates Base Rates	[E] Typical Bill Present Rates Adjusters & Surcharges	[F] Typical Bill Present Rates Total	[G] Typical Bill Proposed Rates - Rebuttal	[H] Increase - Rebuttal Amount	[I] Increase - Rebuttal Percent
1	Residential 5/8 x 3/4 -inch									
2				-	$ 16.00	$ -	$ 16.00	$ 22.00	$ 6.00	37.50%
3				5	23.77	-	23.77	31.72	7.95	33.44%
4				15	50.58	-	50.58	59.21	8.63	17.07%
5	Present Rates			20	66.87	-	66.87	76.32	9.44	14.12%
6				25	83.17	-	83.17	97.45	14.28	17.17%
7				30	99.46	-	99.46	118.58	19.12	19.23%
8	Basic Service Charge:	$ 16.00	$ -	35	115.76	-	115.76	139.72	23.96	20.70%
9				40	132.05	-	132.05	160.85	28.80	21.81%
10	Tier One Breakover (M Gal):	3		45	148.35	-	148.35	181.99	33.64	22.68%
11	Tier Two Breakover (M Gal):	10		50	164.64	-	164.64	203.12	38.48	23.37%
12	Tier Three Breakover (M Gal):	99,999		55	180.94	-	180.94	224.25	43.32	23.94%
13	Tier Four Breakover (M Gal):	99,999		60	197.23	-	197.23	245.39	48.15	24.42%
14				65	213.53	-	213.53	266.52	52.99	24.82%
15	Tier One Rate:	$ 1.1879	$ -	70	229.82	-	229.82	287.65	57.83	25.16%
16	Tier Two Rate:	2.1026	-	75	246.12	-	246.12	308.79	62.67	25.46%
17	Tier Three Rate:	3.2590	-	100	327.59	-	327.59	414.46	86.87	26.52%
18	Tier Four Rate:	3.2590	-	150	490.54	-	490.54	625.80	135.25	27.57%
19				200	653.49	-	653.49	837.13	183.64	28.10%
20				250	816.44	-	816.44	1,048.47	232.03	28.42%
21	Proposed Rates - Rebuttal			300	979.39	-	979.39	1,259.81	280.42	28.63%
22				350	1,142.34	-	1,142.34	1,471.15	328.81	28.78%
23				400	1,305.29	-	1,305.29	1,682.49	377.19	28.90%
24	Basic Service Charge:	$ 22.00	$ -	450	1,468.24	-	1,468.24	1,893.82	425.58	28.99%
25				500	1,631.19	-	1,631.19	2,105.16	473.97	29.06%
26	Tier One Breakover (M Gal):	2		550	1,794.14	-	1,794.14	2,316.50	522.36	29.11%
27	Tier Two Breakover (M Gal):	7		600	1,957.09	-	1,957.09	2,527.84	570.75	29.16%
28	Tier Three Breakover (M Gal):	18		650	2,120.04	-	2,120.04	2,739.18	619.13	29.20%
29	Tier Four Breakover (M Gal):	99,999		700	2,282.99	-	2,282.99	2,950.51	667.52	29.24%
30				750	2,445.94	-	2,445.94	3,161.85	715.91	29.27%
31	Tier One Rate:	$ 1.5406	$ -	800	2,608.89	-	2,608.89	3,373.19	764.30	29.30%
32	Tier Two Rate:	2.2122	-	850	2,771.84	-	2,771.84	3,584.53	812.69	29.32%
33	Tier Three Rate:	2.8837	-	900	2,934.79	-	2,934.79	3,795.87	861.07	29.34%
34	Tier Four Rate:	4.2268	-	1,000	3,260.69	-	3,260.69	4,218.54	957.85	29.38%
35				1,500	4,890.19	-	4,890.19	6,331.92	1,441.73	29.48%
36				2,000	6,519.69	-	6,519.69	8,445.30	1,925.61	29.54%
37				2,500	8,149.19	-	8,149.19	10,558.68	2,409.49	29.57%
38				3,000	9,778.69	-	9,778.69	12,672.06	2,893.37	29.59%
39										
40										
41			Average Usage:	7.8	$ 29.62	$ -	$ 29.62	$ 38.39	$ 8.78	29.64%
42			Median Usage:	5.7	$ 25.24	$ -	$ 25.24	$ 33.27	$ 8.03	31.80%
43			Standardized Usage:	7.5	$ 29.03	$ -	$ 29.03	$ 37.58	$ 8.56	29.49%
44										
45							Proposed Bill at Lifeline Usage:	$ 25.08		
46							Cost of Service at Lifeline Usage:	$ 33.07		
47							% Cost Discount at Lifeline Usage:	24.16%		
48										
49							Cost of Service at Average Usage:	$ 45.19		
50							% Cost Discount at Average Usage:	15.04%		
51										
52										
53										
54										
55										

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Typical Bill Analysis -
With 15% Rate Reduction for Abbott

White Tank

Line No.		[A] Base Rates	[B] Adjusters & Surcharges (ACRM/SIB)	[C] Monthly Usage (M Gal)	[D] Typical Bill Present Rates Base Rates	[E] Adjusters & Surcharges	[F] Total	[G] Proposed Rates - Rebuttal	[H] Increase - Rebuttal Amount	[I] Percent
1	Residential 5/8 x 3/4 -inch									
2				-	$ 23.00	$ -	$ 23.00	$ 30.00	$ 7.00	30.43%
3				5	32.00	-	32.00	43.66	11.66	36.43%
4				15	62.00	-	62.00	82.81	20.81	33.56%
5	Present Rates			20	87.83	-	87.83	105.07	17.24	19.63%
6				25	113.66	-	113.66	127.34	13.68	12.03%
7				30	139.50	-	139.50	149.60	10.11	7.25%
8	Basic Service Charge:	$ 23.00	$ -	35	165.33	-	165.33	182.63	17.30	10.46%
9				40	191.16	-	191.16	215.65	24.49	12.81%
10	Tier One Breakover (M Gal):	5		45	216.99	-	216.99	248.68	31.69	14.60%
11	Tier Two Breakover (M Gal):	15		50	242.82	-	242.82	281.70	38.88	16.01%
12	Tier Three Breakover (M Gal):	99,999		55	268.66	-	268.66	314.73	46.07	17.15%
13	Tier Four Breakover (M Gal):	99,999		60	294.49	-	294.49	347.75	53.26	18.09%
14				65	320.32	-	320.32	380.78	60.46	18.87%
15	Tier One Rate:	$ 1.8000	$ -	70	346.15	-	346.15	413.80	67.65	19.54%
16	Tier Two Rate:	3.0000	-	75	371.98	-	371.98	446.83	74.84	20.12%
17	Tier Three Rate:	5.1664	-	100	501.14	-	501.14	611.95	110.80	22.11%
18	Tier Four Rate:	5.1664	-	150	759.46	-	759.46	942.19	182.73	24.06%
19				200	1,017.78	-	1,017.78	1,272.44	254.66	25.02%
20				250	1,276.10	-	1,276.10	1,602.69	326.58	25.59%
21	Proposed Rates - Rebuttal			300	1,534.42	-	1,534.42	1,932.93	398.51	25.97%
22				350	1,792.74	-	1,792.74	2,263.18	470.43	26.24%
23				400	2,051.06	-	2,051.06	2,593.42	542.36	26.44%
24	Basic Service Charge:	$ 30.00	$ -	450	2,309.38	-	2,309.38	2,923.67	614.29	26.60%
25				500	2,567.70	-	2,567.70	3,253.92	686.21	26.72%
26	Tier One Breakover (M Gal):	3		550	2,826.02	-	2,826.02	3,584.16	758.14	26.83%
27	Tier Two Breakover (M Gal):	10		600	3,084.34	-	3,084.34	3,914.41	830.06	26.91%
28	Tier Three Breakover (M Gal):	30		650	3,342.66	-	3,342.66	4,244.65	901.99	26.98%
29	Tier Four Breakover (M Gal):	99,999		700	3,600.98	-	3,600.98	4,574.90	973.91	27.05%
30				750	3,859.30	-	3,859.30	4,905.14	1,045.84	27.10%
31	Tier One Rate:	$ 2.3012	$ -	800	4,117.62	-	4,117.62	5,235.39	1,117.77	27.15%
32	Tier Two Rate:	3.3771	-	850	4,375.94	-	4,375.94	5,565.64	1,189.69	27.19%
33	Tier Three Rate:	4.4531	-	900	4,634.26	-	4,634.26	5,895.88	1,261.62	27.22%
34	Tier Four Rate:	6.6049	-	1,000	5,150.90	-	5,150.90	6,556.37	1,405.47	27.29%
35				1,500	7,734.10	-	7,734.10	9,858.83	2,124.73	27.47%
36				2,000	10,317.30	-	10,317.30	13,161.29	2,843.99	27.57%
37				2,500	12,900.50	-	12,900.50	16,463.75	3,563.24	27.62%
38				3,000	15,483.70	-	15,483.70	19,766.21	4,282.50	27.66%
39										
40										
41			Average Usage:	11.7	$ 52.20	$ -	$ 52.20	$ 68.26	$ 16.06	30.77%
42			Median Usage:	7.7	$ 40.04	$ -	$ 40.04	$ 52.71	$ 12.67	31.64%
43			Standardized Usage:	7.5	$ 39.50	$ -	$ 39.50	$ 52.10	$ 12.60	31.90%
44										
45					Proposed Bill at Lifeline Usage:			$ 36.90		
46					Cost of Service at Lifeline Usage:			$ 49.26		
47					% Cost Discount at Lifeline Usage:			25.08%		
48										
49					Cost of Service at Average Usage:			$ 76.41		
50					% Cost Discount at Average Usage:			10.66%		
51										
52										
53										
54										
55										

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Typical Bill Analysis -
With 15% Rate Reduction for Abbott

Ajo

Line No.		[A] Base Rates	[B] Adjusters & Surcharges (ACRM/SIB)	[C] Monthly Usage (M Gal)	[D] Typical Bill Present Rates Base Rates	[E] Adjusters & Surcharges	[F] Total	[G] Proposed Rates - Rebuttal	[H] Increase - Rebuttal Amount	[I] Percent
1	Residential 5/8 x 3/4 -inch									
2				-	$ 25.00	$ -	$ 25.00	$ 28.00	$ 3.00	12.00%
3				5	46.99	-	46.99	56.42	9.44	20.09%
4				15	122.85	-	122.85	160.41	37.56	30.58%
5	Present Rates			20	168.96	-	168.96	222.23	53.26	31.52%
6				25	215.08	-	215.08	284.04	68.96	32.06%
7				30	261.19	-	261.19	345.86	84.66	32.41%
8	Basic Service Charge:	$ 25.00	$ -	35	307.31	-	307.31	407.67	100.37	32.66%
9				40	353.42	-	353.42	469.49	116.07	32.84%
10	Tier One Breakover (M Gal):	3		45	399.53	-	399.53	531.30	131.77	32.98%
11	Tier Two Breakover (M Gal):	10		50	445.65	-	445.65	593.12	147.47	33.09%
12	Tier Three Breakover (M Gal):	99,999		55	491.76	-	491.76	654.93	163.17	33.18%
13	Tier Four Breakover (M Gal):	99,999		60	537.88	-	537.88	716.75	178.87	33.26%
14				65	583.99	-	583.99	778.56	194.57	33.32%
15	Tier One Rate:	$ 3.3617	$ -	70	630.10	-	630.10	840.38	210.27	33.37%
16	Tier Two Rate:	5.9502	-	75	676.22	-	676.22	902.19	225.97	33.42%
17	Tier Three Rate:	9.2228	-	100	906.79	-	906.79	1,211.27	304.48	33.58%
18	Tier Four Rate:	9.2228	-	150	1,367.93	-	1,367.93	1,829.42	461.49	33.74%
19				200	1,829.07	-	1,829.07	2,447.57	618.50	33.81%
20				250	2,290.21	-	2,290.21	3,065.72	775.51	33.86%
21	Proposed Rates - Rebuttal			300	2,751.35	-	2,751.35	3,683.87	932.52	33.89%
22				350	3,212.49	-	3,212.49	4,302.02	1,089.53	33.92%
23				400	3,673.63	-	3,673.63	4,920.17	1,246.54	33.93%
24	Basic Service Charge:	$ 28.00	$ -	450	4,134.77	-	4,134.77	5,538.32	1,403.55	33.95%
25				500	4,595.91	-	4,595.91	6,156.47	1,560.56	33.96%
26	Tier One Breakover (M Gal):	2		550	5,057.05	-	5,057.05	6,774.62	1,717.57	33.96%
27	Tier Two Breakover (M Gal):	5		600	5,518.19	-	5,518.19	7,392.77	1,874.58	33.97%
28	Tier Three Breakover (M Gal):	10		650	5,979.33	-	5,979.33	8,010.92	2,031.59	33.98%
29	Tier Four Breakover (M Gal):	99,999		700	6,440.47	-	6,440.47	8,629.07	2,188.60	33.98%
30				750	6,901.61	-	6,901.61	9,247.22	2,345.61	33.99%
31	Tier One Rate:	$ 4.5063	$ -	800	7,362.75	-	7,362.75	9,865.37	2,502.62	33.99%
32	Tier Two Rate:	6.4705	-	850	7,823.89	-	7,823.89	10,483.52	2,659.63	33.99%
33	Tier Three Rate:	8.4347	-	900	8,285.03	-	8,285.03	11,101.67	2,816.64	34.00%
34	Tier Four Rate:	12.3630	-	1,000	9,207.31	-	9,207.31	12,337.97	3,130.66	34.00%
35				1,500	13,818.71	-	13,818.71	18,519.47	4,700.76	34.02%
36				2,000	18,430.11	-	18,430.11	24,700.97	6,270.86	34.03%
37				2,500	23,041.51	-	23,041.51	30,882.47	7,840.96	34.03%
38				3,000	27,652.91	-	27,652.91	37,063.97	9,411.06	34.03%
39										
40										
41			Average Usage:	4.0	$ 40.98	$ -	$ 40.98	$ 49.90	$ 8.91	21.75%
42			Median Usage:	2.7	$ 34.01	$ -	$ 34.01	$ 41.41	$ 7.40	21.77%
43			Standardized Usage:	7.5	$ 61.86	$ -	$ 61.86	$ 77.51	$ 15.65	25.30%
44										
45							Proposed Bill at Lifeline Usage:	$ 37.01		
46							Cost of Service at Lifeline Usage:	$ 44.19		
47							% Cost Discount at Lifeline Usage:	16.24%		
48										
49							Cost of Service at Average Usage:	$ 56.43		
50							% Cost Discount at Average Usage:	11.58%		
51										
52										
53										
54										
55										

ATTACHMENT 31

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Detail Analysis of Revenue by Class

				Western Group								
		[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]
				Water Revenues Per Bill Count								
							Company - As Filed			Company - Rebuttal		
Line No.	Detail Class of Service	Average Number of Customers	Average Monthly Usage	Test Year Rates	Normalizing Adjustments (IS-4, 6 & 7)	Adjusted T.Y. Rates [C + D]	Proposed Rates	Increase [F - E]	%	Proposed Rates	Amount [I - E]	%
1												
2	Residential 5/8 x 3/4 -inch	28,065	7,956	$ 11,518,790	$ (94,383)	$ 11,424,407	$ 14,416,795	$ 2,992,388	26.19%	$ 14,419,580	$ 2,995,173	26.22%
3	Residential 1-inch	914	14,468	974,198	(715)	973,483	1,275,196	301,714	30.99%	1,277,930	304,447	31.27%
4	Residential 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Residential 2-inch	55	179,925	424,390	(7,945)	416,445	566,999	150,554	36.15%	566,278	149,833	35.98%
6	Residential 3-inch	9	547,345	196,224	(3,454)	192,770	262,626	69,856	36.24%	261,806	69,036	35.81%
7	Residential 4-inch	6	730,636	174,978	(2,995)	171,983	236,846	64,863	37.71%	236,126	64,142	37.30%
8	Residential 6-inch	8	646,961	220,807	(2,950)	217,857	310,717	92,859	42.62%	309,967	92,110	42.28%
9	Residential 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
10	Residential 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
11	Commercial 5/8 x 3/4 -inch	963	6,976	422,262	101	422,363	571,893	149,530	35.40%	571,841	149,478	35.39%
12	Commercial 1-inch	554	25,187	787,743	(2,611)	785,132	1,038,600	253,468	32.28%	1,039,550	254,418	32.40%
13	Commercial 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
14	Commercial 2-inch	560	108,268	3,007,434	(2,489)	3,004,945	4,013,646	1,008,701	33.57%	4,012,993	1,008,048	33.55%
15	Commercial 3-inch	37	196,898	351,065	3,351	354,416	476,767	122,351	34.52%	476,333	121,917	34.40%
16	Commercial 4-inch	24	733,268	730,234	2,425	732,660	959,281	226,621	30.93%	956,434	223,774	30.54%
17	Commercial 6-inch	15	827,973	542,261	-	542,261	723,012	180,751	33.33%	721,192	178,931	33.00%
18	Commercial 8-inch	1	2,974,873	108,006	9,819	117,825	152,382	34,557	29.33%	151,913	34,088	28.93%
19	Commercial 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
20	Industrial 5/8 x 3/4 -inch	3	21,125	2,187	-	2,187	3,161	974	44.54%	3,161	974	44.54%
21	Industrial 1-inch	5	106,372	17,560	-	17,560	21,206	3,646	20.76%	21,206	3,646	20.76%
22	Industrial 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
23	Industrial 2-inch	7	139,819	34,648	-	34,648	53,512	18,864	54.44%	53,512	18,864	54.44%
24	Industrial 3-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
25	Industrial 4-inch	4	918,070	107,429	-	107,429	139,488	32,058	29.84%	139,488	32,058	29.84%
26	Industrial 6-inch	5	7,935,970	752,002	-	752,002	892,642	140,639	18.70%	892,642	140,639	18.70%
27	Industrial 8-inch	1	2,158,523	60,134	-	60,134	85,506	25,372	42.19%	85,506	25,372	42.19%
28	Industrial 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
29	Private Fire Serivce	416	-	124,650	-	124,650	174,510	49,860	40.00%	174,510	49,860	40.00%
30	Other Water Revenues											
31	Public Fire Hydrant	-	-	-	-	-	-	-	0.00%	-	-	0.00%
32	Coin Machine	2	41	13,968	-	13,968	14,570	602	4.31%	14,533	565	4.05%
33	Construction 5/8 x 3/4 -inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
34	Construction 1-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
35	Construction 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
36	Construction 2-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
37	Construction 3-Inch	34	71,380	189,121	-	189,121	257,724	68,604	36.27%	257,715	68,594	36.27%
38	Construction 4-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
39	Construction 6-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
40	Construction 8-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
41	Construction 10-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
42	Sales for Resale 5/8 x 3/4-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
43	Sales for Resale 1-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
44	Sales for Resale ½-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
45	Sales for Resale 2-Inch	3	379,606	25,790	-	25,790	37,116	11,326	43.92%	37,006	11,216	43.49%
46	Sales for Resale 3-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
47	Sales for Resale 4-Inch	1	976,083	22,955	-	22,955	33,141	10,186	44.37%	33,047	10,092	43.96%
48	Sales for Resale 6-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
49	Sales for Resale 8-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
50	Sales for Resale 10-Inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
51												
52	Totals	31,691	13,634	$ 20,808,837	$ (101,846)	$ 20,706,991	$ 26,717,335	$ 6,010,344	29.03%	$ 26,714,266	$ 6,007,275	29.01%
53												
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Supporting Schedules:

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Recap Schedules:
H-1 Rebuttal

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Summary Analysis of Revenue by Class

				Western Group								
		[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]
				Water Revenues Per Bill Count								
							Company - As Filed			Company - Rebuttal		
Line No.	Summary Class of Service	Average Number of Customers	Average Monthly Usage	Test Year Rates	Normalizing Adjustments (IS-4, 6 & 7)	Adjusted T.Y. Rates [C + D]	Proposed Rates	Increase [F - E]	%	Proposed Rates	Amount [I - E]	%
1												
2	Total Residential	29,058	8,980	$ 13,509,387	$ (112,442)	$ 13,396,945	$ 17,069,179	$ 3,672,234	27.41%	$ 17,071,686	$ 3,674,741	27.43%
3	Total Commercial	2,153	56,264	5,949,006	10,596	5,959,602	7,935,581	1,975,979	33.16%	7,930,254	1,970,653	33.07%
4	Total Industrial	19	264,100	161,824	-	161,824	217,366	55,542	34.32%	217,366	55,542	34.32%
5	Total Large Industrial	5	1,868,709	225,896	-	225,896	306,103	80,207	35.51%	306,103	80,206	35.51%
6	Abbott Laboratories	1	31,002,167	586,240	-	586,240	672,045	85,805	14.64%	672,046	85,805	14.64%
7	Total Private Fire	416	-	124,650	-	124,650	174,510	49,860	40.00%	174,510	49,860	40.00%
8	Total Other Water Revenues	40	18,195,489	251,834	-	251,834	342,551	90,717	36.02%	342,301	90,467	35.92%
9												
10	Totals	31,691	13,634	$ 20,808,837	$ (101,846)	$ 20,706,991	$ 26,717,335	$ 6,010,344	29.03%	$ 26,714,266	$ 6,007,275	29.01%
11												
12	Miscellaneous Revenues			1,032,757	(522,915)	509,842	509,842	-	0.00%	509,842	-	0.00%
13	Total Revenue Generated						$ 27,227,177			$ 27,224,108		
14												
15	Target Rev. Rqmt. (Sch. C-1)						27,227,177			27,224,107		
16	Difference						$ 0			$ 1		
17												
18	Less: Consolidated Revenue Adj.						-			-		
19	Over/(Short)						$ 0			$ 1		
20	%						0.00%			0.00%		
21												
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ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Detail Analysis of Revenue by Class

Pinal Valley

Line No.	Detail Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Increase [F - E]	[H] %	[I] Company - Rebuttal: Proposed Rates	[J] Amount [I - E]	[K] %
1												
2	Residential 5/8 x 3/4 -inch	25,719	7,781	$ 9,927,216	$ (80,652)	$ 9,846,563	$ 12,491,248	$ 2,644,684	26.86%	$ 12,470,472	$ 2,623,908	26.65%
3	Residential 1-inch	439	20,927	488,330	(4,443)	483,886	650,173	166,286	34.36%	648,858	164,972	34.09%
4	Residential 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Residential 2-inch	54	173,712	392,272	(6,910)	385,363	527,172	141,809	36.80%	525,663	140,300	36.41%
6	Residential 3-inch	9	547,345	196,224	(3,454)	192,770	262,626	69,856	36.24%	261,806	69,036	35.81%
7	Residential 4-inch	6	730,636	174,978	(2,995)	171,983	236,846	64,863	37.71%	236,126	64,142	37.30%
8	Residential 6-inch	8	646,961	220,807	(2,950)	217,857	310,717	92,859	42.62%	309,967	92,110	42.28%
9	Residential 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
10	Residential 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
11	Commercial 5/8 x 3/4 -inch	902	6,950	374,025	(61)	373,964	511,451	137,488	36.76%	510,571	136,607	36.53%
12	Commercial 1-inch	513	24,434	655,888	(640)	655,248	876,238	220,990	33.73%	874,440	219,191	33.45%
13	Commercial 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
14	Commercial 2-inch	537	103,546	2,668,415	(2,489)	2,665,926	3,577,684	911,758	34.20%	3,569,311	903,385	33.89%
15	Commercial 3-inch	35	196,297	321,612	3,351	324,964	437,544	112,581	34.64%	436,559	111,596	34.34%
16	Commercial 4-inch	24	733,268	730,234	2,425	732,660	959,281	226,621	30.93%	956,434	223,774	30.54%
17	Commercial 6-inch	15	827,973	542,261	-	542,261	723,012	180,751	33.33%	721,192	178,931	33.00%
18	Commercial 8-inch	1	2,974,873	108,006	9,819	117,825	152,382	34,557	29.33%	151,913	34,088	28.93%
19	Commercial 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
20	Industrial 5/8 x 3/4 -inch	3	21,125	2,187		2,187	3,161	974	44.54%	3,161	974	44.54%
21	Industrial 1-inch	5	106,372	17,560		17,560	21,206	3,646	20.76%	21,206	3,646	20.76%
22	Industrial 1 ½-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
23	Industrial 2-inch	7	139,819	34,648		34,648	53,512	18,864	54.44%	53,512	18,864	54.44%
24	Industrial 3-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
25	Industrial 4-inch	4	918,070	107,429		107,429	139,488	32,058	29.84%	139,488	32,058	29.84%
26	Industrial 6-inch	4	10,035,991	736,010		736,010	869,084	133,074	18.08%	869,084	133,074	18.08%
27	Industrial 8-inch	1	2,158,523	60,134		60,134	85,506	25,372	42.19%	85,506	25,372	42.19%
28	Industrial 10-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
29	Private Fire Serivce	406	-	121,650		121,650	170,310	48,660	40.00%	170,310	48,660	40.00%
30	Other Water Revenues											
31	Public Fire Hydrant	-	-	-		-	-	-	0.00%	-	-	0.00%
32	Coin Machine	1	41	13,403		13,403	13,978	574	4.28%	13,927	523	3.90%
33	Construction 5/8 x 3/4 -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
34	Construction 1-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
35	Construction 1 ½-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
36	Construction 2-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
37	Construction 3-Inch	28	74,983	153,790		153,790	218,065	64,275	41.79%	217,764	63,974	41.60%
38	Construction 4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
39	Construction 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
40	Construction 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
41	Construction 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
42	Sales for Resale 5/8 x 3/4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
43	Sales for Resale 1-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
44	Sales for Resale ½-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
45	Sales for Resale 2-Inch	3	379,606	25,790		25,790	37,116	11,326	43.92%	37,006	11,216	43.49%
46	Sales for Resale 3-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
47	Sales for Resale 4-Inch	1	976,083	22,955		22,955	33,141	10,186	44.37%	33,047	10,092	43.96%
48	Sales for Resale 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
49	Sales for Resale 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
50	Sales for Resale 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
51												
52	Totals	28,723	13,810	$ 18,095,825	$ (88,999)	$ 18,006,827	$ 23,360,941	$ 5,354,114	29.73%	$ 23,317,320	$ 5,310,493	29.49%
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ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Summary Analysis of Revenue by Class

Pinal Valley

Line No.	Summary Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Increase [F - E]	[H] %	[I] Company - Rebuttal: Proposed Rates	[J] Amount [I - E]	[K] %
1												
2	Total Residential	26,235	8,888	$ 11,399,827	$ (101,404)	$ 11,298,423	$ 14,478,782	$ 3,180,359	28.15%	$ 14,452,890	$ 3,154,468	27.92%
3	Total Commercial	2,026	56,190	5,400,441	12,405	5,412,847	7,237,593	1,824,746	33.71%	7,220,419	1,807,572	33.39%
4	Total Industrial	19	264,100	161,824	-	161,824	217,366	55,542	34.32%	217,366	55,542	34.32%
5	Total Large Industrial	4	2,340,313	209,904	-	209,904	282,546	72,641	34.61%	282,545	72,641	34.61%
6	Abbott Laboratories	1	31,002,167	586,240	-	586,240	672,045	85,805	14.64%	672,046	85,805	14.64%
7	Total Private Fire	406	-	121,650	-	121,650	170,310	48,660	40.00%	170,310	48,660	40.00%
8	Total Other Water Revenues	33	141,960	215,938	-	215,938	302,299	86,361	39.99%	301,744	85,805	39.74%
9												
10	Totals	28,723	13,810	$ 18,095,825	$ (88,999)	$ 18,006,827	$ 23,360,941	$ 5,354,114	29.73%	$ 23,317,320	$ 5,310,493	29.49%
11												
12	Miscellaneous Revenues			984,035	(522,915)	461,120	461,120	-	0.00%	461,120	-	0.00%
13	Total Revenue Generated						$ 23,822,061			$ 23,778,440		
14												
15	Target Rev. Rqmt. (Sch. C-1)						23,822,061			23,778,440		
16	Difference						$ 0			$ 0		
17												
18	Less: Consolidated Revenue Adj.						-			-		
19	Over/(Short)						$ 0			$ 0		
20	%						0.00%			0.00%		
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ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Detail Analysis of Revenue by Class

White Tank

Line No.	Detail Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Increase [F - E]	[H] %	[I] Company - Rebuttal: Proposed Rates	[J] Amount [I - E]	[K] %
1												
2	Residential 5/8 x 3/4 -inch	1,784	11,733	$ 1,287,322	$ (6,833)	$ 1,280,490	$ 1,566,212	$ 285,723	22.31%	$ 1,585,690	$ 305,201	23.83%
3	Residential 1-inch	467	8,588	476,133	3,891	480,023	614,097	134,074	27.93%	618,065	138,041	28.76%
4	Residential 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Residential 2-inch	1	515,983	32,118	(1,035)	31,082	39,826	8,744	28.13%	40,616	9,533	30.67%
6	Residential 3-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
7	Residential 4-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
8	Residential 6-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
9	Residential 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
10	Residential 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
11	Commercial 5/8 x 3/4 -inch	14	15,673	15,249	-	15,249	18,982	3,733	24.48%	19,262	4,013	26.31%
12	Commercial 1-inch	22	39,650	62,072	(1,971)	60,100	76,378	16,277	27.08%	77,538	17,438	29.01%
13	Commercial 1 ½-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
14	Commercial 2-inch	19	256,775	316,825	-	316,825	407,834	91,009	28.73%	415,183	98,358	31.04%
15	Commercial 3-inch	2	207,288	29,452	-	29,452	39,223	9,770	33.17%	39,773	10,321	35.04%
16	Commercial 4-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
17	Commercial 6-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
18	Commercial 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
19	Commercial 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
20	Industrial 5/8 x 3/4 -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
21	Industrial 1-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
22	Industrial 1 ½-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
23	Industrial 2-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
24	Industrial 3-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
25	Industrial 4-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
26	Industrial 6-inch	1	60,892	15,992		15,992	23,557	7,565	47.31%	23,557	7,565	47.31%
27	Industrial 8-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
28	Industrial 10-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
29	Private Fire Serivce	6	-	1,800		1,800	2,520	720	40.00%	2,520	720	40.00%
30	Other Water Revenues											
31	Public Fire Hydrant	-	-	-		-	-	-	0.00%	-	-	0.00%
32	Coin Machine	-	-	-		-	-	-	0.00%	-	-	0.00%
33	Construction 5/8 x 3/4 -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
34	Construction 1-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
35	Construction 1 ½-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
36	Construction 2-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
37	Construction 3-Inch	5	52,591	35,331		35,331	39,659	4,328	12.25%	39,951	4,620	13.08%
38	Construction 4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
39	Construction 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
40	Construction 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
41	Construction 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
42	Sales for Resale 5/8 x 3/4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
43	Sales for Resale 1-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
44	Sales for Resale ½-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
45	Sales for Resale 2-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
46	Sales for Resale 3-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
47	Sales for Resale 4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
48	Sales for Resale 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
49	Sales for Resale 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
50	Sales for Resale 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
51												
52	Totals	2,321	13,864	$ 2,272,294	$ (5,949)	$ 2,266,346	$ 2,828,289	$ 561,944	24.80%	$ 2,862,156	$ 595,810	26.29%
53												
54												
55												

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Summary Analysis of Revenue by Class

White Tank

Line No.	Summary Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Company - As Filed: Increase [F - E]	[H] Company - As Filed: %	[I] Company - Rebuttal: Proposed Rates	[J] Company - Rebuttal: Amount [I - E]	[K] Company - Rebuttal: %
1												
2	Total Residential	2,252	11,305	$ 1,795,573	$ (3,977)	$ 1,791,595	$ 2,220,136	$ 428,541	23.92%	$ 2,244,371	$ 452,776	25.27%
3	Total Commercial	57	112,337	423,599	(1,971)	421,627	542,416	120,789	28.65%	551,757	130,129	30.86%
4	Total Industrial	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Total Large Industrial	1	60,892	15,992	-	15,992	23,557	7,565	47.31%	23,557	7,565	47.31%
6	Abbott Laboratories	-	-	-	-	-	-	-	0.00%	-	-	0.00%
7	Total Private Fire	6	-	1,800	-	1,800	2,520	720	40.00%	2,520	720	40.00%
8	Total Other Water Revenues	5	52,591	35,331	-	35,331	39,659	4,328	12.25%	39,951	4,620	13.08%
9												
10	Totals	2,321	13,864	$ 2,272,294	$ (5,949)	$ 2,266,346	$ 2,828,289	$ 561,944	24.80%	$ 2,862,156	$ 595,810	26.29%
11												
12	Miscellaneous Revenues			44,621	-	44,621	44,621	-	0.00%	44,621	-	0.00%
13	Total Revenue Generated						$ 2,872,910			$ 2,906,777		
14												
15	Target Rev. Rqmt. (Sch. C-1)						2,872,910			2,906,776		
16	Difference						$ 0			$ 0		
17												
18	Less: Consolidated Revenue Adj.						-			-		
19	Over/(Short)						$ 0			$ 0		
20	%						0.00%			0.00%		
21												
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ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Detail Analysis of Revenue by Class

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Line No.	Detail Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Company - As Filed: Increase [F - E]	[H] %	[I] Company - Rebuttal: Proposed Rates	[J] Company - Rebuttal: Amount [I - E]	[K] %
1												
2	Residential 5/8 x 3/4 -inch	562	3,991	$ 304,252	$ (6,898)	$ 297,354	$ 359,334	$ 61,981	20.84%	$ 363,418	$ 66,064	22.22%
3	Residential 1-inch	9	4,493	9,736	(162)	9,573	10,926	1,353	14.13%	11,007	1,434	14.98%
4	Residential 1 ½ -inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Residential 2-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
6	Residential 3-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
7	Residential 4-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
8	Residential 6-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
9	Residential 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
10	Residential 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
11	Commercial 5/8 x 3/4 -inch	47	4,878	32,988	162	33,150	41,460	8,309	25.07%	42,008	8,858	26.72%
12	Commercial 1-inch	20	28,759	69,784	-	69,784	85,984	16,200	23.22%	87,572	17,788	25.49%
13	Commercial 1 ½ -inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
14	Commercial 2-inch	4	36,363	22,194	-	22,194	28,128	5,934	26.74%	28,499	6,305	28.41%
15	Commercial 3-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
16	Commercial 4-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
17	Commercial 6-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
18	Commercial 8-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
19	Commercial 10-inch	-	-	-	-	-	-	-	0.00%	-	-	0.00%
20	Industrial 5/8 x 3/4 -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
21	Industrial 1-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
22	Industrial 1 ½ -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
23	Industrial 2-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
24	Industrial 3-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
25	Industrial 4-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
26	Industrial 6-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
27	Industrial 8-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
28	Industrial 10-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
29	Private Fire Serivce	4	-	1,200		1,200	1,680	480	40.00%	1,680	480	40.00%
30	Other Water Revenues											
31	Public Fire Hydrant	-	-	-		-	-	-	0.00%	-	-	0.00%
32	Coin Machine	1	1	564		564	592	28	4.94%	607	42	7.46%
33	Construction 5/8 x 3/4 -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
34	Construction 1-inch	-	-	-		-	-	-	0.00%	-	-	0.00%
35	Construction 1 ½ -inch	-	-	-		-	-	-	0.00%	-	-	0.00%
36	Construction 2-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
37	Construction 3-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
38	Construction 4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
39	Construction 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
40	Construction 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
41	Construction 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
42	Sales for Resale 5/8 x 3/4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
43	Sales for Resale 1-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
44	Sales for Resale ½ -Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
45	Sales for Resale 2-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
46	Sales for Resale 3-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
47	Sales for Resale 4-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
48	Sales for Resale 6-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
49	Sales for Resale 8-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
50	Sales for Resale 10-Inch	-	-	-		-	-	-	0.00%	-	-	0.00%
51												
52	Totals	647	5,009	$ 440,718	$ (6,898)	$ 433,819	$ 528,105	$ 94,286	21.73%	$ 534,790	$ 100,971	23.27%
53												
54												
55												

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Summary Analysis of Revenue by Class

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Line No.	Summary Class of Service	[A] Average Number of Customers	[B] Average Monthly Usage	[C] Water Revenues Per Bill Count: Test Year Rates	[D] Normalizing Adjustments (IS-4, 6 & 7)	[E] Adjusted T.Y. Rates [C + D]	[F] Company - As Filed: Proposed Rates	[G] Company - As Filed: Increase [F - E]	[H] Company - As Filed: %	[I] Company - Rebuttal: Proposed Rates	[J] Company - Rebuttal: Amount [I - E]	[K] Company - Rebuttal: %
1												
2	Total Residential	571	3,999	$ 313,987	$ (7,060)	$ 306,927	$ 370,261	$ 63,334	20.63%	$ 374,425	$ 67,498	21.99%
3	Total Commercial	71	13,408	124,966	162	125,128	155,572	30,444	24.33%	158,079	32,951	26.33%
4	Total Industrial	-	-	-	-	-	-	-	0.00%	-	-	0.00%
5	Total Large Industrial	-	-	-	-	-	-	-	0.00%	-	-	0.00%
6	Abbott Laboratories	-	-	-	-	-	-	-	0.00%	-	-	0.00%
7	Total Private Fire	4	-	1,200	-	1,200	1,680	480	40.00%	1,680	480	40.00%
8	Total Other Water Revenues	1	7,150	564	-	564	592	28	4.94%	607	42	7.46%
9												
10	Totals	647	5,009	$ 440,718	$ (6,898)	$ 433,819	$ 528,105	$ 94,286	21.73%	$ 534,790	$ 100,971	23.27%
11												
12	Miscellaneous Revenues			4,101	-	4,101	4,101	-	0.00%	4,101	-	0.00%
13	Total Revenue Generated						$ 532,206			$ 538,892		
14												
15	Target Rev. Rqmt. (Sch. C-1)						532,206			538,891		
16	Difference						$ 0			$ 0		
17												
18	Less: Consolidated Revenue Adj.						-			-		
19	Over/(Short)						$ 0			$ 0		
20	%						0.00%			0.00%		
21												
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ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules

Pinal Valley

Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Present	[F] Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2	Residential 5/8 x 3/4 -inch	$ 16.00	$ 22.00	$ 6.00	Tier One	3	2	$ 1.1879	$ 1.5190	$ 0.3311
3					Tier Two	10	7	2.1026	2.1811	0.0785
4					Tier Three	99,999	18	3.2590	2.8432	(0.4158)
5					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
6										
7	Residential 3/4-inch	n/a	$ 33.00	n/a	Tier One	n/a	4	n/a	$ 1.5190	n/a
8					Tier Two	n/a	10	n/a	2.1811	n/a
9					Tier Three	n/a	18	n/a	2.8432	n/a
10					Tier Four	n/a	99,999	n/a	4.1674	n/a
11										
12	Residential 1-inch	$ 40.00	$ 55.00	$ 15.00	Tier One	25	5	$ 2.1026	$ 2.1811	$ 0.0785
13					Tier Two	99,999	18	3.2590	2.8432	(0.4158)
14					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
15					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
16										
17	Residential 1½-inch	$ 80.00	$ 110.00	$ 30.00	Tier One	55	10	$ 2.1026	$ 2.1811	$ 0.0785
18					Tier Two	99,999	35	3.2590	2.8432	(0.4158)
19					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
20					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
21										
22	Residential 2-inch	$ 128.00	$ 176.00	$ 48.00	Tier One	95	16	$ 2.1026	$ 2.1811	$ 0.0785
23					Tier Two	99,999	56	3.2590	2.8432	(0.4158)
24					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
25					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
26										
27	Residential 3-inch	$ 256.00	$ 352.00	$ 96.00	Tier One	195	32	$ 2.1026	$ 2.1811	$ 0.0785
28					Tier Two	99,999	112	3.2590	2.8432	(0.4158)
29					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
30					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
31										
32	Residential 4-inch	$ 400.00	$ 550.00	$ 150.00	Tier One	315	50	$ 2.1026	$ 2.1811	$ 0.0785
33					Tier Two	99,999	175	3.2590	2.8432	(0.4158)
34					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
35					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
36										
37	Residential 6-inch	$ 800.00	$ 1,100.00	$ 300.00	Tier One	650	100	$ 2.1026	$ 2.1811	$ 0.0785
38					Tier Two	99,999	350	3.2590	2.8432	(0.4158)
39					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
40					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
41										
42	Residential 8-inch	$ 1,280.00	$ 1,760.00	$ 480.00	Tier One	1,000	160	$ 2.1026	$ 2.1811	$ 0.0785
43					Tier Two	99,999	560	3.2590	2.8432	(0.4158)
44					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
45					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
46										
47	Residential 10-inch	$ 1,840.00	$ 2,530.00	$ 690.00	Tier One	1,475	230	$ 2.1026	$ 2.1811	$ 0.0785
48					Tier Two	99,999	805	3.2590	2.8432	(0.4158)
49					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
50					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

Pinal Valley

Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2	Commercial 5/8 x 3/4 -inch	$ 16.00	$ 25.00	$ 9.00	Tier One	10	3	$ 2.1026	$ 2.1811	$ 0.0785
3					Tier Two	99,999	15	3.2590	2.8432	(0.4158)
4					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
5					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
6										
7	Commercial 3/4-inch	n/a	$ 37.50	n/a	Tier One	n/a	5	n/a	$ 2.1811	n/a
8					Tier Two	n/a	20	n/a	2.8432	n/a
9					Tier Three	n/a	99,999	n/a	4.1674	n/a
10					Tier Four	n/a	99,999	n/a	4.1674	n/a
11										
12	Commercial 1-inch	$ 40.00	$ 62.50	$ 22.50	Tier One	25	8	$ 2.1026	$ 2.1811	$ 0.0785
13					Tier Two	99,999	38	3.2590	2.8432	(0.4158)
14					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
15					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
16										
17	Commercial 1½-inch	$ 80.00	$ 125.00	$ 45.00	Tier One	55	15	$ 2.1026	$ 2.1811	$ 0.0785
18					Tier Two	99,999	75	3.2590	2.8432	(0.4158)
19					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
20					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
21										
22	Commercial 2-inch	$ 128.00	$ 200.00	$ 72.00	Tier One	95	24	$ 2.1026	$ 2.1811	$ 0.0785
23					Tier Two	99,999	120	3.2590	2.8432	(0.4158)
24					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
25					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
26										
27	Commercial 3-inch	$ 256.00	$ 400.00	$ 144.00	Tier One	195	48	$ 2.1026	$ 2.1811	$ 0.0785
28					Tier Two	99,999	240	3.2590	2.8432	(0.4158)
29					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
30					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
31										
32	Commercial 4-inch	$ 400.00	$ 625.00	$ 225.00	Tier One	315	75	$ 2.1026	$ 2.1811	$ 0.0785
33					Tier Two	99,999	375	3.2590	2.8432	(0.4158)
34					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
35					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
36										
37	Commercial 6-inch	$ 800.00	$ 1,250.00	$ 450.00	Tier One	650	150	$ 2.1026	$ 2.1811	$ 0.0785
38					Tier Two	99,999	750	3.2590	2.8432	(0.4158)
39					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
40					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
41										
42	Commercial 8-inch	$ 1,280.00	$ 2,000.00	$ 720.00	Tier One	1,000	240	$ 2.1026	$ 2.1811	$ 0.0785
43					Tier Two	99,999	1,200	3.2590	2.8432	(0.4158)
44					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
45					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
46										
47	Commercial 10-inch	$ 1,840.00	$ 2,875.00	$ 1,035.00	Tier One	1,475	345	$ 2.1026	$ 2.1811	$ 0.0785
48					Tier Two	99,999	1,725	3.2590	2.8432	(0.4158)
49					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
50					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

Line No.	Class of Service	Pinal Valley [A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2	Industrial 5/8 x 3/4 -inch	$ 16.00	$ 35.00	$ 19.00	Tier One	10	99,999	$ 1.5500	$ 2.5000	$ 0.9500
3					Tier Two	99,999	99,999	2.4800	2.5000	0.0200
4					Tier Three	99,999	99,999	2.4800	2.5000	0.0200
5					Tier Four	99,999	99,999	2.4800	2.5000	0.0200
6										
7	Industrial 3/4-inch	n/a	$ 52.50	n/a	Tier One	n/a	99,999	n/a	$ 2.5000	n/a
8					Tier Two	n/a	99,999	n/a	2.5000	n/a
9					Tier Three	n/a	99,999	n/a	2.5000	n/a
10					Tier Four	n/a	99,999	n/a	2.5000	n/a
11										
12	Industrial 1-inch	$ 40.00	$ 87.50	$ 47.50	Tier One	25	99,999	$ 1.5500	$ 2.5000	$ 0.9500
13					Tier Two	99,999	99,999	2.4800	2.5000	0.0200
14					Tier Three	99,999	99,999	2.4800	2.5000	0.0200
15					Tier Four	99,999	99,999	2.4800	2.5000	0.0200
16										
17	Industrial 1½-inch	$ 80.00	$ 175.00	$ 95.00	Tier One	55	99,999	$ 1.5500	$ 2.5000	$ 0.9500
18					Tier Two	99,999	99,999	2.4800	2.5000	0.0200
19					Tier Three	99,999	99,999	2.4800	2.5000	0.0200
20					Tier Four	99,999	99,999	2.4800	2.5000	0.0200
21										
22	Industrial 2-inch	$ 128.00	$ 280.00	$ 152.00	Tier One	95	99,999	$ 1.5500	$ 2.5000	$ 0.9500
23					Tier Two	99,999	99,999	2.4800	2.5000	0.0200
24					Tier Three	99,999	99,999	2.4800	2.5000	0.0200
25					Tier Four	99,999	99,999	2.4800	2.5000	0.0200
26										
27	Industrial 3-inch	$ 256.00	$ 560.00	$ 304.00	Tier One	195	99,999	$ 1.5500	$ 2.5000	$ 0.9500
28					Tier Two	99,999	99,999	2.4800	2.5000	0.0200
29					Tier Three	99,999	99,999	2.4800	2.5000	0.0200
30					Tier Four	99,999	99,999	2.4800	2.5000	0.0200
31										
32	Industrial 4-inch	$ 400.00	$ 875.00	$ 475.00	Tier One	315	99,999	$ 1.5500	$ 2.5000	$ 0.9500
33					Tier Two	99,999	99,999	2.4800	2.5000	0.0200
34					Tier Three	99,999	99,999	2.4800	2.5000	0.0200
35					Tier Four	99,999	99,999	2.4800	2.5000	0.0200
36										
37	Industrial 6-inch	$ 800.00	$ 1,750.00	$ 950.00	Tier One	99,999	99,999	$ 1.5500	$ 1.7500	$ 0.2000
38					Tier Two	99,999	99,999	1.5500	1.7500	0.2000
39					Tier Three	99,999	99,999	1.5500	1.7500	0.2000
40					Tier Four	99,999	99,999	1.5500	1.7500	0.2000
41										
42	Industrial 8-inch	$ 1,280.00	$ 2,800.00	$ 1,520.00	Tier One	99,999	99,999	$ 1.5500	$ 1.7500	$ 0.2000
43					Tier Two	99,999	99,999	1.5500	1.7500	0.2000
44					Tier Three	99,999	99,999	1.5500	1.7500	0.2000
45					Tier Four	99,999	99,999	1.5500	1.7500	0.2000
46										
47	Industrial 10-inch	$ 1,840.00	$ 4,025.00	$ 2,185.00	Tier One	99,999	99,999	$ 1.5500	$ 1.7500	$ 0.2000
48					Tier Two	99,999	99,999	1.5500	1.7500	0.2000
49					Tier Three	99,999	99,999	1.5500	1.7500	0.2000
50					Tier Four	99,999	99,999	1.5500	1.7500	0.2000
51										
52	Private Fire Service (all connection sizes)	$ 25.00	$ 35.00	$ 10.00	n/a	n/a	n/a	n/a	n/a	n/a
53	Public Fire Hydrant	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

Pinal Valley

Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2										
3	Coin Machine (No. of Gallons / $0.25)	n/a	n/a	n/a	n/a	n/a	n/a	109	105	3.76%
4										
5	Construction 5/8 x 3/4-inch	n/a	$ 25.00	n/a	Tier One	n/a	3	n/a	$ 2.1811	n/a
6					Tier Two	n/a	15	n/a	2.8432	n/a
7					Tier Three	n/a	99,999	n/a	4.1674	n/a
8					Tier Four	n/a	99,999	n/a	4.1674	n/a
9										
10	Construction 3/4-inch	n/a	$ 37.50	n/a	Tier One	n/a	5	n/a	$ 2.1811	n/a
11					Tier Two	n/a	20	n/a	2.8432	n/a
12					Tier Three	n/a	99,999	n/a	4.1674	n/a
13					Tier Four	n/a	99,999	n/a	4.1674	n/a
14										
15	Construction 1-inch	n/a	$ 62.50	n/a	Tier One	n/a	8	n/a	$ 2.1811	n/a
16					Tier Two	n/a	38	n/a	2.8432	n/a
17					Tier Three	n/a	99,999	n/a	4.1674	n/a
18					Tier Four	n/a	99,999	n/a	4.1674	n/a
19										
20	Construction ½-inch	n/a	$ 125.00	n/a	Tier One	n/a	15	n/a	$ 2.1811	n/a
21					Tier Two	n/a	75	n/a	2.8432	n/a
22					Tier Three	n/a	99,999	n/a	4.1674	n/a
23					Tier Four	n/a	99,999	n/a	4.1674	n/a
24										
25	Construction 2-Inch	$ 128.00	$ 200.00	$ 72.00	Tier One	95	24	$ 2.1026	$ 2.1811	$ 0.0785
26					Tier Two	99,999	120	3.2590	2.8432	(0.4158)
27					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
28					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
29										
30	Construction 3-Inch	$ 256.00	$ 400.00	$ 144.00	Tier One	195	48	$ 2.1026	$ 2.1811	$ 0.0785
31					Tier Two	99,999	240	3.2590	2.8432	(0.4158)
32					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
33					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
34										
35	Construction 4-Inch	$ 400.00	$ 625.00	$ 225.00	Tier One	315	75	$ 2.1026	$ 2.1811	$ 0.0785
36					Tier Two	99,999	375	3.2590	2.8432	(0.4158)
37					Tier Three	99,999	99,999	3.2590	4.1674	0.9084
38					Tier Four	99,999	99,999	3.2590	4.1674	0.9084
39										
40	Construction 6-Inch	n/a	$ 1,250.00	n/a	Tier One	n/a	150	n/a	$ 2.1811	n/a
41					Tier Two	n/a	750	n/a	2.8432	n/a
42					Tier Three	n/a	99,999	n/a	4.1674	n/a
43					Tier Four	n/a	99,999	n/a	4.1674	n/a
44										
45	Construction 8-Inch	n/a	$ 2,000.00	n/a	Tier One	n/a	240	n/a	$ 2.1811	n/a
46					Tier Two	n/a	1,200	n/a	2.8432	n/a
47					Tier Three	n/a	99,999	n/a	4.1674	n/a
48					Tier Four	n/a	99,999	n/a	4.1674	n/a
49										
50	Construction 10-Inch	n/a	$ 2,875.00	n/a	Tier One	n/a	345	n/a	$ 2.1811	n/a
51					Tier Two	n/a	1,725	n/a	2.8432	n/a
52					Tier Three	n/a	99,999	n/a	4.1674	n/a
53					Tier Four	n/a	99,999	n/a	4.1674	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules

Pinal Valley

Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2										
3	Sales for Resale 5/8-Inch	$ 16.00	$ 25.00	$ 9.00	Tier One	99,999	99,999	$ 1.5500	$ 2.1811	$ 0.6311
4					Tier Two	99,999	99,999	1.5500	2.1811	0.6311
5					Tier Three	99,999	99,999	1.5500	2.1811	0.6311
6					Tier Four	99,999	99,999	1.5500	2.1811	0.6311
7										
8	Sales for Resale 3/4-Inch	n/a	$ 37.50	n/a	Tier One	n/a	99,999	n/a	$ 2.1811	n/a
9					Tier Two	n/a	99,999	n/a	2.1811	n/a
10					Tier Three	n/a	99,999	n/a	2.1811	n/a
11					Tier Four	n/a	99,999	n/a	2.1811	n/a
12										
13	Sales for Resale 1-Inch	$ 40.00	$ 62.50	$ 22.50	Tier One	99,999	99,999	$ 1.5500	$ 2.1811	$ 0.6311
14					Tier Two	99,999	99,999	1.5500	2.1811	0.6311
15					Tier Three	99,999	99,999	1.5500	2.1811	0.6311
16					Tier Four	99,999	99,999	1.5500	2.1811	0.6311
17										
18	Sales for Resale ½-Inch	$ 80.00	$ 125.00	$ 45.00	Tier One	99,999	99,999	$ 1.5500	$ 2.1811	$ 0.6311
19					Tier Two	99,999	99,999	1.5500	2.1811	0.6311
20					Tier Three	99,999	99,999	1.5500	2.1811	0.6311
21					Tier Four	99,999	99,999	1.5500	2.1811	0.6311
22										
23	Sales for Resale 2-Inch	$ 128.00	$ 200.00	$ 72.00	Tier One	99,999	99,999	$ 1.5500	$ 2.1811	$ 0.6311
24					Tier Two	99,999	99,999	1.5500	2.1811	0.6311
25					Tier Three	99,999	99,999	1.5500	2.1811	0.6311
26					Tier Four	99,999	99,999	1.5500	2.1811	0.6311
27										
28	Sales for Resale 3-Inch	$ 256.00	$ 400.00	$ 144.00	Tier One	99,999	99,999	$ 1.5500	$ 2.1811	$ 0.6311
29					Tier Two	99,999	99,999	1.5500	2.1811	0.6311
30					Tier Three	99,999	99,999	1.5500	2.1811	0.6311
31					Tier Four	99,999	99,999	1.5500	2.1811	0.6311
32										
33	Sales for Resale 4-Inch	$ 400.00	$ 625.00	$ 225.00	Tier One	99,999	99,999	$ 1.5500	$ 2.1811	$ 0.6311
34					Tier Two	99,999	99,999	1.5500	2.1811	0.6311
35					Tier Three	99,999	99,999	1.5500	2.1811	0.6311
36					Tier Four	99,999	99,999	1.5500	2.1811	0.6311
37										
38	Sales for Resale 6-Inch	$ 800.00	$ 1,250.00	$ 450.00	Tier One	99,999	99,999	$ 1.5500	$ 2.1811	$ 0.6311
39					Tier Two	99,999	99,999	1.5500	2.1811	0.6311
40					Tier Three	99,999	99,999	1.5500	2.1811	0.6311
41					Tier Four	99,999	99,999	1.5500	2.1811	0.6311
42										
43	Sales for Resale 8-Inch	$ 1,280.00	$ 2,000.00	$ 720.00	Tier One	99,999	99,999	$ 1.5500	$ 2.1811	$ 0.6311
44					Tier Two	99,999	99,999	1.5500	2.1811	0.6311
45					Tier Three	99,999	99,999	1.5500	2.1811	0.6311
46					Tier Four	99,999	99,999	1.5500	2.1811	0.6311
47										
48	Sales for Resale 10-Inch	$ 1,840.00	$ 2,875.00	$ 1,035.00	Tier One	99,999	99,999	$ 1.5500	$ 2.1811	$ 0.6311
49					Tier Two	99,999	99,999	1.5500	2.1811	0.6311
50					Tier Three	99,999	99,999	1.5500	2.1811	0.6311
51					Tier Four	99,999	99,999	1.5500	2.1811	0.6311
52										
53										
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

White Tank

Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2	Residential 5/8 x 3/4 -inch	$ 23.00	$ 30.00	$ 7.00	Tier One	5	3	$ 1.8000	$ 2.3012	$ 0.5012
3					Tier Two	15	10	3.0000	3.3771	0.3771
4					Tier Three	99,999	30	5.1664	4.4531	(0.7133)
5					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
6										
7	Residential 3/4-inch	n/a	$ 45.00	n/a	Tier One	n/a	5	n/a	$ 2.3012	n/a
8					Tier Two	n/a	15	n/a	3.3771	n/a
9					Tier Three	n/a	30	n/a	4.4531	n/a
10					Tier Four	n/a	99,999	n/a	6.6049	n/a
11										
12	Residential 1-inch	$ 57.50	$ 75.00	$ 17.50	Tier One	25	8	$ 3.0000	$ 3.3771	$ 0.3771
13					Tier Two	99,999	20	5.1664	4.4531	(0.7133)
14					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
15					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
16										
17	Residential 1½-inch	$ 115.00	$ 150.00	$ 35.00	Tier One	50	15	$ 3.0000	$ 3.3771	$ 0.3771
18					Tier Two	99,999	35	5.1664	4.4531	(0.7133)
19					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
20					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
21										
22	Residential 2-inch	$ 184.00	$ 240.00	$ 56.00	Tier One	80	24	$ 3.0000	$ 3.3771	$ 0.3771
23					Tier Two	99,999	60	5.1664	4.4531	(0.7133)
24					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
25					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
26										
27	Residential 3-inch	$ 368.00	$ 480.00	$ 112.00	Tier One	160	48	$ 3.0000	$ 3.3771	$ 0.3771
28					Tier Two	99,999	120	5.1664	4.4531	(0.7133)
29					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
30					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
31										
32	Residential 4-inch	$ 575.00	$ 750.00	$ 175.00	Tier One	250	75	$ 3.0000	$ 3.3771	$ 0.3771
33					Tier Two	99,999	200	5.1664	4.4531	(0.7133)
34					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
35					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
36										
37	Residential 6-inch	$ 1,150.00	$ 1,500.00	$ 350.00	Tier One	500	150	$ 3.0000	$ 3.3771	$ 0.3771
38					Tier Two	99,999	425	5.1664	4.4531	(0.7133)
39					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
40					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
41										
42	Residential 8-inch	$ 1,840.00	$ 2,400.00	$ 560.00	Tier One	800	240	$ 3.0000	$ 3.3771	$ 0.3771
43					Tier Two	99,999	800	5.1664	4.4531	(0.7133)
44					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
45					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
46										
47	Residential 10-inch	$ 2,645.00	$ 3,450.00	$ 805.00	Tier One	1,150	345	$ 3.0000	$ 3.3771	$ 0.3771
48					Tier Two	99,999	1,150	5.1664	4.4531	(0.7133)
49					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
50					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

White Tank

Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2	Commercial 5/8 x 3/4 -inch	$ 23.00	$ 35.00	$ 12.00	Tier One	10	5	$ 3.0000	$ 3.3771	$ 0.3771
3					Tier Two	99,999	20	5.1664	4.4531	(0.7133)
4					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
5					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
6										
7	Commercial 3/4-inch	n/a	$ 52.50	n/a	Tier One	n/a	8	n/a	$ 3.3771	n/a
8					Tier Two	n/a	25	n/a	4.4531	n/a
9					Tier Three	n/a	99,999	n/a	6.6049	n/a
10					Tier Four	n/a	99,999	n/a	6.6049	n/a
11										
12	Commercial 1-inch	$ 57.50	$ 87.50	$ 30.00	Tier One	20	13	$ 3.0000	$ 3.3771	$ 0.3771
13					Tier Two	99,999	35	5.1664	4.4531	(0.7133)
14					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
15					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
16										
17	Commercial 1½-inch	$ 115.00	$ 175.00	$ 60.00	Tier One	45	25	$ 3.0000	$ 3.3771	$ 0.3771
18					Tier Two	99,999	50	5.1664	4.4531	(0.7133)
19					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
20					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
21										
22	Commercial 2-inch	$ 184.00	$ 280.00	$ 96.00	Tier One	75	40	$ 3.0000	$ 3.3771	$ 0.3771
23					Tier Two	99,999	75	5.1664	4.4531	(0.7133)
24					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
25					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
26										
27	Commercial 3-inch	$ 368.00	$ 560.00	$ 192.00	Tier One	155	80	$ 3.0000	$ 3.3771	$ 0.3771
28					Tier Two	99,999	150	5.1664	4.4531	(0.7133)
29					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
30					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
31										
32	Commercial 4-inch	$ 575.00	$ 875.00	$ 300.00	Tier One	245	125	$ 3.0000	$ 3.3771	$ 0.3771
33					Tier Two	99,999	240	5.1664	4.4531	(0.7133)
34					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
35					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
36										
37	Commercial 6-inch	$ 1,150.00	$ 1,750.00	$ 600.00	Tier One	500	250	$ 3.0000	$ 3.3771	$ 0.3771
38					Tier Two	99,999	1,000	5.1664	4.4531	(0.7133)
39					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
40					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
41										
42	Commercial 8-inch	$ 1,840.00	$ 2,800.00	$ 960.00	Tier One	800	400	$ 3.0000	$ 3.3771	$ 0.3771
43					Tier Two	99,999	1,600	5.1664	4.4531	(0.7133)
44					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
45					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
46										
47	Commercial 10-inch	$ 2,645.00	$ 4,025.00	$ 1,380.00	Tier One	1,150	575	$ 3.0000	$ 3.3771	$ 0.3771
48					Tier Two	99,999	2,300	5.1664	4.4531	(0.7133)
49					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
50					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

White Tank

Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2	Industrial 5/8 x 3/4 -inch	$ 23.00	$ 35.00	$ 12.00	Tier One	10	99,999	$ 3.0000	$ 4.4531	$ 1.4531
3					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
4					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
5					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
6										
7	Industrial 3/4-inch	n/a	$ 52.50	n/a	Tier One	n/a	99,999	n/a	$ 4.4531	n/a
8					Tier Two	n/a	99,999	n/a	4.4531	n/a
9					Tier Three	n/a	99,999	n/a	4.4531	n/a
10					Tier Four	n/a	99,999	n/a	4.4531	n/a
11										
12	Industrial 1-inch	$ 57.50	$ 87.50	$ 30.00	Tier One	20	99,999	$ 3.0000	$ 4.4531	$ 1.4531
13					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
14					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
15					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
16										
17	Industrial 1½-inch	$ 115.00	$ 175.00	$ 60.00	Tier One	45	99,999	$ 3.0000	$ 4.4531	$ 1.4531
18					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
19					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
20					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
21										
22	Industrial 2-inch	$ 184.00	$ 280.00	$ 96.00	Tier One	75	99,999	$ 3.0000	$ 4.4531	$ 1.4531
23					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
24					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
25					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
26										
27	Industrial 3-inch	$ 368.00	$ 560.00	$ 192.00	Tier One	155	99,999	$ 3.0000	$ 4.4531	$ 1.4531
28					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
29					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
30					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
31										
32	Industrial 4-inch	$ 575.00	$ 875.00	$ 300.00	Tier One	245	99,999	$ 3.0000	$ 4.4531	$ 1.4531
33					Tier Two	99,999	99,999	5.1664	4.4531	(0.7133)
34					Tier Three	99,999	99,999	5.1664	4.4531	(0.7133)
35					Tier Four	99,999	99,999	5.1664	4.4531	(0.7133)
36										
37	Industrial 6-inch	$ 1,150.00	$ 1,750.00	$ 600.00	Tier One	99,999	99,999	$ 3.0000	$ 3.5000	$ 0.5000
38					Tier Two	99,999	99,999	3.0000	3.5000	0.5000
39					Tier Three	99,999	99,999	3.0000	3.5000	0.5000
40					Tier Four	99,999	99,999	3.0000	3.5000	0.5000
41										
42	Industrial 8-inch	$ 1,840.00	$ 2,800.00	$ 960.00	Tier One	99,999	99,999	$ 3.0000	$ 3.5000	$ 0.5000
43					Tier Two	99,999	99,999	3.0000	3.5000	0.5000
44					Tier Three	99,999	99,999	3.0000	3.5000	0.5000
45					Tier Four	99,999	99,999	3.0000	3.5000	0.5000
46										
47	Industrial 10-inch	$ 2,645.00	$ 4,025.00	$ 1,380.00	Tier One	99,999	99,999	$ 3.0000	$ 3.5000	$ 0.5000
48					Tier Two	99,999	99,999	3.0000	3.5000	0.5000
49					Tier Three	99,999	99,999	3.0000	3.5000	0.5000
50					Tier Four	99,999	99,999	3.0000	3.5000	0.5000
51										
52	Private Fire Service (all connection sizes)	$ 25.00	$ 35.00	$ 10.00	n/a	n/a	n/a	n/a	n/a	n/a
53	Public Fire Hydrant	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

White Tank

Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2										
3	Coin Machine (No. of Gallons / $0.25)	n/a	n/a	n/a	n/a	n/a	n/a	-	n/a	n/a
4										
5	Construction 5/8 x 3/4-inch	n/a	$ 25.00	n/a	Tier One	n/a	5	n/a	$ 3.3771	n/a
6					Tier Two	n/a	20	n/a	4.4531	n/a
7					Tier Three	n/a	99,999	n/a	6.6049	n/a
8					Tier Four	n/a	99,999	n/a	6.6049	n/a
9										
10	Construction 3/4-inch	n/a	$ 37.50	n/a	Tier One	n/a	8	n/a	$ 3.3771	n/a
11					Tier Two	n/a	25	n/a	4.4531	n/a
12					Tier Three	n/a	99,999	n/a	6.6049	n/a
13					Tier Four	n/a	99,999	n/a	6.6049	n/a
14										
15	Construction 1-inch	n/a	$ 62.50	n/a	Tier One	n/a	13	n/a	$ 3.3771	n/a
16					Tier Two	n/a	35	n/a	4.4531	n/a
17					Tier Three	n/a	99,999	n/a	6.6049	n/a
18					Tier Four	n/a	99,999	n/a	6.6049	n/a
19										
20	Construction ½-inch	n/a	$ 125.00	n/a	Tier One	n/a	25	n/a	$ 3.3771	n/a
21					Tier Two	n/a	50	n/a	4.4531	n/a
22					Tier Three	n/a	99,999	n/a	6.6049	n/a
23					Tier Four	n/a	99,999	n/a	6.6049	n/a
24										
25	Construction 2-Inch	$ 184.00	$ 200.00	$ 16.00	Tier One	75	40	$ 3.0000	$ 3.3771	$ 0.3771
26					Tier Two	99,999	75	5.1664	4.4531	(0.7133)
27					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
28					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
29										
30	Construction 3-Inch	$ 368.00	$ 400.00	$ 32.00	Tier One	155	80	$ 3.0000	$ 3.3771	$ 0.3771
31					Tier Two	99,999	150	5.1664	4.4531	(0.7133)
32					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
33					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
34										
35	Construction 4-Inch	$ 575.00	$ 625.00	$ 50.00	Tier One	245	125	$ 3.0000	$ 3.3771	$ 0.3771
36					Tier Two	99,999	240	5.1664	4.4531	(0.7133)
37					Tier Three	99,999	99,999	5.1664	6.6049	1.4385
38					Tier Four	99,999	99,999	5.1664	6.6049	1.4385
39										
40	Construction 6-Inch	n/a	$ 1,250.00	n/a	Tier One	n/a	250	n/a	$ 3.3771	n/a
41					Tier Two	n/a	1,000	n/a	4.4531	n/a
42					Tier Three	n/a	99,999	n/a	6.6049	n/a
43					Tier Four	n/a	99,999	n/a	6.6049	n/a
44										
45	Construction 8-Inch	n/a	$ 2,000.00	n/a	Tier One	n/a	400	n/a	$ 3.3771	n/a
46					Tier Two	n/a	1,600	n/a	4.4531	n/a
47					Tier Three	n/a	99,999	n/a	6.6049	n/a
48					Tier Four	n/a	99,999	n/a	6.6049	n/a
49										
50	Construction 10-Inch	n/a	$ 2,875.00	n/a	Tier One	n/a	575	n/a	$ 3.3771	n/a
51					Tier Two	n/a	2,300	n/a	4.4531	n/a
52					Tier Three	n/a	99,999	n/a	6.6049	n/a
53					Tier Four	n/a	99,999	n/a	6.6049	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules

White Tank

Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2										
3	Sales for Resale 5/8-Inch	$ 23.00	$ 25.00	$ 2.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
4					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
5					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
6					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
7										
8	Sales for Resale 3/4-Inch	n/a	$ 37.50	n/a	Tier One	n/a	99,999	n/a	$ 3.3771	n/a
9					Tier Two	n/a	99,999	n/a	3.3771	n/a
10					Tier Three	n/a	99,999	n/a	3.3771	n/a
11					Tier Four	n/a	99,999	n/a	3.3771	n/a
12										
13	Sales for Resale 1-Inch	$ 57.50	$ 62.50	$ 5.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
14					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
15					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
16					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
17										
18	Sales for Resale ½-Inch	$ 115.00	$ 125.00	$ 10.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
19					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
20					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
21					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
22										
23	Sales for Resale 2-Inch	$ 184.00	$ 200.00	$ 16.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
24					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
25					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
26					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
27										
28	Sales for Resale 3-Inch	$ 368.00	$ 400.00	$ 32.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
29					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
30					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
31					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
32										
33	Sales for Resale 4-Inch	$ 575.00	$ 625.00	$ 50.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
34					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
35					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
36					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
37										
38	Sales for Resale 6-Inch	$ 1,150.00	$ 1,250.00	$ 100.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
39					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
40					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
41					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
42										
43	Sales for Resale 8-Inch	$ 1,840.00	$ 2,000.00	$ 160.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
44					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
45					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
46					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
47										
48	Sales for Resale 10-Inch	$ 2,645.00	$ 2,875.00	$ 230.00	Tier One	99,999	99,999	$ 3.0000	$ 3.3771	$ 0.3771
49					Tier Two	99,999	99,999	3.0000	3.3771	0.3771
50					Tier Three	99,999	99,999	3.0000	3.3771	0.3771
51					Tier Four	99,999	99,999	3.0000	3.3771	0.3771
52										
53										
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

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Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2	Residential 5/8 x 3/4 -inch	$ 25.00	$ 28.00	$ 3.00	Tier One	3	2	$ 3.3617	$ 4.5063	$ 1.1446
3					Tier Two	10	5	5.9502	6.4705	0.5203
4					Tier Three	99,999	10	9.2228	8.4347	(0.7881)
5					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
6										
7	Residential 3/4-inch	n/a	$ 42.00	n/a	Tier One	n/a	3	n/a	$ 4.5063	n/a
8					Tier Two	n/a	7	n/a	6.4705	n/a
9					Tier Three	n/a	11	n/a	8.4347	n/a
10					Tier Four	n/a	99,999	n/a	12.3630	n/a
11										
12	Residential 1-inch	$ 62.50	$ 70.00	$ 7.50	Tier One	15	5	$ 5.9502	$ 6.4705	$ 0.5203
13					Tier Two	99,999	13	9.2228	8.4347	(0.7881)
14					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
15					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
16										
17	Residential 1½-inch	$ 125.00	$ 140.00	$ 15.00	Tier One	30	10	$ 5.9502	$ 6.4705	$ 0.5203
18					Tier Two	99,999	25	9.2228	8.4347	(0.7881)
19					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
20					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
21										
22	Residential 2-inch	$ 200.00	$ 224.00	$ 24.00	Tier One	50	16	$ 5.9502	$ 6.4705	$ 0.5203
23					Tier Two	99,999	40	9.2228	8.4347	(0.7881)
24					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
25					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
26										
27	Residential 3-inch	$ 400.00	$ 448.00	$ 48.00	Tier One	100	32	$ 5.9502	$ 6.4705	$ 0.5203
28					Tier Two	99,999	80	9.2228	8.4347	(0.7881)
29					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
30					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
31										
32	Residential 4-inch	$ 625.00	$ 700.00	$ 75.00	Tier One	150	50	$ 5.9502	$ 6.4705	$ 0.5203
33					Tier Two	99,999	125	9.2228	8.4347	(0.7881)
34					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
35					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
36										
37	Residential 6-inch	$ 1,250.00	$ 1,400.00	$ 150.00	Tier One	330	100	$ 5.9502	$ 6.4705	$ 0.5203
38					Tier Two	99,999	250	9.2228	8.4347	(0.7881)
39					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
40					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
41										
42	Residential 8-inch	$ 2,000.00	$ 2,240.00	$ 240.00	Tier One	525	160	$ 5.9502	$ 6.4705	$ 0.5203
43					Tier Two	99,999	400	9.2228	8.4347	(0.7881)
44					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
45					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
46										
47	Residential 10-inch	$ 2,875.00	$ 3,220.00	$ 345.00	Tier One	775	230	$ 5.9502	$ 6.4705	$ 0.5203
48					Tier Two	99,999	575	9.2228	8.4347	(0.7881)
49					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
50					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

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Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2	Commercial 5/8 x 3/4 -inch	$ 25.00	$ 33.00	$ 8.00	Tier One	10	2	$ 5.9502	$ 6.4705	$ 0.5203
3					Tier Two	99,999	18	9.2228	8.4347	(0.7881)
4					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
5					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
6										
7	Commercial 3/4-inch	n/a	$ 49.50	n/a	Tier One	n/a	3	n/a	$ 6.4705	n/a
8					Tier Two	n/a	20	n/a	8.4347	n/a
9					Tier Three	n/a	99,999	n/a	12.3630	n/a
10					Tier Four	n/a	99,999	n/a	12.3630	n/a
11										
12	Commercial 1-inch	$ 62.50	$ 82.50	$ 20.00	Tier One	15	5	$ 5.9502	$ 6.4705	$ 0.5203
13					Tier Two	99,999	25	9.2228	8.4347	(0.7881)
14					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
15					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
16										
17	Commercial 1½-inch	$ 125.00	$ 165.00	$ 40.00	Tier One	30	10	$ 5.9502	$ 6.4705	$ 0.5203
18					Tier Two	99,999	40	9.2228	8.4347	(0.7881)
19					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
20					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
21										
22	Commercial 2-inch	$ 200.00	$ 264.00	$ 64.00	Tier One	50	16	$ 5.9502	$ 6.4705	$ 0.5203
23					Tier Two	99,999	60	9.2228	8.4347	(0.7881)
24					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
25					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
26										
27	Commercial 3-inch	$ 400.00	$ 528.00	$ 128.00	Tier One	100	32	$ 5.9502	$ 6.4705	$ 0.5203
28					Tier Two	99,999	120	9.2228	8.4347	(0.7881)
29					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
30					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
31										
32	Commercial 4-inch	$ 625.00	$ 825.00	$ 200.00	Tier One	150	50	$ 5.9502	$ 6.4705	$ 0.5203
33					Tier Two	99,999	185	9.2228	8.4347	(0.7881)
34					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
35					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
36										
37	Commercial 6-inch	$ 1,250.00	$ 1,650.00	$ 400.00	Tier One	330	100	$ 5.9502	$ 6.4705	$ 0.5203
38					Tier Two	99,999	300	9.2228	8.4347	(0.7881)
39					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
40					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
41										
42	Commercial 8-inch	$ 2,000.00	$ 2,640.00	$ 640.00	Tier One	525	160	$ 5.9502	$ 6.4705	$ 0.5203
43					Tier Two	99,999	500	9.2228	8.4347	(0.7881)
44					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
45					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
46										
47	Commercial 10-inch	$ 2,875.00	$ 3,795.00	$ 920.00	Tier One	775	230	$ 5.9502	$ 6.4705	$ 0.5203
48					Tier Two	99,999	750	9.2228	8.4347	(0.7881)
49					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
50					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
51										
52										
53					(Continued)					
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

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Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2	Industrial 5/8 x 3/4 -inch	$ 25.00	$ 35.00	$ 10.00	Tier One	10	99,999	$ 5.9502	$ 8.4347	$ 2.4845
3					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
4					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
5					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
6										
7	Industrial 3/4-inch	n/a	$ 52.50	n/a	Tier One	n/a	99,999	n/a	$ 8.4347	n/a
8					Tier Two	n/a	99,999	n/a	8.4347	n/a
9					Tier Three	n/a	99,999	n/a	8.4347	n/a
10					Tier Four	n/a	99,999	n/a	8.4347	n/a
11										
12	Industrial 1-inch	$ 62.50	$ 87.50	$ 25.00	Tier One	15	99,999	$ 5.9502	$ 8.4347	$ 2.4845
13					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
14					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
15					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
16										
17	Industrial 1½-inch	$ 125.00	$ 175.00	$ 50.00	Tier One	30	99,999	$ 5.9502	$ 8.4347	$ 2.4845
18					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
19					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
20					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
21										
22	Industrial 2-inch	$ 200.00	$ 280.00	$ 80.00	Tier One	50	99,999	$ 5.9502	$ 8.4347	$ 2.4845
23					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
24					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
25					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
26										
27	Industrial 3-inch	$ 400.00	$ 560.00	$ 160.00	Tier One	100	99,999	$ 5.9502	$ 8.4347	$ 2.4845
28					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
29					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
30					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
31										
32	Industrial 4-inch	$ 625.00	$ 875.00	$ 250.00	Tier One	150	99,999	$ 5.9502	$ 8.4347	$ 2.4845
33					Tier Two	99,999	99,999	9.2228	8.4347	(0.7881)
34					Tier Three	99,999	99,999	9.2228	8.4347	(0.7881)
35					Tier Four	99,999	99,999	9.2228	8.4347	(0.7881)
36										
37	Industrial 6-inch	$ 1,250.00	$ 1,750.00	$ 500.00	Tier One	99,999	99,999	$ 5.9502	$ 2.2500	$ (3.7002)
38					Tier Two	99,999	99,999	5.9502	2.2500	(3.7002)
39					Tier Three	99,999	99,999	5.9502	2.2500	(3.7002)
40					Tier Four	99,999	99,999	5.9502	2.2500	(3.7002)
41										
42	Industrial 8-inch	$ 2,000.00	$ 2,800.00	$ 800.00	Tier One	99,999	99,999	$ 5.9502	$ 2.2500	$ (3.7002)
43					Tier Two	99,999	99,999	5.9502	2.2500	(3.7002)
44					Tier Three	99,999	99,999	5.9502	2.2500	(3.7002)
45					Tier Four	99,999	99,999	5.9502	2.2500	(3.7002)
46										
47	Industrial 10-inch	$ 2,875.00	$ 4,025.00	$ 1,150.00	Tier One	99,999	99,999	$ 5.9502	$ 2.2500	$ (3.7002)
48					Tier Two	99,999	99,999	5.9502	2.2500	(3.7002)
49					Tier Three	99,999	99,999	5.9502	2.2500	(3.7002)
50					Tier Four	99,999	99,999	5.9502	2.2500	(3.7002)
51										
52	Private Fire Service (all connection sizes)	$ 25.00	$ 35.00	$ 10.00	n/a	n/a	n/a	n/a	n/a	n/a
53	Public Fire Hydrant	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

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Line No.	Class of Service	[A] Basic Service Charge Present Rate	[B] Basic Service Charge Proposed Rate - Rebuttal	[C] Basic Service Charge Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals) Present	[F] Tier Breakover (M Gals) Proposed - Rebuttal	[G] Volumetric Charge (/M Gal) Present Rate	[H] Volumetric Charge (/M Gal) Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal) Change
1										
2										
3	Coin Machine (No. of Gallons / $0.25)	n/a	n/a	n/a	n/a	n/a	n/a	38	35	6.94%
4										
5	Construction 5/8 x 3/4-inch	n/a	$ 33.00	n/a	Tier One	n/a	2	n/a	$ 6.4705	n/a
6					Tier Two	n/a	18	n/a	8.4347	n/a
7					Tier Three	n/a	99,999	n/a	12.3630	n/a
8					Tier Four	n/a	99,999	n/a	12.3630	n/a
9										
10	Construction 3/4-inch	n/a	$ 49.50	n/a	Tier One	n/a	3	n/a	$ 6.4705	n/a
11					Tier Two	n/a	20	n/a	8.4347	n/a
12					Tier Three	n/a	99,999	n/a	12.3630	n/a
13					Tier Four	n/a	99,999	n/a	12.3630	n/a
14										
15	Construction 1-inch	n/a	$ 82.50	n/a	Tier One	n/a	5	n/a	$ 6.4705	n/a
16					Tier Two	n/a	25	n/a	8.4347	n/a
17					Tier Three	n/a	99,999	n/a	12.3630	n/a
18					Tier Four	n/a	99,999	n/a	12.3630	n/a
19										
20	Construction ½-inch	n/a	$ 165.00	n/a	Tier One	n/a	10	n/a	$ 6.4705	n/a
21					Tier Two	n/a	40	n/a	8.4347	n/a
22					Tier Three	n/a	99,999	n/a	12.3630	n/a
23					Tier Four	n/a	99,999	n/a	12.3630	n/a
24										
25	Construction 2-Inch	$ 200.00	$ 264.00	$ 64.00	Tier One	50	16	$ 5.9502	$ 6.4705	$ 0.5203
26					Tier Two	99,999	60	9.2228	8.4347	(0.7881)
27					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
28					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
29										
30	Construction 3-Inch	$ 400.00	$ 528.00	$ 128.00	Tier One	100	32	$ 5.9502	$ 6.4705	$ 0.5203
31					Tier Two	99,999	120	9.2228	8.4347	(0.7881)
32					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
33					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
34										
35	Construction 4-Inch	$ 625.00	$ 825.00	$ 200.00	Tier One	150	50	$ 5.9502	$ 6.4705	$ 0.5203
36					Tier Two	99,999	185	9.2228	8.4347	(0.7881)
37					Tier Three	99,999	99,999	9.2228	12.3630	3.1402
38					Tier Four	99,999	99,999	9.2228	12.3630	3.1402
39										
40	Construction 6-Inch	n/a	$ 1,650.00	n/a	Tier One	n/a	100	n/a	$ 6.4705	n/a
41					Tier Two	n/a	300	n/a	8.4347	n/a
42					Tier Three	n/a	99,999	n/a	12.3630	n/a
43					Tier Four	n/a	99,999	n/a	12.3630	n/a
44										
45	Construction 8-Inch	n/a	$ 2,640.00	n/a	Tier One	n/a	160	n/a	$ 6.4705	n/a
46					Tier Two	n/a	500	n/a	8.4347	n/a
47					Tier Three	n/a	99,999	n/a	12.3630	n/a
48					Tier Four	n/a	99,999	n/a	12.3630	n/a
49										
50	Construction 10-Inch	n/a	$ 3,795.00	n/a	Tier One	n/a	230	n/a	$ 6.4705	n/a
51					Tier Two	n/a	750	n/a	8.4347	n/a
52					Tier Three	n/a	99,999	n/a	12.3630	n/a
53					Tier Four	n/a	99,999	n/a	12.3630	n/a
54					(Continued)					
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Changes in Representative Rate Schedules

Ajo

Line No.	Class of Service	[A] Basic Service Charge: Present Rate	[B] Basic Service Charge: Proposed Rate - Rebuttal	[C] Basic Service Charge: Change	[D] Tier Breakover (M Gals)	[E] Tier Breakover (M Gals): Present	[F] Tier Breakover (M Gals): Proposed - Rebuttal	[G] Volumetric Charge (/M Gal): Present Rate	[H] Volumetric Charge (/M Gal): Proposed Rate - Rebuttal	[I] Volumetric Charge (/M Gal): Change
1										
2										
3	Sales for Resale 5/8-Inch	$ 25.00	$ 33.00	$ 8.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
4					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
5					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
6					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
7										
8	Sales for Resale 3/4-Inch	n/a	$ 49.50	n/a	Tier One	n/a	99,999	n/a	$ 6.4705	n/a
9					Tier Two	n/a	99,999	n/a	6.4705	n/a
10					Tier Three	n/a	99,999	n/a	6.4705	n/a
11					Tier Four	n/a	99,999	n/a	6.4705	n/a
12										
13	Sales for Resale 1-Inch	$ 62.50	$ 82.50	$ 20.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
14					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
15					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
16					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
17										
18	Sales for Resale ½-Inch	$ 125.00	$ 165.00	$ 40.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
19					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
20					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
21					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
22										
23	Sales for Resale 2-Inch	$ 200.00	$ 264.00	$ 64.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
24					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
25					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
26					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
27										
28	Sales for Resale 3-Inch	$ 400.00	$ 528.00	$ 128.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
29					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
30					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
31					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
32										
33	Sales for Resale 4-Inch	$ 625.00	$ 825.00	$ 200.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
34					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
35					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
36					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
37										
38	Sales for Resale 6-Inch	$ 1,250.00	$ 1,650.00	$ 400.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
39					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
40					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
41					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
42										
43	Sales for Resale 8-Inch	$ 2,000.00	$ 2,640.00	$ 640.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
44					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
45					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
46					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
47										
48	Sales for Resale 10-Inch	$ 2,875.00	$ 3,795.00	$ 920.00	Tier One	99,999	99,999	$ 5.9502	$ 6.4705	$ 0.5203
49					Tier Two	99,999	99,999	5.9502	6.4705	0.5203
50					Tier Three	99,999	99,999	5.9502	6.4705	0.5203
51					Tier Four	99,999	99,999	5.9502	6.4705	0.5203
52										
53										
54										
55	**For Service Charges See Western Group Service Charge Tariff at the end of this schedule**									

Western Group

Line No.	Service Charges	[A] Current Rate	[B] Proposed Rate - Rebuttal
2	Establishment	$32.00	$32.00
4–6	Guarantee Deposit	Residential - maximum: Two(2) times average customer class bill. Non-Residential-maximum: Two and one-half (21/2) times that customers estimated maximum monthly bill.	Residential - maximum: Two(2) times average customer class bill. Non-Residential-maximum: Two and one-half (21/2) times that customers estimated maximum monthly bill.
8	Reconnection for Delinquency	$32.00, each time customer is disconnected.	$32.00, each time customer is disconnected.
13–14	Re-Establishment	Eight (8) times the customer's monthly minimum charge, or payment of the minimums since disconnection, whichever is less.	Eight (8) times the customer's monthly minimum charge, or payment of the minimums since disconnection, whichever is less.
16–17	After Hours Service Charge	$35.00, each service call-out after regular working hours, on Saturdays, Sundays or holidays.	$35.00, each service call-out after regular working hours, on Saturdays, Sundays or holidays.
20	Returned Payment	$25.00, each returned payment for insufficient funds.	$25.00, each returned payment for insufficient funds.
24	Meter Re-read	All Meter Re-Reads - $25.00	All Meter Re-Reads - $25.00
27–29	Meter Test	No charge for the first test; for the second test for the same customer within any twelve (12) month period, $25.00, or actual time and material whichever is greater.	No charge for the first test; for the second test for the same customer within any twelve (12) month period, $25.00, or actual time and material whichever is greater.

Service Line and Meter Installation

Meter Size	[A] Service Line[1]	[A] Meter	[A] Total[1]	[B] Service Line[1]	[B] Meter	[B] Total[1]
5/8 x 3/4-inch	$ 445.00	$ 155.00	$ 600.00	$ 565.00	Actual Cost	Varies
3/4-inch	n/a	n/a	n/a	565.00	Actual Cost	Varies
1-inch	495.00	315.00	810.00	629.00	Actual Cost	Varies
1 ½ -inch	n/a	n/a	n/a	699.00	Actual Cost	Varies
2-inch turbine	830.00	1,045.00	1,875.00	1,054.00	Actual Cost	Varies
2-inch compound	830.00	1,890.00	2,720.00	1,054.00	Actual Cost	Varies
3-inch turbine	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
3-inch compound	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
4-inch turbine	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
4-inch compound	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
6-inch turbine	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
6-inch compound	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
8-inch turbine	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
8-inch compound	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
10-inch turbine	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost
10-inch compound	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost	Actual Cost

[1]Actual cost of service line if boring under roadway is required.

[1]Actual cost of service line if boring under, or cutting roadway/sidewalk is required.

53–54	Late Charge	1.5 percent after 15 days.	1.5 percent after 15 days.

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Typical Bill Analysis

Line No.		[A] Base Rates	[B] Adjusters & Surcharges (ACRM/SIB)	[C] Monthly Usage (M Gal)	Pinal Valley [D] Typical Bill Present Rates Base Rates	[E] Adjusters & Surcharges	[F] Total	[G] Proposed Rates - Rebuttal	[H] Increase - Rebuttal Amount	[I] Percent
1	Residential 5/8 x 3/4 -inch									
2				-	$ 16.00	$ -	$ 16.00	$ 22.00	$ 6.00	37.50%
3				5	23.77	-	23.77	31.58	7.81	32.87%
4				15	50.58	-	50.58	58.69	8.11	16.04%
5	Present Rates			20	66.87	-	66.87	75.55	8.68	12.98%
6				25	83.17	-	83.17	96.39	13.22	15.90%
7				30	99.46	-	99.46	117.23	17.76	17.86%
8	Basic Service Charge:	$ 16.00	$ -	35	115.76	-	115.76	138.06	22.31	19.27%
9				40	132.05	-	132.05	158.90	26.85	20.33%
10	Tier One Breakover (M Gal):	3		45	148.35	-	148.35	179.74	31.39	21.16%
11	Tier Two Breakover (M Gal):	10		50	164.64	-	164.64	200.57	35.93	21.82%
12	Tier Three Breakover (M Gal):	99,999		55	180.94	-	180.94	221.41	40.47	22.37%
13	Tier Four Breakover (M Gal):	99,999		60	197.23	-	197.23	242.25	45.02	22.82%
14				65	213.53	-	213.53	263.08	49.56	23.21%
15	Tier One Rate:	$ 1.1879	$ -	70	229.82	-	229.82	283.92	54.10	23.54%
16	Tier Two Rate:	2.1026	-	75	246.12	-	246.12	304.76	58.64	23.83%
17	Tier Three Rate:	3.2590	-	100	327.59	-	327.59	408.94	81.35	24.83%
18	Tier Four Rate:	3.2590	-	150	490.54	-	490.54	617.31	126.77	25.84%
19				200	653.49	-	653.49	825.68	172.19	26.35%
20				250	816.44	-	816.44	1,034.05	217.61	26.65%
21	Proposed Rates - Rebuttal			300	979.39	-	979.39	1,242.42	263.02	26.86%
22				350	1,142.34	-	1,142.34	1,450.78	308.44	27.00%
23				400	1,305.29	-	1,305.29	1,659.15	353.86	27.11%
24	Basic Service Charge:	$ 22.00	$ -	450	1,468.24	-	1,468.24	1,867.52	399.28	27.19%
25				500	1,631.19	-	1,631.19	2,075.89	444.70	27.26%
26	Tier One Breakover (M Gal):	2		550	1,794.14	-	1,794.14	2,284.26	490.12	27.32%
27	Tier Two Breakover (M Gal):	7		600	1,957.09	-	1,957.09	2,492.63	535.53	27.36%
28	Tier Three Breakover (M Gal):	18		650	2,120.04	-	2,120.04	2,700.99	580.95	27.40%
29	Tier Four Breakover (M Gal):	99,999		700	2,282.99	-	2,282.99	2,909.36	626.37	27.44%
30				750	2,445.94	-	2,445.94	3,117.73	671.79	27.47%
31	Tier One Rate:	$ 1.5190	$ -	800	2,608.89	-	2,608.89	3,326.10	717.21	27.49%
32	Tier Two Rate:	2.1811	-	850	2,771.84	-	2,771.84	3,534.47	762.63	27.51%
33	Tier Three Rate:	2.8432	-	900	2,934.79	-	2,934.79	3,742.84	808.04	27.53%
34	Tier Four Rate:	4.1674	-	1,000	3,260.69	-	3,260.69	4,159.57	898.88	27.57%
35				1,500	4,890.19	-	4,890.19	6,243.26	1,353.06	27.67%
36				2,000	6,519.69	-	6,519.69	8,326.94	1,807.25	27.72%
37				2,500	8,149.19	-	8,149.19	10,410.62	2,261.43	27.75%
38				3,000	9,778.69	-	9,778.69	12,494.31	2,715.62	27.77%
39										
40										
41			Average Usage:	7.8	$ 29.62	$ -	$ 29.62	$ 38.16	$ 8.55	28.86%
42			Median Usage:	5.7	$ 25.24	$ -	$ 25.24	$ 33.11	$ 7.87	31.17%
43			Standardized Usage:	7.5	$ 29.03	$ -	$ 29.03	$ 37.37	$ 8.34	28.73%
44										
45							Proposed Bill at Lifeline Usage:	$ 25.04		
46							Cost of Service at Lifeline Usage:	$ 32.99		
47							% Cost Discount at Lifeline Usage:	24.10%		
48										
49							Cost of Service at Average Usage:	$ 44.58		
50							% Cost Discount at Average Usage:	14.39%		
51										
52										
53										
54										
55										

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Typical Bill Analysis

White Tank

Line No.		[A] Base Rates	[B] Adjusters & Surcharges (ACRM/SIB)	[C] Monthly Usage (M Gal)	[D] Typical Bill Present Rates Base Rates	[E] Typical Bill Present Rates Adjusters & Surcharges	[F] Typical Bill Present Rates Total	[G] Typical Bill Proposed Rates - Rebuttal	[H] Increase - Rebuttal Amount	[I] Increase - Rebuttal Percent
1	Residential 5/8 x 3/4 -inch									
2				-	$ 23.00	$ -	$ 23.00	$ 30.00	$ 7.00	30.43%
3				5	32.00	-	32.00	43.66	11.66	36.43%
4				15	62.00	-	62.00	82.81	20.81	33.56%
5	Present Rates			20	87.83	-	87.83	105.07	17.24	19.63%
6				25	113.66	-	113.66	127.34	13.68	12.03%
7				30	139.50	-	139.50	149.60	10.11	7.25%
8	Basic Service Charge:	$ 23.00	$ -	35	165.33	-	165.33	182.63	17.30	10.46%
9				40	191.16	-	191.16	215.65	24.49	12.81%
10	Tier One Breakover (M Gal):	5		45	216.99	-	216.99	248.68	31.69	14.60%
11	Tier Two Breakover (M Gal):	15		50	242.82	-	242.82	281.70	38.88	16.01%
12	Tier Three Breakover (M Gal):	99,999		55	268.66	-	268.66	314.73	46.07	17.15%
13	Tier Four Breakover (M Gal):	99,999		60	294.49	-	294.49	347.75	53.26	18.09%
14				65	320.32	-	320.32	380.78	60.46	18.87%
15	Tier One Rate:	$ 1.8000	$ -	70	346.15	-	346.15	413.80	67.65	19.54%
16	Tier Two Rate:	3.0000	-	75	371.98	-	371.98	446.83	74.84	20.12%
17	Tier Three Rate:	5.1664	-	100	501.14	-	501.14	611.95	110.80	22.11%
18	Tier Four Rate:	5.1664	-	150	759.46	-	759.46	942.19	182.73	24.06%
19				200	1,017.78	-	1,017.78	1,272.44	254.66	25.02%
20				250	1,276.10	-	1,276.10	1,602.69	326.58	25.59%
21	Proposed Rates - Rebuttal			300	1,534.42	-	1,534.42	1,932.93	398.51	25.97%
22				350	1,792.74	-	1,792.74	2,263.18	470.43	26.24%
23				400	2,051.06	-	2,051.06	2,593.42	542.36	26.44%
24	Basic Service Charge:	$ 30.00	$ -	450	2,309.38	-	2,309.38	2,923.67	614.29	26.60%
25				500	2,567.70	-	2,567.70	3,253.92	686.21	26.72%
26	Tier One Breakover (M Gal):	3		550	2,826.02	-	2,826.02	3,584.16	758.14	26.83%
27	Tier Two Breakover (M Gal):	10		600	3,084.34	-	3,084.34	3,914.41	830.06	26.91%
28	Tier Three Breakover (M Gal):	30		650	3,342.66	-	3,342.66	4,244.65	901.99	26.98%
29	Tier Four Breakover (M Gal):	99,999		700	3,600.98	-	3,600.98	4,574.90	973.91	27.05%
30				750	3,859.30	-	3,859.30	4,905.14	1,045.84	27.10%
31	Tier One Rate:	$ 2.3012	$ -	800	4,117.62	-	4,117.62	5,235.39	1,117.77	27.15%
32	Tier Two Rate:	3.3771	-	850	4,375.94	-	4,375.94	5,565.64	1,189.69	27.19%
33	Tier Three Rate:	4.4531	-	900	4,634.26	-	4,634.26	5,895.88	1,261.62	27.22%
34	Tier Four Rate:	6.6049	-	1,000	5,150.90	-	5,150.90	6,556.37	1,405.47	27.29%
35				1,500	7,734.10	-	7,734.10	9,858.83	2,124.73	27.47%
36				2,000	10,317.30	-	10,317.30	13,161.29	2,843.99	27.57%
37				2,500	12,900.50	-	12,900.50	16,463.75	3,563.24	27.62%
38				3,000	15,483.70	-	15,483.70	19,766.21	4,282.50	27.66%
39										
40										
41			Average Usage:	11.7	$ 52.20	$ -	$ 52.20	$ 68.26	$ 16.06	30.77%
42			Median Usage:	7.7	$ 40.04	$ -	$ 40.04	$ 52.71	$ 12.67	31.64%
43			Standardized Usage:	7.5	$ 39.50	$ -	$ 39.50	$ 52.10	$ 12.60	31.90%
44										
45							Proposed Bill at Lifeline Usage:	$ 36.90		
46							Cost of Service at Lifeline Usage:	$ 49.26		
47							% Cost Discount at Lifeline Usage:	25.08%		
48										
49							Cost of Service at Average Usage:	$ 76.41		
50							% Cost Discount at Average Usage:	10.66%		
51										
52										
53										
54										
55										

ARIZONA WATER COMPANY
Test Year Ended December 31, 2014
Typical Bill Analysis

Ajo

Line No.		[A] Base Rates	[B] Adjusters & Surcharges (ACRM/SIB)	[C] Monthly Usage (M Gal)	[D] Typical Bill Present Rates Base Rates	[E] Typical Bill Present Rates Adjusters & Surcharges	[F] Typical Bill Present Rates Total	[G] Typical Bill Proposed Rates - Rebuttal	[H] Increase - Rebuttal Amount	[I] Increase - Rebuttal Percent
1	Residential 5/8 x 3/4 -inch									
2				-	$ 25.00	$ -	$ 25.00	$ 28.00	$ 3.00	12.00%
3				5	46.99	-	46.99	56.42	9.44	20.09%
4				15	122.85	-	122.85	160.41	37.56	30.58%
5	Present Rates			20	168.96	-	168.96	222.23	53.26	31.52%
6				25	215.08	-	215.08	284.04	68.96	32.06%
7				30	261.19	-	261.19	345.86	84.66	32.41%
8	Basic Service Charge:	$ 25.00	$ -	35	307.31	-	307.31	407.67	100.37	32.66%
9				40	353.42	-	353.42	469.49	116.07	32.84%
10	Tier One Breakover (M Gal):	3		45	399.53	-	399.53	531.30	131.77	32.98%
11	Tier Two Breakover (M Gal):	10		50	445.65	-	445.65	593.12	147.47	33.09%
12	Tier Three Breakover (M Gal):	99,999		55	491.76	-	491.76	654.93	163.17	33.18%
13	Tier Four Breakover (M Gal):	99,999		60	537.88	-	537.88	716.75	178.87	33.26%
14				65	583.99	-	583.99	778.56	194.57	33.32%
15	Tier One Rate:	$ 3.3617	$ -	70	630.10	-	630.10	840.38	210.27	33.37%
16	Tier Two Rate:	5.9502	-	75	676.22	-	676.22	902.19	225.97	33.42%
17	Tier Three Rate:	9.2228	-	100	906.79	-	906.79	1,211.27	304.48	33.58%
18	Tier Four Rate:	9.2228	-	150	1,367.93	-	1,367.93	1,829.42	461.49	33.74%
19				200	1,829.07	-	1,829.07	2,447.57	618.50	33.81%
20				250	2,290.21	-	2,290.21	3,065.72	775.51	33.86%
21	Proposed Rates - Rebuttal			300	2,751.35	-	2,751.35	3,683.87	932.52	33.89%
22				350	3,212.49	-	3,212.49	4,302.02	1,089.53	33.92%
23				400	3,673.63	-	3,673.63	4,920.17	1,246.54	33.93%
24	Basic Service Charge:	$ 28.00	$ -	450	4,134.77	-	4,134.77	5,538.32	1,403.55	33.95%
25				500	4,595.91	-	4,595.91	6,156.47	1,560.56	33.96%
26	Tier One Breakover (M Gal):	2		550	5,057.05	-	5,057.05	6,774.62	1,717.57	33.96%
27	Tier Two Breakover (M Gal):	5		600	5,518.19	-	5,518.19	7,392.77	1,874.58	33.97%
28	Tier Three Breakover (M Gal):	10		650	5,979.33	-	5,979.33	8,010.92	2,031.59	33.98%
29	Tier Four Breakover (M Gal):	99,999		700	6,440.47	-	6,440.47	8,629.07	2,188.60	33.98%
30				750	6,901.61	-	6,901.61	9,247.22	2,345.61	33.99%
31	Tier One Rate:	$ 4.5063	$ -	800	7,362.75	-	7,362.75	9,865.37	2,502.62	33.99%
32	Tier Two Rate:	6.4705	-	850	7,823.89	-	7,823.89	10,483.52	2,659.63	33.99%
33	Tier Three Rate:	8.4347	-	900	8,285.03	-	8,285.03	11,101.67	2,816.64	34.00%
34	Tier Four Rate:	12.3630	-	1,000	9,207.31	-	9,207.31	12,337.97	3,130.66	34.00%
35				1,500	13,818.71	-	13,818.71	18,519.47	4,700.76	34.02%
36				2,000	18,430.11	-	18,430.11	24,700.97	6,270.86	34.03%
37				2,500	23,041.51	-	23,041.51	30,882.47	7,840.96	34.03%
38				3,000	27,652.91	-	27,652.91	37,063.97	9,411.06	34.03%
39										
40										
41			Average Usage:	4.0	$ 40.98	$ -	$ 40.98	$ 49.90	$ 8.91	21.75%
42			Median Usage:	2.7	$ 34.01	$ -	$ 34.01	$ 41.41	$ 7.40	21.77%
43			Standardized Usage:	7.5	$ 61.86	$ -	$ 61.86	$ 77.51	$ 15.65	25.30%
44										
45							Proposed Bill at Lifeline Usage:	$ 37.01		
46							Cost of Service at Lifeline Usage:	$ 44.19		
47							% Cost Discount at Lifeline Usage:	16.24%		
48										
49							Cost of Service at Average Usage:	$ 56.43		
50							% Cost Discount at Average Usage:	11.58%		
51										
52										
53										
54										
55										