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BEFORE THE ARIZONA CORPORATIO

COMMISSIONERS

DOUG LITTLE- Interim Chairman
BOB STUMP
BOB BURNS
TOM FORESE

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AZ CORP COMMISSION
DOCKET CONTROL

IN THE MATTER OF THE APPLICATION OF SAHUARITA WATER COMPANY, LLC, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PROPERTY AND FOR THE ESTABLISHMENT OF JUST AND REASONABLE RATES AND CHARGES.

DOCKET NO. W-03718A-15-0213

**STAFF'S NOTICE OF FILING
DIRECT TESTIMONY**

Staff of the Arizona Corporation Commission ("Staff") hereby files the Direct Testimony of Staff Witnesses Teresa B. Hunsaker, Crystal S. Brown and Michael Thompson in the above docket.

RESPECTFULLY SUBMITTED this 15th day of January 2016.

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Original and thirteen (13) copies of the foregoing filed this 15th day of January 2016 with:

Docket Control
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1200 West Washington Street
Phoenix, Arizona 85007

Arizona Corporation Commission

DOCKETED

JAN 15 2016

Copy of the foregoing emailed/mailed this 15th day of January 2016 to:

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BEFORE THE ARIZONA CORPORATION COMMISSION

DOUG LITTLE
Interim Chairman
BOB STUMP
Commissioner
BOB BURNS
Commissioner
TOM FORESE
Commissioner

IN THE MATTER OF THE APPLICATION OF)
SAHUARITA WATER COMPANY, LLC AN)
ARIZONA WATER CORPORATION, FOR A)
DETERMINATION OF THE CURRENT FAIR)
VALUE OF ITS UTILITY PROPERTY AND)
FOR THE ESTABLISHMENT OF JUST AND)
REASONABLE RATES AND CHARGES.)
_____)

DOCKET NO. W-03718A-15-0213

DIRECT
TESTIMONY
OF
TERESA B. HUNSAKER
PUBLIC UTILITIES ANALYST
UTILITIES DIVISION
ARIZONA CORPORATION COMMISSION

JANUARY 15, 2016

TABLE OF CONTENTS

	Page
INTRODUCTION	1
BACKGROUND.....	2
CONSUMER SERVICES.....	3
COMPLIANCE	3
SUMMARY OF FILING, RECOMMENDATIONS, AND ADJUSTMENTS.....	3
RATE BASE.....	6
<i>Fair Value Rate Base</i>	6
<i>Rate Base Summary</i>	6
<i>Rate Base Adjustment No. 1 – Plant Reclassification</i>	6
<i>Rate Base Adjustment No. 2 – Plant Retirement</i>	7
<i>Rate Base Adjustment No. 3 – Post –Test Year Plant</i>	7
<i>Rate Base Adjustment No. 4 – Accumulated Depreciation</i>	8
OPERATING INCOME.....	8
<i>Operating Income Summary</i>	8
<i>Operating Income Adjustment No. 1 – Expenses Reclassification</i>	8
<i>Operating Income Adjustment No. 2 – Contractual Services – Other Expense</i>	9
<i>Operating Income Adjustment No. 3 – Management Fees Expense</i>	9
<i>Operating Income Adjustment No. 4 – Water Testing Expense</i>	10
<i>Operating Income Adjustment No. 5 – Rate Case Expense</i>	11
<i>Operating Income Adjustment No. 7 – Depreciation Expense</i>	11
<i>Operating Income Adjustment No. 8 – Property Tax Expense</i>	12
<i>Operating Income Adjustment No. 9 – Income Tax Expense</i>	12

SCHEDULES

Revenue Requirement.....	TBH-1
Gross Revenue Conversion Factor	TBH-2
Rate Base – Original Cost/Fair Value.....	TBH-3
Summary of Original Cost Rate Base Adjustments.....	TBH-4
Rate Base Adjustment No. 1 – Plant Reclassification.....	TBH-5
Rate Base Adjustment No. 2 – Plant Retirement	TBH-6
Rate Base Adjustment No. 3 – Post-Test Year Plant	TBH-7
Rate Base Adjustment No. 4 – Accumulated Depreciation.....	TBH-8
Rate Base Adjustment No. 5 – Not Used.....	TBH-9
Operating Income Statement – Adjusted Test Year and Staff Recommended	TBH-10
Summary of Operating Income Statement Adjustments – Test Year.....	TBH-11
Operating Income Adj. No. 1 – Expenses Reclassification.....	TBH-12
Operating Income Adj. No. 2 – Contractual Service – Other Expense	TBH-13
Operating Income Adj. No. 3 – Management Fees Expense.....	TBH-14
Operating Income Adj. No. 4 – Water Testing Expense.....	TBH-15
Operating Income Adj. No. 5 – Rate Case Expense	TBH-16
Operating Income Adj. No. 6 – Not Used.....	TBH-17
Operating Income Adj. No. 7 – Depreciation Expense.....	TBH-18
Operating Income Adj. No. 8 – Property Tax Expense.....	TBH-19
Operating Income Adj. No. 9 – Income Tax Expense	TBH-20

**EXECUTIVE SUMMARY
SAHUARITA WATER COMPANY, LLC
DOCKET NO. W-03718A-15-0213**

Sahuarita Water Company, LLC (“SWC” or “Company”) is an Arizona Limited Liability Company engaged in the business of providing water utility services in Sahuarita, Arizona. The Company served approximately 5,500 customers during the test year ended December 31, 2014. The Company’s original Certificate of Convenience and Necessity Application was approved in Decision No. 59431 dated December 28, 1995. The Company’s current authorized rates and charges were determined in Decision No. 72177 dated February 11, 2011.

RATE APPLICATION:

The Company proposes an increase of \$332,734, or 11.49 percent, over test year revenue of \$2,896,746 to \$3,229,480. The Company’s proposal results in operating income of \$855,419 for a 9.20 percent rate of return on its proposed original cost rate base (“OCRB”) of \$9,298,032.

Staff recommends rates that would increase operating revenue by \$70,562, or 2.44 percent over test year revenue of \$2,896,746 to \$2,967,308 resulting in operating income of \$738,256 for an 8.41 percent rate of return. Staff recommends an OCRB of \$8,778,456.

CENTRAL ARIZONA GROUND WATER REPLENISHMENT DISTRICT (“CAGR”):

Staff recommends that the Company continue the CAGR adjustor mechanism authorized in Decision No. 72177 dated February 11, 2011.

1 **INTRODUCTION**

2 **Q. Please state your name, occupation, and business address.**

3 A. My name is Teresa B. Hunsaker. I am a Public Utilities Analyst III employed by the Arizona
4 Corporation Commission (“ACC” or “Commission”) in the Utilities Division (“Staff”). My
5 business address is 1200 West Washington Street, Phoenix, Arizona 85007.
6

7 **Q. Briefly describe your responsibilities as a Public Utilities Analyst.**

8 A. In my capacity as a Public Utilities Analyst I analyze and examine accounting, financial,
9 statistical and other information included in utility rate, financing and other applications. In
10 addition, I prepare written reports based on my analyses and present Staff’s recommendations
11 to the Commission on utility revenue requirements, rate design and other issues. I am also
12 responsible for testifying at formal hearings on these matters.
13

14 **Q. Please describe your educational background and professional experience.**

15 A. I received a Bachelor of Science Degree in Accounting from the University of Nevada, Las
16 Vegas and an Associate Degree in Business Management from Clark County Community
17 College. I have attended the National Association of Regulatory Utility Commissioners
18 (“NARUC”) Utilities Rate School which presents general regulatory and business issues. I
19 joined the Commission as a Public Utilities Analyst in October of 2013. Prior to employment
20 with the Commission, I worked in several different accounting and auditing positions for
21 more than 25 years.
22

23 **Q. What is the scope of your testimony in this case?**

24 A. I am presenting Staff’s analysis and recommendations regarding Sahuarita Water Company,
25 LLC’s (“SWC” or “Company”) application for a permanent increase in its rates and charges
26 for water utility service within Pima County, Arizona. I am presenting testimony and

1 schedules addressing rate base, operating revenues and expenses, revenue requirement, and
2 will file additional direct testimony regarding rate design later. Staff witness, Ms. Crystal
3 Brown, is presenting Staff's cost of capital analysis. Mr. Michael Thompson is presenting
4 Staff's engineering analysis and related recommendations.

5
6 **Q. What is the basis of your testimony in this case?**

7 A. I performed a regulatory audit of the Company's application and records. The regulatory
8 audit consisted of examining and testing financial information, accounting records, and other
9 supporting documentation and verifying that the accounting principles applied were in
10 accordance with the Commission-adopted NARUC Uniform System of Accounts ("USOA").

11
12 **BACKGROUND**

13 **Q. Please review the background of this application.**

14 A. The Company is an Arizona Limited Liability Company ("LLC") engaged in the business of
15 providing water utility services in Sahuarita, Arizona. The Company served approximately
16 5,500 customers during the test year ended December 31, 2014. The Company's original
17 Certificate of Convenience and Necessity application was approved in Decision No. 59431
18 dated December 28, 1995. The Company's current authorized rates and charges were
19 determined in Decision No. 72177 dated February 11, 2011.

20
21 **Q. Why did the Company file this rate case?**

22 A. Pursuant to Decision No. 74389, the Company was ordered to file a permanent rate case
23 application by no later than June 30, 2015, using a 2014 calendar year test year.

1 **CONSUMER SERVICES**

2 **Q. Please provide a brief history of customer complaints received by the Commission**
3 **regarding the Company. Additionally, please discuss customer responses to the**
4 **Company's proposed rate increase.**

5 A. A review of the Commission's Consumer Services database for the Company from January 1,
6 2012, to November 23, 2015, revealed the following:

7 2012 through 2014 – Zero complaints, inquiries and opinions.

8 2015 – Two complaints (two disconnect/termination) and zero opinions.

9 All complaints and inquiries have been resolved and closed.

10
11 **COMPLIANCE**

12 **Q. Please provide a summary of the compliance status of the Company.**

13 A. A check of the ACC's Compliance database indicates that there are currently no delinquencies
14 for the Company.

15
16 **SUMMARY OF FILING, RECOMMENDATIONS, AND ADJUSTMENTS**

17 **Q. Please summarize the Company's proposals in this filing.**

18 A. The Company proposes an increase of \$332,734, or 11.49 percent, over test year revenue of
19 \$2,896,746, to \$3,229,480. The Company's proposal results in operating income of \$855,419
20 for a 9.20 percent rate of return on its proposed original cost rate base ("OCRB") of
21 \$9,298,032.

22
23 **Q. Please summarize Staff's recommendations.**

24 A. Staff recommends rates that would increase operating revenue by \$70,562, or 2.44 percent
25 over test year revenue of \$2,896,746 to \$2,967,308 resulting in operating income of \$738,256
26 for an 8.41 percent rate of return. Staff recommends an OCRB of \$8,778,456.

1 **Q. What test year did the Company use in this filing?**

2 A. The Company's rate filing is based on the twelve months ended December 31, 2014 ("test
3 year").

4
5 **Q. Please summarize the rate base adjustments addressed in your testimony.**

6 A. My testimony addresses the following issues:

7
8 Plant Reclassifications – This adjustment reclassifies Water Treatment Equipment and
9 Distribution Reservoirs and Standpipes to the plant sub-categories.

10
11 Plant Retirement – This adjustment decreases Plant in Service by \$575,005 due to retirement
12 of the original arsenic absorption media investment.

13
14 Post-Test Year Plant – This adjustment decreases Plant in Service by \$1,650 due to the cost
15 of the arsenic absorption media regeneration being lower than originally estimated.

16
17 Accumulated Depreciation – This adjustment decreases accumulated depreciation by \$57,079
18 based upon the adjustments Staff made to Plant in Service.

19
20 **Q. Please summarize the operating revenue and expense adjustments addressed in your
21 testimony.**

22 A. My testimony addresses the following issues:

23
24 Expenses Reclassification – This adjustment reclassifies expenses from repairs and
25 maintenance for water testing of \$6,584 and contractual service – other of \$1,020 to
26 contractual services – water testing.

1 Contractual Services - Other Expense – This adjustment decreases contractual services –
2 other expense by \$9,983 to reclassify workman’s compensation to management fees.

3
4 Management Fees Expense – This adjustment decreases Management Services by \$28,894 to
5 remove expenses attributable to 2013 that were recorded and paid in the test year, employee
6 bonuses with payroll taxes for non-dedicated and dedicated employees, and to include the
7 reclassification of the workman’s compensation from contractual services – other expenses.

8
9 Water Testing Expense – This adjustment increases water testing expense by \$1,030 to reflect
10 Staff’s Engineer’s recommended annual water testing costs.

11
12 Rate Case Expense – This adjustment decreases rate case expense by \$20,000 to reflect Staff’s
13 normalization over 5 years.

14
15 Depreciation Expense – This adjustment decreases depreciation expense by \$43,225 to reflect
16 application of Staff’s recommended depreciation rates to Staff recommended plant amounts.

17
18 Property Tax Expense – This adjustment has no increase to the adjusted property taxes to
19 Staff’s adjusted test year revenues. However, there is an increase due to Staff’s recommended
20 revenues requirement.

21
22 Income Tax Expense – This adjustment increases income tax expense by \$17,532 to reflect
23 application of the Company’s income tax rates as provided on the Company’s Schedule C-3,
24 Page 2 for this LLC to Staff’s adjusted test year taxable income.

25

1 **RATE BASE**

2 *Fair Value Rate Base*

3 **Q. Did the Company prepare a schedule showing the elements of Reconstruction Cost**
4 **New Rate Base?**

5 A. No. The Company's filing treats the OCRB the same as the Fair Value Rate Base ("FVRB").
6

7 *Rate Base Summary*

8 **Q. Please summarize Staff's adjustments to the Company's rate base shown on**
9 **Schedules TBH-3 and TBH-4.**

10 A. Staff's adjustments to the Company's rate base resulted in a net decrease of \$519,576, from
11 \$9,298,032 to \$8,778,456. This net decrease was primarily due to: (1) reclassification of water
12 treatment equipment and distribution reservoirs and standpipes, (2) the retirement of the
13 original arsenic absorption media, and (3) an adjustment to accumulated depreciation.
14

15 *Rate Base Adjustment No. 1 – Plant Reclassification*

16 **Q. Did Staff reclassify plant to the appropriate classifications?**

17 A. Yes, Staff reclassified and moved \$2,001,053 from Water Treatment Equipment in Acct. No.
18 320 to the appropriate sub-accounts of Water Treatment Equipment into Acct. No. 320.1 in
19 the amount of \$1,379,569, Solution Chemical Feeders into Acct. No. 320.2 into the amount
20 of \$46,479 and Arsenic Media into Acct. No. 320.3 in the amount of \$575,005, as shown on
21 Schedule TBH-5. Staff reclassified and moved \$1,848,872 from Distribution Reservoirs and
22 Standpipes in Acct. No. 330 to the appropriate sub-accounts of Storage Tanks into Acct. No.
23 330.1 in the amount of \$1,811,998 and Pressure Tanks into Acct. No. 330.2 in the amount of
24 \$36,874, as shown on Schedule TBH-5.
25

1 **Q. What is Staff's recommendation?**

2 A. Staff recommends the reclassification of plant to the appropriate classifications, as shown on
3 Schedules TBH-4 and TBH-5.
4

5 *Rate Base Adjustment No. 2 – Plant Retirement*

6 **Q. Did Staff make an adjustment for arsenic absorption media included in Water
7 Treatment Plant Equipment?**

8 A. Yes. Staff identified \$575,005 in arsenic absorption media that was misclassified to Water
9 Treatment Plant as shown in Rate Base Adjustment No. 1 on Schedules TBH-4 and TBH-5.
10

11 **Q. Did Staff determine that this plant should have been retired?**

12 A. Yes. Staff reviewed the invoices and expenses from the last rate case to the current period
13 and found that the original batches of arsenic absorption media have since been replaced or
14 regenerated. Therefore, Staff determined that the Company should have retired the original
15 arsenic absorption media investment when the Company began regenerating or replacing the
16 arsenic absorption media.
17

18 **Q. What is Staff's recommendation?**

19 A. Staff recommends decreasing plant in service account 320.3 arsenic absorption media by
20 \$575,005, as shown on Schedules TBH-4 and TBH-6.
21

22 *Rate Base Adjustment No. 3 – Post-Test Year Plant*

23 **Q. Did Staff make an adjustment to the post-test year plant additions requested by the
24 Company?**

25 A. Yes. Staff adjusted the post-test year plant for the arsenic absorption media plant additions
26 of \$152,307 to the actual expense of \$150,657 resulting in a net decrease of \$1,650.

1 **Q. What is Staff's recommendation?**

2 A. Staff recommends decreasing plant in service account 320.3 arsenic absorption media by
3 \$1,650, as shown on Schedules TBH-4 and TBH-7.
4

5 *Rate Base Adjustment No. 4 – Accumulated Depreciation*

6 **Q. Did Staff make an adjustment to accumulated depreciation?**

7 A. Yes. Staff adjusted accumulated depreciation to reflect the application of depreciation to the
8 Staff-recommended plant balances.
9

10 **Q. What is Staff's recommendation?**

11 A. Staff recommends decreasing accumulated depreciation by \$57,079, from \$6,309,380 to
12 \$6,252,301, as shown on Schedules TBH-4 and TBH-8.
13

14 **OPERATING INCOME**

15 *Operating Income Summary*

16 **Q. What are the results of Staff's analysis of test year revenues, expenses, and operating
17 income?**

18 A. Staff's analysis resulted in test year operating revenues of \$2,896,746, adjusted operating
19 expenses of \$2,215,202 and adjusted operating income of \$681,544, as shown on Schedules
20 TBH-10 and TBH-11. Staff made nine ~~eight~~ adjustments to operating expenses.
21

22 *Operating Income Adjustment No. 1 – Expenses Reclassification*

23 **Q. Did Staff make an adjustment for repairs and maintenance expense?**

24 A. Yes. Staff decreased repairs and maintenance expense by \$6,584 due to the Company
25 inadvertently classifying water testing expenses in that account.
26

1 **Q. Did Staff make an adjustment for contract services – other expense?**

2 A. Yes. Staff decreased contract services - other expense by \$1,020 due to the Company
3 inadvertently classifying water testing expenses in that account.
4

5 **Q. What is Staff's recommendation?**

6 A. Staff recommends decreasing repairs and maintenance expense by \$6,584 and contract
7 services – other expense by \$1,020 and reclassifying \$7,604 to contractual services – water
8 testing, as shown on Schedules TBH-11 and TBH-12.
9

10 *Operating Income Adjustment No. 2 – Contractual Services – Other Expense*

11 **Q. Did Staff make an adjustment for contractual services – other expense?**

12 A. Yes. Staff decreased contractual services - other expense by \$9,983 due to reclassifying
13 workman's compensation in the amount of \$9,983 to management fees in Acct No. 634.
14

15 **Q. What is Staff's recommendation?**

16 A. Staff recommends decreasing contractual services - other expense by \$9,983, as shown on
17 Schedules TBH-11 and TBH-13.
18

19 *Operating Income Adjustment No. 3 – Management Fees Expense*

20 **Q. Did Staff make an adjustment for management fees expense?**

21 A. Yes. Staff decreased the management fees expense paid to Rancho Sahuarita Management
22 Company ("RSMC") by \$28,894 due to removal of the management fees expenses
23 attributable to 2013 that were recorded and paid in the test year in the amount of \$17,407,
24 removal of the employee bonuses for both non-dedicated and dedicated contract employees
25 in the amount of \$21,470, and the addition of the reclassification of workman's compensation

1 in the amount of \$9,983. RSMC has steadily increased the salaries of the contract employees
2 over the years as their duties and responsibilities have changed.

3
4 **Q. Why did Staff make this adjustment to contract employee bonuses?**

5 A. Paying bonuses to non-dedicated and dedicated contract employees covered by RSMC is not
6 necessary to the provision of water services.

7
8 **Q. What is Staff's recommendation?**

9 A. Staff recommends decreasing management fees expense by \$28,894, as shown on Schedules
10 TBH-11 and TBH-14.

11
12 *Operating Income Adjustment No. 4 – Water Testing Expense*

13 **Q. Did Staff make an adjustment for water testing expense?**

14 A. Yes. Staff increased water testing expense by \$1,030.

15
16 **Q. Why did Staff make this adjustment?**

17 A. Staff increased water testing expense based on the determination contained in the Staff
18 Engineering Report on Table M.

19
20 **Q. What is Staff's recommendation?**

21 A. Staff recommends increasing water testing expense by \$1,030, from \$12,945 (after Staff's
22 adjustments to water testing) to \$13,975, as shown on Schedules TBH-11 and TBH-15.

23

1 *Operating Income Adjustment No. 5 – Rate Case Expense*

2 **Q. What did the Company propose for rate case expense?**

3 A. The Company proposed annual rate case expense of \$50,000, calculated by normalizing the
4 anticipated total expense of \$250,000 over 5 years.

5
6 **Q. Did Staff make an adjustment to expected level rate case expense that should be
7 recovered from ratepayers?**

8 A. Yes.

9
10 **Q. Why did Staff make this adjustment?**

11 A. The Company's anticipated total cost of \$250,000 was equivalent to the level of costs
12 incurred to process the previous SWC rate case. However, Staff determined that the
13 Company's present rate case is less complex than the last rate case. Therefore, Staff reduced
14 the total rate case expense to \$150,000 to be normalized over a 5 year period.

15
16 **Q. What is Staff's recommendation?**

17 A. Staff recommends decreasing annual rate case expense by \$20,000, from \$50,000 to \$30,000,
18 as shown on Schedules TBH-11 and TBH-16, to reflect normalization over 5 years.

19
20 *Operating Income Adjustment No. 7 – Depreciation Expense*

21 **Q. Did Staff make an adjustment to depreciation expense?**

22 A. Yes. As a result of adjustments made to plant in service, Staff also adjusted the associated
23 depreciation expense.

24

1 **Q. What is Staff's recommendation?**

2 **A. Staff's adjustment decreases depreciation expense by \$43,225, from \$721,109 to**
3 **\$677,884. Please see Schedules TBH-11 and TBH-18 for Staff's calculation.**
4

5 *Operating Income Adjustment No. 8 – Property Tax Expense*

6 **Q. Did Staff make an adjustment to test year Property Tax Expense?**

7 **A. No.** There is no adjustment to property taxes based on Staff's adjusted test year revenue.
8 However, there is an increase due to Staff's recommended revenue requirement. Property tax
9 expenses for the test year and recommended revenues are shown on Schedules TBH-11 and
10 TBH-19.

11

12 *Operating Income Adjustment No. 9 – Income Tax Expense*

13 **Q. Did Staff make an adjustment to test year Income Tax Expense?**

14 **A. Yes.** Staff applied the Company's income tax rates as provided on the Company's Schedule
15 C-3, Page 2 for this LLC to Staff's adjusted test year taxable income. Income tax expenses
16 for the test year and recommended revenues are shown on Schedules TBH-11 and TBH-20.
17

18 **Q. Does this conclude your direct testimony?**

19 **A. Yes, it does.**

REVENUE REQUIREMENT

LINE NO.	DESCRIPTION	[A]	[B]
		COMPANY ORIGINAL COST	STAFF ORIGINAL COST
1	Adjusted Rate Base	\$9,298,032	\$8,778,456
2	Adjusted Operating Income (Loss)	\$598,003	\$681,544
3	Current Rate of Return (L2 / L1)	6.43%	7.76%
4	Required Rate of Return	9.20%	8.41%
5	Required Operating Income (L4 * L1)	\$855,419	\$738,256
6	Operating Income Deficiency (L5 - L2)	\$257,416	\$56,713
7	Gross Revenue Conversion Factor	1.2926	1.2442
8	Required Revenue Increase (L7 * L6)	\$332,734	\$70,562
9	Adjusted Test Year Revenue	\$2,896,746	\$2,896,746
10	Proposed Annual Revenue (L8 + L9)	\$3,229,480	\$2,967,308
11	Required Increase in Revenue (%)	11.49%	2.44%

References:

Column [A]: Company Schedule B-1

Column [B]: Staff Schedules OCRB, GRCF, TYOI & COC

GROSS REVENUE CONVERSION FACTOR

Line No.	Description	[A]	[B]	[C]	[D]	[E]	[F]
<i>Calculation of Gross Revenue Conversion Factor:</i>							
1	Revenue	100.0000%					
2	Uncollectible Factor (Line 11)	0.0000%					
3	Revenues (L1 - L2)	100.0000%					
4	Combined Federal and State Income Tax and Property Tax Rate (L23)	19.6267%					
5	Subtotal (L3 - L4)	80.3733%					
6	Revenue Conversion Factor (L1 / L5)	1.244194					
<i>Calculation of Uncollectible Factor:</i>							
7	Unity	100.0000%					
8	Combined Federal and State Tax Rate (L17)	18.1684%					
9	One Minus Combined Income Tax Rate (L7 - L8)	81.8316%					
10	Uncollectible Rate	0.0000%					
11	Uncollectible Factor (L9 * L10)		0.0000%				
<i>Calculation of Effective Tax Rate:</i>							
12	Operating Income Before Taxes (Arizona Taxable Income)	100.0000%					
13	Arizona State Income Tax Rate	2.8592%					
14	Federal Taxable Income (L12 - L13)	97.1408%					
15	Applicable Federal Income Tax Rate (L55 Col F)	15.7598%					
16	Effective Federal Income Tax Rate (L14 * L15)	15.3092%					
17	Combined Federal and State Income Tax Rate (L13 + L16)		18.1684%				
<i>Calculation of Effective Property Tax Factor:</i>							
18	Unity	100.0000%					
19	Combined Federal and State Income Tax Rate (L17)	18.1684%					
20	One Minus Combined Income Tax Rate (L18 - L19)	81.8316%					
21	Property Tax Factor	1.7821%					
22	Effective Property Tax Factor (L20 * L21)		1.4583%				
23	Combined Federal and State Income Tax and Property Tax Rate (L17 + L22)				19.6267%		
24	Required Operating Income (Schedule TBH-1, L5)	\$ 738,256					
25	Adjusted Test Year Operating Income (Loss) (Schedule TBH-10, L32)	\$ 681,544					
26	Required Increase in Operating Income (L24 - L25)		\$ 56,713				
27	Income Taxes on Recommended Revenue (Col. [F], L52)	\$ 144,546					
28	Income Taxes on Test Year Revenue (Col. [C], L52)	\$ 120,232					
29	Required Increase in Revenue to Provide for Income Taxes (L27 - L28)		\$ 24,314				
30	Recommended Revenue Requirement (Schedule TBH-1, L10)	\$ 2,967,308					
31	Uncollectible Rate (L10)	0.0000%					
32	Uncollectible Expense on Recommended Revenue (L24 * L25)	\$ 0					
33	Adjusted Test Year Uncollectible Expense	\$ 0					
34	Required Increase in Revenue to Provide for Uncollectible Exp.		\$ 0				
35	Property Tax with Recommended Revenue (Schedule TBH-19, L19)	\$ 155,820					
36	Property Tax on Test Year Revenue (Schedule TBH-19, L20)	\$ 154,562					
37	Increase in Property Tax Due to Increase in Revenue (L35 - L36) (Schedule TBH-19, L21)		\$ 1,257				
38	Total Required Increase in Revenue (L26 + L29 + L34 + L37)		\$82,285				

	(A)	(B)	(C)	(D)	(E)	(F)
	Test Year		Water	Total		Water
39 Revenue	\$2,896,746		\$2,896,746	\$2,967,308		\$2,967,308
40 Operating Expenses Excluding Income Taxes	2,094,972		2,094,972	2,096,229		2,096,229
41 Synchronized Interest (L47)	75,495		75,495	75,495		75,495
42 Arizona Taxable Income (L39 - L40 - L41)	\$ 726,279		\$ 726,279	\$ 795,584		\$ 795,584
43 Arizona State Effective Income Tax Rate (see Company Schedule C-3, Page 2)	2.7401%		2.7401%	2.8592%		2.8592%
44 Arizona Income Tax (L42 * L43)	\$ 19,901		\$ 19,901	\$ 22,747		\$ 22,747
45 Federal Taxable Income (L42 - L44)	\$ 706,379		\$ 706,379	\$ 772,836		\$ 772,836
46 Federal Tax Rate (see Company Schedule C-3, Page 2)	14.2034%		14.2034%	15.7598%		15.7598%
47 Federal Tax	\$ 100,330		\$ 100,330	\$ 121,797		\$ 121,797
48						
49						
50						
51						
52						
53 Total Federal Income Tax	\$ 100,330		\$ 100,330	\$ 121,797		\$ 121,797
54 Combined Federal and State Income Tax (L35 + L42)	\$ 120,232		\$ 120,232	\$ 144,546		\$ 144,546

55 COMBINED Applicable Federal Income Tax Rate [Col. [D], L53 - Col. [A], L53] / [Col. [D], L45 - Col. [A], L45]	32.3028%
56 Applicable Federal Income Tax Rate [Col. [F], L53 - Col. [C], L53] / [Col. [F], L45 - Col. [C], L45]	32.3028%
57 Applicable State Income Tax Rate [Col. [F], L44 - Col. [C], L44] / [Col. [F], L42 - Col. [C], L42]	4.1073%

Calculation of Interest Synchronization:

58 Rate Base	
59 Weighted Average Cost of Debt	
60 Synchronized Interest (L59 * L60)	

	Wastewater	Water
	\$0	\$8,778,456
	0.0000%	0.8600%
	\$0	\$75,495

RATE BASE - ORIGINAL COST/FAIR VALUE

LINE NO.	DESCRIPTION	[A]	[B]	REF	[C]
		COMPANY AS FILED	STAFF ADJUSTMENTS		STAFF AS ADJUSTED
1	Plant in Service	\$27,468,728	(\$576,655)	1,2,3	\$26,892,073
2	Less: Accumulated Depreciation	6,309,380	(57,079)	4	6,252,301
3	Net Plant in Service	<u>\$21,159,348</u>	<u>(519,576)</u>		<u>\$20,639,772</u>
<i>LESS:</i>					
4	Net Contribution in Aid-of Construction (CIAC)	\$6,335,865	\$0		\$6,335,865
5	Advances in Aid of Construction (ALAC)	5,189,497	0		5,189,497
6	Customer Deposits	52,876	0		52,876
7	Deferred Income Tax Credits	283,077	0		283,077
	Total Deductions	<u>\$11,861,315</u>	<u>\$0</u>		<u>\$11,861,315</u>
<i>ADD:</i>					
8	Unamortized Finance Charges	\$0	\$0		\$0
9	Deferred Tax Assets	0	0		0
10	Allowance for Working Capital	0	0		0
11	Rounding	(1)	0		(1)
	Total Additions	<u>(\$1)</u>	<u>\$0</u>		<u>(\$1)</u>
12	Original Cost Rate Base	<u>\$9,298,032</u>	<u>(519,576)</u>		<u>\$8,778,456</u>

References:

Column [A]: Company Schedule B-1

Column [B]: Schedule TBH-4

Column [C]: Column [A] + Column [B]

SUMMARY OF ORIGINAL COST RATE BASE ADJUSTMENTS

LINE NO.	ACCT. NO.	DESCRIPTION	[A]	[B]	[C]	[D]	[E]	[F]	[G]
			COMPANY AS FILED	Plant Reclass ADJ No. 1	Plant Retirement ADJ No. 2	Post-Test Year ADJ No. 3	Accum. Dep. ADJ No. 4	Not Used ADJ No. 5	STAFF ADJUSTED
				Ref. Sch TBH-5	Ref. Sch TBH-6	Ref. Sch TBH-7	Ref. Sch TBH-8	Ref. Sch TBH-9	
<i>PLANT IN SERVICE:</i>									
1	301	Organization Costs	\$7,541	\$0	\$0	\$0	\$0	\$0	\$7,541
2	302	Franchise Costs	352,403	0	0	0	0	0	352,403
3	303	Land & Land Rights	13,636	0	0	0	0	0	13,636
4	304	Structures & Improvements	401,832	0	0	0	0	0	401,832
5	307	Wells & Springs	2,142,644	0	0	0	0	0	2,142,644
6	310	Power Generation Equipment	549,708	0	0	0	0	0	549,708
7	311	Electric Pumping Equipment	195,407	0	0	0	0	0	195,407
8	320	Water Treatment Equipment	2,001,053	(2,001,053)	0	0	0	0	0
9	320.1	Water Treatment Plants	0	1,379,569	0	0	0	0	1,379,569
10	320.2	Solutions & Feeders	0	46,479	0	0	0	0	46,479
	320.3	Arsenic Media	152,307	575,005	(575,005)	(1,650)	0	0	150,657
11	330	Distribution Reservoirs & Standpipes	1,848,872	(1,848,872)	0	0	0	0	0
12	330.1	Storage Tank	0	1,811,998	0	0	0	0	1,811,998
13	330.2	Pressure Tanks	0	36,874	0	0	0	0	36,874
14	331	Transmission & Distribution Mains	13,281,053	0	0	0	0	0	13,281,053
15	333	Services	2,256,719	0	0	0	0	0	2,256,719
16	334	Meters & Meter Installations	1,489,172	0	0	0	0	0	1,489,172
17	335	Hydrants	732,251	0	0	0	0	0	732,251
18	336	Backflow Prevention Devices	1,660	0	0	0	0	0	1,660
19	339	Other Plant & Misc. Equip.	0	0	0	0	0	0	0
20	340	Office Furniture & Fixtures	160,855	0	0	0	0	0	160,855
21	340.1	Computer & Software	122,607	0	0	0	0	0	122,607
22	341	Transportation Equipment	139,706	0	0	0	0	0	139,706
23	342	Store Equipment	0	0	0	0	0	0	0
24	343	Tools & Work Equipment	37,840	0	0	0	0	0	37,840
25	344	Laboratory Equipment	132	0	0	0	0	0	132
26	345	Power Operated Equipment	0	0	0	0	0	0	0
27	345	Communications Equipment	577,721	0	0	0	0	0	577,721
28	347	Miscellaneous Equipment	695	0	0	0	0	0	695
29	348	Other Intangibles	1,002,914	0	0	0	0	0	1,002,914
30	Gross Utility Plant in Service		\$27,468,728	\$0	(\$575,005)	(\$1,650)	\$0	\$0	\$26,892,073
31	Less: Accumulated Depreciation		6,309,380	0	0	0	(57,079)	0	6,252,301
32	Net Utility Plant in Service (L29 - L30)		\$21,159,348	\$0	(\$575,005)	(\$1,650)	\$57,079	\$0	\$20,639,772
<i>DEDUCTIONS:</i>									
33	Contributions in Aid of Construction (CIAC)		\$7,712,717	\$0	\$0	\$0	\$0	\$0	\$7,712,717
34	Less: Accumulated Amortization		1,376,852	0	0	0	0	0	1,376,852
35	Net CIAC (L32 - L33)		\$6,335,865	\$0	\$0	\$0	\$0	\$0	\$6,335,865
36	Advances in Aid of Construction (AIAC)		5,189,497	0	0	0	0	0	5,189,497
37	Customer Meter Deposits		52,876	0	0	0	0	0	52,876
38	Deferred Income Tax Credits		283,077	0	0	0	0	0	283,077
39	Total Deductions		\$11,861,315	\$0	\$0	\$0	\$0	\$0	\$11,861,315
<i>ADDITIONS:</i>									
40	Unamortized Finance Charges		\$0	\$0	\$0	\$0	\$0	\$0	\$0
41	Deferred Tax Assets		0	0	0	0	0	0	0
42	Allowance for Working Capital		0	0	0	0	0	0	0
43	Rounding		(1)	0	0	0	0	0	(1)
44	Total Additions		(\$1)	\$0	\$0	\$0	\$0	\$0	(\$1)
45	ORIGINAL COST RATE BASE		\$9,298,032	\$0	(\$575,005)	(\$1,650)	\$57,079	\$0	\$8,778,456

ADJ No.	Schedule
1	TBH-5
2	TBH-6
3	TBH-7
4	TBH-8
5	TBH-9

RATE BASE ADJUSTMENT NO. 1 - Plant Reclassification

LINE NO.	DESCRIPTION	[A] COMPANY AS FILED	[B] ADJUSTMENT	[C] STAFF ADJUSTED
1	Water Treatment Equipment	\$2,001,053	(\$2,001,053)	\$0
2	Water Treatment Plants	0	1,379,569	1,379,569
3	Solutions & Feeders	0	46,479	46,479
4	Arsenic Media	152,307	575,005	727,312
5	Distribution Reservoirs & Standpipes	1,848,872	(1,848,872)	0
6	Storage Tank	0	1,811,998	1,811,998
7	Pressure Tanks	0	36,874	36,874

REFERENCES:

Column [A]: Company Schedule B-2

Column [B]: Testimony TBH

Column [C]: Column [A] + Column [B]

SAHUARITA WATER COMPANY LLC
Docket No. W-03718A-15-0213
Test Year December 31, 2014

Schedule TBH-6

RATE BASE ADJUSTMENT NO. 2 - Plant Retirement			
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LINE NO.	DESCRIPTION	[A] COMPANY AS FILED	[B] ADJUSTMENT	[C] STAFF ADJUSTED
1	Arsenic Media Retirement (original)	\$0	(\$575,005)	(\$575,005)
2	Total	\$0	(\$575,005)	(\$575,005)

REFERENCES:

Column [A]: Company Schedule B-2

Column [B]: Testimony TBH

Column [C]: Column [A] + Column [B]

SAHUARITA WATER COMPANY LLC
Docket No. W-03718A-15-0213
Test Year December 31, 2014

Schedule TBH-7

RATE BASE ADJUSTMENT NO. 3 - Post-Test Year Plant				
LINE NO.	DESCRIPTION	[A] COMPANY AS FILED	[B] ADJUSTMENT	[C] STAFF ADJUSTED
1	Arsenic Media Retirement (regeneration)	\$152,307	(\$1,650)	\$150,657

REFERENCES:

Column [A]: Company Schedule B-2
Column [B]: Testimony TBH
Column [C]: Column [A] + Column [B]

SAHUARITA WATER COMPANY LLC
Docket No. W-03718A-15-0213
Test Year December 31, 2014

Schedule TBH-8

RATE BASE ADJUSTMENT NO. 4 - Accumulated Depreciation				
LINE		[A]	[B]	[C]
NO.	DESCRIPTION	COMPANY		STAFF
		AS FILED	ADJUSTMENT	ADJUSTED
1	Accumulated Depreciation	\$6,309,380	(\$57,079)	\$6,252,301

REFERENCES:

Column [A]: Company Schedule B-2

Column [B]: Testimony TBH

Column [C]: Column [A] + Column [B]

SAHUARITA WATER COMPANY LLC
Docket No. W-03718A-15-0213
Test Year December 31, 2014

Schedule TBH-9

RATE BASE ADJUSTMENT NO. 5 - NOT USED				
LINE		[A]	[B]	[C]
NO.	DESCRIPTION	COMPANY	STAFF	STAFF
		PROPOSED	ADJUSTMENT	RECOMMENDED
1	Not Used	\$0	\$0	\$0
2	Total	\$0	\$0	\$0

References:

Column [A]: Company Schedule C-2 & Workpapers

Column [B]: Testimony TBH

Column [C]: Column [A] + Column [B]

OPERATING INCOME STATEMENT - ADJUSTED TEST YEAR AND STAFF RECOMMENDED

LINE NO.	ACCT. NO.	DESCRIPTION	[A] COMPANY ADJUSTED TEST YEAR AS FILED	[B] STAFF TEST YEAR ADJUSTMENTS	REF	[C] STAFF TEST YEAR AS ADJUSTED	[D] STAFF RECOMMENDED CHANGES	[E] STAFF RECOMMENDED
1		REVENUES:						
2	461	Metered Water Sales	\$2,843,219	\$0		\$2,843,219	\$70,562	\$2,913,781
3	460	Water Sales - Unmetered	0	0		0	0	0
4	474	Other Operating Revenue	53,527	0		53,527	0	53,527
5		Total Operating Revenues	\$2,896,746	\$0		\$2,896,746	\$70,562	\$2,967,308
6		OPERATING EXPENSES:						
7	601	Salaries & Wages	\$0	\$0		\$0	\$0	\$0
8	610	Purchased Water	5,265	0		5,265	0	5,265
9	615	Purchased Power	138,933	0		138,933	0	138,933
10	618	Chemicals	14,734	0		14,734	0	14,734
11	620	Repairs & Maintenance	102,989	(6,584)	1	96,406	0	96,406
12	621	Office Supplies & Expense	0	0		0	0	0
13	630	Contract Services - Accounting	13,497	0		13,497	0	13,497
14	633	Contract Services - Legal	10,603	0		10,603	0	10,603
15	631	Contract Services - Eng	7,968	0		7,968	0	7,968
16	636	Contract Services - Other	126,034	(11,003)	1, 2	115,031	0	115,031
17	634	Management Fees	765,161	(28,894)	3	736,267	0	736,267
18	635	Contractual Services - Water Testing	5,341	8,634	1, 4	13,975	0	13,975
19	641	Rents	1,666	0		1,666	0	1,666
20	650	Transportation Expense	20,650	0		20,650	0	20,650
21	657	Insurance - General Liability	17,137	0		17,137	0	17,137
22	659	Insurance - Health & Life	0	0		0	0	0
23	666	Regulatory Commission Expense - Rate Case	50,000	(20,000)	5	30,000	0	30,000
24	675	Miscellaneous Expense	29,504	0		29,504	0	29,504
25	670	Bad Debt Expense	541	0		541	0	541
26	403	Depreciation Expense	721,109	(43,225)	7	677,884	0	677,884
27	408	Taxes Other than Income	10,350	0		10,350	0	10,350
28	408.11	Property Taxes	154,562	0	8	154,562	1,257	155,820
29	409	Income Tax	102,700	17,532	9	120,232	24,314	144,546
30		Rounding	(1)	0		(1)	0	(1)
31		Total Operating Expenses	\$2,298,743	(\$83,541)		\$2,215,202	\$25,572	\$2,240,774
32		Operating Income (Loss)	\$598,003	\$83,541		\$681,544	\$44,990	\$726,534

References:

Column [A]: Company Schedule C-1
Column [B]: Schedule TBH-11
Column [C]: Column [A] + Column [B]
Column [D]: Schedules TBH-1, TBH-2 and TBH-18
Column [E]: Column [C] + Column [D]

SUMMARY OF OPERATING INCOME STATEMENT ADJUSTMENTS - TEST YEAR

LINE NO.	ACCT. NO.	DESCRIPTION	[A] COMPANY AS FILED	[B] Expenses Reclass ADJ No. 1	[C] Contract Services ADJ No. 2	[D] Mgmt. Fees ADJ No. 3	[E] Water Testing ADJ No. 4	[F] Rate Case ADJ No. 5	[G] Not Used ADJ No. 6	[H] Depr. Exp. ADJ No. 7	[I] Prop. Tax ADJ No. 8	[K] Income Tax ADJ No. 9	[L] STAFF ADJUSTED
1 REVENUES:													
2	461	Metered Water Sales	\$2,843,219	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,843,219
3	460	Water Sales - Unmetered	0	0	0	0	0	0	0	0	0	0	0
4	474	Other Operating Revenue	53,527	0	0	0	0	0	0	0	0	0	53,527
5		Total Operating Revenues	\$2,896,746	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,896,746
6 OPERATING EXPENSES:													
7	601	Salaries & Wages	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	610	Purchased Water	5,265	0	0	0	0	0	0	0	0	0	5,265
9	615	Purchased Power	138,933	0	0	0	0	0	0	0	0	0	138,933
10	618	Chemicals	14,734	0	0	0	0	0	0	0	0	0	14,734
11	620	Repairs & Maintenance	102,989	(6,584)	0	0	0	0	0	0	0	0	96,406
12	621	Office Supplies & Expense	0	0	0	0	0	0	0	0	0	0	0
13	630	Contract Services - Accounting	13,497	0	0	0	0	0	0	0	0	0	13,497
14	633	Contract Services - Legal	10,603	0	0	0	0	0	0	0	0	0	10,603
15	631	Contract Services - Eng	7,968	0	0	0	0	0	0	0	0	0	7,968
17	636	Contract Services - Other	126,034	(1,020)	(9,983)	0	0	0	0	0	0	0	115,031
16	634	Management Fees	765,161	0	0	(28,894)	0	0	0	0	0	0	736,267
18	635	Contractual Services - Water Testing	5,341	0	0	0	1,030	0	0	0	0	0	6,371
19	641	Rents	1,666	0	0	0	0	0	0	0	0	0	1,666
20	650	Transportation Expense	20,650	0	0	0	0	0	0	0	0	0	20,650
21	657	Insurance - General Liability	17,137	0	0	0	0	0	0	0	0	0	17,137
22	659	Insurance - Health & Life	0	0	0	0	0	0	0	0	0	0	0
23	666	Regulatory Commission Expense - Rate Case	50,000	0	0	0	0	(20,000)	0	0	0	0	30,000
24	675	Miscellaneous Expense	29,504	0	0	0	0	0	0	0	0	0	29,504
25	670	Bad Debt Expense	541	0	0	0	0	0	0	0	0	0	541
26	403	Depreciation Expense	721,109	0	0	0	0	0	0	(43,225)	0	0	677,884
27	408	Taxes Other than Income	10,350	0	0	0	0	0	0	0	0	0	10,350
28	408.11	Property Taxes	154,562	0	0	0	0	0	0	0	0	0	154,562
29	409	Income Tax	102,700	0	0	0	0	0	0	0	0	0	102,700
30		Rounding	(1)	0	0	0	0	0	0	0	0	0	0
31		Total Operating Expenses	\$2,298,743	\$0	(\$9,983)	(\$28,894)	\$1,030	(\$20,000)	\$0	(\$43,225)	\$0	\$17,532	\$2,215,202
32		Operating Income (Loss)	\$598,003	\$0	\$9,983	\$28,894	(\$1,030)	\$20,000	\$0	\$43,225	(\$0)	(\$17,532)	\$681,544

OPERATING INCOME ADJUSTMENT NO. 1 - Expenses Reclassification

LINE NO.	DESCRIPTION	[A] COMPANY PROPOSED	[B] STAFF ADJUSTMENT	[C] STAFF RECOMMENDED
1	Repairs and Maintenance	\$102,989	(\$6,584)	\$96,406
2	Contract Services - Other	126,034	(1,020)	125,014
3	Water Testing	5,341	7,604	12,945
4	Total	\$234,364	\$0	\$234,364

References:

Column [A]: Company Schedule C-2 & Workpapers

Column [B]: Testimony TBH

Column [C]: Column [A] + Column [B]

OPERATING INCOME ADJUSTMENT NO. 2 - Contractual Services - Other Expense

LINE NO.	DESCRIPTION	[A] COMPANY PROPOSED	[B] STAFF ADJUSTMENT	[C] STAFF RECOMMENDED
1	Contractual Services - Other Expense	\$126,034	(\$9,983)	\$116,051
2	Total	\$126,034	(\$9,983)	\$116,051

Staff Adjustments

Contractual Services - Workman's Comp (Reclass to Mgmt. Services)	\$9,983
Total Adjustment	\$9,983

References:

- Column [A]: Company Schedule C-2 & Workpapers
- Column [B]: Testimony TBH
- Column [C]: Column [A] + Column [B]

OPERATING INCOME ADJUSTMENT NO. 3 - Management Fees Expense

LINE NO.	DESCRIPTION	[A] COMPANY PROPOSED	[B] STAFF ADJUSTMENT	[C] STAFF RECOMMENDED
1	Management Fees Expense	\$765,161	(\$28,894)	\$736,267
2	Total	\$765,161	(\$28,894)	\$736,267

Staff Adjustments

Remove Management Services for Underpayment of Mar. to Nov. 2013 Ex	\$17,407
Remove Bonuses with payroll taxes for Non-Dedicated Employees	8,552
Remove Bonuses with payroll taxes for Dedicated Employees	12,918
Reclass Workman's Compensation from Contractual Services	(9,983)
Total Adjustment	<u>\$28,894</u>

References:

Column [A]: Company Schedule C-2 & Workpapers
Column [B]: Testimony TBH
Column [C]: Column [A] + Column [B]

SAHUARITA WATER COMPANY LLC
Docket No. W-03718A-15-0213
Test Year December 31, 2014

Schedule TBH-15

OPERATING INCOME ADJUSTMENT NO. 4 - Water Testing Expense				
LINE NO.	DESCRIPTION	[A] COMPANY PROPOSED	[B] STAFF ADJUSTMENT	[C] STAFF RECOMMENDED
1	Water Testing Expense	\$5,341	\$1,030	\$6,371
2	Total	\$5,341	\$1,030	\$6,371

References:

Column [A]: Company Schedule C-2 & Workpapers

Column [B]: Testimony TBH & Staff Engineering Table M

Column [C]: Column [A] + Column [B]

SAHUARITA WATER COMPANY LLC
Docket No. W-03718A-15-0213
Test Year December 31, 2014

Schedule TBH-16

OPERATING INCOME ADJUSTMENT NO. 5 - Rate Case Expense				
LINE		[A]	[B]	[C]
NO.	DESCRIPTION	COMPANY	STAFF	STAFF
		PROPOSED	ADJUSTMENT	RECOMMENDED
1	Rate Case Expense	\$50,000	(\$20,000)	\$30,000
2	Total	\$50,000	(\$20,000)	\$30,000

References:

Column [A]: Company Schedule C-2

Column [B]: Testimony TBH

Column [C]: Column [A] + Column [B]

SAHUARITA WATER COMPANY LLC
Docket No. W-03718A-15-0213
Test Year December 31, 2014

Schedule TBH-17

OPERATING INCOME ADJUSTMENT NO. 6 - Not Used

LINE NO.	DESCRIPTION	[A] COMPANY PROPOSED	[B] STAFF ADJUSTMENT	[C] STAFF RECOMMENDED
1	Not Used	\$0	\$0	\$0
2	Total	\$0	\$0	\$0

References:

Column [A]: Company Schedule C-2

Column [B]: Testimony TBH

Column [C]: Column [A] + Column [B]

OPERATING INCOME ADJUSTMENT No. 7 - Depreciation Expense

Line No.	ACCT NO.	DESCRIPTION	[A] GROSS UTILITY PLANT IN SERVICE	[B] FULLY/NON DEPRECIABLE	[C] DEPRECIABLE PLANT	[D] DEPREC. RATE	[E] EXPENSE
<i>Plant In Service</i>							
1	301	Organization Costs	\$7,541	\$7,541	\$0	0.00%	\$0
2	302	Franchise Costs	352,403	352,403	0	0.00%	0
3	303	Land & Land Rights	13,636	13,636	0	0.00%	0
4	304	Structures & Improvements	401,832		401,832	3.33%	13,381
5	307	Wells & Springs	2,142,644		2,142,644	3.33%	71,350
6	310	Power Generation Equipment	549,708		549,708	5.00%	27,485
7	311	Electric Pumping Equipment	195,407		195,407	12.50%	24,426
8	320	Water Treatment Equipment					
9	320.1	Water Treatment Plants	1,379,569		1,379,569	3.33%	45,940
10	320.2	Solutions & Feeders	46,479		46,479	20.00%	9,296
11	320.3	Arsenic Media	150,657		150,657	40.00%	60,263
12	330	Distribution Reservoirs & Standpipes					
13	330.1	Storage Tank	1,811,998		1,811,998	2.22%	40,226
14	330.2	Pressure Tanks	36,874		36,874	5.00%	1,844
15	331	Transmission & Distribution Mains	13,281,053		13,281,053	2.00%	265,621
16	333	Services	2,256,719		2,256,719	3.33%	75,149
17	334	Meters & Meter Installations	1,489,172		1,489,172	8.33%	124,048
18	335	Hydrants	732,251		732,251	2.00%	14,645
19	336	Backflow Prevention Devices	1,660		1,660	6.67%	111
20	339	Other Plant & Misc. Equip.	0		0	6.67%	0
21	340	Office Furniture & Fixtures	160,855		160,855	6.67%	10,729
22	340.1	Computer & Software	122,607	67,883	54,724	20.00%	10,945
23	341	Transportation Equipment	139,706	123,399	16,307	20.00%	3,261
24	342	Store Equipment	0		0	4.00%	0
25	343	Tools & Work Equipment	37,840		37,840	5.00%	1,892
26	344	Laboratory Equipment	132		132	10.00%	13
27	345	Power Operated Equipment	0		0	5.00%	0
28	345	Communications Equipment	577,721		577,721	10.00%	57,772
29	347	Miscellaneous Equipment	695		695	10.00%	70
30	348	Other Intangibles	1,002,914		1,002,914	10.00%	100,291
		Rounding	-	(1)	1		0
31		Subtotal General	\$26,892,073	\$564,861	\$26,327,212		\$958,758
32		Less: Amortization of Contributions			\$7,712,717	3.64%	\$280,874
31		Staff Recommended Depreciation Expense					\$677,884
32		Company Proposed Depreciation Expense					721,109
33		Increase/(Decrease) to Depreciation Expense					(\$43,225)

OPERATING INCOME ADJUSTMENT No. 8 - Property Taxes Expense

LINE NO.	DESCRIPTION	[A]	[B]
		STAFF AS ADJUSTED	STAFF RECOMMENDED
1	Staff Adjusted Test Year Revenues	\$2,896,746	\$2,896,746
2	Weight Factor	2	2
3	Subtotal (Line 1 * Line 2)	\$5,793,492	\$5,793,492
4	Staff Recommended Revenue	2,896,746	2,967,308
5	Subtotal (Line 4 + Line 5)	\$8,690,238	\$8,760,800
6	Number of Years	3	3
7	Three Year Average (Line 5 / Line 6)	\$2,896,746	\$2,920,267
8	Department of Revenue Multiplier	2	2
9	Revenue Base Value (Line 7 * Line 8)	\$5,793,492	\$5,840,533
10	Plus: 10% of CWIP (Company Excluded)	0	0
11	Less: Net Book Value of Licensed Vehicles	11,415	11,415
12	Full Cash Value (Line 9 + Line 10 - Line 11)	\$5,782,077	\$5,829,118
13	Assessment Ratio	18.00%	18.00%
14	Assessment Value (Line 12 * Line 13)	\$1,040,774	\$1,049,241
15	Composite Property Tax Rate - Obtained from ADOR	14.85070%	14.85070%
16	Staff Test Year Adjusted Property Tax Expense (Line 14 * Line 15)	\$154,562	
17	Company Proposed Property Tax	154,562	
18	Staff Test Year Adjustment (Line 16 - Line 17)	\$0	
19	Property Tax - Staff Recommended Revenue (Line 14 * Line 15)		\$155,820
20	Staff Test Year Adjusted Property Tax Expense (Line 16)		154,562
21	Increase in Property Tax Due to Increase in Revenue Requirement		\$1,257
22	Increase in Property Tax Due to Increase in Revenue Requirement (Line 21)		\$1,257
23	Increase in Revenue Requirement		\$70,562
24	Increase in Property Tax Per Dollar Increase in Revenue (Line 22 / Line 23)		1.782084%

REFERENCES:

Line 15: Composite Tax Rate obtained from Arizona Department of Revenue
Line 17: Company Schedule C-1 Page 2
Line 21: Line 19 - Line 20
Line 23: Schedule TBH-10

SAHUARITA WATER COMPANY LLC
Docket No. W-03718A-15-0213
Test Year December 31, 2014

Schedule TBH-20

OPERATING INCOME ADJUSTMENT NO. 9 - Income Tax Expense				
LINE		[A]	[B]	[C]
NO.	DESCRIPTION	COMPANY PROPOSED	STAFF ADJUSTMENT	STAFF RECOMMENDED
1	Income Tax Expense	\$102,700	\$17,532	\$120,232
2	Total	\$102,700	\$17,532	\$120,232

References:

Column [A]: Company Schedule C-2

Column [B]: Testimony TBH

Column [C]: Column [A] + Column [B]

BEFORE THE ARIZONA CORPORATION COMMISSION

DOUG LITTLE
Interim Chairman
BOB STUMP
Commissioner
BOB BURNS
Commissioner
TOM FORESE
Commissioner

IN THE MATTER OF THE APPLICATION OF)
SAHUARITA WATER COMPANY, LLC, FOR A)
DETERMINATION OF THE CURRENT FAIR)
VALUE OF ITS UTILITY PROPERTY AND)
FOR THE ESTABLISHMENT OF JUST AND)
REASONABLE RATES AND CHARGES)
_____)

DOCKET NO. W-03718A-15-0213

DIRECT
TESTIMONY
OF
CRYSTAL S. BROWN
EXECUTIVE CONSULTANT III
UTILITIES DIVISION
ARIZONA CORPORATION COMMISSION

JANUARY 15, 2016

TABLE OF CONTENTS

	Page
I. Introduction	1
<i>Summary of Testimony and Recommendations</i>	2
<i>Sabuarita's Proposed Overall Rate of Return</i>	7
II. THE WEIGHTED AVERAGE COST OF CAPITAL	7
III. CAPITAL STRUCTURE.....	9
<i>Background</i>	9
<i>Sabuarita's Capital Structure</i>	10
<i>Staff's Capital Structure</i>	10
IV. RETURN ON EQUITY.....	10
<i>Background</i>	10
<i>Risk</i>	13
V. ESTIMATING THE COST OF EQUITY	16
<i>Introduction</i>	16
<i>Discounted Cash Flow Model Analysis</i>	17
<i>The Constant-Growth DCF</i>	17
<i>The Multi-Stage DCF</i>	26
<i>Capital Asset Pricing Model</i>	28
VI. SUMMARY OF STAFF'S COST OF EQUITY ANALYSIS	32
VII. FINANCIAL RISK AND ECONOMIC ASSESSMENT ADJUSTMENTS.....	35
VIII. RATE OF RETURN RECOMMENDATION	43

SCHEDULES

Capital Structure and Weighted Cost of Capital	CSB-1
Intentionally Left Blank.....	CSB-2
Final Cost of Equity Estimates for Sample Water Utilities.....	CSB-3
Average Capital Structure of Sample Water Utilities	CSB-4
Growth in Earnings & Dividends of Sample Water Utilities	CSB-5
Sustainable Growth for Sample Water Utilities	CSB-6
Selected Financial Data of Sample Water Utilities	CSB-7
Calculation of Expected Infinite Annual Growth in Dividends	CSB-8
Multi-Stage DCF Estimates	CSB-9
Cost of Capital Calculation Capitalization.....	CSB-10

EXECUTIVE SUMMARY
SAHUARITA WATER COMPANY, LLC,
DOCKET NO. W-03718A-15-0213

Sahuarita Water Company, LLC (“Sahuarita” or “Company”) proposed a 9.20 percent rate of return. Sahuarita’s proposed rate of return was calculated using a 10.50 percent cost of equity, a 4.20 percent cost of debt, and a capital structure consisting of 20.57 percent debt and 79.43 percent equity.

Staff recommends an 8.41 percent rate of return. Staff’s recommended rate of return was calculated using a 9.50 percent cost of equity, a 4.20 percent cost of debt, and a capital structure consisting of 20.57 percent debt and 79.43 percent equity.

1 **I. INTRODUCTION**

2 **Q. Please state your name, occupation, and business address.**

3 A. My name is Crystal S. Brown. I am an Executive Consultant III employed by the Arizona
4 Corporation Commission ("ACC" or "Commission") in the Utilities Division ("Staff"). My
5 business address is 1200 West Washington Street, Phoenix, Arizona 85007.
6

7 **Q. Briefly describe your responsibilities as an Executive Consultant III.**

8 A. I am responsible for the examination and verification of financial and statistical information
9 included in utility rate applications and other financial matters, including performing studies
10 to estimate the cost of capital component in rate filings and developing revenue requirements.
11 In addition, I prepare written reports, testimonies, and schedules that include Staff
12 recommendations to the Commission. I am also responsible for testifying at formal hearings
13 on these matters.
14

15 **Q. Please describe your educational background and professional experience.**

16 A. I received a Bachelor of Science Degree in Business Administration from the University of
17 Arizona and a Bachelor of Science Degree in Accounting from Arizona State University.
18

19 Since joining the Commission in August 1996, I have participated in numerous rate cases and
20 other regulatory proceedings involving electric, gas, water, and wastewater utilities. I have
21 testified on matters involving regulatory accounting, auditing, and the cost of capital.
22 Additionally, I have attended utility-related seminars sponsored by the National Association
23 of Regulatory Utility Commissioners ("NARUC") on ratemaking and accounting designed to
24 provide continuing and updated education in these areas.

1 **Q. What is the scope of your testimony in this case?**

2 A. My testimony provides Staff's recommended capital structure, cost of equity, and overall rate
3 of return ("ROR") for establishing the revenue requirement for Sahuarita Water Company,
4 LLC ("Sahuarita" or "Company").
5

6 **Q. Please provide a brief description of Sahuarita.**

7 A. Sahuarita is an Arizona Class B utility engaged in the business of providing water service in
8 the Rancho Sahuarita Master Planned Development in the Town of Sahuarita in Pima
9 County, Arizona. Sahuarita provided service to approximately 16,000 customers during the
10 test year.
11

12 *Summary of Testimony and Recommendations*

13 **Q. Briefly summarize how Staff's cost of capital testimony is organized.**

14 A. Staff's cost of capital testimony is presented in eight sections. Section I is this introduction.
15 Section II discusses the concept of weighted average cost of capital ("WACC"). Section III
16 presents Staff's cost of debt for Sahuarita. Section IV discusses the concepts of return on
17 equity ("ROE") and risk. Section V presents the methods employed by Staff to estimate
18 Sahuarita's ROE. Section VI presents the findings of Staff's ROE analysis. Section VII
19 discusses the financial risk and economic assessment adjustments. Section VIII presents
20 Staff's ROR recommendation.
21

22 **Q. Have you prepared any schedules in support of your cost of capital analysis?**

23 A. Yes, my supporting schedules are shown on CSB-1 to CSB-10.
24
25

1 **Q. Ms. Brown, are you also sponsoring the pro forma revenue requirement and resulting**
2 **rate change being recommended by Staff?**

3 A. No. Staff witness Teresa Hunsaker is supporting Staff's recommended pro forma revenue
4 requirement in this case, and she is also supporting the quantification of the resulting change
5 in such revenues Staff is recommending. In completing her responsibilities, Ms. Hunsaker
6 utilizes the capital structure, cost of equity ("COE"), and the overall ROR recommendations
7 that I am sponsoring.

8
9 **Q. Before discussing Staff's specific rate of return recommendation for Sahuarita, please**
10 **provide an overview of the approach Staff takes to developing the ROE it utilized in**
11 **quantifying Staff's overall rate change recommendation?**

12 A. As discussed in greater detail later in my testimony, Staff utilizes traditionally accepted models
13 for estimating a reasonable COE range. These models utilize observed market data and
14 forecasts to define the parameters of what would constitute the reasonable investing returns
15 associated with alternative investments. Generally, Staff believes than any ROE falling within
16 this model-driven cost-of-equity range would be an acceptable ROE for the Commission to
17 recognize in quantifying its final rate change decision. Since, arguably, the low point in this
18 model-driven ROE range is just as reasonable as any other point, Staff believes that any
19 movement ABOVE the low end of this range represents a fair accommodation of any and all
20 company-specific risk factors an individual ACC-regulated utility might be facing. Clearly
21 such company-specific risk factors can exist, and these risk factors may increase or reduce
22 what would otherwise constitute a reasonable ROE for an individual utility. Perhaps
23 unfortunately, but honestly, it is not really possible to precisely quantify specific basis point
24 weighting for each such risk factor, though Staff notes that cost of capital consultants usually
25 go to great lengths to attempt to show that quantifying company-specific basis point
26 weightings for such factors is possible.

1 **Q. Ms. Brown, can you give an example of a company-specific risk consideration that**
2 **could actually support a lower overall ROE requirement?**

3 A. Yes. A regulated utility with a relatively high percent of equity in its capital structure mix
4 presents a lower risk to stockholders than a regulated utility with a higher reliance on debt.
5 This is because equity holder claims against assets is subordinate to the positions held by debt
6 holders. The point being that NOT ALL company-specific risk considerations increase the
7 required ROE.

8
9 **Q. Please continue.**

10 A. Once the ROE model-driven reasonableness range has been defined, utilizing the traditionally
11 recognized models such as the Capital Asset Pricing Model ("CAPM") and Discounted Cash
12 Flow ("DCF") models discussed later in my testimony, the next question is "What level of
13 ROE should Staff utilize to build its revenue requirement schedules around"?

14
15 Generally, Staff will utilize the mathematically determined mid-point of this ROE model-
16 driven range since, as just noted, this mid-point effectively makes reasonable accommodation
17 for the net of any company-specific risks that might exist.

18
19 However, there can be instances where Staff may choose to recommend using some other
20 point within this ROE model-driven range to calculate the underlying utility's revenue
21 requirement and required rate change. Staff believes movement away from the mid-point of
22 the ROE model-driven range will be, and should be, a rare modification to its primary
23 approach. The pending Sahuarita rate case filing does present one of those cases where
24 movement away from the mid-point might be reasonable, so Staff has utilized the upper limit
25 of the ROE model-driven range to quantify the revenue requirement and resulting rate
26 increase sponsored by Staff witness Ms. Hunsaker.

1 **Q. Ms. Brown, before continuing with your explanation of the Sahuarita-specific**
2 **considerations that resulted in Staff's ROE recommendation in the instant case, can**
3 **you tell us if Staff has a specific list of factors that would lead to a recommendation**
4 **from Staff to use an ROE level above or below the model-driven mid-point?**

5 A. No, Staff does not have such a list. Nor does Staff believe that such a list should be
6 generated. Each rate case filing is unique in some respect and defining reasonable ROE
7 recommendations is more or less an art than a science, as we all know.

8
9 That being said, Staff believes that it is important to again stress that such movements **from**
10 **Staff** are likely to be rare. On the other hand, the Commission certainly has considerable
11 latitude in reaching its ultimate ROE finding after giving consideration to all evidence before
12 it.

13
14 **Q. Ms. Brown, please return to your explanation as to why Staff chose to recommend the**
15 **high end of the model-driven ROE range in the pending Sahuarita case.**

16 A. As I will discuss in detail later in my testimony, the model-driven range for the ROE in the
17 Sahuarita case spans from a low of 7.6 percent to a high of 9.5 percent, and the
18 mathematically determined mid-point is 8.6 percent. The quarter points within this range are
19 8.1 percent and 9.0 percent. If Staff had utilized 8.6 percent for ROE in the revenue
20 requirement schedules sponsored by Ms. Hunsaker, Staff would have recommended a small
21 rate decrease for Sahuarita in this case. So as a step to support the general Commission
22 policy of promoting rate change gradualism, Staff recommended utilizing the upper limit
23 ROE of 9.5 percent in this case. Hopefully this accommodation will help the Company push
24 out the timing of the Company's next rate change filing and also moderate the level of
25 Sahuarita's next rate increase.

1 Again this Staff movement is unique to the Sahuarita case and does not mean that Staff will
2 always be recommending that the Commission only approve rate increases and not authorize
3 rate decreases if such a finding is supported by available and convincing evidence.
4

5 **Q. Thank you Ms. Brown for those preliminary comments and clarifications. Please**
6 **continue with your discussion regarding general cost of capital concepts you are**
7 **sponsoring, and the specific recommendations Staff is making in this case.**

8 A. Again to assure clear communications regarding our shift in focus, I am now returning to
9 Staff's more theoretical and academic discussion of cost of capital concepts, wherein I
10 present and explain how Staff developed its ROE model-driven range results.
11

12 **Q. Thank you. What is Staff's recommended rate of return for Sahuarita?**

13 A. Staff recommends an 8.41 percent overall ROR, as shown in Schedule CSB-1. The ROR is
14 calculated from the capital structure, ROE and cost of debt. Staff's capital structure is
15 composed of 79.43 percent equity and 20.57 percent debt. Staff's estimated ROE for the
16 Company is based on the results of its DCF method and the CAPM cost of equity
17 methodology estimate- average for the sample companies of 8.6 percent for the CAPM and
18 8.6 percent average for the DCF. The CAPM model-driven range is 8.2 percent to 9.0
19 percent (which averages 8.6 percent), while the DSC model range is 7.6 percent to 9.5 percent
20 (which also averages 8.6 percent), as shown on Schedule CSB-3.
21

1 *Sahuarita's Proposed Overall Rate of Return*

2 **Q. Briefly summarize Sahuarita's proposed capital structure, cost of debt, ROE and**
3 **overall ROR for this proceeding.**

4 A. Table 1 summarizes the Company's proposed capital structure, cost of debt, ROE and overall
5 ROR of 9.20 in this proceeding:

6
7 **Table 1**

	Weight	Cost	Weighted Cost
Long-term Debt	20.57%	4.20%	0.86%
Common Equity	79.43%	10.50%	<u>8.34%</u>
Cost of Capital/ROR			9.20%

8
9 **II. THE WEIGHTED AVERAGE COST OF CAPITAL**

10 **Q. Briefly explain the cost of capital concept.**

11 A. The cost of capital is the opportunity cost of choosing one investment over others with
12 equivalent risk. In other words, the cost of capital is the return that stakeholders expect for
13 investing their financial resources in a determined business venture over another alternative
14 business venture.

15
16 **Q. What is the overall cost of capital?**

17 A. The overall cost of capital for a firm issuing a variety of securities (i.e., stock and
18 indebtedness) represents an average of the various cost rates on all securities issued by the
19 firm adjusted to reflect the relative weighting of each security within the firm's capital
20 structure. Thus, for any given firm, the overall cost of capital is the firm's WACC.
21

1 **Q. How is the WACC calculated?**

2 A. The WACC is calculated by adding the weighted expected returns of a firm's securities. The
3 WACC formula is:

4 Equation 1.

5
6
$$\text{WACC} = \sum_{i=1}^n W_i * r_i$$

7

8 In this equation, W_i is the weight given to the i^{th} security (the proportion of the i^{th} security
9 relative to the portfolio) and r_i is the expected return on the i^{th} security.

10

11 **Q. Can you provide an example demonstrating application of Equation 1?**

12 A. Yes. For this example, assume that an entity has a capital structure composed of 60 percent
13 debt and 40 percent equity. Also, assume that the embedded cost of debt is 6.0 percent and
14 the expected return on equity, i.e., the cost of equity, is 10.5 percent. Calculation of the
15 WACC is as follows:

16
$$\text{WACC} = (60\% * 6.0\%) + (40\% * 10.5\%)$$

17
$$\text{WACC} = 3.60\% + 4.20\%$$

18
$$\text{WACC} = 7.80\%$$

19

20 The weighted average cost of capital in this example is 7.80 percent. The entity in this
21 example would need to earn an overall rate of return of 7.80 percent to cover its cost of
22 capital.

23

1 **III. CAPITAL STRUCTURE**

2 *Background*

3 **Q. Please explain the capital structure concept.**

4 A. The capital structure of a firm is the relative proportions of each type of security--short-term
5 debt, long-term debt (including capital leases), preferred stock and common stock--that are
6 used to finance the firm's assets.

7
8 **Q. How is the capital structure expressed?**

9 A. The capital structure of a company is expressed as the percentage of each component of the
10 capital structure (capital leases, short-term debt, long-term debt, preferred stock and common
11 stock) relative to the entire capital structure.

12
13 As an example, the capital structure for an entity that is financed by \$20,000 of short-term debt,
14 \$85,000 of long-term debt (including capital leases), \$15,000 of preferred stock and \$80,000 of
15 common stock is shown in Table 2.

16 **Table 2**

Component			Percent
Short-Term Debt	\$20,000	(\$20,000/\$200,000)	10.0%
Long-Term Debt	\$85,000	(\$85,000/\$200,000)	42.5%
Preferred Stock	\$15,000	(\$15,000/\$200,000)	7.5%
Common Stock	\$80,000	(\$80,000/\$200,000)	40.0%
Total	\$200,000		100.0%

17
18 The capital structure in this example is composed of 10.0 percent short-term debt, 42.5 percent
19 long-term debt, 7.5 percent preferred stock and 40.0 percent common stock.

20

1 *Sahuarita's Capital Structure*

2 **Q. What capital structure does Sahuarita propose?**

3 A. The Company proposes a capital structure composed of 20.57 percent long-term debt and
4 79.43 percent common equity. Sahuarita's proposed capital structure reflects projected long-
5 term debt and common equity balances as of December 31, 2014.

6
7 **Q. How does Sahuarita's proposed capital structure compare to capital structures of
8 publicly-traded water utilities?**

9 A. Schedule CSB-4 shows the capital structures of six publicly-traded water companies ("sample
10 water companies" or "sample water utilities") as of December 2014. The average capital
11 structure for the sample water utilities is comprised of approximately 46.1 percent debt and
12 53.9 percent equity.

13
14 *Staff's Capital Structure*

15 **Q. What is Staff's recommended capital structure for Sahuarita?**

16 A. Staff recommends a capital structure composed of 20.57 percent debt and 79.43 percent
17 equity. Staff's recommended capital structure consists of \$2,326,035 long-term debt and
18 \$8,982,660 common equity as shown on Schedule CSB-10.

19
20 **IV. RETURN ON EQUITY**

21 *Background*

22 **Q. Please define the term "cost of equity capital."**

23 A. The cost of equity is the rate of return that investors expect to earn on their investment in a
24 business entity given its risk. In other words, the cost of equity to the entity is the investors'
25 expected rate of return on other investments of similar risk. As investors have a wide

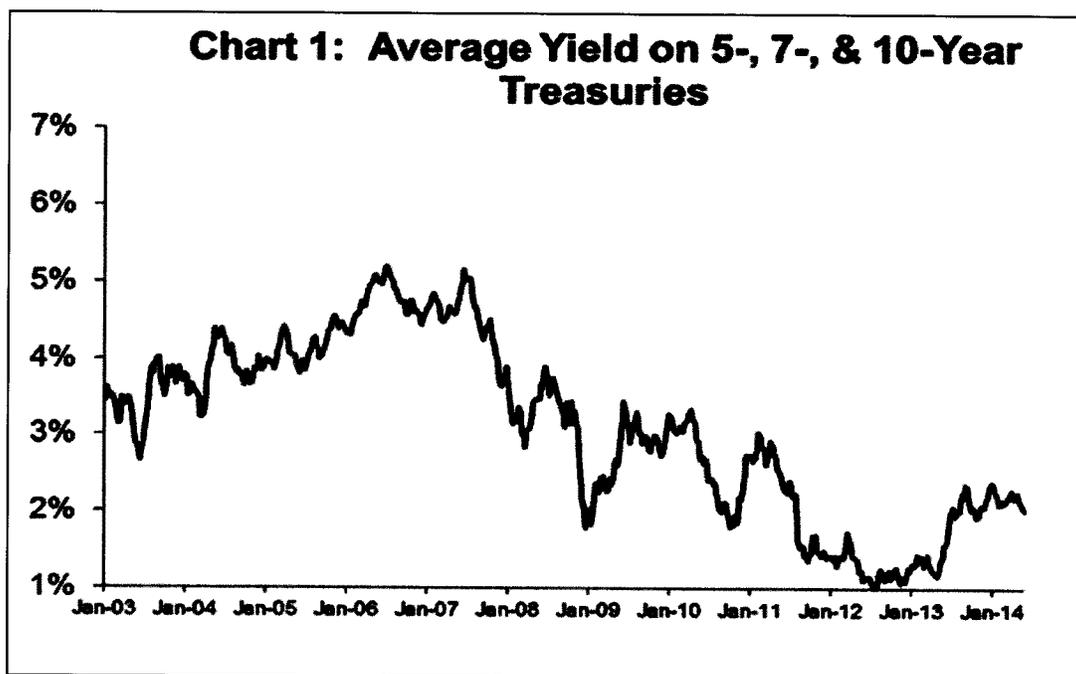
1 selection of investments to choose from, they will generally choose from investments with
2 similar risks and similar returns. Therefore, the market determines the entity's cost of equity.
3

4 **Q. Is there a correlation between interest rates and the cost of equity?**

5 A. Yes, there is a positive correlation between interest rates and the cost of equity, as the two
6 tend to move in the same direction. This relationship is reflected in the CAPM formula. The
7 CAPM is a market-based model employed by Staff for estimating the cost of equity. The
8 CAPM is further discussed in Section VI of this testimony.
9

10 **Q. What has been the general trend of interest rates in recent years?**

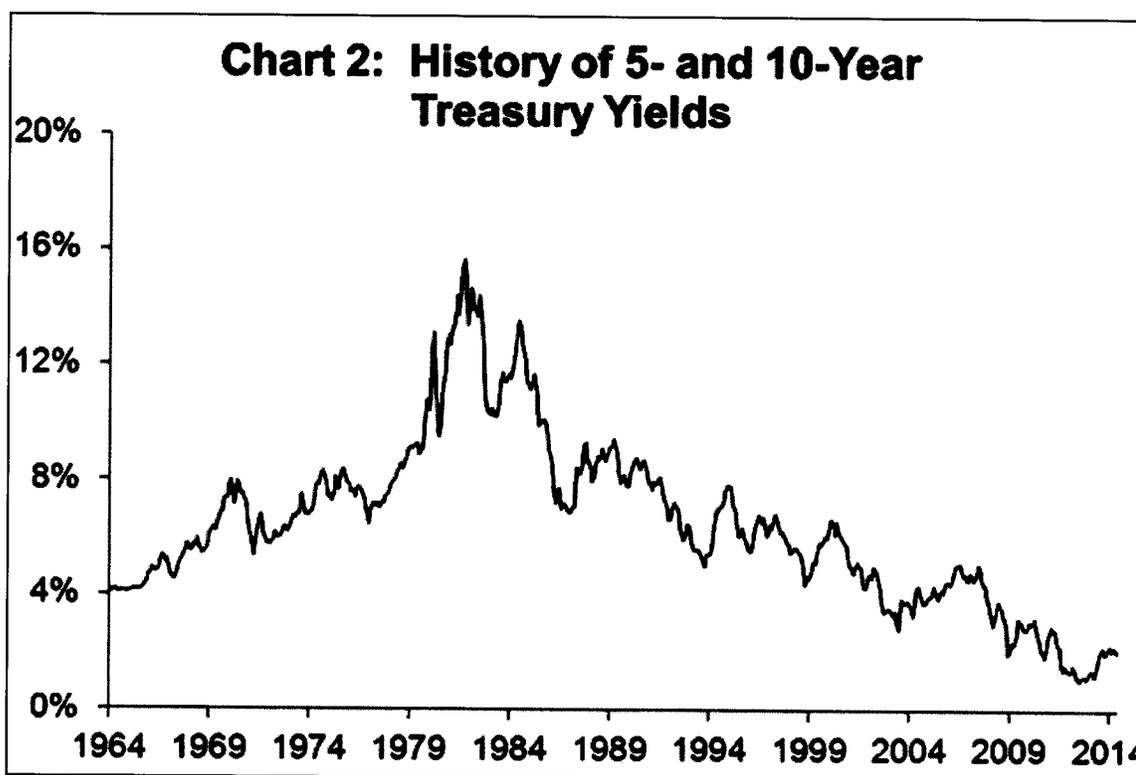
11 A. A chronological chart of interest rates is a good tool to show interest rate history and identify
12 trends. Chart 1 graphs intermediate U.S. treasury rates from January 3, 2003, to January 30,
13 2014.
14



1 As shown in Chart 1, intermediate-term interest rates generally trended upward from 2003 to
2 mid-2007, trended downward until late-2012, and have trended upward since that time.

3
4 **Q. What has been the general trend in interest rates longer term?**

5 A. U.S. Treasury rates from January 1964- January 2014 are shown in Chart 2. The chart shows
6 that interest rates trended upward through the mid-1980s and have trended downward since
7 that time.



20
21 Source: Federal Reserve

22 **Q. Do these trends suggest anything in terms of cost of equity?**

23 A. Yes. As previously noted, interest rates and the cost of equity tend to move in the same
24 direction; therefore, the cost of equity has declined in the past 30 years.

25

1 **Q. Do actual returns represent the cost of equity?**

2 A. No. The cost of equity represents investors' *expected* returns and not realized returns.

3
4 **Q. Is there any information available that leads to an understanding of the relationship**
5 **between the equity returns required for a regulated water utility and those required in**
6 **the market as a whole?**

7 A. Yes. A comparison of betas, a component of the CAPM discussed in Section V, for the
8 water utility industry and the market provide insight into this relationship. In theory, the
9 overall market has a beta value of 1.0, with stocks bearing greater risk (less risk) than the
10 market having beta values higher than (lower than) 1.0, respectively. Furthermore, in
11 accordance with the CAPM, the cost of equity capital moves in the same direction as beta.
12 Therefore, because the average beta value (0.73)¹ for a water utility is less than 1.0, the
13 required return on equity for a regulated water utility is below that of the market as a whole.

14
15 *Risk*

16 **Q. Please define risk in relation to cost of capital.**

17 A. Risk, as it relates to an investment, is the variability or uncertainty of the returns on a
18 particular security. Investors are risk averse and require a greater potential return to invest in
19 opportunities with relatively greater risk, i.e., investors require compensation for taking on
20 additional risk. Risk is generally separated into two components. Those components are
21 market risk (systematic risk) and non-market risk (unsystematic risk, diversifiable risk or firm-
22 specific risk).

23

¹ See Schedule CSB-7.

1 **Q. What is market risk?**

2 A. Market risk, or systematic risk, is the risk associated with an investment that cannot be
3 reduced through diversification. Market risk stems from factors that affect all securities, such
4 as possibilities of recession, war, inflation and high interest rates. Since these factors affect
5 the entire market they cannot be eliminated through diversification. Market risk does not
6 impact each security to the same degree. The degree to which a given security's return is
7 affected by market fluctuations can be measured using Beta. Beta reflects the business risk
8 and the financial risk of a security.

9
10 **Q. Please define business risk.**

11 A. Business risk is the potential fluctuation of earnings inherent in a firm's operations and
12 environment, such as competition and adverse economic conditions that may impair its
13 ability to provide returns on investment. Companies in the same industry or similar lines of
14 business tend to experience the same fluctuations in business cycles.

15
16 **Q. Please define financial risk.**

17 A. Financial risk is the potential fluctuation of earnings, inherent in the use of debt financing,
18 that may impair a firm's ability to provide adequate return; the higher the percentage of debt
19 in a firm's capital structure, the greater its exposure to financial risk.

20
21 **Q. Do business risk and financial risk affect the cost of equity?**

22 A. Yes.

23
24 **Q. Is a firm subject to any other risk?**

25 A. Yes. Firms may also be subject to unsystematic or firm-specific risk. Examples of
26 unsystematic risk include losses caused by labor problems, nationalization of assets, loss of a

1 big client or weather conditions. Investors can eliminate firm-specific risk by holding a
2 diverse portfolio; thus, it is not of concern to diversified investors.

3
4 **Q. How does Sahuarita's financial risk exposure compare to that of Staff's sample group**
5 **of water companies?**

6 A. CSB-4 shows the capital structures of Staff's six sample water companies as of December 30,
7 2014, and Sahuarita's adjusted capital structure as of the end of the test year, December 31,
8 2014. As shown, the sample water utilities were capitalized with approximately 46.1 percent
9 debt and 53.9 percent equity, while Sahuarita's capital structure consists of approximately
10 20.57 percent debt and 79.43 percent equity. Thus, Sahuarita bears significantly less financial
11 risk than do Staff's sample companies.

12
13 **Q. Is firm-specific risk measured by beta?**

14 A. No. Firm-specific risk is not measured by beta.

15
16 **Q. Is the cost of equity affected by firm-specific risk?**

17 A. No. Since firm-specific risk can be eliminated through diversification, it does not affect the
18 determination of a reasonable cost of equity.

19
20 **Q. Should investors expect additional returns for firm-specific risk?**

21 A. No. Investors who hold diversified portfolios can eliminate firm-specific risk and,
22 consequently, do not require any additional return. Since investors who choose to be less
23 than fully-diversified must compete in the market with fully-diversified investors, the former
24 cannot expect to be compensated for unique risk.

1 **V. ESTIMATING THE COST OF EQUITY**

2 *Introduction*

3 **Q. Did Staff directly estimate the cost of equity for Sahuarita?**

4 A. No. Sahuarita is not a publicly-traded company and, as such, Staff is unable to directly
5 estimate its market cost of equity due to the lack of firm-specific market data. Instead, Staff
6 must estimate the Company's cost of equity indirectly using a representative sample group of
7 publicly traded water utilities as a proxy for Sahuarita. Use of a sample is appropriate, as it
8 reduces the sample error resulting from random fluctuations in the market at the time the
9 information is gathered.

10
11 **Q. What water utilities did Staff select for its proxy group of sample companies?**

12 A. Staff's sample consists of the following six publicly-traded water utilities: American States
13 Water, California Water, Aqua America, Connecticut Water Services, Middlesex Water and
14 SJW Corp. Staff chose these companies because they are publicly-traded and receive the
15 majority of their earnings from regulated operations.

16
17 **Q. What models did Staff implement to estimate Sahuarita's cost of equity?**

18 A. Staff used two market-based models to estimate the cost of equity for Sahuarita: the DCF
19 model and the CAPM.

20
21 **Q. Please explain why Staff chose the DCF and CAPM models.**

22 A. Staff chose to use the DCF and CAPM models because they are widely-recognized market-
23 based models and have been used extensively to estimate the cost of equity. An explanation
24 of the DCF and CAPM models follows.

1 *Discounted Cash Flow Model Analysis*

2 **Q. Please provide a brief summary of the theory upon which the DCF method of**
3 **estimating the cost of equity is based.**

4 A. The DCF method of stock valuation is based on the theory that the value of an investment is
5 equal to the sum of the future cash flows generated from the aforementioned investment
6 discounted to the present time. This method uses expected dividends, market price and
7 dividend growth rate to calculate the cost of capital. Professor Myron Gordon pioneered the
8 DCF method in the 1960s. The DCF method has become widely used to estimate the cost of
9 equity for public utilities due to its theoretical merit and its simplicity. Staff used the financial
10 information for the relevant six sample companies in the DCF model and averaged the results
11 to determine an estimated cost of equity for the sample companies.

12
13 **Q. Does Staff use more than one version of the DCF?**

14 A. Yes. Staff uses two versions of the DCF model: the constant-growth DCF and the multi-
15 stage or non-constant growth DCF. The constant-growth DCF assumes that an entity's
16 dividends will grow indefinitely at the same rate. The multi-stage growth DCF model
17 assumes the dividend growth rate will change at some point in the future.

18
19 *The Constant-Growth DCF*

20 **Q. What is the mathematical formula used in Staff's constant-growth DCF analysis?**

21 A. The constant-growth DCF formula used in Staff's analysis is:

Equation 2 :

$$K = \frac{D_1}{P_0} + g$$

where : K = the cost of equity
 D₁ = the expected annual dividend
 P₀ = the current stock price
 g = the expected infinite annual growth rate of dividends

1 Equation 2 assumes that the entity has a constant earnings retention rate and that its earnings
2 are expected to grow at a constant rate. According to Equation 2, a stock with a current
3 market price of \$10 per share, an expected annual dividend of \$0.45 per share and an
4 expected dividend growth rate of 3.0 percent per year has a cost of equity to the entity of 7.5
5 percent reflected by the sum of the dividend yield ($\$0.45 / \$10 = 4.5$ percent) and the 3.0
6 percent annual dividend growth rate.

7
8 **Q. How did Staff calculate the expected dividend yield (D_1/P_0) component of the**
9 **constant-growth DCF formula?**

10 A. Staff calculated the expected yield component of the DCF formula by dividing the expected
11 annual dividend (D_1) by the spot stock price (P_0) after the close of market on December 9,
12 2015, as reported by *Yahoo Finance*.

13
14 **Q. Why did Staff use the December 9, 2015, spot price rather than a historical average**
15 **stock price to calculate the dividend yield component of the DCF formula?**

16 A. The current, rather than historic, market price is used in order to be consistent with financial
17 theory. In accordance with the Efficient Market Hypothesis, the current stock price is
18 reflective of all available information relating to the stock, and as such reveals investors'
19 expectations of future returns. Use of historical average stock prices illogically discounts the
20 most recent information in favor of less recent information. The latter is obviously stale and
21 is representative of underlying conditions that may have changed.

22
23 **Q. How did Staff estimate the dividend growth (g) component of the constant-growth**
24 **DCF model represented by Equation 2?**

25 A. The dividend growth component used by Staff is determined by the average of six different
26 estimation methods, as shown in Schedule CSB-8. Staff calculated historical and projected

1 growth estimates on dividend-per-share (“DPS”),² earnings-per-share (“EPS”)³ and
2 sustainable growth bases.

3
4 **Q. Why did Staff examine EPS growth to estimate the dividend growth component of the**
5 **constant-growth DCF model?**

6 A. Historic and projected EPS growth are used because dividends are related to earnings.
7 Dividend distributions may exceed earnings in the short run, but cannot continue indefinitely.
8 In the long term, dividend distributions are dependent on earnings.

9
10 **Q. How did Staff estimate historical DPS growth?**

11 A. Staff estimated historical DPS growth by calculating a compound annual DPS growth rate for
12 each of its sample companies over the 10-year period, 2005-2014. As shown in Schedule
13 CSB-5, the average historical DPS growth rate for the sample was 3.8 percent.

14
15 **Q. How did Staff estimate projected DPS growth?**

16 A. Staff calculated an average of the projected DPS growth rates for the sample water utilities
17 from *Value Line* through the period, 2018-2020. The average projected DPS growth rate is
18 5.7 percent, as shown in Schedule CSB-5.

19
20 **Q. How did Staff estimate historical EPS growth rate?**

21 A. Staff estimated historical EPS growth by calculating a compound annual EPS growth rate for
22 each of its sample companies over the 10-year period, 2005-2014. As shown in Schedule
23 CSB-5, the average historical EPS growth rate for the sample was 7.1 percent.

24

² Derived from information provided by *Value Line*.

³ Derived from information provided by *Value Line*.

1 **Q. How did Staff estimate projected EPS growth?**

2 A. Staff calculated an average of the projected EPS growth rates for the sample water utilities
3 from *Value Line* through the period, 2018-2020. The average projected EPS growth rate is
4 5.1 percent, as shown in Schedule CSB-5.

5
6 **Q. How does Staff calculate its historical and projected sustainable growth rates?**

7 A. Historical and projected sustainable growth rates are calculated by adding their respective
8 retention growth rate terms (*br*) to their respective stock financing growth rate terms (*vs*), as
9 shown in Schedule CSB-6.

10
11 **Q. What is retention growth?**

12 A. Retention growth is the growth in dividends due to the retention of earnings. The retention
13 growth concept is based on the theory that dividend growth cannot be achieved unless the
14 company retains and reinvests some of its earnings. The retention growth is used in Staff's
15 calculation of sustainable growth shown in Schedule CSB-6.

16
17 **Q. What is the formula for the retention growth rate?**

18 A. The retention growth rate is the product of the retention ratio and the book/accounting
19 return on equity. The retention growth rate formula is:

20

Equation 3:

$$\text{Retention Growth Rate} = br$$

where: b = the retention ratio (1 – dividend payout ratio)
 r = the accounting/book return on common equity

21

1 **Q. How did Staff calculate the average historical retention growth rate (br) for the**
2 **sample water utilities?**

3 A. Staff calculated the mean of the 10-year average historical retention rate for each sample
4 company over the period, 2005-2014. As shown in Schedule CSB-6, the historical average
5 retention (br) growth rate for the sample is 3.1 percent.

6
7 **Q. How did Staff estimate its projected retention growth rate (br) for the sample water**
8 **utilities?**

9 A. Staff used the retention growth projections for the sample water utilities for the period, 2018-
10 2020, from *Value Line*. As shown in Schedule CSB-6, the projected average retention growth
11 rate for the sample companies is 4.6 percent.

12
13 **Q. When can retention growth provide a reasonable estimate of future dividend growth?**

14 A. The retention growth rate is a reasonable estimate of future dividend growth when the
15 retention ratio is reasonably constant and the entity's market price to book value ("market-to-
16 book ratio") is expected to be 1.0. The average retention ratio has been reasonably constant
17 in recent years. However, the market-to-book ratio for the sample water utilities is 2.3,
18 notably higher than 1.0, as shown in Schedule CSB-7.

19
20 **Q. Is there any financial implication of a market-to-book ratio greater than 1.0?**

21 A. Yes. A market-to-book ratio greater than 1.0 implies that investors expect an entity to earn
22 an accounting/book return on its equity that exceeds its cost of equity. The relationship
23 between required returns and expected cash flows is readily observed in the fixed securities
24 market. For example, assume an entity contemplating issuance of bonds with a face value of
25 \$10 million at either 6 percent or 8 percent and, thus, paying annual interest of \$600,000 or
26 \$800,000, respectively. Regardless of investors' required return on similar bonds, investors

1 will be willing to pay more for the bonds if issued at 8 percent than if the bonds are issued at
2 6 percent. For example, if the current interest rate required by investors is 6 percent, then
3 they would bid \$10 million for the 6 percent bonds and more than \$10 million for the 8
4 percent bonds. Similarly, if equity investors require a 9 percent return and expect an entity to
5 earn accounting/book returns of 13 percent, the market will bid up the price of the entity's
6 stock to provide the required return of 9 percent.

7
8 **Q. How has Staff generally recognized a market-to-book ratio exceeding 1.0 in its cost of**
9 **equity analyses in recent years?**

10 A. Staff has assumed that investors expect the market-to-book ratio to remain greater than 1.0.
11 Given that assumption, Staff has added a stock financing growth rate (vs) term to the
12 retention ratio (br) term to calculate its historical and projected sustainable growth rates.

13
14 **Q. Do the historical and projected sustainable growth rates Staff uses to develop its DCF**
15 **cost of equity in this case continue to include a stock financing growth rate term?**

16 A. Yes.

17
18 **Q. What is stock financing growth?**

19 A. Stock financing growth is the growth in an entity's dividends due to the sale of stock by that
20 entity. Stock financing growth is a concept developed by Myron Gordon and discussed in his
21 book *The Cost of Capital to a Public Utility*.⁴ Stock financing growth is the product of the
22 fraction of the funds raised from the sale of stock that accrues to existing shareholders (v)
23 and the fraction resulting from dividing the funds raised from the sale of stock by the existing
24 common equity (s).

25

⁴ Gordon, Myron J. *The Cost of Capital to a Public Utility*. MSU Public Utilities Studies, Michigan, 1974. pp 31-35.

1 **Q. What is the mathematical formula for the stock financing growth rate?**

2 A. The mathematical formula for stock financing growth is:

Equation 4:

$$\text{Stock Financing Growth} = vs$$

where: v = Fraction of the funds raised from the sale of stock that accrues
to existing shareholders

s = Funds raised from the sale of stock as a fraction of the existing
common equity

3

4 **Q. How is the variable v presented above calculated?**

5 A. Variable v is calculated as follows:

Equation 5:

$$v = 1 - \left(\frac{\text{book value}}{\text{market value}} \right)$$

6

7 For example, assume that a share of stock has a \$30 book value and is selling for \$45. Then,
8 to find the value of v , the formula is applied:

$$v = 1 - \left(\frac{30}{45} \right)$$

9

In this example, v is equal to 0.33.

10

11 **Q. How is the variable s presented above calculated?**

12 A. Variable s is calculated as follows:

13 Equation 6:

14

15

$$s = \frac{\text{Funds raised from the issuance of stock}}{\text{Total existing common equity before the issuance}}$$

1 For example, assume that an entity has \$150 in existing equity, and it sells \$30 of stock.
2 Then, to find the value of s , the formula is applied:

$$s = \left(\frac{30}{150} \right)$$

3 In this example, s is equal to 20.0 percent.
4

5 **Q. What is the vs term when the market-to-book ratio is equal to 1.0?**

6 A. A market-to-book ratio of 1.0 reflects that investors expect an entity to earn a
7 book/accounting return on their equity investment equal to the cost of equity. When the
8 market-to-book ratio is equal to 1.0, none of the funds raised from the sale of stock by the
9 entity accrues to the benefit of existing shareholders, i.e., the term v is equal to zero (0.0).
10 Consequently, the vs term is also equal to zero (0.0). When stock financing growth is zero,
11 dividend growth depends solely on the br term.
12

13 **Q. What is the effect of the vs term when the market-to-book ratio is greater than 1.0?**

14 A. A market-to-book ratio greater than 1.0 reflects that investors expect an entity to earn a
15 book/accounting return on their equity investment greater than the cost of equity. Equation
16 5 shows that, when the market-to-book ratio is greater than 1.0, the v term is also greater than
17 zero. The excess by which new shares are issued and sold over book value per share of
18 outstanding stock is a contribution that accrues to existing stockholders in the form of a
19 higher book value. The resulting higher book value leads to higher expected earnings and
20 dividends. Continued growth from the vs term is dependent upon the continued issuance and
21 sale of additional shares at a price that exceeds book value per share.
22

1 **Q. What *vs* estimate did Staff calculate from its analysis of the sample water utilities?**

2 A. Staff estimated an average stock financing growth of 1.7 percent for the sample water utilities,
3 as shown in Schedule CSB-6.

4
5 **Q. What would occur if an entity had a market-to-book ratio greater than 1.0 as a result of**
6 **investors expecting earnings to exceed its cost of equity, and subsequently**
7 **experienced newly-authorized rates equal only to its cost of equity?**

8 A. Holding all other factors constant, one would expect market forces to move the company's
9 stock price lower, closer to a market-to-book ratio of 1.0, to reflect investor expectations of
10 reduced expected future cash flows.

11
12 **Q. If the average market-to-book ratio of Staff's sample water utilities were to fall to 1.0**
13 **due to authorized ROEs equaling their cost of equity, would inclusion of the *vs* term**
14 **be necessary to Staff's constant-growth DCF analysis?**

15 A. No. As discussed above, when the market-to-book ratio is equal to 1.0, no portion of the
16 funds raised from the sale of stock by the entity accrues to the benefit of existing
17 shareholders because the *v* term is equal to zero; thus, the *vs* term is also equal to zero. When
18 the market-to-book ratio equals 1.0, dividend growth depends solely on the *br* term. Staff's
19 inclusion of the *vs* term assumes that the market-to-book ratio continues to exceed 1.0, and
20 that the sample water utilities will continue to issue and sell stock at prices above book value
21 with the effect of benefitting existing shareholders.

22
23 **Q. What are Staff's historical and projected sustainable growth rates?**

24 A. Staff's estimated historical sustainable growth rate is 4.9 percent based on an analysis of
25 earnings retention for the sample water companies. Staff's projected sustainable growth rate

1 is 6.3 percent based on retention growth projected by *Value Line*. Schedule CSB-6 presents
2 Staff's estimates of the sustainable growth rate.

3
4 **Q. What is Staff's expected infinite annual growth rate in dividends?**

5 A. Staff's expected dividend growth rate (g) is 5.5 percent, which is the average of historical and
6 projected DPS, EPS, and sustainable growth estimates. Staff's calculation of the expected
7 infinite annual growth rate in dividends is shown in Schedule CSB-8.

8
9 **Q. What is Staff's constant-growth DCF estimate for the sample utilities?**

10 A. Staff's constant-growth DCF estimate is 8.2 percent, as shown in Schedule CSB-3.

11
12 *The Multi-Stage DCF*

13 **Q. Why did Staff implement the multi-stage DCF model to estimate Sahuarita's cost of
14 equity?**

15 A. Staff generally uses the multi-stage DCF model to consider the assumption that dividends
16 may not grow at a constant rate. The multi-stage DCF uses two stages of growth, the first
17 stage (near-term) having a four-year duration, followed by the second stage (long-term) of
18 constant growth.

19
20

1 **Q. What is the mathematical formula for the multi-stage DCF?**

2 A. The multi-stage DCF formula is shown in the following equation:

Equation 7 :

$$P_0 = \sum_{t=1}^n \frac{D_t}{(1+K)^t} + \frac{D_n(1+g_n)}{K-g_n} \left[\frac{1}{(1+K)} \right]^n$$

Where : P_0 = current stock price
 D_t = dividends expected during stage 1
 K = cost of equity
 n = years of non – constant growth
 D_n = dividend expected in year n
 g_n = constant rate of growth expected after year n

3

4 **Q. What steps did Staff take to implement its multi-stage DCF cost of equity model?**

5 A. First, Staff projected future dividends for each of the sample water utilities using near-term
6 and long-term growth rates. Second, Staff calculated the internal rate of return (cost of
7 equity) which equates the present value of the forecasted dividends to the current stock price
8 for each of the sample water utilities. Lastly, Staff calculated an overall sample average cost
9 of equity estimate.

10

11 **Q. How did Staff calculate near-term (stage-1) growth?**

12 A. The stage-1 growth rate is based on *Value Lines's* projected dividends for the next twelve
13 months, when available, and on the average dividend growth (g) rate of 5.5 percent, calculated
14 in Staff's constant DCF analysis for the remainder of the stage as shown on Schedule CSB-8.

15

1 **Q. How did Staff estimate long-term (stage-2) growth?**

2 A. Staff calculated the stage-2 growth rate using the arithmetic mean rate of growth in Gross
3 Domestic Product (“GDP”) from 1929 to 2014.⁵ Using the GDP growth rate assumes that
4 the water utility industry is expected to grow at the same rate as the overall economy.

5
6 **Q. What is the historical GDP growth rate that Staff used to estimate stage-2 growth?**

7 A. Staff used 6.4 percent to estimate the stage-2 growth rate as shown on Schedule CSB-9.

8
9 **Q. What is Staff’s multi-stage DCF estimate for the sample utilities?**

10 A. Staff’s multi-stage DCF estimate is 9.0 percent, as shown in Schedule CSB-3.

11
12 **Q. What is Staff’s overall DCF estimate for the sample utilities?**

13 A. Staff’s overall DCF estimate is 8.6 percent. Staff calculated the overall DCF estimate by
14 averaging the constant growth DCF (8.2%) and multi-stage DCF (9.0%) estimates, as shown
15 in Schedule CSB-3.

16
17 *Capital Asset Pricing Model*

18 **Q. Please describe the CAPM.**

19 A. The CAPM is used to determine the prices of securities in a competitive market. The CAPM
20 model describes the relationship between a security’s investment risk and its market rate of
21 return. Under the CAPM, an investor requires the expected return of a security to equal the
22 rate on a risk-free security plus a risk premium. The model also assumes that investors will
23 sufficiently diversify their investments to eliminate any non-systematic or unique risk.⁶ In

⁵ www.bea.doc.gov.

⁶ The CAPM makes the following assumptions: 1) single holding period; 2) perfect and competitive securities market; 3) no transaction costs; 4) no restrictions on short selling or borrowing; 5) the existence of a risk-free rate; and 6) homogeneous expectations.

1 1990, Professors Harry Markowitz, William Sharpe, and Merton Miller earned the Nobel
2 Prize in Economic Sciences for their contribution to the development of the CAPM.

3
4 **Q. Did Staff use the same sample water utilities in its CAPM and DCF cost of equity**
5 **estimation analyses?**

6 A. Yes. Staff's CAPM cost of equity estimation analysis uses the same sample water companies
7 as did its DCF cost of equity estimation analysis.

8
9 **Q. What is the mathematical formula for the CAPM?**

10 A. The mathematical formula for the CAPM is:

11

Equation 8 :

$$K = R_f + \beta (R_m - R_f)$$

where: R_f = risk free rate
 R_m = return on market
 β = beta
 $R_m - R_f$ = market risk premium
 K = expected return

12

13 The equation shows that the expected return (K) on a risky asset is equal to the risk-free
14 interest rate (R_f) plus the product of the market risk premium ($R_m - R_f$) multiplied by the
15 beta (β) coefficient, where beta represents the riskiness of the investment relative to the
16 market.

17

18 **Q. What is the risk-free rate?**

19 A. The risk-free rate is the rate of return of an investment free of default risk.

1 **Q. What does Staff use as surrogates to represent estimations of the risk-free rates of**
2 **interest in its historical and current market risk premium CAPM methods?**

3 A. As previously noted, Staff uses separate parameters as surrogates for the estimations of the
4 risk-free rates of interest for the historical market risk premium CAPM cost of equity
5 estimation and the current market risk premium CAPM cost of equity estimation. Staff uses
6 the average of three (5-, 7-, and 10-year) intermediate-term U.S. Treasury securities' spot rates
7 in its historical market risk premium CAPM cost of equity estimation, and the 30-year U.S.
8 Treasury bond spot rate in its current market risk premium CAPM cost of equity estimation.
9 Rates on U.S. Treasuries are largely verifiable and readily available.

10
11 **Q. What does beta measure?**

12 A. Beta is a measure of a security's price volatility, or systematic risk, relative to the market as a
13 whole. Since systematic risk cannot be diversified away, it is the only risk that is relevant
14 when estimating a security's required return. Using a baseline market beta of 1.0, a security
15 having a beta value less than 1.0 will be less volatile (i.e., less risky) than the market. A
16 security with a beta value greater than 1.0 will be more volatile (i.e., more risky) than the
17 market.

18
19 **Q. How did Staff estimate Sahuarita's beta?**

20 A. Staff used the average of the *Value Line* betas for the sample water utilities as a proxy for the
21 Company's beta. Schedule CSB-7 shows the *Value Line* betas for each of the sample water
22 utilities. The 0.73 average beta for the sample water utilities is Staff's estimated beta for
23 Sahuarita. A security having a beta value of 0.73 is less volatile than the market as a whole,
24 and thus requires a lower return on equity than does the overall market.

25

1 **Q. What is the market risk premium ($R_m - R_f$)?**

2 A. The market risk premium is the expected return on the market, minus the risk-free rate.
3 Simplified, it is the return an investor expects as compensation for market risk.
4

5 **Q. What did Staff use for the market risk premium?**

6 A. Staff uses separate calculations for the market risk premium in its historical and current
7 market risk premium CAPM methods.
8

9 **Q. How did Staff calculate an estimate for the market risk premium in its historical
10 market risk premium CAPM method?**

11 A. Staff uses the intermediate-term government bond income returns published in the Ibbotson
12 Associates' *Stocks, Bonds, Bills, and Inflation 2015 Yearbook* to calculate the historical market risk
13 premium. Ibbotson Associates calculates the historical risk premium by averaging the
14 historical arithmetic differences between the S&P 500 and the intermediate-term government
15 bond income returns for the period 1926-2014. Staff's historical market risk premium
16 estimate is 7.6 percent, as shown in Schedule CSB-3.
17

18 **Q. How did Staff calculate an estimate for the market risk premium in its current market
19 risk premium CAPM method?**

20 A. Staff solves equation 8 above to arrive at a market risk premium using a DCF-derived
21 expected return (K) of 12.03 ($2.30 + 9.73^7$) percent using the expected dividend yield (2.3
22 percent over the next twelve months) and the annual per share growth rate (12.03 percent)
23 that *Value Line* projects for all dividend-paying stocks under its review⁸ along with the current
24 long-term risk-free rate (30-year Treasury note at 2.88 percent) and the market's average beta

⁷ The three to five year price appreciation is 45%. $1.45^{0.25} - 1 = 9.73\%$.

⁸ November 4, 2015 issue date.

1 of 1.0. Staff calculated the current market risk premium as 9.5 percent,⁹ as shown in Schedule
2 CSB-3.

3
4 **Q. What is the result of Staff's historical market risk premium CAPM and current market**
5 **risk premium CAPM cost of equity estimations for the sample utilities?**

6 A. Staff's cost of equity estimates are 7.6 percent using the historical market risk premium
7 CAPM and 9.5 percent using the current market risk premium CAPM as shown on Schedule
8 CSB-3.

9
10 **Q. What is Staff's overall CAPM estimate for the sample utilities?**

11 A. Staff's overall CAPM cost of equity estimate is 8.6 percent which is the average of the
12 historical market risk premium CAPM (7.6 percent) and the current market risk premium
13 CAPM (9.5 percent) estimates, as shown in Schedule CSB-3.

14
15 **VI. SUMMARY OF STAFF'S COST OF EQUITY ANALYSIS**

16 **Q. What is the result of Staff's constant-growth DCF analysis to estimate the cost of**
17 **equity for the sample water utilities?**

18 A. Schedule CSB-3 shows the result of Staff's constant-growth DCF analysis. The result of
19 Staff's constant-growth DCF analysis is as follows:

20 $k = 2.7\% + 5.5\%$

21
22 $k = 8.2\%$

23
24 Staff's constant-growth DCF estimate of the cost of equity for the sample water utilities is 8.2
25 percent.

⁹ 12.03% = 2.88% + (1) (9.15%).

1 **Q. What is the result of Staff's multi-stage DCF analysis to estimate of the cost of equity**
2 **for the sample utilities?**

3 A. Schedule CSB-9 shows the result of Staff's multi-stage DCF analysis. The result of Staff's
4 multi-stage DCF analysis is:

5

6 Company	7 Equity Cost Estimate (k)
8 American States Water	8.6%
9 California Water	9.3%
10 Aqua America	8.8%
11 Connecticut Water	9.3%
12 Middlesex Water	9.4%
13 SJW Corp	8.9%
14 York Water	<u>9.0%</u>
15	
16 Average	9.0%

17

18 Staff's multi-stage DCF estimate of the cost of equity for the sample water utilities is 9.0
19 percent.

20

21 **Q. What is Staff's overall DCF estimate of the cost of equity for the sample utilities?**

22 A. Staff's overall DCF estimate of the cost of equity for the sample utilities is 8.6 percent. Staff
23 calculated an overall DCF cost of equity estimate by averaging Staff's constant growth DCF
24 (8.2 percent) and Staff's multi-stage DCF (9.0 percent) estimates, as shown in Schedule CSB-
25 3.

26

27 **Q. What is the result of Staff's historical market risk premium CAPM analysis to estimate**
28 **the cost of equity for the sample utilities?**

29 A. Schedule CSB-3 shows the result of Staff's CAPM analysis using the historical risk premium
30 estimate. The result is as follows:

31

1 $k = 2.1\% + 0.73 * 7.6\%$

2
3 $k = 7.6\%$

4
5 Staff's CAPM estimate (using the historical market risk premium) of the cost of equity for the
6 sample water utilities is 7.6 percent.

7
8 **Q. What is the result of Staff's current market risk premium CAPM analysis to estimate**
9 **the cost of equity for the sample utilities?**

10 A. Schedule CSB-3 shows the result of Staff's CAPM analysis using the current market risk
11 premium estimate. The result is:

12 $k = 2.9\% + 0.73 * 9.2\%$

13 $k = 9.5\%$

14
15 Staff's CAPM estimate (using the current market risk premium) of the cost of equity to the
16 sample water utilities is 9.5 percent.

17
18 **Q. What is Staff's overall CAPM estimate of the cost of equity for the sample utilities?**

19 A. Staff's overall CAPM estimate for the sample utilities is 8.6 percent. Staff's overall CAPM
20 estimate is the average of the historical market risk premium CAPM (7.6 percent) and the
21 current market risk premium CAPM (9.5 percent) estimates, as shown in Schedule CSB-3.

22
23 **Q. Please summarize the results of Staff's cost of equity analysis for the sample utilities.**

24 A. The following table shows the results of Staff's cost of equity analysis:

25

Table 2

Method	Estimate
Average DCF Estimate	8.6%
Average CAPM Estimate	8.6%
Overall Average	8.6%

Staff's average estimate of the cost of equity to the sample water utilities is 8.6 percent. As previously noted, the full range of Staff's model-driven ROE range is 7.6 percent to 9.5 percent.

Q. Ms. Brown, in the recent past, Staff chose not to incorporate the results of its CAPM-based ROE in developing its overall ROE recommendation. Would you please explain why Staff has moved away from that previous position?

A. Yes. Staff has always calculated the CAPM Model-driven ROE range but effectively gave this result a zero weighting. The zero weighting approach was followed due to a noted divergence of the CAPM Model-driven results from the DCF Model-driven results.

As noted later in my cost-of-capital testimony, Staff is now analyzing two CAPM Models, giving equal weight to both and the result is a CAPM-driven ROE range that compliments the results of its DCF Model runs.

VII. FINANCIAL RISK AND ECONOMIC ASSESSMENT ADJUSTMENTS

Q. Has Staff discontinued the direct recognition of the financial risk and economic assessment adjustments in its cost of equity analysis?

A. Yes. Staff has moved to an approach to developing its ROE recommendation that it believes is more straight forward, conceptually sound, and simpler to understand.

1 Let me say again that while Staff's recommended revenue requirement is based upon a
2 specific ROE recommendation, Staff also believes that defining a point-in-time specific fair
3 and reasonable ROE can only realistically be achieved to the point of establishing an ROE
4 range of reasonableness. Therefore, while Staff retains the right to evaluate and/or to argue
5 considerations of relevance that might support a more specifically defined ROE, Staff
6 generally believes that any ROE falling within the ROE range it will discuss in specific rate
7 case dockets would constitute an acceptable Commission decision. I will expand upon this
8 statement as I progress through my explanation of Staff's current approach to developing its
9 ROE recommendations.
10

11 **Q. Ms. Brown, please continue with your explanation of the structure and conceptual**
12 **support for Staff's current approach to developing its ROE recommendations.**

13 A. In a very broad sense, there are two general steps to developing an estimate of Staff's
14 recommended ROE. These two steps are the use of acceptable ROE models to establish the
15 currently defined market-driven requirements for ROE, and determining how to
16 appropriately give consideration to more specific risk factors (collectively referred to as
17 "other factors" or "more specific risk factors") not directly given attention in these models.
18

19 The ROE models referred to would include the traditionally recognized DCF and CAPM
20 Models and variations of assumptions within the use of these Models. Discussions regarding
21 the results from such Models are placed into evidence in most rate cases for Class A and B
22 utilities, including the pending rate application filed by Liberty Sahuarita Sewer. Parties take
23 differing positions with regards to some of the assumptions to be built into these Model runs,
24 but Staff and Mr. Bourassa, on the part of Liberty, have already discussed these Model runs
25 and the assumptions made, so I will not repeat that information here. How to appropriately

1 give consideration to more specific risk factors is really where Staff's current approach to
2 developing its recommended ROE takes a different direction.

3
4 **Q. Ms. Brown, before discussing the details and reasonableness of Staff's current**
5 **approach to giving consideration to these more specific risk factors, can you identify**
6 **the type of factors to which you are referring?**

7 A. Yes. The factors would include separate ROE modifiers for such things as financial risk and
8 the previous economic assessment adjustment. I would note that Mr. Bourassa spends a
9 great deal of time identifying and discussing such risk factors, specifically on pages 40 through
10 42 of the cost-of-capital testimony he sponsors.

11
12 Mr. Bourassa then assigns a specific ROE modifier to some of these factors, such as his
13 financial risk, which results in a 40 basis point reduction in ROE, but in general he
14 recommends an arbitrary 100 basis point ROE upward adjustment to the conglomeration of
15 all such risks he identifies and discusses. For the most part, as can be seen on Mr. Bourassa's
16 Schedule D-4.1, the Model-driven results have all been and individually adjusted upward by
17 100 basis points.

18
19 **Q. Does Staff believe that such other factors can exist that may not be addressed in the**
20 **traditionally utilized ROE Models?**

21 A. Yes.

22
23 **Q. How does Staff's approach to giving consideration to such other factors differ from**
24 **the approach taken by Mr. Bourassa?**

25 A. First, let me say that, instead of capturing ROE adders (or ROE reductions) related to these
26 factors in an arbitrary manner as Mr. Bourassa does, Staff believes it is reasonable for the

1 Commission to conclude that by using the mid-point of Staff's ROE Model results,
2 reasonable recognition is already being given to the collective spectrum of such other risks.

3
4 To be honest, it is a bit disingenuous to suggest to the Commission, as Mr. Bourassa has
5 done, that an exact 40 basis point ROE modifier is required for Sahuarita due to financial
6 risk. Arguably, this could require a 39 basis point reduction, a 41 basis point reduction, or a
7 50 basis point reduction.

8
9 Staff's point here is really not to take issue with Mr. Bourassa's specific ROE basis point
10 recommendations but to point out that, when it comes to developing an ROE
11 recommendation, we are not dealing with an exact science. Staff believes its approach is
12 reasonable and will probably eliminate lengthy discussions and cross examination regarding
13 issues without one correct answer.

14
15 **Q. Ms. Brown, before discussing Staff's specific arguments regarding the reasonableness**
16 **of accepting the mid-point of the Model-driven ROE range as a fair accommodation**
17 **of these other risk factors, please explain how Staff believes the Commission should**
18 **view the results of the ROE range established through use of the traditional ROE**
19 **Models.**

20 **A.** When boiled down, the argument regarding the ROE range defined through use of these
21 traditional ROE models is that any ROE falling within this range should be considered a
22 reasonable ROE for alternative investments with similar risk considerations. Or, said another
23 way, the lowest ROE resulting from the Model runs is just as valid or reasonable as any other
24 ROE point defined by these Model runs.

25

1 Staff could have, but chose not to, structure its specific ROE recommendation based upon
2 the lowest, but still reasonable, ROE resulting from these Model runs. Further, any
3 movement above this low point represents an acknowledgement or concession to the other
4 risk factors identified and discussed by Mr. Bourassa.

5
6 **Q. Ms. Brown, to be clear, what was the lowest ROE resulting from the Model runs**
7 **made by Staff?**

8 A. As can be seen on Staff Schedule, CSB-3, the lowest ROE is 7.6 percent resulting from the
9 CAPM Historic Market Risk Premium run.

10
11 **Q. Ms. Brown, would this be a good point to again interject that your current testimony**
12 **discussion go to how the Staff's ROE model-driven results would have been utilized**
13 **but for the secondary decision to develop Staff's revenue requirement calculation**
14 **utilizing the 9.5 percent upper end ROE of the Staff advocated ROE reasonableness**
15 **range instead of using the mid-point of this ROE reasonableness range?**

16 A. Yes.

17
18 **Q. Ms. Brown, again for clarification, if Staff had utilized the mid-point of its ROE range**
19 **to calculate Sahuarita's revenue requirement, how much higher would Staff's ROE**
20 **recommendation be above this ROE low point?**

21 A. The ROE used in Staff's revenue requirement schedules would have been 8.6 percent which,
22 in essence, represents in a 100 basis point upward adjustment related to the other risk factors.

23

1 Q. **And, again Ms. Brown, what was the ROE adder recommended by Mr. Bourassa?**

2 A. As seen on Mr. Bourassa's Schedule D-4.1, the ROE adder recommended by Mr. Bourassa
3 was 100 basis points, before factoring in a 40 basis point reduction attributable to Mr.
4 Bourassa's financial risk arguments.

5
6 Q. **So, would you agree, that effectively, Staff's much simpler approach to making**
7 **reasonable accommodation for these other risk factors aligns very closely with the**
8 **results recommended by Mr. Bourassa?**

9 A. Yes. And again, we do not want to lose sight of the fact that Mr. Bourassa's approach, while
10 involving a lot of detailed analysis, still relies upon some very arbitrary ROE modification
11 recommendations, e.g., the required financial risk ROE modifier is exactly minus 40 basis
12 points.

13
14 Q. **Ms. Brown, are you aware of any other instances where Mr. Bourassa seems to**
15 **suggest that using an approach which gives consideration to these other risk factors is**
16 **very close to the manner being recommended by Staff?**

17 A. Yes. In cost of capital testimony filed in both the pending Liberty Bella Vista rate case
18 (Docket No. 15-0367) and in the pending Liberty Rio Rico Water and Wastewater rate cases
19 (Docket No. 15-0368), page 6 line 14 through page 7, line 5, Mr. Bourassa seems to suggest
20 that he followed an approach very similar to the approach Staff is now recommending. In
21 response to a question regarding the "other risk factors" he considered in determining the
22 appropriate ROE for these three utility divisions, Mr. Bourassa says:

23
24 "I considered explicit adjustments to my ROE estimate for these
25 factors and I did take them into consideration when determining
26 **where, within the reasonableness range of analytical results** from
27 **the DCF, CAPM, and RPM models, the required ROE for each of the**
28 **two utilities rightfully falls."** [Emphasis supplied.]

1 **Q. Ms. Brown, perhaps a question at this point would be, how the application of Staff's**
2 **current approach to establishing a recommended ROE varies from utility to utility, if**
3 **we assume that two rate filings were docketed and processed pretty much**
4 **simultaneously?**

5 A. Staff's ROE recommendations and the mid-point ROE utilized in Staff's revenue
6 requirement schedules would be the same for both utilities.

7
8 **Q. So, would that suggest that Staff has not recognized that even minor variances in the**
9 **size, structure and operating characteristics can and do exist?**

10 A. No. Staff understands that minor differences will always exist. But the Commission should
11 be unpersuaded by suggestions that a more detailed analysis (and perhaps more costly
12 analysis) increases, to any necessary degree, the precision of the results. Staff's approach is
13 reasonable and is less burdened by unsubstantiated suggestions of preciseness that really do
14 not exist.

15
16 **Q. Ms. Brown, I would like to return to the initial caveat you expressed on behalf of Staff,**
17 **i.e.,**

18
19 **“Staff also believes that defining a point-in-time specific fair and**
20 **reasonable ROE can only realistically be achieved to the point of**
21 **establishing an ROE range of reasonableness. Therefore, while**
22 **Staff retains the right to evaluate and/or to argue considerations**
23 **of relevance that might support a more specifically defined**
24 **ROE, Staff generally believes that any ROE falling within the**
25 **ROE range it will discuss in specific rate case dockets would**
26 **constitute an acceptable Commission decision.”**

27
28 **By this caveat is Staff suggesting that the Commission should accept its approach to**
29 **establishing an ROE but then continue to encourage parties to interject general**

1 **arguments regarding the recognition of ROE adders to accommodate other general**
2 **risk factors?**

3 A. No. Regulated utilities, especially smaller utilities, often raise concerns about the
4 complexities, cost, and lack of transparency associated with the process employed to define a
5 range of reasonableness for ROE. Staff shares, and understands these concerns and believes
6 that steps to simplification should be given fair consideration. The caveat raised by Staff was
7 not meant to suggest that Staff was only interested in injecting yet another layer of complexity
8 into the process. Staff's intent was to acknowledge the broad discretion of the Commission
9 to base its final ROE decision on the full range of evidence before it. On a case-by-case
10 basis, any number of additional considerations, individually and collectively, could impact the
11 Commission's ultimate ROE decision.

12
13 **Q. Thank you Ms. Brown. Are there other modifications to Staff's development of its**
14 **ROE recommendations that you would like to note?**

15 A. Yes. Staff has incorporated in its analysis two versions of the CAPM (a model which links
16 the COE to risk). As discussed in Section V, the CAPM is composed of a risk free rate and a
17 risk premium. The risk premium is the additional return an investor is paid for assuming all
18 types of risk above and beyond the risk free rate, which includes financial risk and all other
19 compensation that was previously reflected by the economic assessment adjustment.

20
21 As shown on Schedule CSB-1, Staff's COE estimates a range from a low of 7.6 percent to a
22 high of 9.5 percent. Staff believes that any point within this range is reasonable. However,
23 Staff believes that the midpoint provides the best balance for all of the various types of risk.
24 Staff's methodology simplifies the COE analysis and recognizes that the Commission could
25 choose to set the ROE anywhere within the Staff recommended range.

1 **VIII. RATE OF RETURN RECOMMENDATION**

2 **Q. What overall rate of return did Staff determine for Sahuarita?**

3 A. Staff determined a 8.41 percent ROR for the Company, as shown in Schedule CSB-1 and the
4 following table: *(this table needs to be pulled and replaced)*

5
6 **Table 3**
7

	Weight	Cost	Weighted Cost
Long-term Debt	20.57%	4.20%	0.86%
Common Equity	79.43%	8.60%	<u>6.83%</u>
Overall ROR			<u>7.69%</u>

8
9 **Q. Does this conclude your direct testimony?**

10 A. Yes, it does.

Sahuarita Water Company, Inc. Cost of Capital Calculation
 Capital Structure
 And Weighted Average Cost of Capital
 Staff Recommended and Company Proposed

[A]	[B]	[C]	[D]
Description	Weight (%)	Cost	Weighted Cost
Staff Recommended Capital Structure			
Debt	20.57%	4.20%	0.86%
Common Equity	79.43%	9.50%	7.55%
Weighted Average Cost of Capital			8.41%
Company Proposed Capital Structure			
Debt	20.57%	4.20%	0.86%
Common Equity	79.43%	10.50%	8.34%
Weighted Average Cost of Capital			9.20%

[D] : [B] x [C]

Supporting Schedules: CSB-3 and CSB-4.

Intentionally left blank

Sahuarita Water Company, Inc. Cost of Capital Calculation
 Final Cost of Equity Estimates
 Sample Water Utilities

[A]	[B]	[C]	[D]	[E]
DCF Method				
Constant Growth DCF Estimate		$\frac{D_1/P_0^1}{2.7\%}$	$+ g^2$ 5.5%	k 8.2%
Multi-Stage DCF Estimate			$=$	<u>9.0%</u>
Average DCF Estimate			$=$	8.60%
CAPM Method				
Historical Market Risk Premium ²	Rf 2.1%	$+ \beta^2$ 0.73	\times (Rp) 7.6% ⁶	k 7.6%
Current Market Risk Premium ⁴	2.9%	0.73	\times 9.2% ⁷	<u>9.5%</u>
Average CAPM Estimate			$=$	8.60%
			Staff's Estimated Cost of Equity	8.6%
			Economic Assessment Adjustment	<u>0.0%</u>
			Sub-Total	8.60%
			Financial Risk Adjustment	<u>0.0%</u>
			Total	8.60%

1 MSN Money and Value Line

2 Schedule JAC-8

3 Risk-free rate (Rf) for 5, 7, and 10 year Treasury rates from the U.S. Treasury Department at www.ustreas.gov

4 Risk-free rate (Rf) for 30 Year Treasury bond rate from the U.S. Treasury Department at www.ustreas.gov

5 Value Line

6 Historical Market Risk Premium (Rp) calculated from 2015 Ibbotson SBBBI Classic Yearbook data

7 Testimony

Sahuarita Water Company, Inc. Cost of Capital Calculation
Average Capital Structure of Sample Water Utilities

[A]	[B]	[C]	[D]
<u>Company</u>	<u>Debt</u>	<u>Common Equity</u>	<u>Total</u>
American States Water	38.7%	61.3%	100.0%
California Water	45.9%	54.1%	100.0%
Aqua America	50.3%	49.7%	100.0%
Connecticut Water	45.6%	54.4%	100.0%
Middlesex Water	44.3%	55.7%	100.0%
SJW Corp	54.7%	45.3%	100.0%
York Water	<u>43.4%</u>	<u>56.6%</u>	<u>100.0%</u>
 Average Sample Water Utilities	 46.1%	 53.9%	 100.0%
 Sahuarita	 20.57%	 79.43%	 100.0%

Source:

Sample Water Companies from Value Line

Sahuarita Water Company, Inc. Cost of Capital Calculation
Growth in Earnings and Dividends
Sample Water Utilities

[A]	[B]	[C]	[D]	[E]
<u>Company</u>	Dividends Per Share 2005 to 2014 <u>DPS¹</u>	Dividends Per Share Projected <u>DPS¹</u>	Earnings Per Share 2005 to 2014 <u>EPS¹</u>	Earnings Per Share Projected <u>EPS¹</u>
American States Water	6.4%	6.7%	11.6%	6.5%
California Water	1.4%	8.3%	5.0%	5.4%
Aqua America	7.8%	9.7%	8.9%	6.6%
Connecticut Water	1.9%	5.2%	5.2%	3.2%
Middlesex Water	1.4%	2.3%	4.5%	3.6%
SJW Corp	3.9%	1.3%	8.5%	NA
York Water	<u>3.9%</u>	<u>6.7%</u>	<u>6.1%</u>	<u>5.3%</u>
 Average Sample Water Utilities	 3.8%	 5.7%	 7.1%	 5.1%

1 Value Line

Sahuarita Water Company, Inc. Cost of Capital Calculation
Sustainable Growth
Sample Water Utilities

[A]	[B]	[C]	[D]	[E]	[F]
<u>Company</u>	Retention Growth 2005 to 2014 <u>br</u>	Retention Growth Projected <u>br</u>	Stock Financing Growth <u>vs</u>	Sustainable Growth 2005 to 2014 <u>br + vs</u>	Sustainable Growth Projected <u>br + vs</u>
American States Water	4.6%	7.0%	1.6%	6.3%	8.6%
California Water	2.9%	3.6%	1.2%	4.0%	4.8%
Aqua America	4.3%	5.7%	1.2%	5.5%	6.8%
Connecticut Water	2.3%	4.1%	2.9%	5.2%	7.0%
Middlesex Water	1.6%	3.6%	1.7%	3.3%	5.3%
SJW Corp	4.0%	4.2%	0.9%	4.9%	5.1%
York Water	<u>2.4%</u>	<u>3.8%</u>	<u>2.6%</u>	<u>5.0%</u>	<u>6.5%</u>
Average Sample Water Utilities	3.1%	4.6%	1.7%	4.9%	6.3%

[B]: Value Line

[C]: Value Line

[D]: Value Line, Yahoo Finance, and Form 10-Ks filed with the Securities and Exchange Commission (<http://www.sec.gov/>)

[E]: [B]+[D]

[F]: [C]+[D]

Sahuarita Water Company, Inc. Cost of Capital Calculation
Selected Financial Data of Sample Water Utilities

[A] [B] [C] [D] [E] [F] [G]

[A]	[B]	[C]	[D]	[E]	[F]	[G]
<u>Company</u>	<u>Symbol</u>	<u>Spot Price</u> <u>11/4/2015</u>	<u>Book Value</u>	<u>Mkt To</u> <u>Book</u>	<i>Value Line</i> <u>Beta</u> <i>b</i>	<u>Raw</u> <u>Beta</u> <i>braw</i>
American States Water	AWR	40.89	13.72	3.0	0.70	0.52
California Water	CWT	22.67	13.28	1.7	0.75	0.60
Aqua America	WTR	29.26	9.39	3.1	0.75	0.60
Connecticut Water	CTWS	36.76	20.87	1.8	0.65	0.45
Middlesex Water	MSEX	25.24	12.48	2.0	0.75	0.60
SJW Corp	SJW	31.21	17.05	1.8	0.75	0.60
York Water	YORW	23.04	8.59	<u>2.7</u>	<u>0.75</u>	<u>0.60</u>
Average				2.3	0.73	0.57

[C]: Msn Money

[D]: Value Line

[E]: [C] / [D]

[F]: Value Line

[G]: (-0.35 + [F]) / 0.67

Sahuarita Water Company, Inc. Cost of Capital Calculation
 Calculation of Expected Infinite Annual Growth in Dividends
 Sample Water Utilities

[A]	[B]
<u>Description</u>	<u>g</u>
DPS Growth - Historical ¹	3.8%
DPS Growth - Projected ¹	5.7%
EPS Growth - Historical ¹	7.1%
EPS Growth - Projected ¹	5.1%
Sustainable Growth - Historical ²	4.9%
<u>Sustainable Growth - Projected²</u>	<u>6.3%</u>
Average	5.5%

1 Schedule CSB-5

2 Schedule CSB-6

Sahuarita Water Company, Inc. Cost of Capital Calculation
 Multi-Stage DCF Estimates
 Sample Water Utilities

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
Company	Current Mkt. Price (P_0) ¹ 11/4/2015	Projected Dividends ² (Stage 1 growth) (D_t)				Stage 2 growth ³ (g_n)	Equity Cost Estimate (K) ⁴
		d_1	d_2	d_3	d_4		
American States Water	40.9	0.90	0.95	1.00	1.05	6.4%	8.6%
California Water	22.7	0.67	0.71	0.75	0.79	6.4%	9.3%
Aqua America	29.3	0.70	0.74	0.78	0.82	6.4%	8.8%
Connecticut Water	36.8	1.08	1.14	1.20	1.27	6.4%	9.3%
Middlesex Water	25.2	0.77	0.81	0.86	0.90	6.4%	9.4%
SJW Corp	31.2	0.78	0.83	0.87	0.92	6.4%	8.9%
York Water	23.0	0.60	0.63	0.67	0.70	6.4%	9.0%

$$P_0 = \sum_{t=1}^n \frac{D_t}{(1+K)^t} + \frac{D_n(1+g_n)}{K-g_n} \left[\frac{1}{(1+K)} \right]^n$$

Average **9.0%**

- Where : P_0 = current stock price
 D_t = dividends expected during stage 1
 K = cost of equity
 n = years of non - constant growth
 D_n = dividend expected in year n
 g_n = constant rate of growth expected after year n

1 [B] see Schedule CSB-7

2 Derived from Value Line Information

3 Average annual growth in GDP 1929 - 2012 in current dollars.

4 Internal Rate of Return of Projected Dividends

**Sahuarita Water Company, Inc. Cost of Capital Calculation
Capitalization**

	<u>Interest Rate</u>	<u>Annual Interest</u>	<u>Amount outstanding as of 12/31/2014</u>	<u>Percentage of Capital Structure</u>
Long-Term Debt				
WIFA Loan	4.20%	\$ 97,693	\$ 2,326,035	
Long-Term Debt		\$ 97,693	\$ 2,326,035	20.57%
Short-Term Debt		\$ -		0.00%
Total Debt	4.20%	\$ 97,693	\$ 2,326,035	20.57%
Common Equity			\$ 8,982,660	
Common Shares Outstanding				
Paid in Capital				
Retained Earnings				
Total Common Equity			\$ 8,982,660	79.43%
Total Capitalization			\$ 11,308,695	100.00%

BEFORE THE ARIZONA CORPORATION COMMISSION

DOUG LITTLE
Interim Chairman
BOB STUMP
Commissioner
BOB BURNS
Commissioner
TOM FORESE
Commissioner

IN THE MATTER OF THE APPLICATION OF)
SAHUARITA WATER COMPANY, LLC AN)
ARIZONA WATER CORPORATION, FOR A)
DETERMINATION OF THE CURRENT FAIR)
VALUE OF ITS UTILITY PROPERTY AND)
FOR THE ESTABLISHMENT OF JUST AND)
REASONABLE RATES AND CHARGES.)
_____)

DOCKET NO. W-03718A-15-0213

DIRECT

TESTIMONY

OF

MICHAEL S. THOMPSON, P. E.

UTILITIES ENGINEER

UTILITIES DIVISION

ARIZONA CORPORATION COMMISSION

JANUARY 15, 2016

TABLE OF CONTENTS

	PAGE
INTRODUCTION	1
PURPOSE OF TESTIMONY.....	3
ENGINEERING REPORT	3
CONCLUSIONS AND RECOMMENDATIONS.....	4

EXHIBITS

Engineering Report for Sahuarita Water Company, LLC	MST-1
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1 **INTRODUCTION**

2 **Q. Please state your name and business address.**

3 A. My name is Michael Thompson. My business address is 1200 West Washington Street,
4 Phoenix, Arizona 85007.

5
6 **Q. By whom and in what position are you employed?**

7 A. I am employed by the Arizona Corporation Commission ("Commission" or "ACC") as a
8 Utilities Engineer - Water/Wastewater in the Utilities Division.

9
10 **Q. How long have you been employed by the Commission?**

11 A. I have been employed by the Commission since June 2013.

12
13 **Q. What are your responsibilities as a Utilities Engineer - Water/Wastewater?**

14 A. As a Utilities Engineer specializing in water and wastewater engineering, my responsibilities
15 include: the inspection, investigation, and evaluation of water and wastewater systems;
16 obtaining data and preparing investigative reports; providing technical recommendations and
17 suggesting corrective action for water and wastewater systems; and providing written and oral
18 testimony in rate cases and other cases before the Commission.

19
20 **Q. How many companies have you analyzed for the Utilities Division?**

21 A. I have analyzed 17 companies covering various responsibilities for the Utilities Division Staff
22 ("Utilities Staff" or "Staff").

23
24 **Q. Have you previously testified before this Commission?**

25 A. Yes, I have testified before this Commission.

26

1 **Q. What is your educational background?**

2 A. I graduated from the SUNY College of Environmental Science and Forestry (“ESF”) at
3 Syracuse, New York, and Syracuse University (“SU”) at Syracuse, New York. I have a
4 Bachelor of Science Degree in Pulp and Paper Engineering from ESF and Chemical
5 Engineering from SU.

6
7 **Q. Briefly describe your pertinent work experience.**

8 A. Prior to my employment with the Commission, I was the Operations Engineer, from 2009 to
9 2012, for the Southwest and Central Districts of Golden State Water Company (“GSWC”),
10 located in Gardena and Santa Fe Springs, California, respectively. As the Operations
11 Engineer, I provided technical assistance and support to the districts’ operations departments
12 with primary focus on resolving operational problems and optimizing the efficiency of the
13 water system operations. Prior to my employment with GSWC, I was employed with
14 Chaparral City Water Company (“Chaparral”), from 2002 to 2009, as District Operations
15 Engineer. While at Chaparral, I performed all capital, new business, and water quality
16 activities within the district. I served as field engineer/construction manager for all capital
17 and new business projects under construction. I also managed all water quality activities
18 including monitoring, sampling, and reporting as required by 40 CFR (National Primary
19 Drinking Water Regulations) and Arizona Administrative Code, Title 18, Chapter 4.

20
21 From 2000 to 2002, I was employed with the Fountain Hills Sanitary District as Engineering
22 Assistant. I performed plan review of all commercial and residential projects in the Town of
23 Fountain Hills, and managed the district’s construction projects.

24
25 From 1996 to 2000, I was employed as an Environmental Engineering Specialist with the
26 Arizona Department of Environmental Quality (“ADEQ”). During that time period, I

1 performed operations and maintenance site inspections of public water systems in Gila,
2 LaPaz, Mohave, and Southwestern Yavapai counties.

3
4 **Q. Please state your professional membership, registrations, and licenses.**

5 A. I am registered as a Professional Engineer (Civil) in the State of Arizona, a Grade 2 Certified
6 Water Treatment Plant Operator, and a Grade 3 Certified Water Distribution System
7 Operator. I am a member of the American Water Works Association and Arizona Water
8 Association.

9
10 **PURPOSE OF TESTIMONY**

11 **Q. What was your assignment in this rate proceeding?**

12 A. My assignment was to provide Staff's engineering evaluations for the Sahuarita Water
13 Company, LLC ("SWC" or "Company") rate proceedings.

14
15 **Q. What is the purpose of your testimony in this proceeding?**

16 A. My testimony presents the findings of Staff's engineering evaluation of the operations for the
17 SWC Water System. The findings are contained in the Engineering Report that I have
18 prepared for this proceeding. The report is included as Exhibit MST-1 in this pre-filed
19 testimony.

20
21 **ENGINEERING REPORT**

22 **Q. Please describe the information contained in your Engineering Report.**

23 A. The Report is divided into three (3) general sections: 1) *Executive Summary*, 2) *Engineering*
24 *Report Discussion*, and 3) *Engineering Report Figures*. The *Discussion* section for the SWC Water
25 System is further divided into nine (9) subsections: 1) *Introduction and Location of the Water*
26 *System*, 2) *Description of the Water System*, 3) *Water Usage*, 4) *Growth*, 5) *Arizona Department*

1 *Environmental Quality Compliance, 6) Arizona Department of Water Resources Compliance, 7) Arizona*
2 *Corporation Commission Compliance, 8) Depreciation Rates, and 9) Other Issues.*

3

4 **Q. Was the Engineering Report prepared by you?**

5 A. Yes.

6

7 **CONCLUSIONS AND RECOMMENDATIONS**

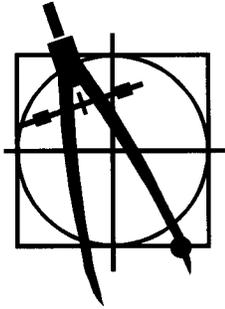
8 **Q. What are Staff's conclusions and recommendations regarding the operations of the**
9 **SWC Water System?**

10 A. Staff's conclusions and recommendations are contained in the Executive Summary of the
11 Engineering Report.

12

13 **Q. Does this conclude your Direct Testimony?**

14 A. Yes, it does.



**ENGINEERING REPORT FOR
Sahuarita Water Company, LLC**

Docket No. W-03718A-15-0213 (Rates)

By Michael Thompson, P. E.

December 21, 2015

EXECUTIVE SUMMARY

CONCLUSIONS

1. The Arizona Corporation Commission (“ACC” or “Commission”) Utilities Division Staff (“Utilities Staff” or “Staff”) concludes that the Sahuarita Water Company (“SWC” or “Company”) water system has adequate production and storage capacity to serve the present customer base and any reasonable growth.
2. SWC’s current CC&N covers an area totaling approximately 6.04 square-miles (3,869 acres), and consists of two (2) non-contiguous areas. The service area for the existing water system is within the 5.30 square-miles (3,395.98 acres) of certified area located along the eastern edge of Township 16S and Range 13E and Township 17S and Range 13E.
3. The Arizona Department of Environmental Quality (“ADEQ”) Drinking Water Compliance Status Report (“CSR”), dated July 22, 2015, indicates that the SWC water system, Public Water System No. 10-312, is currently delivering water that meets water quality standards required by 40 CFR 141 (National Primary Drinking Water Regulations) and Arizona Administrative Code, Title 18, Chapter 4.
4. The SWC water system service area is located within the Tucson Active Management Area (“AMA”). According to the Arizona Department of Water Resources (“ADWR”) water provider compliance report, dated July 2, 2015, SWC is in compliance with its requirements governing water providers and/or community water systems.
5. SWC’s water loss during the test year was 5.13 percent which is within the acceptable limits.
6. According to the Commission’s Utilities Division Compliance Section database, SWC currently has no delinquent Commission compliance items.
7. SWC has approved Cross-Connection/Backflow Prevention and Curtailment Tariffs on file with the Commission.

8. SWC currently has an approved Off-Site Hook-up Fee Tariff on file with the Commission. The tariff became effective October 25, 2013.
9. SWC does not have any Best Management Practice ("BMP") tariffs on file with the Commission. Per Decision No. 74867, dated December 18, 2014, SWC is no longer required to file any BMP tariffs.
10. Staff concludes that Well No. 23 is currently in operation and considered used and useful to the water systems provision of service.
11. Staff finds the Estancia del Corazon subdivision on-site plant facilities listed in Table Q, totaling \$76,082, to be used and useful to the water system's provision of service. Staff also finds the on-site plant facility costs, totaling \$76,082, to be reasonable and appropriate to the water system's provision of service.
12. Staff finds the post-test year ("PTY") plant for the arsenic absorption media cost, totaling \$150,657, to be reasonable and appropriate to the water system's provision of service.
13. Staff concludes that the PTY capital improvement projects listed in Table R, totaling \$214,912, are currently in operation and considered used and useful to the water system's provision of service. Staff also finds the PTY capital improvement project costs, totaling \$214,912, to be reasonable and appropriate to the water system's provision of service.

RECOMMENDATIONS

1. Staff recommends the annual water testing expenses of \$13,975 be used for purposes of this proceeding.
2. Staff further recommends that SWC use the Staff recommended depreciation rates listed in Table N.
3. Staff further recommends that SWC continue to use the service line and meter installation charges included in Table O.

TABLE OF CONTENTS

	PAGE
A. INTRODUCTION AND LOCATION OF COMPANY	4
B. DESCRIPTION OF THE WATER SYSTEM	5
C. WATER USE.....	11
1. <i>WATER SOLD</i>	11
2. <i>NON-ACCOUNTED FOR WATER</i>	12
3. <i>WATER SYSTEM ANALYSIS</i>	13
D. GROWTH	15
E. ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (“ADEQ”) COMPLIANCE.....	16
1. <i>COMPLIANCE STATUS</i>	16
2. <i>WATER MONITORING AND TESTING EXPENSES</i>	16
F. ARIZONA DEPARTMENT OF WATER RESOURCES (“ADWR”) COMPLIANCE	18
G. ARIZONA CORPORATION COMMISSION COMPLIANCE.....	18
H. DEPRECIATION RATES	18
I. OTHER ISSUES	19
1. <i>SERVICE LINE AND METER INSTALLATION CHARGES</i>	19
2. <i>CURTAILMENT TARIFF</i>	20
3. <i>CROSS-CONNECTION/BACKFLOW PREVENTION TARIFF</i>	20
4. <i>OFF-SITE HOOK-UP FEE</i>	20
5. <i>BEST MANAGEMENT PRACTICES (“BMP”) TARIFF</i>	20
6. <i>ARSENIC BLENDING PLAN</i>	20
7. <i>PLANT USED AND USEFUL - ESTANCLA DEL CORAZON SUBDIVISION</i>	21
8. <i>POST-TEST YEAR PLANT - ARSENIC ABSORPTION MEDIA REGENERATION</i>	21
9. <i>POST-TEST YEAR PLANT - MANUAL TRANSFER SWITCH & EMERGENCY STANDBY GENERATOR</i>	21

FIGURES

	PAGE
FIGURE 1. PIMA COUNTY MAP	24
FIGURE 2. SAHUARITA WATER SYSTEM CERTIFIED AREA.....	25
FIGURE 3. SAHUARITA WATER SYSTEM SITE MAP	26
FIGURE 4. SAHUARITA WATER TREATMENT PLANT NO.1 (AWTP & WELL NO. 23).....	27
FIGURE 5. SAHUARITA 2850 ZONE STORAGE TANKS & BOOSTER PUMP STATION NO. 1.....	28
FIGURE 6. SAHUARITA WELL SITE NO. 14 & WELL NO. 18	29
FIGURE 7. SAHUARITA BOOSTER PUMP STATION NO. 2 & WELL SITE NO. 17.....	30
FIGURE 8. SAHUARITA WATER CONSUMPTION GRAPH	31
FIGURE 9. SAHUARITA WATER USAGE PER CONNECTION.....	31
FIGURE 10. SAHUARITA WATER SYSTEM HISTORICAL WATER LOSS	32
FIGURE 11. SAHUARITA ACTUAL & PROJECTED GROWTH	32

A. INTRODUCTION AND LOCATION OF COMPANY

On July 28, 2015, Sahuarita Water Company, LLC (“SWC” or “Company”) filed an application with the Arizona Corporation Commission (“ACC” or “Commission”) for approval of a rate increase, with a 2014 test year, in Docket No. W-01853A-15-0145. SWC’s current rates were approved in Commission Decision No. 72177 dated February 11, 2011, and amended in Decision No. 74389 dated March 19, 2014.

Company Location

SWC is a Class B public utility water company that provides service to approximately 5,596 metered connections.¹ The water system, shown in Figure 1 located in the figure section of this report, is a groundwater-based system serving the Town of Sahuarita (“Sahuarita”), Arizona which is located approximately 20 miles south of the city of Tucson off Interstate Highway 19 in Pima County, Arizona.

Company Ownership and Certificate of Convenience and Necessity (“CC&N”) History

On September 16, 1994, Interchange Water Company, Inc. (“IWC”) filed an application with the Commission for a CC&N to provide water service to approximately 3,000 acres located within Sahuarita. The CC&N was granted to IWC in Commission Decision No. 59431, dated December 20, 1995. On March 11, 1999, IWC and Rancho Sahuarita Water Company, LLC (“RSWC”) filed a joint application for approval of the sale of assets and transfer of the CC&N from IWC to RSWC. The sale and the transfer of assets and the CC&N to RSWC were approved in Decision No. 62032 dated November 2, 1999. On January 2, 2004, RSWC filed an application for an extension of its CC&N, and was granted the extension on June 25, 2004 in Decision No. 67068. On October 18, 2007, RSWC filed Articles of Amendment advising the Commission that RSWC was changing its name to SWC. On December 14, 2007, SWC filed an application for an extension of the CC&N. In Decision No. 70620 dated November 19, 2008, the Commission approved both the name change (RSWC to SWC) and SWC’s request for an extension of the CC&N. The CC&N extension approved in Decision No. 70620 covered three (3) parcels each held by a different owner: Mission Peaks 4000, L.L.C. (“Mission Peaks”), Arizona State Land Department (“ASLD”), and Sahuarita Mission Partners (“SMP”). Due to the economic downturn of the real estate market, Mission Peaks sold its parcel to Freeport-McMoRan Copper and Gold, Inc. (“Freeport-McMoRan”), and ASLD sold its parcel to ASARCO, L.L.C. (“ASARCO”). In Decision No. 74604, the parcels owned by Freeport-McMoRan, and ASARCO were deleted from SWC’s CC&N. The current CC&N, which covers an area totaling approximately 6.04 square-miles (3,866.84 acres), consists of two (2) non-contiguous areas as shown in Figure 2. The service area for the existing water system is within the 5.30 square-miles (3,393.08 acres) of certified area, located along the eastern edges of Township 16S and Range 13E, and Township 17S and Range 13E. The remaining portion of the certified area, located on the eastern edge of Township 17S and Range 12E and within 0.74 square-miles (473.76 acres), currently has no facilities and is not provided service by SWC.

¹ Per water use data submitted with the application.

B. DESCRIPTION OF THE WATER SYSTEM²

The SWC water system was visited on July 28, 2015, by Staff Utilities Engineer, Michael Thompson, and Staff Public Utility Analyst III, Ms. Teresa Hunsaker. Prior to the field inspection, Mr. Thompson and Ms. Hunsaker met with Company representatives Mr. Geoffrey Caron, and Ms. Marian Homiak. Mr. Caron is SWC's General Manager and Ms. Homiak is SWC's Controller. During the field inspection, Mr. Thompson and Ms. Hunsaker were accompanied by Mr. Caron and Mr. Louis Valencia, SWC's Designated Operator.³

SWC's water system consists of three (3) active groundwater wells, five (5) inactive wells, three (3) storage tanks, three (3) booster pump stations, six (6) hydro-pneumatic pressure tanks, three (3) emergency generators, twenty three (23) sample stations, 395 fire hydrants, a supervisory control and data acquisition ("SCADA") communications system, an Arsenic Water Treatment Plant ("AWTP") located at Water Plant No. 1 ("WP No. 1"), and a distribution system that encompasses three (3) pressure zones (2,850, 2,950 and 3,050 feet). The in-service plant facilities (i.e., wells, tanks, booster pumps, and visible pipe) appeared to be in proper working order, properly maintained, and in excellent condition. Staff did not observe any leaks at the plant facilities or in the distribution system. A site map of the service area is illustrated in Figure 3. Schematics of the water system are illustrated in Figures 4, 5, 6, and 7.

1. *Active Well Sites*

The three (3) active groundwater production wells (Well Nos. 14, 18, & 23) pump water directly to WP No. 1 via dedicated raw water transmission mains. Well No. 14, located at the intersection of S. Calle Puente Lindo and E. Calle Puente Lindo, is equipped with a turbine pump and motor which produces approximately 1,800 gallons per minute ("gpm"). The well is owned by Sahuarita; however, SWC operates the well pursuant to a 99-year lease agreement with Sahuarita. There are approximately 84-years remaining on the lease. The well site also contains a 5,000 gallon hydro-pneumatic pressure tank, electrical control panels, a motor control panel, a manual transfer switch with connectors for a portable emergency generator, and a SCADA communications system. Well No. 18, located at 15299 S. Camino Lago Azul, is equipped with a turbine pump and motor which produces approximately 1,350 gpm. The well site also contains a 5,000 gallon hydro-pneumatic pressure tank, electrical control panels, a motor control panel that includes a manual transfer switch with connectors for a portable emergency generator, and a SCADA communications system. Well No. 23, located at WP No. 1, is equipped with a turbine pump and motor which produces approximately 1,800 gpm. The well site also contains a 5,000 gallon hydro-pneumatic pressure tank, tablet chlorination system, electrical control panels, a motor control panel, a SCADA

² The description of the water systems is based on one, or a combination of, the following sources: 1) Company's Application, 2) Information contained in the Company's 2011 Updated Water System Master Plan prepared by Westland Resources, Inc. dated August 2012, 3) Information contained in the Company's Response to Staff Data Requests and, 4) Information collected during Staff's site visit.

³ Mr. Caron is certified with the Arizona Department of Environmental Quality ("ADEQ") as a Grade 4 Water Distribution System Operator, a Grade 2 Water Treatment Plant Operator, a Grade 1 Wastewater Collection System Operator, and a Grade 1 Wastewater Treatment Plant Operator. Mr. Caron's ADEQ Operator Identification No. is OP009983, with an expiration date of January 31, 2018. Mr. Valencia is certified with the ADEQ as a Grade 4 Water Distribution System Operator, and a Grade 4 Water Treatment Plant Operator. Mr. Valencia's ADEQ Operator Identification No. is OP012274, with an expiration date of April 30, 2017.

communications system, a 500 kW emergency generator, and an automatic transfer switch for the emergency generator. Detailed listings of the active wells are included in Table A.

Table A. SWC Water System Active Wells								
Well ID	ADWR Well ID	Pump (hp)	Pump Yield (gpm)	Pump Yield (MGD)	Casing Depth (feet)	Casing Diameter (inches)	Meter Size (inches)	Date Drilled
(T) Well No. 14	55-611142	300	1,800	2.592	1,135	24	10	10/9/1970
(T) Well No. 18	55-611144	300	1,365	1.966	905	20	10	4/18/1975
(T) Well No. 23	55-216840	300	1,800	2.592	1,080	18	10	4/15/2008
Total			4,965	7.150				

(T) indicates Turbine Well.

(MGD) indicates million gallons per day

2. Inactive Well Sites

SWC has five (5) inactive wells (Well Nos. 1, 12, 17, 19, & 20) that are utilized for monitoring purposes only. Well No. 1 was drilled in 1997, per an agreement with Phelps Dodge Sierrita, Inc., for the sole purpose of monitoring and investigating a groundwater sulfate plume. Well No. 1 was never equipped for or utilized as a drinking water production well. Freeport-McMoRan, which acquired Phelps Dodge Sierrita, Inc., no longer monitors the well for the sulfate plume. However, SWC continues to monitor the well on a quarterly basis to track aquifer water levels. Well Nos. 12, 17, 19, & 20 were addressed in a previous rate case, Docket No. W-03718A-09-0359, and determined to be not used and useful. Subsequently, they were removed from plant-in-service per Decision No. 72177 dated February 11, 2011. The wells remain as such, however they are utilized by SWC for monitoring its aquifer water levels on a quarterly basis. A detailed listing of the inactive wells are included in Table B.

Table B. SWC Water System Inactive Wells							
Well ID	ADWR Well ID	Pump (hp)	Pump Yield (gpm)	Casing Depth (feet)	Casing Diameter (inches)	Meter Size (inches)	Year Drilled
Well No. 1	55-562962	Not Equipped	0	500	8	Not Equipped	1997
Well No. 12	55-611141	Not Equipped	0	982	24	Not Equipped	1970
Well No. 17	55-611143	Not Equipped	0	1,053	24	Not Equipped	1974
Well No. 19	55-611145	Not Equipped	0	990	24	Not Equipped	1981
Well No. 20	55-611146	Not Equipped	0	975	16	Not Equipped	1969

3. *Water Plant No. 1 (WP No. 1) – Arsenic Water Treatment Plant (“AWTP”) & Well No. 23*

WP No. 1 consists of the AWTP, Well No. 23, one (1) 5,000 gallon hydro-pneumatic pressure tank, tablet chlorination system, electrical control panels, a motor control panel, a SCADA communications system, a 500 kW emergency standby generator, and an automatic transfer switch for the emergency generator. The generator provides emergency standby power for both Well No. 23 and the AWTP. A detailed listing of WP No.1 facilities is included in Table C.

Table C. SWC Water System Water Plant No. 1 – Arsenic Water Treatment Plant (“AWTP”)				
Well ID	Arsenic Filtration Vessels	Hydro-pneumatic Pressure Tank	Arsenic Pre-Filters	Emergency Back-up Generator w/ Automatic Transfer Switch
Well No. 23	4 – 7,000 gallons each (Steel) (2 Pairs – Lead/Lag Vessels)	1 – 5,000 Gallons	2 – Rated at a flow of 2,000 gallons each	1 – 500 kW generator

The AWTP is a Layne Christensen facility designed to treat a maximum flow of 2,000 gpm. The current capacity of the AWTP is capable of providing blended finish water that meets the water system peak daily demand (“PDD”) and meeting an arsenic treatment objective where the arsenic concentration of the blended finish water is equal to or less than 8.0 parts per billion (“ppb”). The AWTP became operational on November 25, 2009. The facility consists of two (2) 1,000 gpm treatment trains (treatment trains No. 1 and No. 2), each of which includes two (2) 7,000 gallon steel filtration vessels containing arsenic absorption media, and two (2) pre-filters.⁴ Treatment Train No. 1 contains vessels 1-1 and 1-2, and Treatment Train No. 2 contains vessels 2-1 and 2-2. The filtration vessels in each treatment train are arranged in a lead/lag configuration (design). The lead/lag configuration provides flexibility in the treatment plant operation, and enables the treatment plant to meet the design criteria of providing design capacity with one filtration vessel in each treatment train being out of service. Each vessel is designed to contain 375 cubic feet (“ft³”) of arsenic absorption media. Combined, all four (4) vessels contain a total volume of 1,500 ft³ of arsenic absorption media.

Arsenic is removed from the source water, via an absorption process, as it passes through the lead filtration vessels. Media within the filtration vessels removes arsenic from the source water by absorbing the arsenic onto the media.⁵ Once the media in the lead filtration vessels becomes saturated and arsenic breakthrough occurs (exceeds its treatment capacity), the lag filtration vessels are switched to the lead operating position. Media in the lead filtration vessels is then removed and replaced with fresh media (regenerated media) without interrupting the treatment process. The exhausted media is transported to a regeneration facility where the absorbed arsenic is removed and disposed of. The regenerated media (arsenic removed from the media) is returned to the facility for reuse.

⁴ In accordance with the requirements stated in ADEQ Engineering Bulletin No. 10 Chapter 4 Section F, a filtration plant shall be designed to provide at least two (2) filter units, and the filters shall be capable of meeting the plant design capacity at the approved filtration rate with the largest filter out of service.

⁵ SWC currently uses Layne RT hydrous iron oxide adsorption media, however, SWC will be switching to Purolite FerrIX A33E, an iron-infused anion resin, for future make up media.

The AWTP treats source water from Well Nos. 14, 18, & 23 to meet safe drinking water standards. The current arsenic maximum contaminant level (“MCL”) is 10 ppb. Well Nos. 14 & 23 have arsenic concentrations of 22 ppb and 11 ppb, respectively, while Well No. 18 has an arsenic concentration of 8.2 ppb. Currently, all three (3) production wells are capable of pumping water to the AWTP filtration vessels via dedicated raw water transmission mains. Based on the arsenic concentration of each well and the arsenic treatment objective (8.0 ppb or less), a calculated volume of source water is automatically directed to the treatment filtration vessels via the SCADA communications system for arsenic removal. The remaining portion of source water bypasses the filtration vessels to be blended with the treated water from the filtration vessels. The blended water is first delivered to two (2) 2850 zone storage tanks located adjacent to the WP No. 1 site. Blended water from the 2850 zone storage tanks is further distributed to the SWC water distribution system via gravity flow, booster stations, or a combination of both.

4. *Storage Tanks*

Storage tanks are used primarily to accommodate hourly fluctuations in water demand, PDD fluctuations, fire flow requirements, and emergency reserve storage. Each of these, added together, form the required storage capacity for the water system. Since SWC has a multiple well system, the average daily demand (“ADD”) plus fire flow requirement was used to determine SWC storage tank capacities.

SWC’s existing water system consists of three (3) storage tanks: a 1.0 million gallon (“MG”) and a 1.2 MG 2850 Zone floating storage tanks, and a 350,000 gallon 2950N Zone storage tank. Two (2) of the storage tanks, located adjacent to WP No. 1 in the 2950 Zone, are classified as the 2850 Zone floating storage tanks with capacities of 1.0 MG and 1.2 MG. The 2850 Zone is served by the floating storage tanks via gravity flow. SWC’s third tank, the 2950N Zone storage tank located in the 2850 Zone at Well No. 17, receives water from the 2850 Zone floating storage. Booster pumps also located at Well No. 17 provide service to the 2950N Zone from the 2950N Zone storage tank. Detailed listings of the storage tank facilities are included in Table D.

Table D. SWC Water System Storage Tanks			
Storage Tank Classification	Storage Tank Capacity (Gallons)	Quantity (Each)	Location
2850 Zone	1,200,000	1	Booster Station No.1 – located adjacent to WP No. 1
2850 Zone	1,000,000	1	Booster Station No.1 – located adjacent to WP No. 1
2950N Zone	350,000	1	Booster Station No.2 – located at Well No. 17
	2,550,000	3	

5. *Booster Pump Stations⁶*

The SWC water system consists of two (2) booster pump stations. Booster Pump Station No. 1 ("BPS No. 1"), located at the 2850 Zone storage tank site, consists of a 2950 Zone and a 3050 Zone booster station that draw suction from the two (2) 2850 Zone floating storage tanks to provide service to those respective zones. Each booster pump station consists of four (4) booster pumps and one (1) 5,000 gallon hydro-pneumatic pressure tank. Booster Pump Station No. 2, located at Well Site No. 17, consists of four (4) booster pumps and one (1) 5,000 gallon hydro-pneumatic pressure tank. The booster pumps draw suction from the 2950N Zone storage tank, also located at Well Site No. 17, to provide service to its respective zone. Detailed listings of the booster pump facilities are included in Table E.

Table E. SWC Water System Booster Pump Stations		
Booster Pump Facilities		Location
Facilities for the 2950 Elevation Zone	10, 25, 40 & 40 hp Booster Pumps and a 5,000 gallon Hydro-pneumatic Pressure Tank	Booster Station No. 1 (located adjacent to WP No. 1)
Facilities for the 3050 Elevation Zone	25, 50, 75 & 75 hp Booster Pumps and a 5,000 gallon Hydro-pneumatic Pressure Tank	Booster Station No. 1 (located adjacent to WP No. 1)
Facilities for the 2950N Elevation Zone	20, 30, 50 & 100 hp Booster Pumps and a 5,000 gallon Hydro-pneumatic Pressure Tank	Booster Station No. 2 (located at Well No. 17)

6. *Transmission & Distribution Water Mains*

The SWC service area transmission and distribution water main sizing is based on meeting the maximum velocity and maximum pipe friction loss requirements, and maintaining adequate pressure within the system during all flow conditions, especially PHD and PDD plus fire flow conditions. The distribution system is primarily a looped grid system, with the exceptions of dead ends located in cul-de-sacs or areas where looping was not possible or practical. Table F lists distribution water mains within the SWC system.

Table F. SWC Water System Service Area Transmission & Distribution Mains		
Diameter (inches)	Material	Length (feet)
4	Poly Vinyl Chloride ("PVC")	5,805
6	PVC	26,507
8	PVC	189,504
12	PVC	61,970
16	PVC	9,054
24	PVC	7,163
Total Length		(56.8 miles) 300,003

⁶ Booster pump stations are commonly sized to provide peak hourly demand ("PHD") or PDD plus fire flow, whichever is greater.

7. *Pressure Zones*

The highest area of the SWC water system is located near the southwest corner of its service area with an elevation of approximately 2,920 feet. The lowest area of the water system is located near the northeast corner of its service area with an elevation of approximately 2,670 feet. The difference in elevation is approximately 250 feet.

The SWC service area is separated into pressure zones with zone boundaries routinely located at 100 foot intervals. The high water elevations of the zones are also separated by intervals of approximately 100 feet. Static pressure fluctuations within the system typically vary from approximately 40 pounds per square inch (“psi”) at the top of a zone to approximately 87 psi at the bottom of a zone. However, system pressure varies with daily demand fluctuations and high demand situations such as a fire flow condition. The SWC water system is currently divided into three pressure zones (2,850, 2,950 and 3,050 feet). The 2,950 pressure zone includes two (2) non-contiguous areas: the area to the north is identified as the 2950 North (“2950N”) Zone, while the area to the south is identified as the 2950 Zone. The zone boundaries and high water elevations are shown in Table G.

Pressure Zone	Elevation Boundaries (feet)	Static Pressure (psi)
2850	2650 – 2750	87 – 43
2950 and 2950N	2730 – 2850	95 – 43
3050	2850 – 2950	87 – 43

8. *Customer Meters, Fire Hydrants, Structures & Equipment*

Table H provides a list of SWC customer meters, fire hydrants, structures and equipment.

Customer Meters		Fire Hydrants		Structures & Equipment	
Size (inches)	Quantity	Type	Quantity		
5/8 x 3/4	4,701	Standard	395	Well No. 14	Block Wall & Tablet Chlorination Unit
3/4	675			Well No. 18	Block Wall & Tablet Chlorination Unit
1	122			Well No. 23 & WP No. 1	Block Wall, Tablet Chlorination, 500 kW Generator, & by-pass line that blends treated and untreated water
1 1/2	19			Booster Station No. 1	Block Wall & 400 kW Diesel Generator
2	76			Booster Station No. 2	Block Wall & 230 kW Diesel Generator
3 (Compound)	1			Pressure Relief Valve	10-inch PRV w/2-inch by-pass. PRV controls pressure between the 2950 and 2850 Zones.
3 (Turbine)	17				
4 (Compound)	1				
Total	5,612		395		

C. WATER USE

1. Water Sold

The average daily water consumption (gallons used) per connection SWC's water system experienced each month during the 2014 test year are indicated in Table I and graphically illustrated in Figure 8. Customer consumption included an average daily high water usage of 330 gallons per day ("gpd") per connection (5,549 connections) in June 2014, and an average daily low water usage of 197 gpd per connection (5,534 connections) in January 2014. The average daily water usage during the twelve-month period was 250 gpd per connection. SWC reported 534,806,000 gallons of water produced, 507,354,290 gallons of water sold, and 27,451,710 gallons of water unaccounted for during the test year.⁷

Month/Year	Active Meters (Connections)	Gallons Produced	Gallons Sold	Gallons Unaccounted For	Gallons Consumed per Day	Gallons Consumed per Day per Connection	Water Loss
Jan-14	5,534	36,353,000	33,810,170	2,542,830	1,090,651	197	6.99%
Feb-14	5,532	39,004,000	39,486,150	482,150	1,410,220	255	-1.24%
Mar-14	5,547	47,889,000	44,652,140	3,236,860	1,440,392	260	6.76%
Apr-14	5,544	47,297,000	44,829,530	2,467,470	1,494,318	270	5.22%
May-14	5,545	50,363,000	47,918,290	2,444,710	1,545,751	279	4.85%
Jun-14	5,549	57,764,000	55,007,090	2,756,910	1,833,570	330	4.77%
Jul-14	5,559	48,976,000	46,647,180	2,328,820	1,504,784	271	4.76%
Aug-14	5,571	43,246,000	40,732,470	2,513,530	1,313,951	236	5.81%
Sep-14	5,570	44,396,000	41,934,820	2,461,180	1,397,827	251	5.54%
Oct-14	5,587	43,262,000	40,958,710	2,303,290	1,321,249	236	5.32%
Nov-14	5,590	37,540,000	35,081,210	2,458,790	1,169,374	209	6.55%
Dec-14	5,596	38,716,000	36,296,530	2,419,470	1,170,856	209	6.25%
Total		534,806,000	507,354,290	27,451,710	1,391,075*	250*	5.13%*

Note: * Asterisk indicates the value is an average

Table J lists the number of connections, gallons of water sold, and the average daily water consumption (gallons used) per connection that SWC's water system experienced each year from 2005 through 2014. Figure 9, included in the figure section of this report, graphically illustrates the average daily water consumption (gallons used) per connection that SWC experienced during the same period. As indicated in Table J and graphically illustrated in Figure 9, the average daily water consumption per connection has been decreasing each year since 2005, with the exception of slight increases in 2007, 2009 and 2011. Overall, the average daily water consumption per connection has

⁷ Water produced and sold during the test year is based on the monthly data taken from the meter reads as submitted with SWC's application.

decreased approximately 33 gallons per day per connection, an 11.7 percent decrease in water consumption since 2005.

Month/Year	Active Connections	Gallons Sold	Average Daily Consumption per Day per Connection
December – 2005	3,009	310,551,000	283
December – 2006	3,729	375,565,500	276
December – 2007	4,306	444,026,000	283
December – 2008	4,664	458,977,000	269
December – 2009	4,939	509,132,000	282
December – 2010	5,078	499,206,990	269
December – 2011	5,176	516,975,650	274
December – 2012	5,404	536,439,700	271
December – 2013	5,501	520,266,740	259
December – 2014	5,596	507,354,280	250

2. *Non-Accounted For Water*

Non-accounted for water (the difference between the gallons of water produced and sold) should be 10 percent or less and never more than 15 percent. It is important to be able to reconcile the difference between water sold and water produced by the source. A water balance will allow a water company to identify water and revenue losses due to leakage and any non-metered water use such as construction, theft, and line flushing. As indicated in Table I, SWC had 27,451,710 gallons of water unaccounted for during the test year ending December 2014. As a result, SWC's water loss was 5.13 percent which is within the acceptable limits.

Table K lists SWC's water loss volumes and percentages from the past ten (10) year period, beginning in 2005 and ending in 2014. Figure 10, located in the figure section of this report, graphically illustrates the percentage of water loss SWC experienced during the same period. As indicated in Table K and graphically illustrated in Figure 10, SWC's water loss ranged between 3.70 and 8.40 percent, resulting in an average of 4.72 percent for the ten (10) year period. Furthermore, SWC's water loss each year during the ten (10) year period was below 5.0 percent with the exception of 2006 and 2014 where water loss was 8.40 percent and 5.13 percent, respectively. However, as Table J and Figure 10 indicate, SWC water loss has been gradually increasing since 2012.

Table K. SWC Historical Water Loss (Non-Accounted For Water)			
Year	Non-Accounted for Water (Gallons)	Non-Accounted for Water (Percent)	Source
2005	12,452,590	3.86	Annual Report
2006	34,429,510	8.40	Annual Report
2007	23,159,000	4.96	Annual Report
2008	17,969,000	3.77	Annual Report
2009	19,570,000	3.70	Annual Report
2010	21,580,770	4.14	Annual Report
2011	20,234,210	3.77	Annual Report
2012	26,471,300	4.70	Annual Report
2013	25,893,260	4.74	Annual Report
2014	27,451,720	5.13	Application
Average	22,921,136	4.72	

3. *Water System Analysis*

The SWC water system has three (3) active drinking water wells (Well Nos. 14, 18, and 23) with a total potential production capacity of approximately 4,965 gpm (7,149,600 gpd). The water system has three (3) storage tanks with a total capacity of approximately 2,550,000 gallons. During the peak month, June 2014, the water system was serving 5,549 connections when SWC reported 55,007,090 gallons of water sold. Average daily demand for the month of June 2014 was determined to be 1,833,570 gpd, while average daily demand per connection was determined to be 330 gpd. Staff concludes that the SWC water system has adequate production and storage capacity to serve the present customer base and any reasonable growth.

All three (3) of the active drinking water wells currently pump to the AWTP via dedicated raw water transmission mains. Well No. 23 is located next to the AWTP, while Well No. 14 and 18 are located approximately 1.64 miles and 1.05 miles from the AWTP, respectively. Raw source water from all three (3) wells is treated at the AWTP. Depending on the arsenic concentration of each well and the arsenic treatment goal, currently at 8.0 ppb or less, a calculated volume of source water is automatically directed to the AWTP vessels via the SCADA system for arsenic removal. The remaining volume bypasses the AWTP to be blended with the treated water from the AWTP which is then discharged to the 2850 Zone storage tanks for storage and further delivery to the distribution system. Arsenic concentration levels in the wells vary, with Well No. 14 and 23 exceeding the arsenic maximum contaminant level (“MCL”) of 10 parts ppb. The current arsenic levels, as provided by SWC, for each well are: Well No. 14 at 22 ppb, Well No. 23 at 11 ppb and Well No. 18 at 8.2 ppb.

The wells are controlled on storage tank level, with any necessary adjustments of operating set-points conducted at the SCADA communications system human machine interface (“HMI”). SWC utilizes an operating strategy where one well is designated the lead well while one of the other

two remaining wells is designated the lag well. Should the lead well become unable to meet system demand and the storage tank levels drop below the lag well set-point, the lag well will start and run with the lead well until the off-set-point is satisfied. Currently, Well No. 23 is set to run in the lead position during the off-peak hours (potential 16 hour operating period), while either Well No. 14 or Well No. 18 are set to run in the lag position. During on-peak hours, either Well No. 14 or Well No. 18 are set to run in the lead position (potential 8 hour operating period). Generally, Well No. 18 is placed in the lead position during the on-peak hours primarily due to the high arsenic concentration in Well No. 14.

Historical well production figures (2009 through 2014) are provided in Table L. As illustrated, Well Nos. 18 and 23 have far greater production than Well No. 14. The only exception was in 2009, when Well No. 23 didn't come on-line until November of that year. Well No. 14 production figures include delivery to the both AWTP and Sahuarita Lake. The reduction in the use of Well No. 14 for treatment at the AWTP is primarily due to its high arsenic concentration. The majority of Well No. 14 production is delivered to Sahuarita Lake.

Table L. SWC Historical Well Production				
Year	Well No. 14 Production (Gallons)		Well No. 18 Production (Gallons)	Well No. 23 Production (Gallons)
	Water Pumped to Sahuarita Lake	Water Pumped to AWTP	Water Pumped to AWTP	Water Pumped to AWTP
2009	28,893,000	85,266,697	407,499,303	7,043,000
2010	52,906,530	13,193,710	104,219,981	350,467,543
2011	50,330,100	3,626,720	158,709,043	324,544,005
2010	51,616,000	2,408,000	237,124,000	271,763,000
2013	42,242,000	3,444,000	276,802,000	223,672,000
2014	51,866,000	2,834,000	224,998,000	255,108,000
Average	46,308,938	18,462,188	234,892,055	238,766,258

In its July 17, 2009 rate increase application, SWC requested that Well No. 23 be included in post-test year plant. However, in Commission Decision No. 72177, Well No. 23 was excluded from rate base. SWC is currently requesting that Well No. 23 be included in rate base for the following reasons:

- 1) Due to its relatively low arsenic concentration it has less impact on the AWTP arsenic absorption media.
- 2) It is the only well equipped with an Emergency Standby Generator which enables SWC to provide water production during an electrical outage.
- 3) It has lower power costs due to its close proximity to the AWTP.
- 4) It replaces Well No. 17 which was inactivated due to bacteriological issues.
- 5) It provides the opportunity for each well to shut down allowing the aquifer to recover.

Based on the July 28, 2015 site visit and inspection of the SWC water system, Staff concludes that Well No. 23 is currently in operation and should be considered used and useful to the water system's provision of service.

D. GROWTH

Table M below and Figure 11, located in the figure section of this report, show SWC's customer growth based on service connection data from its past ten (10) Annual Reports (2005 thru 2014), actual growth in 2015, and its projected growth (2016 thru 2020). From 2006 to 2015, SWC gained approximately 2,647 connections (88 percent increase) for an average of approximately 265 connections per year. However, from 2016 through 2020 SWC is projecting growth to increase by approximately 585 residential connections and approximately 25,000 square feet of commercial business (approximately 10 additional connections) for a total projected growth of 595 connections. The projections are based on land and platted lots that are currently being marketed.

Table M. SWC Actual and Projected Growth		
Month/Year	Number of Customers	Source
December – 2005	3,009	Annual Report
December – 2006	3,729	Annual Report
December – 2007	4,306	Annual Report
December – 2008	4,664	Annual Report
December – 2009	4,939	Annual Report
December – 2010	5,078	Annual Report
December – 2011	5,176	Annual Report
December – 2012	5,404	Annual Report
December – 2013	5,501	Annual Report
December – 2014	5,596	Annual Report
December – 2015	5,656	Actual
December – 2016	5,773	Projected
December – 2017	5,892	Projected
December – 2018	6,011	Projected
December – 2019	6,130	Projected
December – 2020	6,251	Projected

E. ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (“ADEQ”) COMPLIANCE

1. *Compliance Status*

ADEQ regulates the SWC water system under ADEQ Public Water System Identification (“PWS ID”) No. 04-10-312. On July 11, 2013, the Pima County Department of Environmental Quality (“Pima County DEQ”) inspected the SWC water system. Based on the Pima County DEQ inspection report, no major deficiencies were found in the operation, maintenance, or certified operator status of the water system.

According to the ADEQ Drinking Water Compliance Status Report (“CSR”) dated July 22, 2015, the SWC water system is currently delivering water that meets water quality standards required by 40 CFR 141 (National Primary Drinking Water Regulations) and Arizona Administrative Code, Title 18, Chapter 4. SWC is considered to be in full compliance by ADEQ.

2. *Water Monitoring and Testing Expenses*

SWC’s water sampling for monitoring and testing is divided into two (2) categories, Compliance Analysis and Operational Analysis. Compliance sampling is conducted, as required by ADEQ, on source water, finished/treated water, and water in the distribution system. Operational sampling is conducted on source water, finished/treated water, and at various stages of a treatment process. Operational sampling essentially provides timely data to 1) ensure that a well or plant is operating as expected in producing water that meets regulatory limits; 2) adjust plant operations based on changes to source and finished water quality; 3) adjust chemical additions (volume and type); 4) track the breakthrough of filtration media; and 5) adjust the volume of water required to be treated for contaminant removal in order to maintain compliance with ADEQ.

In its Income Statement, line item 19 (Contractual Services – Water Testing), SWC reported \$5,341 in water testing expenses for the 2014 test year. However, upon reviewing SWC’s water testing invoices, it was determined that approximately \$6,584 and \$1020 in additional water testing expenses were entered in Line Item 12 (Repairs and Maintenance) and Line 17 (Contract Services – Other). Consequently, SWC’s water testing expenses during the test year were actually \$12,945 (\$5,341 + \$6,584 + \$1020).

Staff reviewed, re-evaluated, and recalculated the water monitoring and testing expenses and determined the adjusted annual water testing expenses to be \$13,975, as represented in Table N. Staff recommends the annual water testing expenses of \$13,975 be used for purposes of this proceeding.

Table N. Staff Recommended Monitoring and Testing					
Compliance Analysis Monitoring & Testing (Routine Tests per 3 Years, unless noted)	Cost Per Test	Number of Samples	Cost per Monitoring	Total Cost	Annual Cost
Total Coliform - Monthly Tests	\$ 12	20	\$ 240	\$ 2,880	\$ 2,880
Inorganics - Priority Pollutants	\$ 126	1	\$ 126	\$ 126	\$ 42
Radiochemicals - 1 Routine Test per 6 Years					
Gross Alpha	\$ 77	1	\$ 77	\$ 77	\$ 13
Radium 226 & 228	\$ 176	1	\$ 176	\$ 176	\$ 29
Uranium	\$ 135	1	\$ 135	\$ 135	\$ 23
Phase II & V:					
Asbestos - Routine Test per 9 Years	\$ 149	1	\$ 149	\$ 149	\$ 17
Inorganics - Barium, Calcium, Fluoride, Etc.	\$ 48	1	\$ 48	\$ 48	\$ 16
Nitrate - Routine Test Annually	\$ 14	1	\$ 14	\$ 14	\$ 14
Nitrite - Routine Test per 9 Years	\$ 14	1	\$ 14	\$ 14	\$ 2
VOCs	\$ 158	1	\$ 158	\$ 158	\$ 53
Pesticides/PCBs/Unregulated Contaminants/SOCs:					
EDB & DBCP	\$ 135	2	\$ 270	\$ 270	\$ 90
Group 1 - Alachlor, Etc.	w/Group 4	2			
Group 2 - Aldrin, Etc.	\$ 135	2	\$ 270	\$ 270	\$ 90
Group 3 - 2,4-Dichlorophenoxyacetic Acid (2,4-D), Etc.	\$ 162	2	\$ 324	\$ 324	\$ 108
Group 4 - Benzo[a]Pyrene, Etc.	\$ 297	2	\$ 594	\$ 594	\$ 198
Group 5 - Aldicarb, Etc.	\$ 194	2	\$ 388	\$ 388	\$ 129
Dioxin	\$ 495	2	\$ 990	\$ 990	\$ 330
Diquat	\$ 171	2	\$ 342	\$ 342	\$ 114
Endothall	\$ 194	2	\$ 388	\$ 388	\$ 129
Glyphosate	\$ 171	2	\$ 342	\$ 342	\$ 114
Lead & Copper	\$ 34	30	\$ 1,020	\$ 1,020	\$ 340
Disinfection-by-Products (DBPs)					
Total Trihalomethanes (TTHMs) - Routine Test Annually	\$ 100	2	\$ 200	\$ 200	\$ 200
Haloacetic Acids (HAA5s) - Routine Test Annually	\$ 135	2	\$ 270	\$ 270	\$ 270
Unregulated Contaminant Monitoring Rule (UCMR)					
Distribution System	\$ 290	2	\$ 580	\$ 580	\$ 116
Entry Point to Distribution System (EDPS)	\$ 1,095	2	\$ 2,190	\$ 2,190	\$ 438
Arsenic - Routine Testing Quarterly	\$ 21	1	\$ 21	\$ 84	\$ 84
Operational Analysis Monitoring & Testing					
Water Treatment Plant (WTP)					
Arsenic - Routine Testing Bi-Weekly	\$ 31	6	\$ 186	\$ 4,464	\$ 4,464
Wells					
Alkalinity - Routine Testing Monthly	\$ 14	3	\$ 42	\$ 504	\$ 504
Arsenic - Routine Testing Monthly	\$ 21	3	\$ 63	\$ 756	\$ 756
Calcium (Ca), Hardness - Routine Testing Monthly	\$ 7	3	\$ 21	\$ 252	\$ 252
Fluoride - Routine Testing Monthly	\$ 14	3	\$ 42	\$ 504	\$ 504
Metals Preparation - ICP/MS	\$ 9	3	\$ 27	\$ 324	\$ 324
Metals Preparation - ICP	\$ 9	3	\$ 27	\$ 324	\$ 324
Sulfate - Routine Testing Monthly	\$ 14	3	\$ 42	\$ 504	\$ 504
Total Dissolved Solids - Routine Testing Monthly	\$ 14	3	\$ 42	\$ 504	\$ 504
Totals	\$ 4,671	118	\$ 9,818	\$ 20,165	\$ 13,975

Note: DBCP = Dibromochloropropane, EDB = Ethylene Dibromide, PCBs = Polychlorinated Biphenyls, SOCs = Synthetic Organic Compounds, and VOCs = Volatile Organic Compounds

F. ARIZONA DEPARTMENT OF WATER RESOURCES (“ADWR”) COMPLIANCE

The SWC water system service area is located within the Tucson Active Management Area (“AMA”). According to the ADWR water provider compliance report dated July 2, 2015, SWC is in compliance with its requirements governing water providers and/or community water systems.

G. ARIZONA CORPORATION COMMISSION COMPLIANCE

A check of the Utilities Division Compliance Section database showed that there are no delinquent Commission compliance items for SWC.⁸

H. DEPRECIATION RATES

Staff’s typical and customary depreciation rates, which vary by National Association of Regulatory Utility Commissioners (“NARUC”) plant categories, are illustrated in Table O. These rates represent typical and customary values within a range of anticipated equipment life. SWC is proposing to keep the arsenic absorption media depreciation rate at 67 percent (1.5 years of service life) since it expects the media to last only 1.5 years, on average, going forward. However, after Staff’s review and evaluation of SWC’s arsenic absorption media timeline, submitted from a data request, Staff has determined that the depreciation rate be changed to 40 percent (2.5 years of service life). Consequently, Staff recommends that SWC use Staff’s recommended depreciation rates listed in Table O.

Table O. Depreciation Rate Table					
NARUC Acct. No.	Depreciable Plant	SWC Current & Proposed Rates		Staff Recommended Rates	
		Service Life (Years)	Accrual Rate (%)	Service Life (Years)	Accrual Rate (%)
304	Structures & Improvements	30	3.33	30	3.33
305	Collecting & Impounding Reservoirs	40	2.50	40	2.50
306	Lake, River, Canal Intakes	40	2.50	40	2.50
307	Wells & Springs	30	3.33	30	3.33
308	Infiltration Galleries	15	6.67	15	6.67
309	Raw Water Supply Mains	50	2.00	50	2.00
310	Power Generation Equipment	20	5.00	20	5.00
311	Pumping Equipment	8	12.5	8	12.50
320	Water Treatment Equipment				
320.1	Water Treatment Plants	30	3.33	30	3.33
320.2	Solution Chemical Feeders	5	20.00	5	20.00
320.3	Arsenic Treatment Media	1.5	67.00	2.5	40.00
330	Distribution Reservoirs & Standpipes				
330.1	Storage Tanks	45	2.22	45	2.22
330.2	Pressure Tanks	20	5.00	20	5.00

⁸ Per Compliance Section email dated July 21, 2015.15

331	Transmission & Distribution Mains	50	2.00	50	2.00
333	Services	30	3.33	30	3.33
334	Meters	12	8.33	12	8.33
335	Hydrants	50	2.00	50	2.00
336	Backflow Prevention Devices	15	6.67	15	6.67
339	Other Plant & Misc. Equipment	15	6.67	15	6.67
340	Office Furniture & Equipment	15	6.67	15	6.67
340.1	Computers & Software	5	20.00	5	20.00
341	Transportation Equipment	5	20.00	5	20.00
342	Stores Equipment	25	4.00	25	4.00
343	Tools, Shop & Garage Equipment	20	5.00	20	5.00
344	Laboratory Equipment	10	10.00	10	10.00
345	Power Operated Equipment	20	5.00	20	5.00
346	Communication Equipment	10	10.00	10	10.00
347	Miscellaneous Equipment	10	10.00	10	10.00
348	Other Tangible Plant	10	10.00	10	10.00

I. OTHER ISSUES

1. Service Line and Meter Installation Charges

SWC has not proposed changes to its existing service line and meter installation charges.⁹ The installation charges, listed in Table P, are refundable advances and are similar to Staff's current range of charges for service line and meter installations. Staff recommends that SWC continue to use the installation charges included in Table P.

Meter Size	SWC Current Charges			SWC Proposed Charges			Staff's Recommendations		
	Service Line Charge	Meter Charge	Total Charge	Service Line Charge	Meter Charge	Total Charge	Service Line Charge	Meter Charge	Total Charge
5/8 x 3/4-inch	\$445	\$155	\$600	\$445	\$155	\$600	\$445	\$155	\$600
3/4-inch	\$445	\$255	\$700	\$445	\$255	\$700	\$445	\$255	\$700
1-inch	\$495	\$315	\$810	\$495	\$315	\$810	\$495	\$315	\$810
1-1/2-inch	\$550	\$525	\$1,075	\$550	\$525	\$1,075	\$550	\$550	\$1,075
2-inch Turbine	\$830	\$1,045	\$1,875	\$830	\$1,045	\$1,875	\$830	\$1,045	\$1,875
2-inch Compound	\$830	\$1,890	\$2,720	\$830	\$1,890	\$2,720	\$830	\$1,890	\$2,720
3-inch Turbine	\$1,045	\$1,670	\$2,715	\$1,045	\$1,670	\$2,715	\$1,045	\$1,670	\$2,715
3-inch Compound	\$1,165	\$2,545	\$3,710	\$1,165	\$2,545	\$3,710	\$1,165	\$2,545	\$3,710
4-inch Turbine	\$1,490	\$2,670	\$4,160	\$1,490	\$2,670	\$4,160	\$1,490	\$2,670	\$4,160
4-inch compound	\$1,670	\$3,645	\$5,315	\$1,670	\$3,645	\$5,315	\$1,670	\$3,645	\$5,315
6-inch Turbine	\$2,210	\$5,025	\$7,235	\$2,210	\$5,025	\$7,235	\$2,210	\$5,025	\$7,235

⁹ SWC's current charges were approved in Decision No. 72177, effective March 1, 2011.

6-inch Compound	\$2,330	\$6,920	\$9,250	\$2,330	\$6,920	\$9,250	\$2,330	\$6,920	\$9,250
Over 6-inch	At Cost								

2. *Curtailment Tariff*

SWC has an approved Curtailment Tariff on file with the Commission. This tariff became effective September 2, 2015.

3. *Cross-Connection/Backflow Prevention Tariff*

SWC has an approved Cross-Connection/Backflow Prevention Tariff on file with the Commission. This tariff became effective November 1, 2002.

4. *Off-Site Hook-Up Fee*

SWC currently has an approved Off-Site Hook-up Fee Tariff on file with the Commission. The tariff became effective October 25, 2013.

5. *Best Management Practices ("BMP") Tariff*

Currently, SWC does not have any Best Management Practice ("BMP") tariffs on file with the Commission. Per Decision No. 74867, dated December 18, 2014, SWC is no longer required to file any BMP tariffs.

6. *Arsenic Blending Plan*

On November 25, 2009, Pima County DEQ issued a Certificate of Approval of Construction ("AOC") for the AWTP authorizing SWC to operate the treatment plant. Upon placing the AWTP into operation, SWC began blending treated water from the AWTP with untreated water from its wells. According to Arizona Administrative Code ("AAC") R18-4-217, a public water system may use blending to achieve compliance with a Maximum Contaminant Level ("MCL"), in this case Arsenic, if certain requirements are met and written approval has been obtained from ADEQ.

During its field inspection, Staff requested to see SWC's approved arsenic blending plan. SWC was unable to produce its blending plan since it had never obtained one from ADEQ. Consequently, SWC has been blending treated and untreated water without an approved blending plan and written approval from ADEQ. Subsequently, Staff suggested that SWC take measures to develop an arsenic blending plan and obtain written approval from ADEQ. As a result, SWC met with ADEQ on December 1, 2015, to present its proposed blending plan. On December 11, 2015, SWC submitted its blending plan and associated documents for ADEQ approval. Subsequently, ADEQ issued its written approval of SWC's blending plan on December 21, 2015.

7. *Plant Used and Useful – Estancia del Corazon Subdivision*

In Decision No. 72177, the Estancia del Corazon Subdivision, Region 5, Block 29 on-site plant facilities (89 services, 11 fire hydrants, and 1,100 feet of 8-inch distribution main) were removed from plant in service. During its field inspection, Staff determined that the subdivision was completely built-out with homes. Therefore, Staff concludes that the Estancia del Corazon subdivision on-site plant facilities, totaling \$76,082, are used and useful to the water systems provision of service. Staff also concludes that the on-site plant facility costs, totaling \$76,082, are reasonable and appropriate to the water system's provision of service. A summary of the plant facilities and associated costs is included in Table Q.

Table Q. Estancia del Corazon Subdivision Plant Facilities				
Account Number	Plant Facility	Year Construction Completed	Quantity	Original Cost
331	8-inch Ductile PVC Distribution Main	2007	1,100 feet	\$30,250
333	Residential Services	2007	89	\$30,159
335	Fire Hydrants	2007	11	\$15,673
Total				\$76,082

8. *Post-Test Year Plant - Arsenic Absorption Media Regeneration*

The initial arsenic absorption media installed in the AWTP vessels (approximately 1,500 ft³) cost approximately \$575,005. Since then, two (2) batches of arsenic absorption media (750 ft³ each) were removed for regeneration and re-installed at a total cost of \$245,917. One batch of media was damaged during the regeneration process and replaced with virgin arsenic absorption media by Layne Christensen at the regeneration cost of \$130,000. The current arsenic absorption media depreciation rate (NARUC Account No. 320.3), approved in Decision No. 72177, is 67 percent (1.5 years of service life). Subsequently, the initial and regenerated arsenic absorption media were fully depreciated.

On December 8, 2015, SWC received an invoice from Purolite, in the amount of \$150,657 for the regeneration of its latest batch (Batch 3-0) of exhausted arsenic absorption media. Batch 3-0 was removed on October 13, 2015, for regeneration and returned and reinstalled as Batch 3-1 on December 15, 2015. SWC is requesting a post-test year ("PTY") plant adjustment in the amount of \$150,657 for the regeneration and installation of Batch 3-1 arsenic absorption media. Staff concludes that the PTY plant adjustment for the arsenic absorption media cost, totaling \$150,657, is reasonable and appropriate to the water systems provision of service.

9. *Post-Test Year Plant – Manual Transfer Switch & Emergency Standby Generator Improvement Projects*

In its application, SWC requested PTY plant adjustment in the amount of \$214,912 for two (2) capital improvement projects that included: 1) the installation of two (2) manual transfer switches; and, 2) an emergency standby generator. Table R illustrates the capital costs associated with SWC's manual transfer switch and emergency standby generator installations.

The first capital improvement project involved the installation of manual transfer switches at two (2) of SWC's well sites. In 2014, SWC had an arc-flash study conducted at Well Site No. 14 and Well Site No. 18. The study concluded that both well sites required the installation of manual transfer switches to mitigate a potential arc-flash incident. Due to the potential danger created by the lack of main power disconnect switches at each well site, SWC had the manual transfer switches installed. Installation was completed in June 2015 at a total capital cost of approximately \$34,994.

The second capital improvement project involved the installation of an emergency standby generator at WP No. 1. Due to the lack of an emergency power source at WP No. 1, the location of the AWTP and Well No. 23, SWC determined that an emergency standby generator was needed especially since the AWTP treats all three (3) wells (Well No. 14, 18, & 23). Installation was completed in January 2015 at a total capital cost of approximately \$179,918.

Table R. Post Test Year Capital Improvement Projects		
Well No. Site No. 14 & Well Site No. 18 - Manual Transfer Switch Installations		
Item	Vendor	Costs
Electrical Permits - Manual Transfer Switches	Town of Sahuarita	\$ 120
Building Permits - Manual Transfer Switches	Town of Sahuarita	\$ 246
Arc-Flash Study	Sturgeon Electric Company, Inc.	\$ 2,146
Arc-Flash Mitigation - Manual Transfer Switch Installation's	Sturgeon Electric Company, Inc.	\$ 32,482
Sub-total Cost		\$ 34,994
WP No.1 (AWTP & Well No. 23) - Emergency Standby Generator Installation		
Item	Vendor	Costs
Emergency Generator Installation Design	Richard Canney Engineering	\$ 12,000
Electrical Permit - Emergency Standby Generator Installation	Town of Sahuarita	\$ 60
Building Permit - Emergency Standby Generator Installation	Town of Sahuarita	\$ 272
Emergency Generator - Caterpillar Model C15 PGAN & Automatic Transfer Switch - Caterpillar Model 800A/480V	Empire Power Systems	\$ 120,989
Emergency Generator Installation - Crane Service	Desert Hill Crane Service	\$ 420
Diesel Fuel	Western Refining Wholesale	\$ 2,503
Air Quality Permit	Pima County DEQ	\$ 122
Site Inspection	Richard Canney Engineering	\$ 696
Site Preparation Work	Sturgeon Electric Company, Inc.	\$ 42,856
Sub-total Cost		\$ 179,918
Total Cost - Manual Transfer Switch and Emergency Standby Generator Installations		\$ 214,912

The total cost of both SWC PTY capital improvement projects was \$214,912. Based on the July 28, 2015, site visit and inspection of the SWC water system, Staff concludes that the PTY capital improvement projects listed in Table R, totaling \$214,912, are currently in operation and considered used and useful to the water system's provision of service. Staff also concludes that the PTY capital improvement project costs, totaling \$214,912, are reasonable and appropriate to the water system's provision of service.

FIGURES

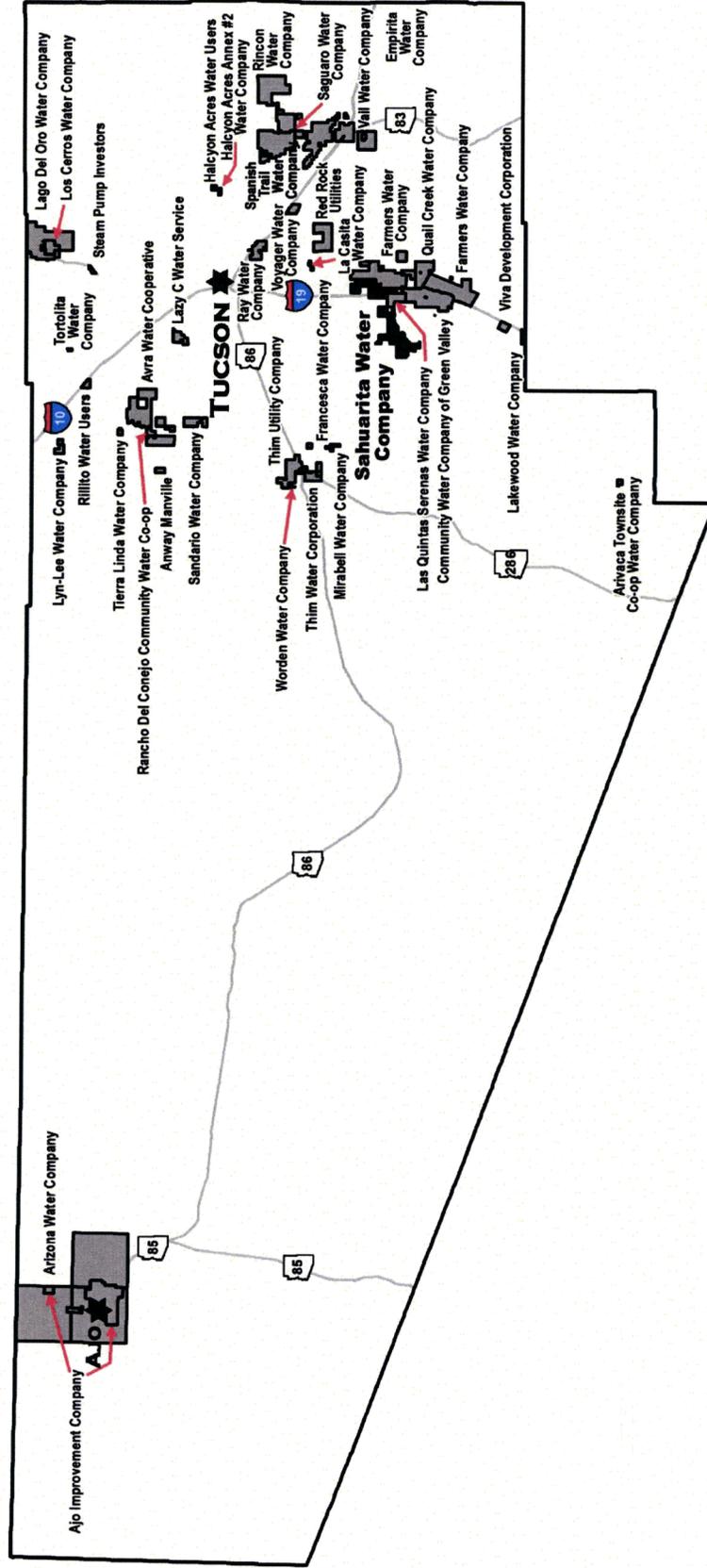


FIGURE 1 – PIMA COUNTY MAP

P I M A C O U N T Y

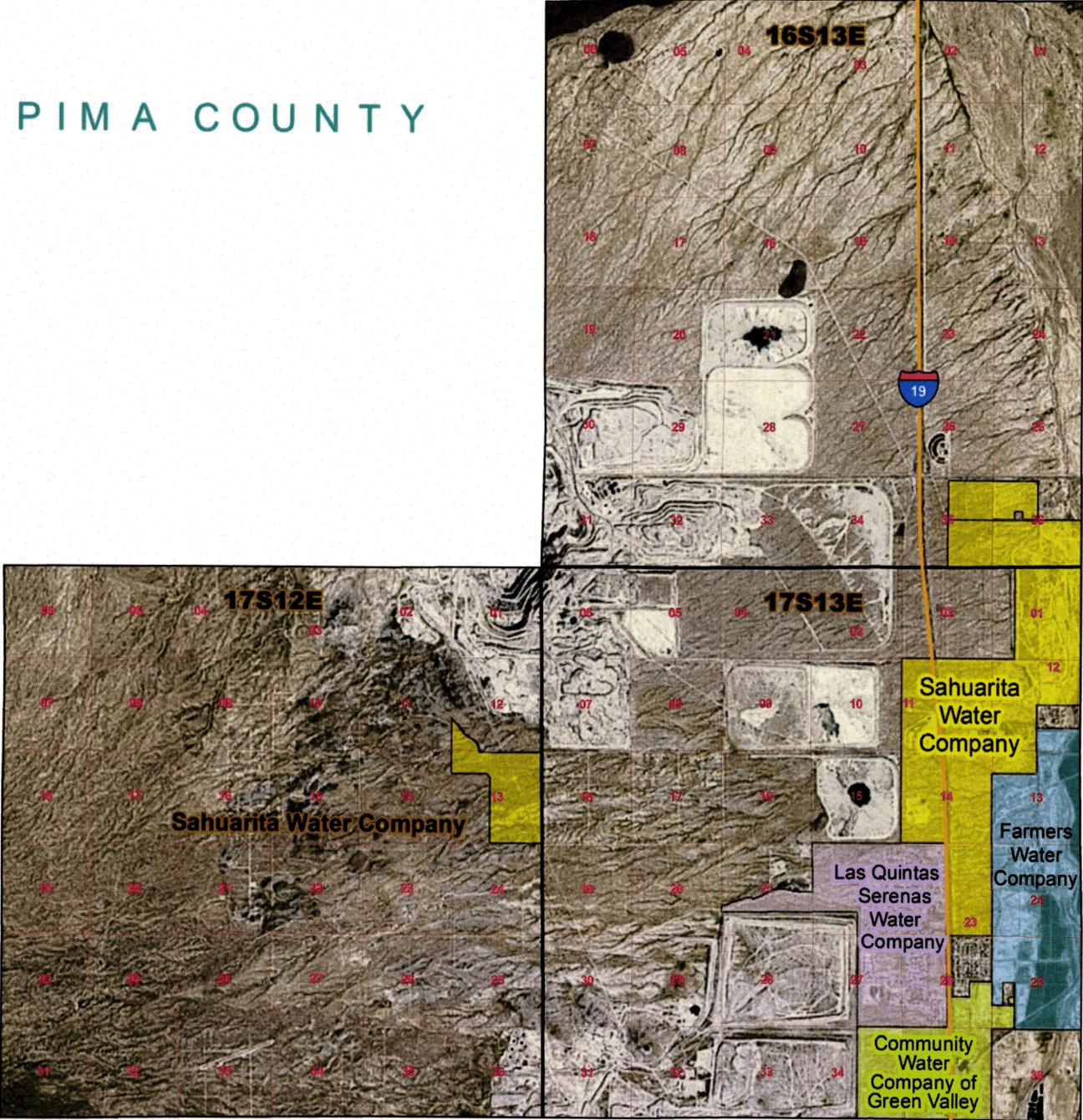


FIGURE 2 – SAHUARITA WATER COMPANY CERTIFICATED AREAS

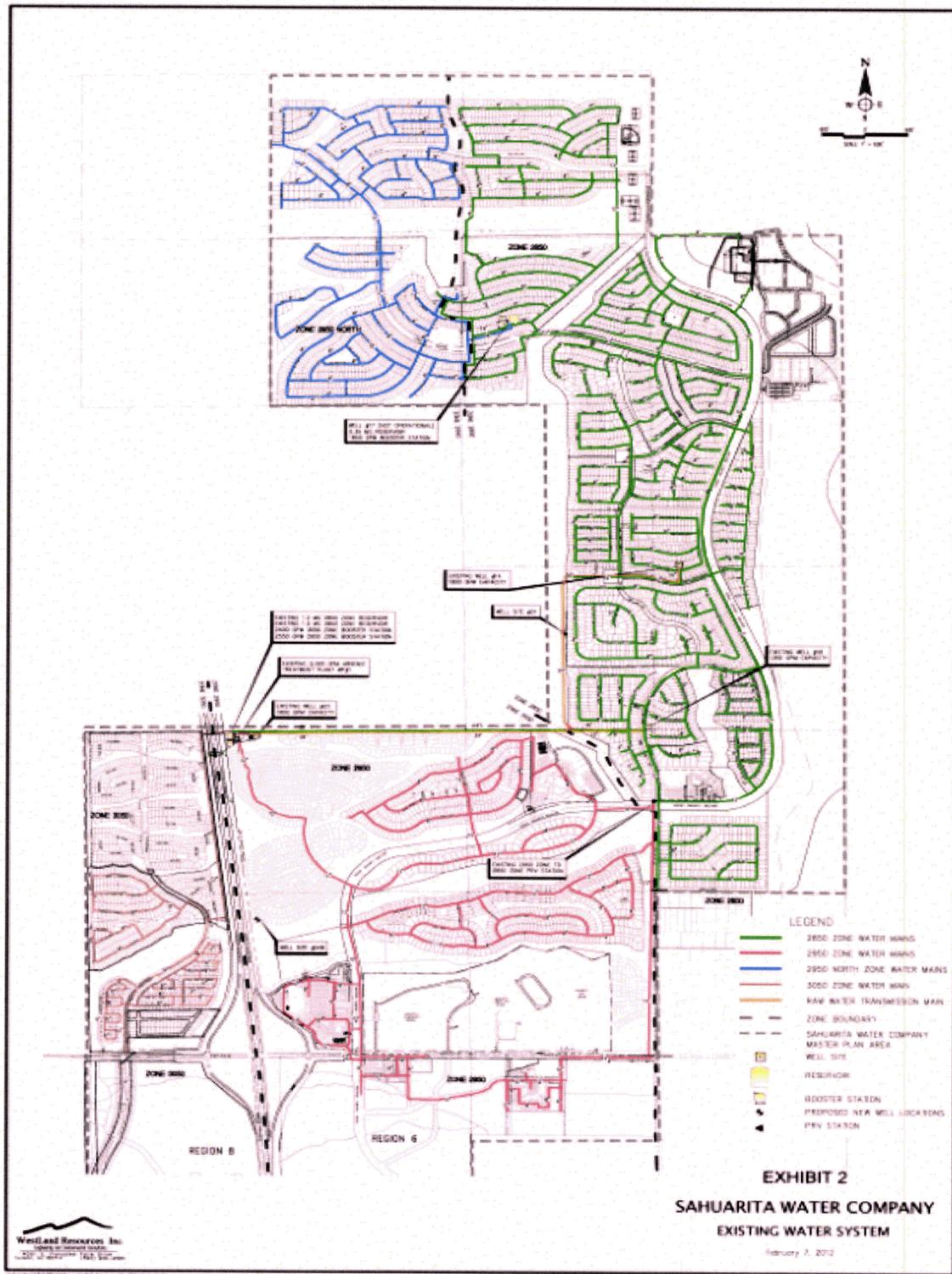


FIGURE 3 – SAHUARITA WATER COMPANY SITE MAP

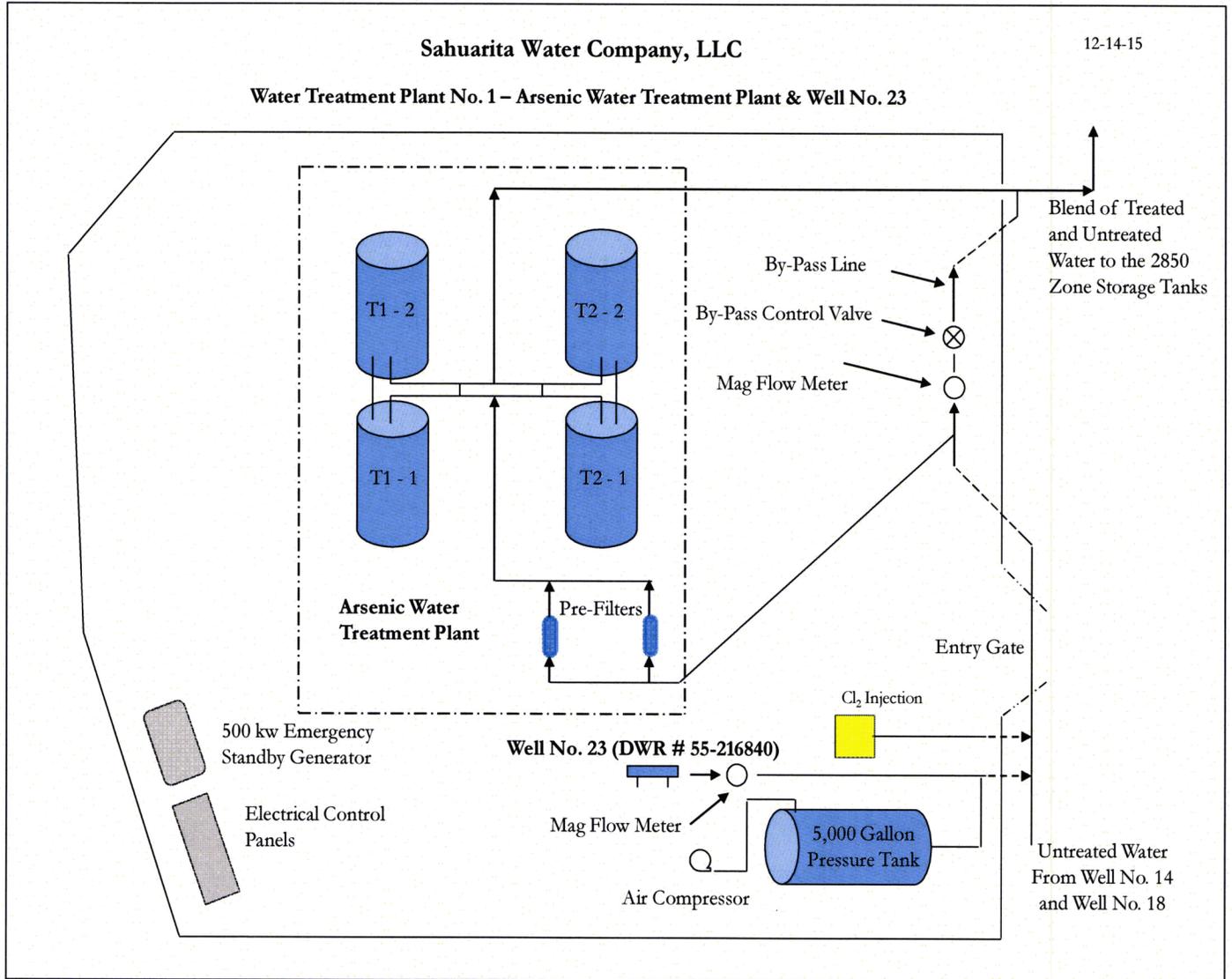


FIGURE 4 – WATER TREATMENT PLANT NO. 1 (AWTP AND WELL NO. 23)

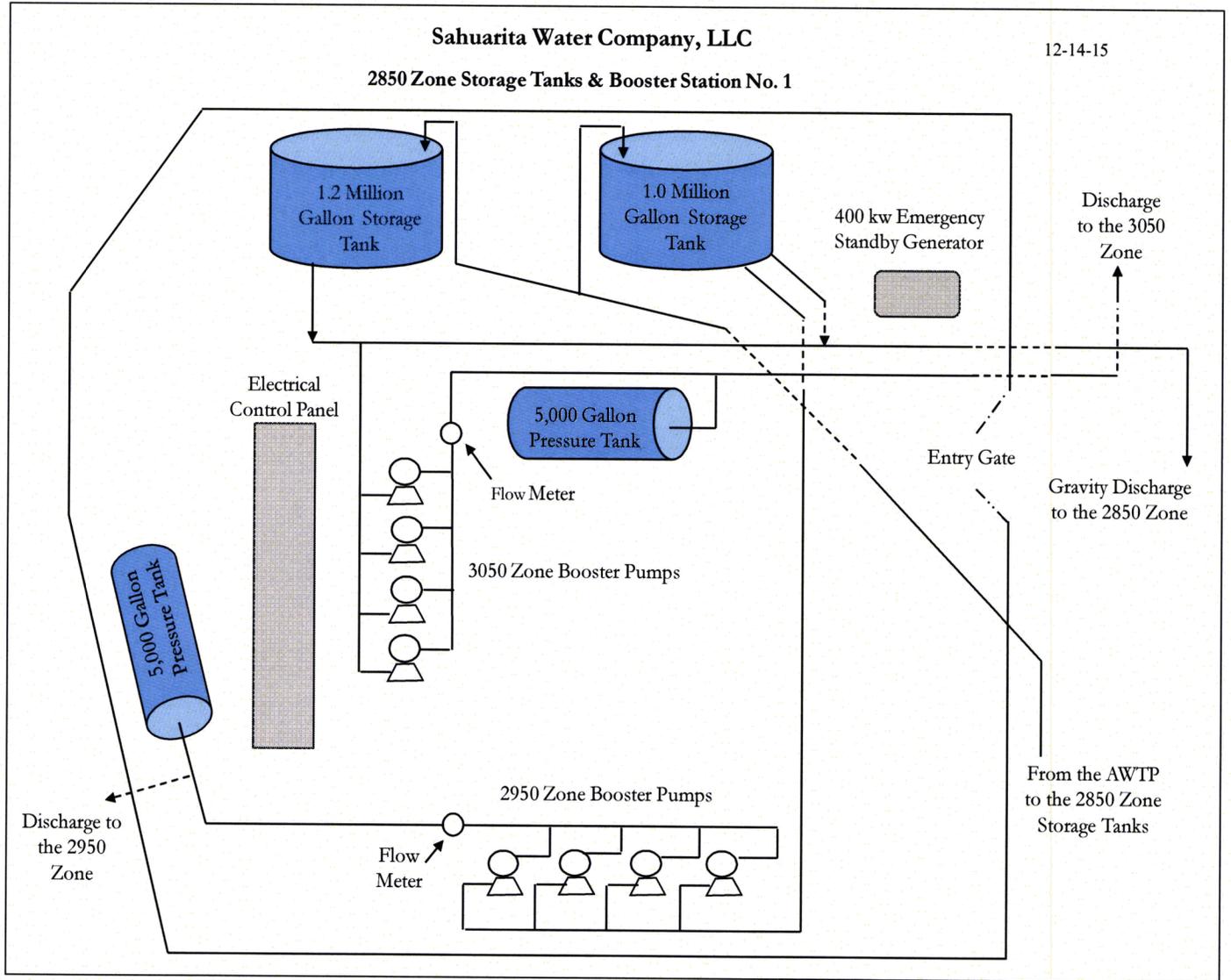


FIGURE 5 – 2850 ZONE STORAGE TANKS AND BOOSTER PUMP STATION NO. 1

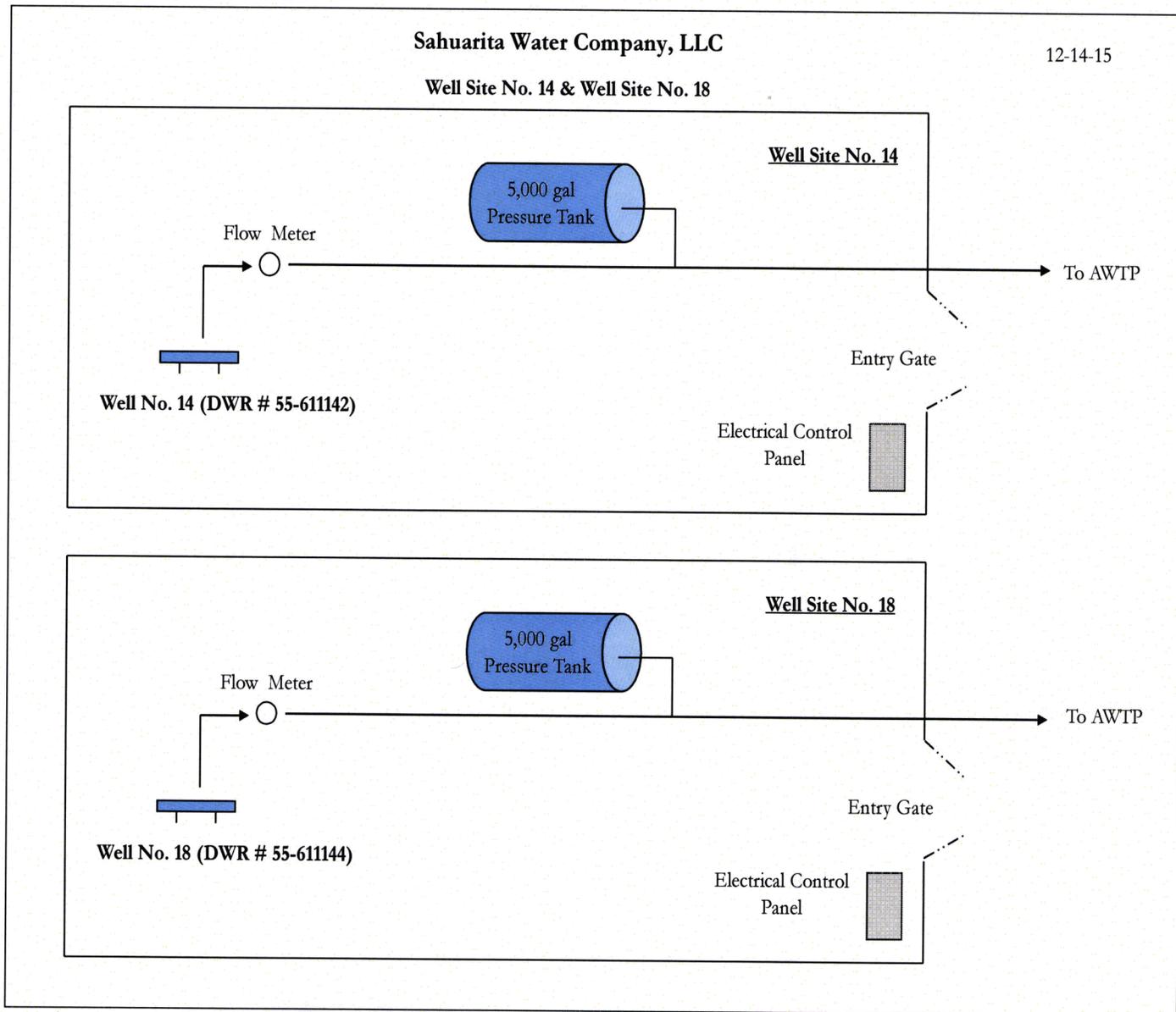


FIGURE 6 – WELL SITE NO. 14 AND WELL SITE NO. 18

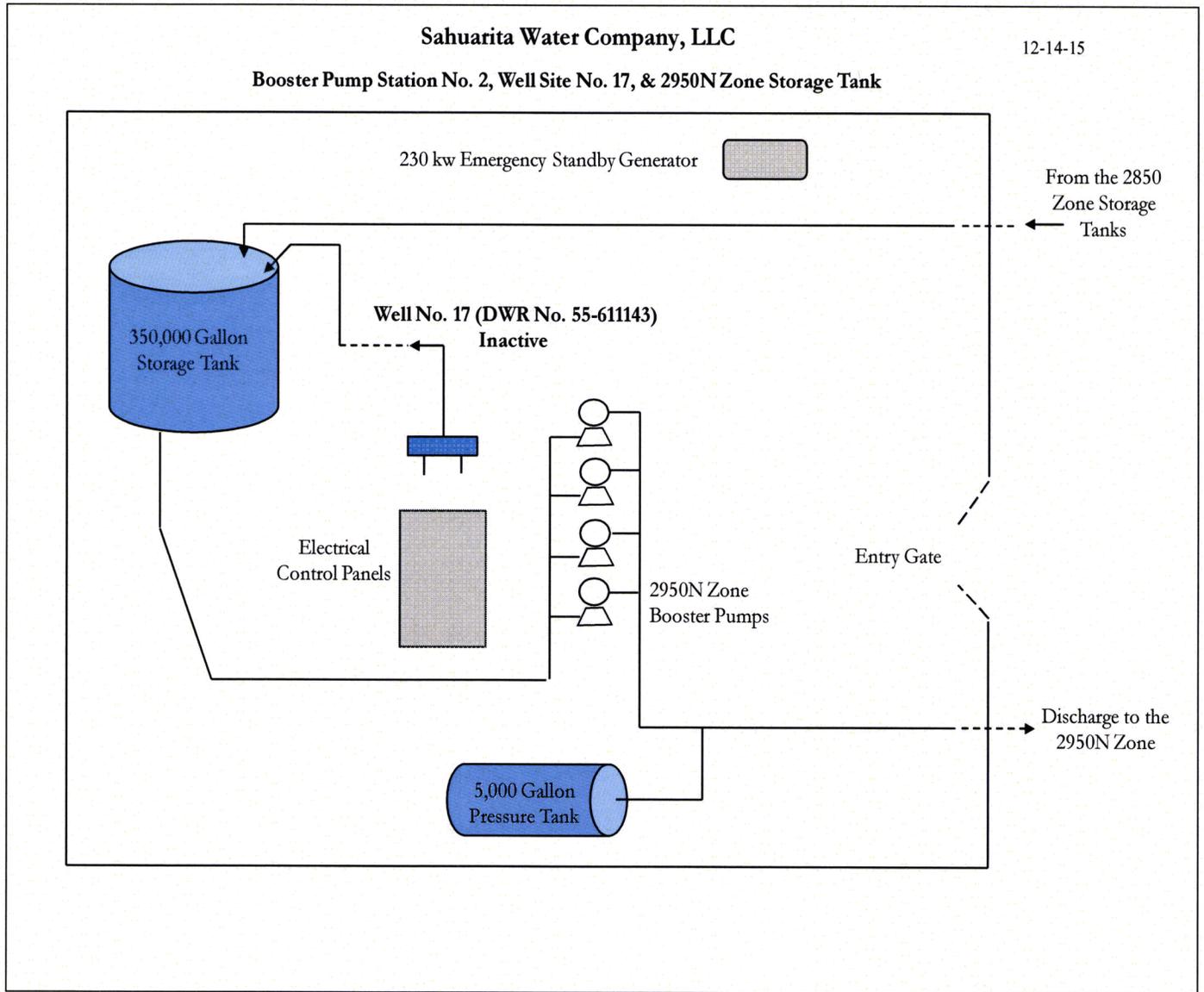


FIGURE 7 – BOOSTER PUMP STATION NO. 2 AND WELL SITE NO. 17

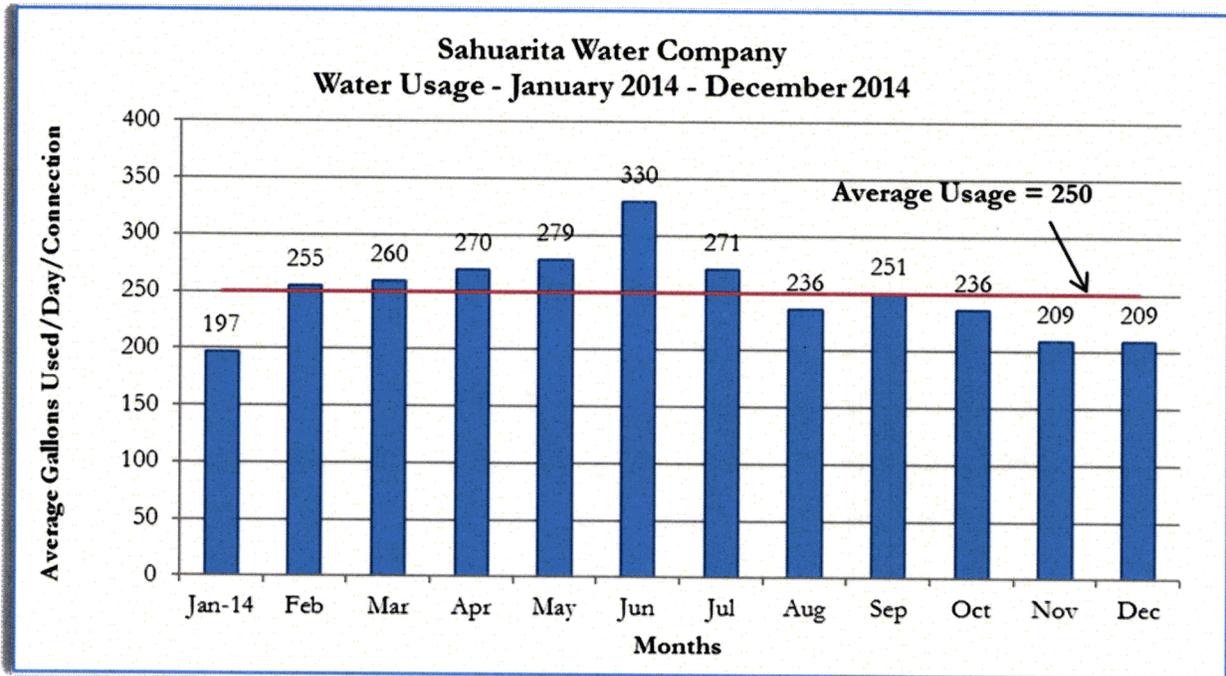


FIGURE 8 – SWC WATER CONSUMPTION

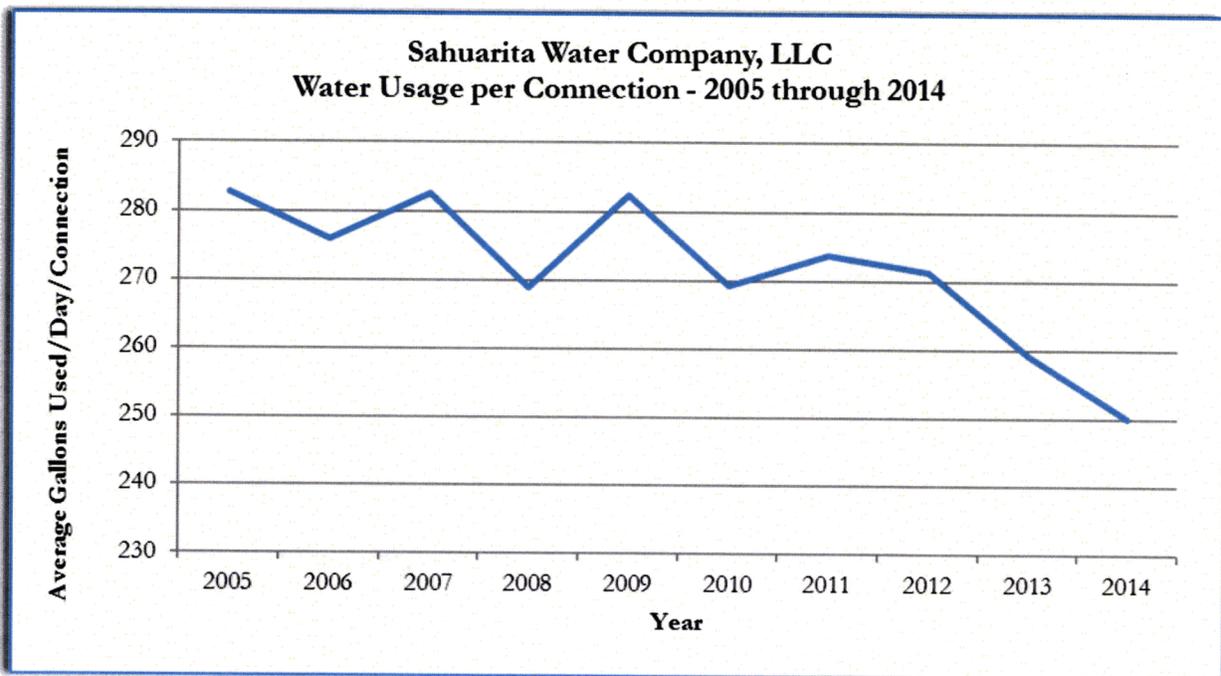


FIGURE 9 – SWC WATER USAGE PER CONNECTION

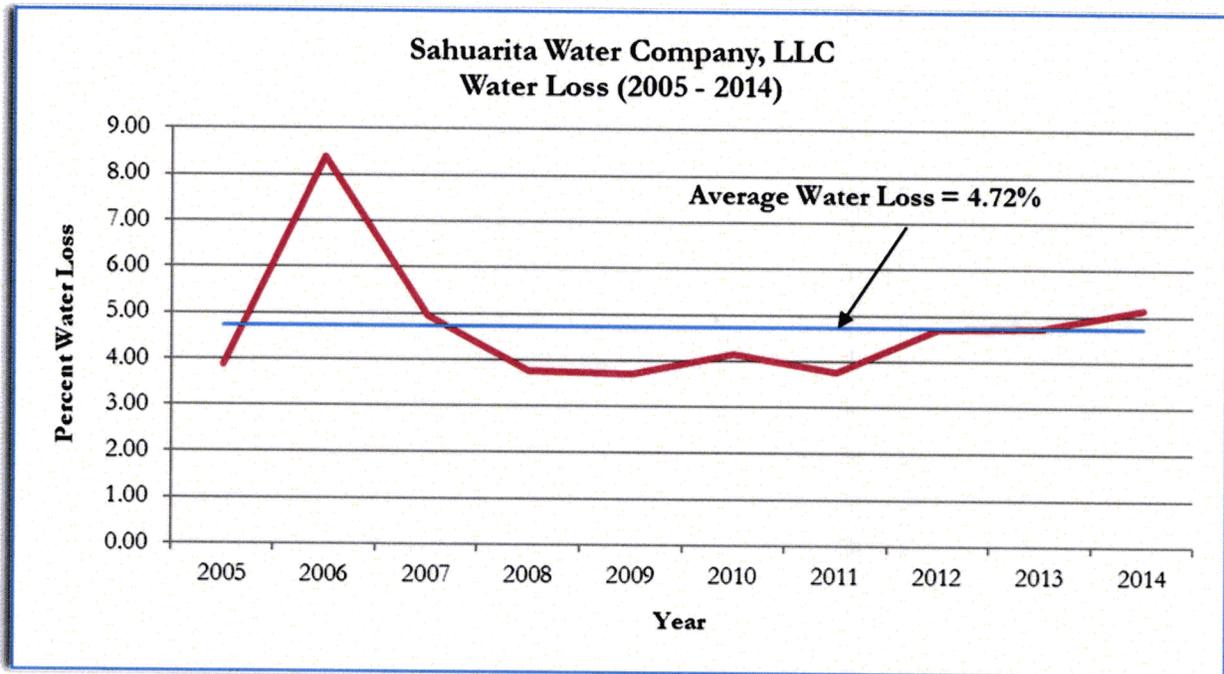


FIGURE 10 – SWC HISTORICAL WATER LOSS

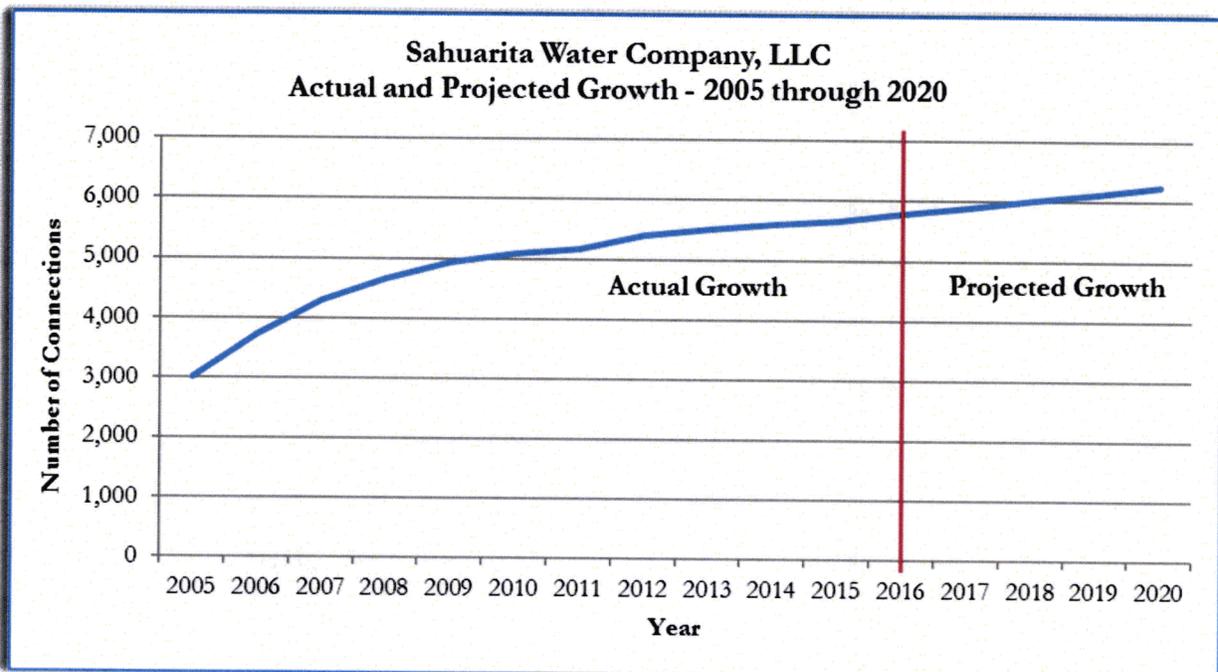


FIGURE 11 – SWC GROWTH