



CULINARY WATER RATE STUDY

CULINARY WATER UTILITY
CITY OF OREM, UTAH

AUGUST 2016





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SECTION I: EXECUTIVE SUMMARY

The City of Orem (“City”) commissioned Lewis Young Robertson & Burningham, Inc. (“LYRB”) to review the existing culinary water utility fees (or rates) and provide a recommended rate schedule based on changes in forecasted expenses, capital improvements and bonding needs. The primary objectives of the rate analysis were to ensure sufficient revenues to cover all operation and maintenance (“O&M”) expenses, maintain bond covenants, ensure appropriate debt service coverage ratios, and provide sufficient revenue to fund the proposed projects identified in the Master Plan and Capital Improvement Plan (“CIP”). In addition, the proposed rate structure is intended to promote conservation and to proportionately allocate the utility system costs based on the impact from varying meter sizes through the implementation of a tiered rate structure.

A review of projected revenues under the existing rate structure relative to proposed expenses illustrated that the City would not have sufficient revenues to fund the needed capital improvements without a rate increase. As a result, City staff, the City Council and consultants evaluated many potential rate scenarios during the study phase of this analysis, with the City ultimately focusing on four scenarios:

- Scenario 1 – Phasing the proposed CIP over a five (5) year period with no new debt;
- Scenario 2 – Phasing the proposed CIP over a five (5) year period with new debt;
- Scenario 3 – Phasing the proposed CIP over a seven (7) year period with no new debt; and,
- Scenario 4 – Phasing the proposed CIP over a ten (10) year period with no new debt.

From these scenarios, the City Council and staff isolated Scenario 3 as the preferred alternative. The rate structure shown below is designed to fund the proposed CIP, necessary O&M and other expenses forecasted within the planning horizon. In addition, the proposed base rates by meter size are structured to bring the City into closer alignment with American Water Works Association (AWWA) multipliers.

TABLE 1.1: ILLUSTRATION OF PROPOSED BASE RATE

METER SIZE	AWWA MULTIPLIER	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
0.75	1.00	\$15.74	\$17.16	\$18.70	\$20.20	\$21.72	\$23.02	\$24.17	\$25.14	\$25.89	\$26.10
1	1.67	\$39.22	\$39.22	\$39.22	\$39.22	\$39.22	\$39.22	\$39.22	\$41.98	\$43.24	\$43.59
1.5	3.33	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42
2	5.33	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64
3	10.00	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59
4	20.00	\$466.48	\$466.48	\$466.48	\$466.48	\$466.48	\$466.48	\$466.48	\$502.80	\$517.80	\$522.00
6	41.67	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58
8	53.33	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21
10	96.67	\$2,361.32	\$2,361.32	\$2,361.32	\$2,361.32	\$2,361.32	\$2,361.32	\$2,361.32	\$2,361.32	\$2,502.79	\$2,523.09

The City has adopted a four-tiered approach based on usage. The schedules found in Tables 1.2-1.3 establish the fee by tier and the usage parameters within each meter category, with the base meter set at a ¾ inch. AWWA multipliers are then applied to larger meters to allow for proportional usage for each meter size. This ensures that each meter size is bound by a four-tier structure, while providing consideration of the need for greater capacity in larger meters.



TABLE 1.2: ILLUSTRATION OF PROPOSED TIERED RATE

	TIER MULTIPLIER	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
Tier 1	1.00	\$0.71	\$0.79	\$0.88	\$0.98	\$1.09	\$1.17	\$1.23	\$1.28	\$1.31	\$1.32
Tier 2	1.25	\$0.89	\$0.99	\$1.10	\$1.22	\$1.35	\$1.44	\$1.51	\$1.57	\$1.61	\$1.63
Tier 3	1.50	\$1.07	\$1.18	\$1.31	\$1.45	\$1.61	\$1.72	\$1.81	\$1.88	\$1.93	\$1.95
Tier 4	2.00	\$1.42	\$1.58	\$1.75	\$1.94	\$2.15	\$2.30	\$2.42	\$2.52	\$2.58	\$2.61

TABLE 1.3: ILLUSTRATION OF FLOW ALLOCATION BY METER SIZE (1,000 GALLONS)

METER	AWWA MULTIPLIER	TIER 1	TIER 2		TIER 3		TIER 4	
		HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
0.75	1.00	11.000	11.001	34.000	34.001	65.000	65.001	Plus
1	1.67	18.000	18.001	57.000	57.001	109.000	109.001	Plus
1.5	3.33	37.000	37.001	113.000	113.001	216.000	216.001	Plus
2	5.33	59.000	59.001	181.000	181.001	346.000	346.001	Plus
3	10.00	110.000	110.001	340.000	340.001	650.000	650.001	Plus
4	20.00	220.000	220.001	680.000	680.001	1,300.000	1,300.001	Plus
6	41.67	458.000	458.001	1,417.000	1,417.001	2,709.000	2,709.001	Plus
8	53.33	587.000	587.001	1,813.000	1,813.001	3,466.000	3,466.001	Plus
10	96.67	1,063.000	1,063.001	3,287.000	3,287.001	6,284.000	6,284.001	Plus

*The 3/4" block volumes are based on the 90th percentile of usage for that meter size. For 1" and greater, AWWA multipliers are applied. Figures are rounded.

This analysis assumes an annual growth of one percent in connections. Annual O&M expenditures increase by three percent annually. The comparison of revenues and expenditures under the proposed rate increase, as shown in Table 1.4, illustrates that the City will continue to maintain necessary debt service coverage ratios, while providing adequate funding for capital improvement and replacement projects according to the proposed CIP scenarios.

TABLE 1.4: SUMMARY PRO FORMA

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 10
Total Operating Revenue	\$14,185,556	\$15,220,506	\$16,352,059	\$17,551,017	\$18,840,405	\$22,485,239
Total Operating Expense	(9,019,999)	(9,347,998)	(9,692,410)	(10,050,517)	(10,424,831)	(12,133,955)
Total Non-Operating Revenue	91,851	92,770	93,697	94,634	95,581	100,456
Total DS	(1,414,550)	(1,412,376)	(1,384,297)	(1,399,876)	(1,405,665)	(1,409,610)
Total CIP	(3,228,979)	(4,145,726)	(5,048,439)	(6,049,930)	(6,854,032)	(8,867,163)
Net Income (Loss) Before Transfers	613,878	407,175	320,610	145,328	251,458	174,968
Change in Net Position after Transfers and Contributions	609,173	402,423	315,810	140,481	246,563	169,822
Beginning Fund Balance	4,500,000	5,109,173	5,511,597	5,827,407	5,967,887	7,464,181
Ending Fund Balance (Unrestricted)	\$5,109,173	\$5,511,597	\$5,827,407	\$5,967,887	\$6,214,450	\$7,634,003
Fund Balance as % of O&M	57%	59%	60%	59%	60%	63%
Days of Working Capital	204	212	216	214	215	226
Coverage Ratio	3.65	4.16	4.81	5.36	5.99	7.34



The proposed rate structure will preserve the proportional "Days of Working Capital" through year 10 and the fund balance will remain above the minimum set by the City of maintaining at least 50 percent of O&M expenses in reserve funds through Year 10. It is also important to note that working capital will remain above 150 days of O&M expense, which is a standard benchmark for an AA to an A rated sewer or water utility bond. The City should reevaluate the proposed rates after the five-year planning horizon. A detailed pro forma can be found in **Appendix A**.

SECTION II: GENERAL RATE METHODOLOGY

This study analyzes the proposed rate increase scenarios to meet current and future debt obligations, while ensuring revenue sufficiency for capital improvements, the funding of depreciation (repair and replacement) and existing bond covenants. The recommendations presented in this study are based on reasonable planning, cost, and demand projections. The proposed rate scenarios are designed to recover the costs necessary to maintain a viable utility, while balancing economic and affordability concerns.

EXISTING RATE STRUCTURE

The existing monthly charge for water services consist of a base rate based on meter size plus a flat fee of \$0.58 per 1,000 gallons of water used (usage fee). The base rate per meter is found in Table 2.1.

GENERAL RATE OBJECTIVES

The following objectives were identified by the City, which served as the foundation of the rate update and scenario analysis.

1. Ensure sufficient revenues to cover all operation and maintenance expenses while maintaining bond covenants and the appropriate debt coverage ratio of at least 1.25x.
2. Continue to fund capital improvements in the 10-year window using rate revenues, while minimizing future bonding needs and maintaining a fund balance of 50 percent of annual O&M expenses.
3. Evaluate a policy to maintain the existing rate structure based on a base rate assessment plus a usage fee, with the following adjustments applied in Fiscal Year (FY) 2017:
 - ☞ Bring the base rate by meter size into alignment with AWWA multipliers (See Table 2.2).
 - ☞ Promote conservation through the application of a tiered rate structure by meter size. The proposed rate schedule will allow for the monthly usage (in 1,000 gallons) as identified in Table 2.3.

TABLE 2.1: BASE RATE BASED ON METER SIZE

METER	2016	METERS AS % OF TOTAL	METER	2016	METERS AS % OF TOTAL
3/4" Meter	\$14.19	79.53%	4" Meter	\$427.61	0.22%
1" Meter	\$35.95	16.05%	6" Meter	\$1,080.38	0.05%
1 1/2" Meter	\$101.22	1.95%	8" Meter	\$1,443.05	0.02%
2" Meter	\$166.50	2.10%	10" Meter	\$2,164.59	0.01%
3" Meter	\$253.55	0.07%			

Source: Orem City

TABLE 2.2: ILLUSTRATION OF CURRENT BASE RATE MULTIPLIERS TO AWWA MULTIPLIERS

METER	CURRENT BASE RATE MULTIPLIER	AWWA MULTIPLIER
0.75	1.00	1.00
1	2.53	1.67
1.5	7.13	3.33
2	11.73	5.33
3	17.87	10.00
4	30.13	20.00
6	76.14	41.67
8	101.70	53.33
10	152.54	96.67

TABLE 2.3: PROPOSED TIERED RATE STRUCTURE BY METER SIZE

METER	AWWA MULTIPLIER	TIER 1	TIER 2		TIER 3		TIER 4	
		HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
0.75	1.00	11.000	11.001	34.000	34.001	65.000	65.001	Plus
1	1.67	18.000	18.001	57.000	57.001	109.000	109.001	Plus
1.5	3.33	37.000	37.001	113.000	113.001	216.000	216.001	Plus
2	5.33	59.000	59.001	181.000	181.001	346.000	346.001	Plus
3	10.00	110.000	110.001	340.000	340.001	650.000	650.001	Plus
4	20.00	220.000	220.001	680.000	680.001	1,300.000	1,300.001	Plus
6	41.67	458.000	458.001	1,417.000	1,417.001	2,709.000	2,709.001	Plus
8	53.33	587.000	587.001	1,813.000	1,813.001	3,466.000	3,466.001	Plus
10	96.67	1,063.000	1,063.001	3,287.000	3,287.001	6,284.000	6,284.001	Plus

*The 3/4" block volumes are based on the 90th percentile of usage for that meter size. For 1" and greater, AWWA multipliers are applied. Figures are rounded.



4. Finally, the proposed rate recommendations should be implementable and equitably distribute cost relative to demand.

RATE DETERMINATION METHODOLOGY

Based on the above objectives, the water rate analysis has been divided into the following three phases:

1. **Revenue Growth Analysis:** LYRB studied existing revenue data and growth projections provided by the City. This information was then analyzed to determine the potential allocation of new accounts and the revenue potential within the water utility.
2. **Cost of Service Analysis:** The cost of service analysis is structured to balance revenue sufficiency with future operating and maintenance costs, contracts, repair and replacement, capital expenditures, funding for current system deficiencies and bond service coverage ratios. Expenses were projected out to 2026 and revenues were analyzed under a variety of scenarios to meet the City's needs.
3. **Rate Design Analysis:** The final phase focuses on structuring rates that will collect the necessary revenues based on the City's budgetary needs and rate objectives.



SECTION III: REVENUE GROWTH ANALYSIS

SERVICE AREA

The utility rates identified in this document will be assessed to all accounts within the water utility service area.

DEMAND UNITS

The demand units in this analysis are connections and projected flows. According to information provided by the City, there were 22,634 system connections in 2015. The City has projected connections based on an annual growth rate of one percent, resulting in a total of 23,789 connections by 2020. This analysis applies the same growth rate through 2026, resulting in a total of 25,252 connections. Connections are distributed based on meter size using the percentages shown in **Table 2.1**.

For the purposes of this analysis, estimated flows for 2016 are 6.4 million units (measured in 1,000 gallons), which is similar to FY 2015. FY 2017 is projected with a two percent decline as a result of anticipated conservation in usage due to the adopted conservation policies. As a result, FY 2017, or Year 1, is projected at 6.3 million units and held constant through 2026. Historic flow data shows a declining trend, dropping from 6.94 million units in 2009 to 6.4 million units in 2014 and 2015. Further decline in flows will affect the projected revenue as shown in this report.

HISTORIC AND PROJECTED OPERATING REVENUES

Utilizing the growth estimates shown in **Table 3.1**, LYRB forecasted the potential revenues generated from current service charges, as shown below. The City desired to maintain a rate structure based on a base rate assessment and a usage fee, with the proposed rate structure incorporating a tiered usage fee based on meter size.

TABLE 3.1: CITY-WIDE GROWTH PROJECTIONS

(FY)	TOTAL CONNECTIONS
2016	22,860
2017	23,089
2018	23,320
2019	23,553
2020	23,789
2021	24,026
2022	24,267
2023	24,509
2024	24,754
2025	25,002
2026	25,252

TABLE 3.2: HISTORIC OPERATING REVENUES

	2009	2010	2011	2012	2013	2014	2015
Charges for Services	8,496,116	8,345,652	9,106,746	9,765,330	10,071,475	10,882,384	11,001,098
Other Revenues	906,746	122,437	130,465	1,275,567	950,270	2,319,142	2,424,603
Total Operating Revenue	\$9,402,862	\$8,468,089	\$9,237,211	\$11,040,897	\$11,021,745	\$13,201,526	\$13,425,701

Source: Orem City Financial Statements

TABLE 3.3: PROJECTED OPERATING REVENUES

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 10
Projected Operating Revenues	\$14,185,556	\$15,220,506	\$16,352,059	\$17,551,017	\$18,840,405	\$22,485,239

PROJECTED NON-OPERATING REVENUES

Non-operating revenues are primarily comprised of impact fee revenues and interest revenues. The City currently assesses an impact fee within a recently annexed area of the City. However, revenues from these sources are not considered in the analysis at this time due to the uncertainty of the timing of new growth. Historic and projected total non-operating revenues are shown in **Tables 3.4-3.5**. The projections assume non-operating revenue will grow at an annual rate of one percent.



TABLE 3.4: HISTORIC NON-OPERATING REVENUES

NON-OPERATING REVENUES (EXPENSES)	2009	2010	2011	2012	2013	2014	2015
Interest Revenue	195,153	54,021	36,740	58,852	48,672	51,457	69,904
Impact Fee Revenues	-	-	-	-	-	-	-
Gain (Loss) on Sale of Capital Assets	18,655	9,000	-	94,629	1,300	8,533	8,845
Donations/Grants	-	12,842	-	-	-	-	-
Deferred Charges	(18,748)	(5,713)	(16,304)	(16,304)	(16,304)	(72,798)	-
Total Non-Operating Revenue	\$195,060	\$70,150	\$20,436	\$137,177	\$33,668	(\$12,808)	\$78,749

TABLE 3.5: PROJECTED NON-OPERATING REVENUE

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 10
Total Non-Operating Revenues (Expenses)	\$91,851	\$92,770	\$93,697	\$94,634	\$95,581	\$100,456



SECTION IV: COST OF SERVICE ANALYSIS

This analysis considers historic revenues and expenses during the period from FY 2009 through FY 2015, and forecasts revenues and expenditures through 2026. Projected cash flows for the water utility were analyzed to ensure that the City's objectives are met – to ensure revenue sufficiency to cover O&M while maintaining bond covenants and the appropriate debt coverage ratio; fund all necessary capital improvements; and, provide an appropriate fund balance according to the City's existing budget policies.

COSTS TO BE RECOVERED THROUGH SERVICE CHARGES

OPERATIONS AND MAINTENANCE

General O&M expenses are incurred through the normal day-to-day operations of the water system. These expenses can include costs such as wages and salaries, benefits, utility costs and supplies. These costs can be variable based on fluctuations in water flows. Projections of the future O&M expenses, excluding the Administrative Fee, are projected to grow at an annual rate of three percent. Historic data shows an average annual growth of nearly four percent in expenditures from 2009 to 2015, primarily driven by an increase in Contract Services. The City anticipates growth in this expense category will be less pronounced moving forward. A comparison to the Municipal Cost Index ("MCI") and Construction Cost Index ("CCI") shows an average annual change in cost components of 2.8 percent and 3.2 percent respectively.¹ Thus, a three percent increase in operations and maintenance expenses appears reasonable for the purposes of forecasting expenses. According to the City, Administrative Expense is set to 10 percent of new revenue plus the previous year's total. Therefore, as revenues increase, the Administrative Fee expense is adjusted based on the calculated revenues.

TABLE 4.1: HISTORIC OPERATIONS AND MAINTENANCE EXPENSES

OPERATING EXPENSE	2009	2010	2011	2012	2013	2014	2015
Personal Services	(1,978,028)	(1,978,120)	(1,804,670)	(1,829,309)	(1,851,773)	(1,793,600)	(1,775,120)
Supplies and Maintenance	(528,876)	(672,872)	(712,989)	(680,674)	(667,690)	(615,341)	(668,167)
Administrative Fee	(1,136,496)	(1,222,675)	(1,243,701)	(1,295,151)	(1,322,372)	(1,431,360)	(1,195,628)
Utilities	(419,047)	(428,602)	(420,542)	(462,322)	(534,023)	(569,852)	(570,411)
Contract Services	(1,952,774)	(2,624,103)	(2,635,961)	(2,708,624)	(3,055,319)	(3,464,945)	(3,445,335)
Equipment Lease and Rentals	(45,112)	(37,269)	(30,007)	(35,231)	(26,561)	(32,328)	(28,833)
Insurance	(119,834)	(119,834)	(120,209)	(138,462)	(139,263)	(152,985)	(152,985)
Changes in Lieu of Property Tax	(95,000)	(97,500)	(100,000)	(122,500)	(75,000)	(75,000)	(71,787)
Miscellaneous	(77,156)	(64,740)	(78,126)	(83,892)	(91,077)	(95,626)	(109,629)
Total Operating Expense	(\$6,352,323)	(\$7,245,715)	(\$7,146,205)	(\$7,356,165)	(\$7,763,078)	(\$8,231,037)	(\$8,017,895)

Source: City of Orem Financial Statements. *According to the City, Administrative Expense is set to 10 percent of new revenue plus previous year's total.

TABLE 4.2: PROJECTED OPERATION AND MAINTENANCE EXPENSES

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 10
Projected Total Operating Expense	(\$9,019,999)	(\$9,347,998)	(\$9,692,410)	(\$10,050,517)	(\$10,424,831)	(\$12,133,955)

¹ Source: <http://americancityandcounty.com/mciarchive/#Archive>, Accessed January 2016. Based on averages from 2000-2015.



CAPITAL PROJECTS

Capital projects must be constructed to update and expand the water system. Capital project costs may be paid through cash reserves, impact fees or debt financing. If the City is able to accumulate sufficient cash reserves and chooses to use these reserves to fund capital projects, the need for debt financing may be mitigated. In this analysis, several projects are identified that must be constructed through 2026 and beyond. **Table 4.3** summarizes the total proposed capital improvement estimated construction costs, by scenario. The City's Master Plan provides details for the proposed CIP. The sum of capital costs for the 10-year period fluctuates for each scenario due to construction timing. Scenario 2, which includes bonding, allows projects to be built earlier, reducing the amount of inflation that is accumulated over time. As is shown in the five-year totals, Scenario 2 funds a larger portion of the CIP within the five-year window. From these scenarios, the City Council and staff isolated Scenario 3 as the preferred alternative.

TABLE 4.3: SUMMARY OF CAPITAL PROJECT COSTS

FIGURES REPRESENTED AS (EXPENSE)	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	5 Year Total	Year 6	Year 7	Year 8	Year 9	Year 10	10-Year Total
Scenario 1: 5-Year CIP (No Bond)	\$3,528,538	\$5,716,192	\$6,730,329	\$7,194,908	\$7,558,183	\$30,728,149	\$7,783,727	\$8,049,602	\$8,324,555	\$8,608,896	\$8,867,163	\$72,362,092
Scenario 2: 5-Year CIP (With Bond)	2,843,186	15,110,929	3,319,765	4,079,251	16,432,102	41,785,233	4,542,823	5,324,272	5,936,074	6,328,281	6,981,631	70,898,314
Scenario 3: 7-Year CIP (No Bond)	3,228,979	4,145,726	5,048,439	6,049,930	6,854,032	25,327,107	7,584,540	8,049,602	8,324,555	8,608,896	8,867,163	66,761,863
Scenario 4: 10-Year CIP (No Bond)	2,929,936	3,637,712	4,403,366	5,177,661	5,931,334	22,080,008	6,731,214	7,469,076	8,025,268	8,483,195	8,867,163	61,655,924

FUNDING OF DEPRECIATION (REPAIR AND REPLACEMENT)

Funding depreciation in the proposed rate structure, or adopting a formal repair and replacement plan, will reduce the City's need to issue future debt, and will therefore decrease future interest expense and help the City avoid abrupt rate increases to fund unforeseen expenses. The City's CIP includes both growth related projects and repair/replacement projects. Thus, an additional allocation in the CIP for depreciation is not included in this analysis.

DEBT SERVICE COSTS

The City has funded its existing capital infrastructure through a combination of different revenue sources, including rate revenues and the issuance of debt. The following outstanding bonds are applicable to this analysis: the 2005A Water and Storm Sewer Revenue Bonds, of which 66.5 percent is related to the water utility; the 2005B Water and Storm Sewer Revenue Bonds, of which 100 percent is related to the water utility; the 2008 Water and Storm Sewer Revenue Bonds, of which 100 percent is related to the water utility; and, the 2013 Water and Storm Sewer Revenue Refunding Bonds, which refunded the 2005A Bonds, of which 66.5 percent is related to the water utility. The proceeds of the bonds were used to construct and expand facilities at the water system.

TABLE 4.4: OUTSTANDING DEBT

DEBT SERVICE	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
2005A	(545,871)	-	-	-	-	-	-	-	-	-	-
2005B	(174,018)	(174,828)	(174,593)	(174,329)	(174,035)	(174,711)	(174,343)	(173,946)	(174,518)	(174,047)	(174,546)
2008	(315,938)	(338,438)	(335,344)	(258,750)	(307,500)	(329,375)	(330,500)	(331,375)	(332,000)	(332,375)	(332,500)
2013 Refunding of 2005A	(\$355,392)	(\$901,285)	(\$902,439)	(\$951,219)	(\$918,341)	(\$901,579)	(\$900,583)	(\$900,540)	(\$902,078)	(\$901,866)	(\$902,564)

The City Council and staff isolated CIP Scenario 3 as the preferred alternative, which does not utilize new debt as a mechanism for funding future capital improvements. Therefore, no additional debt service obligations other than the outstanding bonds are included in this analysis.



SECTION V: RATE DESIGN ANALYSIS

The City commissioned LYRB to review the existing culinary water utility fees (or rates) and provide a recommended rate schedule based on changes in forecasted expenses, capital improvements and bonding needs. The primary objectives of the rate analysis were to ensure sufficient revenues to cover all O&M expenses, maintain bond covenants, ensure the appropriate debt service coverage ratio, and provide sufficient revenue to fund the proposed projects identified in the Master Plan and CIP. In addition, the proposed rate structure is intended to promote conservation and to proportionately allocate the utility system costs based on the impact from varying meter sizes through the implementation of a tiered rate structure.

A review of projected revenues under the existing rate structure relative to proposed expenses illustrated that the City would not have sufficient revenues to fund the needed capital improvements without a rate increase. As a result, City staff, the City Council and consultants evaluated many potential rate scenarios during the study phase of this analysis, with the City ultimately focusing on four scenarios:

- Scenario 1 – Phasing the proposed CIP over a five (5) year period with no new debt;
- Scenario 2 – Phasing the proposed CIP over a five (5) year period with new debt;
- Scenario 3 – Phasing the proposed CIP over a seven (7) year period with no new debt; and,
- Scenario 4 – Phasing the proposed CIP over a ten (10) year period with no new debt.

From these scenarios, the City Council and staff isolated Scenario 3 as the preferred alternative. The rate structure shown below is designed to fund the proposed CIP, necessary O&M and other expenses forecasted within the planning horizon. In addition, the proposed Base Rates by meter size are structured to bring the City into closer alignment with AWWA multipliers.

TABLE 5.1: ILLUSTRATION OF PROPOSED BASE RATE

METER SIZE	AWWA MULTIPLIER	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
0.75	1.00	\$15.74	\$17.16	\$18.70	\$20.20	\$21.72	\$23.02	\$24.17	\$25.14	\$25.89	\$26.10
1	1.67	\$39.22	\$39.22	\$39.22	\$39.22	\$39.22	\$39.22	\$39.22	\$41.98	\$43.24	\$43.59
1.5	3.33	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42	\$110.42
2	5.33	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64	\$181.64
3	10.00	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59	\$276.59
4	20.00	\$466.48	\$466.48	\$466.48	\$466.48	\$466.48	\$466.48	\$466.48	\$502.80	\$517.80	\$522.00
6	41.67	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58	\$1,178.58
8	53.33	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21	\$1,574.21
10	96.67	\$2,361.32	\$2,361.32	\$2,361.32	\$2,361.32	\$2,361.32	\$2,361.32	\$2,361.32	\$2,361.32	\$2,502.79	\$2,523.09

The City has adopted a four-tiered approach based on usage. The schedules found in Tables 5.2-5.3 establishes the fee by tier and the usage parameters within each meter category, with the base meter set at a ¾ inch. AWWA multipliers are then applied to larger meters to allow for proportional usage for each meter size. This ensures that each meter size is bound by a four-tier structure, while providing consideration of the need for greater capacity in larger meters.



TABLE 5.2: ILLUSTRATION OF PROPOSED TIERED RATE

	TIER MULTIPLIER	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
Tier 1	1.00	\$0.71	\$0.79	\$0.88	\$0.98	\$1.09	\$1.17	\$1.23	\$1.28	\$1.31	\$1.32
Tier 2	1.25	\$0.89	\$0.99	\$1.10	\$1.22	\$1.35	\$1.44	\$1.51	\$1.57	\$1.61	\$1.63
Tier 3	1.50	\$1.07	\$1.18	\$1.31	\$1.45	\$1.61	\$1.72	\$1.81	\$1.88	\$1.93	\$1.95
Tier 4	2.00	\$1.42	\$1.58	\$1.75	\$1.94	\$2.15	\$2.30	\$2.42	\$2.52	\$2.58	\$2.61

TABLE 5.3: ILLUSTRATION OF FLOW ALLOCATION BY METER SIZE (1,000 GALLONS)

METER	AWWA MULTIPLIER	TIER 1	TIER 2		TIER 3		TIER 4	
		MAX	LOW	HIGH	LOW	HIGH	LOW	HIGH
0.75	1.00	11.000	11.001	34.000	34.001	65.000	65.001	Plus
1	1.67	18.000	18.001	57.000	57.001	109.000	109.001	Plus
1.5	3.33	37.000	37.001	113.000	113.001	216.000	216.001	Plus
2	5.33	59.000	59.001	181.000	181.001	346.000	346.001	Plus
3	10.00	110.000	110.001	340.000	340.001	650.000	650.001	Plus
4	20.00	220.000	220.001	680.000	680.001	1,300.000	1,300.001	Plus
6	41.67	458.000	458.001	1,417.000	1,417.001	2,709.000	2,709.001	Plus
8	53.33	587.000	587.001	1,813.000	1,813.001	3,466.000	3,466.001	Plus
10	96.67	1,063.000	1,063.001	3,287.000	3,287.001	6,284.000	6,284.001	Plus

*The 3/4" block volumes are based on the 90th percentile of usage for that meter size. For 1" and greater, AWWA multipliers are applied. Figures rounded.

This analysis assumes an annual growth of one percent in connections. Annual O&M expenditures are assumed to increase by three percent annually. The comparison of revenues and expenditures under the proposed rate increase, as shown in Table 5.4, illustrates that the City will continue to maintain the necessary debt service coverage ratios, while providing necessary funding for capital improvement and replacement projects according to the proposed CIP scenarios.

TABLE 5.4: SUMMARY PRO FORMA

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 10
Total Operating Revenue	\$14,185,556	\$15,220,506	\$16,352,059	\$17,551,017	\$18,840,405	\$22,485,239
Total Operating Expense	(9,019,999)	(9,347,998)	(9,692,410)	(10,050,517)	(10,424,831)	(12,133,955)
Total Non-Operating Revenue	91,851	92,770	93,697	94,634	95,581	100,456
Total DS	(1,414,550)	(1,412,376)	(1,384,297)	(1,399,876)	(1,405,665)	(1,409,610)
Total CIP	(3,228,979)	(4,145,726)	(5,048,439)	(6,049,930)	(6,854,032)	(8,867,163)
Net Income (Loss) Before Transfers	613,878	407,175	320,610	145,328	251,458	174,968
Change in Net Position after Transfers and Contributions	609,173	402,423	315,810	140,481	246,563	169,822
Beginning Fund Balance	4,500,000	5,109,173	5,511,597	5,827,407	5,967,887	7,464,181
Ending Fund Balance (Unrestricted)	\$5,109,173	\$5,511,597	\$5,827,407	\$5,967,887	\$6,214,450	\$7,634,003
Fund Balance as % of O&M	57%	59%	60%	59%	60%	63%
Days of Working Capital	204	212	216	214	215	226
Coverage Ratio	3.65	4.16	4.81	5.36	5.99	7.34



The proposed rate structure will preserve the proportional “Days of Working Capital” through year 10 and the fund balance will remain above the minimum set by the City of maintaining at least 50 percent of O&M expenses in reserve funds through Year 10. It is also important to note that working capital will remain above 150 days of O&M expense, which is a standard benchmark for an AA to an A rated sewer or water utility bond.² The City should reevaluate the proposed rates after the five-year planning horizon. A detailed pro forma can be found in **Appendix A**.

² See “2015 Water and Sewer Medians”, December 10, 2014, Fitch Ratings.

SECTION VI: EVALUATION OF PRICING OBJECTIVES

Several objectives were identified by the City, which serve as the foundation of the rate update and scenario analysis.

- ☞ First, the City wanted to ensure sufficient revenues to cover all operation and maintenance expenses while maintaining bond covenants and the appropriate debt coverage ratio of at least 1.25x.
- ☞ Second, the City wanted to continue to fund capital improvements in the 10-year window using rate revenues, while minimizing future bonding needs and maintaining a fund balance of 50 percent of annual O&M expenses.
- ☞ Third, the rates should evaluate a policy to maintain the existing rate structure based on a base rate assessment plus a usage fee, with the following adjustments, applied in Fiscal Year (FY) 2017:
 - Bring the base rate by meter size into alignment with AWWA multipliers.
 - Promote conservation through the application of a tiered rate structure by meter size.
- ☞ Finally, the proposed rate recommendations should be implementable and equitably distribute cost relative to daily and peak demand.

EVALUATION OF EFFECTIVENESS OF RATE OBJECTIVES

- ☞ **Revenue Sufficiency:** The comparison of revenues and expenditures under the proposed rate increases illustrates that the City will continue to maintain the necessary debt coverage ratios, while providing necessary funding for capital improvement and replacement projects according to the proposed CIP scenarios. The proposed rate structure will preserve the proportional "Days of Working Capital" through year 10 and the fund balance will remain above the minimum set by the City of maintaining at least 50 percent of O&M expenses in reserve funds through Year 10. It is also important to note that working capital will remain above 150 days of O&M expense, which is a standard benchmark for an AA to an A rated sewer or water utility bond. The City should reevaluate the proposed rates after the five-year planning horizon.
- ☞ **Funding Capital Costs and Maintaining Revenue Sufficiency:** The rate analysis considers necessary increases to adequately fund the repair and replacement of existing facilities, future capital costs and to maintain a fund balance at the end of each year utilizing a pay-as-you go approach.
- ☞ **Rate Structure:** The adopted rate structure promotes conservation through a four-tier usage rate assessed by meter size and a base rate that is more in line with AWWA multipliers. This ensures that each meter size is bound by a four-tier structure, while providing consideration of the need for greater capacity in larger meters.
- ☞ **Equity and Implementation:** The adopted rate calculations follow a reasonable methodology to promote conservation while ensuring the proposed rates do not disproportionately affect larger meter sizes.



CUSTOMER IMPACT AND AFFORDABILITY

The City must collect, through monthly rates, the costs of running efficient and effective utilities while making certain that the rates are affordable to the customers to whom the service is provided. The maximum proposed rates by year 10 register at 2.35 percent of current median household incomes (“MHI”), including proposed changes to the sewer utility rates. An affordability index of 1.6 - 2.6 percent of MHI is used as a benchmark in this analysis, which is the affordability index for a combined annual water and sewer bill for an AA to an A rated sewer or water utility bond. The proposed rates fall within this affordability threshold.³ It is important to note that the table below includes the full increase to the sewer and water rates at the end of the pro forma (FY 2026) compared to the unadjusted 2015 MHI. Thus, this illustration represents a very affordable estimate.

TABLE 6.1: AFFORDABILITY OF PROPOSED RATES AT END OF 10-YEAR PERIOD

Orem 2015 Median Household Income	\$54,048
Estimate of Annual Sewer Bill	\$544
Estimate of Annual Water Bill	\$724
Total Combined Water & Sewer Annual Bill	\$1,262
% of MHI	2.35%

Source: U.S. Census Bureau 2008-2012 ACS Survey 5-Year Estimates, Selected Economic Characteristics
Estimate of annual bill based on typical single-family dwelling.

³ See “2015 Water and Sewer Medians”, December 10, 2014, Fitch Ratings.

APPENDIX A: DETAILED PRO FORMAS

TABLE A.1: DETAILED PRO FORMA

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Charges for Services	\$13,327,056	\$14,353,421	\$15,476,303	\$16,666,503	\$17,947,047	\$18,938,800	\$19,771,105	\$20,644,974	\$21,255,229	\$21,546,310
Other Revenues (Including Connection Fees)	858,500	867,085	875,756	884,513	893,359	902,292	911,315	920,428	929,632	938,929
Total Operating Revenue	14,185,556	15,220,506	16,352,059	17,551,017	18,840,405	19,841,092	20,682,420	21,565,402	22,184,862	22,485,239
Operating Expense										
Personal Services	(1,883,225)	(1,939,722)	(1,997,913)	(2,057,851)	(2,119,586)	(2,183,174)	(2,248,669)	(2,316,129)	(2,385,613)	(2,457,181)
Supplies and Maintenance	(708,858)	(730,124)	(752,028)	(774,589)	(797,826)	(821,761)	(846,414)	(871,806)	(897,961)	(924,899)
Administrative Fee	(1,491,916)	(1,594,552)	(1,706,841)	(1,825,861)	(1,953,915)	(2,053,090)	(2,136,321)	(2,223,708)	(2,284,733)	(2,313,841)
Utilities	(605,149)	(623,304)	(642,003)	(661,263)	(681,101)	(701,534)	(722,580)	(744,257)	(766,585)	(789,582)
Contract Services	(3,945,496)	(4,063,381)	(4,184,803)	(4,309,867)	(4,438,683)	(4,571,843)	(4,708,999)	(4,850,268)	(4,995,777)	(5,145,650)
Equipment Lease and Rentals	(30,589)	(31,507)	(32,452)	(33,425)	(34,428)	(35,461)	(36,525)	(37,621)	(38,749)	(39,912)
Insurance	(162,302)	(167,171)	(172,186)	(177,352)	(182,672)	(188,152)	(193,797)	(199,611)	(205,599)	(211,767)
Changes in Lieu of Property Tax	(76,159)	(78,444)	(80,797)	(83,221)	(85,717)	(88,289)	(90,938)	(93,666)	(96,476)	(99,370)
Miscellaneous	(116,305)	(119,795)	(123,388)	(127,090)	(130,903)	(134,830)	(138,875)	(143,041)	(147,332)	(151,752)
Total Operating Expense	(9,019,999)	(9,347,998)	(9,692,410)	(10,050,517)	(10,424,831)	(10,778,134)	(11,123,116)	(11,480,107)	(11,818,824)	(12,133,955)
Net Operating Income (Loss)	5,165,556	5,872,507	6,659,649	7,500,500	8,415,574	9,062,958	9,559,304	10,085,295	10,366,038	10,351,284
Non-Operating Revenues (Expenses)										
Interest Revenue	71,309	72,022	72,742	73,470	74,205	74,947	75,696	76,453	77,218	77,990
Impact Fee Revenues	-	-	-	-	-	-	-	-	-	-
Gain (Loss) on Sale of Capital Assets	20,542	20,748	20,955	21,165	21,376	21,590	21,806	22,024	22,244	22,467
Donations/Grants	-	-	-	-	-	-	-	-	-	-
Deferred Charges	-	-	-	-	-	-	-	-	-	-
Total Non-Operating Revenue	91,851	92,770	93,697	94,634	95,581	96,537	97,502	98,477	99,462	100,456
Total Revenue Available for DS	5,257,408	5,965,277	6,753,346	7,595,134	8,511,155	9,159,495	9,656,806	10,183,772	10,465,499	10,451,740
Debt Service										
1994	-	-	-	-	-	-	-	-	-	-
2005A	-	-	-	-	-	-	-	-	-	-
2005B	(174,828)	(174,593)	(174,329)	(174,035)	(174,711)	(174,343)	(173,946)	(174,518)	(174,047)	(174,546)
2008	(338,438)	(335,344)	(258,750)	(307,500)	(329,375)	(330,500)	(331,375)	(332,000)	(332,375)	(332,500)
2010	-	-	-	-	-	-	-	-	-	-
2013 Refunding of 2005A	(901,285)	(902,439)	(951,219)	(918,341)	(901,579)	(900,583)	(900,540)	(902,078)	(901,866)	(902,564)
Proposed: Series 2018	-	-	-	-	-	-	-	-	-	-
Proposed: Series 2021	-	-	-	-	-	-	-	-	-	-
Total DS	(1,414,550)	(1,412,376)	(1,384,297)	(1,399,876)	(1,405,665)	(1,405,426)	(1,405,860)	(1,408,596)	(1,408,288)	(1,409,610)
Total Revenue Available for CIP	3,842,857	4,552,901	5,369,049	6,195,258	7,105,490	7,754,069	8,250,946	8,775,176	9,057,211	9,042,131
Total CIP	(3,228,979)	(4,145,726)	(5,048,439)	(6,049,930)	(6,854,032)	(7,584,540)	(8,049,602)	(8,324,555)	(8,608,896)	(8,867,163)
Proposed: Series 2018 Proceeds	-	-	-	-	-	-	-	-	-	-
Proposed: Series 2021 Proceeds	-	-	-	-	-	-	-	-	-	-
Total Bond Proceeds	-	-	-	-	-	-	-	-	-	-
Net Income (Loss) Before Transfers	613,878	407,175	320,610	145,328	251,458	169,528	201,345	450,621	448,315	174,968
Contributions from Developers	162,888	164,517	166,162	167,824	169,502	171,197	172,909	174,638	176,384	178,148
Transfers In	109,936	111,035	112,146	113,267	114,400	115,544	116,699	117,866	119,045	120,235
Transfers Out	(277,529)	(280,304)	(283,107)	(285,938)	(288,797)	(291,685)	(294,602)	(297,548)	(300,524)	(303,529)
Change in Net Position	609,173	402,423	315,810	140,481	246,563	164,584	196,350	445,577	443,220	169,822
Beginning Cash Balance	4,500,000	5,109,173	5,511,597	5,827,407	5,967,887	6,214,450	6,379,034	6,575,384	7,020,961	7,464,181
Ending Fund Balance	5,109,173	5,511,597	5,827,407	5,967,887	6,214,450	6,379,034	6,575,384	7,020,961	7,464,181	7,634,003
General Fund Restricted (Bond Proceeds)	-	-	-	-	-	-	-	-	-	-
Unrestricted	\$5,109,173	\$5,511,597	\$5,827,407	\$5,967,887	\$6,214,450	\$6,379,034	\$6,575,384	\$7,020,961	\$7,464,181	\$7,634,003
Unrestricted Days of Working Capital	204	212	216	214	215	213	213	220	227	226
Coverage Ratio (w/Impact Fees)	3.65	4.16	4.81	5.36	5.99	6.45	6.80	7.16	7.36	7.34
Coverage Ratio (w/o Impact Fees)	3.65	4.16	4.81	5.36	5.99	6.45	6.80	7.16	7.36	7.34