

City of Bellingham, WA



Final Draft Report for  
2012 WATER & SEWER  
RATE UPDATE

August 2012

**FCS GROUP**

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August 27, 2012

Mr. Bob Bandarra, Superintendent of Operations  
City of Bellingham  
210 Lottie Street  
Bellingham, WA 98225

Subject: 2012 Water & Sewer Rate Update

Dear Mr. Bandarra:

FCS GROUP is pleased to submit this final draft report documenting the findings and recommendations of the 2012 Water & Sewer Rate Update conducted for the City of Bellingham. Enclosed is a description of the background and methodology followed for each major task in the study, a discussion of findings and policy implications, and a description of the final recommendations.

It has been a pleasure to work with City staff on this effort. We look forward to working with you in the future, and we encourage the City to direct any comments or questions regarding this study to us at (425) 867-1802.

Sincerely,

A handwritten signature in black ink, appearing to read "Ed Cebron", with a stylized flourish at the end.

Ed Cebron  
Principal

A handwritten signature in black ink, appearing to read "Gordon Wilson", with a long horizontal stroke extending to the right.

Gordon Wilson  
Project Manager

A handwritten signature in black ink, appearing to read "Chris Gonzalez", with a stylized flourish at the end.

Chris Gonzalez  
Project Consultant

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## EXECUTIVE SUMMARY

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The City engaged FCS GROUP in February 2012 to perform a comprehensive rate study for its water and sewer utilities. The rate study includes the following components:

- ◆ A review of water and sewer utility revenue requirements incorporating:
  - A revised metering schedule reflecting the conversion of the City’s unmetered water customers to metered water service by January 22, 2017, as required by the Water Use Efficiency Rule established by the Washington State Department of Health
  - Recent trends in water demands suggesting that per capita water usage has been declining, and will continue to decline
  - Recent economic conditions that have impacted both the behavior of existing customers and the addition of new customers to the water and wastewater systems
  - A change in customer service policy to allow credit cards to be used for monthly utility payments without a separate transaction fee
- ◆ Development of recommended water and sewer rates based on projected revenue needs and an updated cost-of-service analysis for each utility
  - For water, shifting separately metered condos from the non-single family to the single-family customer class

In addition to development of projected rates, this report addresses the following elements:

- ◆ A review of the City’s cost of providing fire protection service, in response to the Washington State Supreme Court’s decision in *Lane v. Seattle*
- ◆ An update of rates for untreated water service
- ◆ An update of sewer rates for the City’s special industrial users (SIUs)
- ◆ A potential expansion of the existing low-income discount program
- ◆ The rate impact of monthly billing

We are preparing separate issue papers that discuss:

- ◆ An update of water and sewer SDCs to reflect current estimates of the City’s investment in infrastructure and system growth
- ◆ A review of the City’s methodology for recovering costs from Lake Whatcom Water & Sewer District (LWWSO)
- ◆ Development of a wholesale water rate to facilitate possible water sales to other communities

This study developed a multi-year financial plan integrating these various elements, projecting operating and capital costs for the six-year planning period from 2013 to 2018.

Key findings and recommendations resulting from the study include:

## Water

- ◆ Overall water rate revenue should be increased by 9.0% in 2013, 8.0% per year from 2014 – 2016, and by 6.0% per year from 2017 – 2018. Key factors that drive these adjustments are:
  - **O&M:** Operating costs are expected to increase by 2% – 5% per year, with a higher near-term impact due to costs associated with the metering program. When the metering program has been completed (by 2017), these incremental costs are expected to go away.
  - **Debt:** The proposed 2013 – 2018 water utility capital funding strategy contemplates a total of \$35.5 million in revenue bond proceeds (net of issuance costs and reserve requirements) to fund the projected capital costs. An \$11.6-million bond issue in 2015 is expected to increase the water utility’s annual debt burden by about \$983,000 per year beginning in 2016; a 2018 bond issue of \$23.9 million would increase annual debt service by an additional \$2.1 million (for a total of \$3.1 million per year by the end of the study period). In addition, with the planned transfer of \$5 million of existing bond proceeds from the sewer utility to the water utility, the water utility is assumed to fund a proportionate share of debt service on the 2011 Revenue Bond. In the near-term, this amounts to about \$270,000 per year.
  - **Capital:** Consistent with prior recommendations, the forecast incorporates a policy to fund system reinvestment through water rates. The prior water rate study completed in 2007 established an annual funding level based on annual depreciation expense, net of debt principal. However, given the projected increases in debt service discussed above, this analysis reflects a revised benchmark (50% of annual depreciation expense) to stabilize the annual funding level. By the end of the study period, the annual transfers for system reinvestment are projected to increase to about \$1.4 million. This is in addition to cash funding provided through SDCs.
  - **Reserve Funding:** Consistent with the prior study, this analysis reflects a policy assumption that the water utility maintains an operating (or “working capital”) reserve with a balance sufficient to cover 60 days of projected operating expenses. Because the City has currently been maintaining an operating reserve balance of 5% (about 18 days) of budgeted expenses, this analysis phases in the higher reserve target over several years. In addition, this analysis introduces a separate “rate stabilization reserve” intended to provide additional security against revenue risk associated with volumetric revenues, preserving the City’s ability to meet its debt obligations even in low sales years. The target balance for this reserve is 50% of annual debt service for debt issued on or after January 1, 2011. Debt issued prior to 2011 is not included in this calculation because the covenants for that debt do not allow use of a rate stabilization reserve to meet bond coverage requirements.
  - **Expansion of Reduced-Rate Program:** This study included the evaluation of the incremental impact of expanding the City’s reduced-rate program based on the low-income threshold established by Whatcom County (\$35,000 per year). Based on staff recommendations, the adopted rates assume that this program is expanded.
- ◆ The water rate schedule shown in **Table EX-1** is recommended for adoption as inside-City rates. Per City policy, outside-City customers would pay rates that are 1.5 times the rates shown in **Table EX-1**.

**Table EX-1: Summary of Proposed 2013 – 2018 Inside-City Water Rates**

<b>Single-Family Residential &amp; Water Districts</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Unmetered Single-Family</b>							
Monthly Flat Rate:							
Single-Family Residence	\$29.96	<b>\$32.66</b>	<b>\$35.27</b>	\$38.09	\$41.14	<i>All Customers Are Metered</i>	
Duplex	\$59.92	<b>\$65.31</b>	<b>\$70.54</b>	\$76.18	\$82.28		
<b>Transitional Single-Family</b>							
Monthly Fixed Rate					<i>Combined With Metered Single-Family Residential Rates</i>		
5/8" Meter	\$11.61	<b>\$16.33</b>	<b>\$17.90</b>	\$19.35			
3/4" Meter	\$15.97	<b>\$22.46</b>	<b>\$24.62</b>	\$26.62			
Volume Rate per ccf	\$1.53	<b>\$1.27</b>	<b>\$1.42</b>	\$1.64			
<b>Metered Single-Family &amp; Water Districts</b>							
Monthly Fixed Rate:							
5/8" Meter	\$11.61	<b>\$13.10</b>	<b>\$14.21</b>	\$15.42	\$19.35	\$20.33	\$21.46
3/4" Meter	\$15.97	<b>\$18.02</b>	<b>\$19.55</b>	\$21.21	\$26.62	\$27.97	\$29.52
1" Meter	\$24.69	<b>\$27.85</b>	<b>\$30.23</b>	\$32.78	\$41.15	\$43.24	\$45.64
1-1/2" Meter	\$46.51	<b>\$52.47</b>	<b>\$56.94</b>	\$61.76	\$77.52	\$81.44	\$85.98
2" Meter	\$72.68	<b>\$82.00</b>	<b>\$88.98</b>	\$96.51	\$121.13	\$127.27	\$134.36
3" Meter	\$142.49	<b>\$160.76</b>	<b>\$174.44</b>	\$189.21	\$237.48	\$249.52	\$263.41
4" Meter	\$221.02	<b>\$249.35</b>	<b>\$270.57</b>	\$293.48	\$368.37	\$387.03	\$408.58
6" Meter	\$439.16	<b>\$495.45</b>	<b>\$537.62</b>	\$583.14	\$731.93	\$769.02	\$811.83
Volume Rate per ccf:							
Metered Single-Family Residential	\$1.53	<b>\$1.58</b>	<b>\$1.63</b>	\$1.67	\$1.72	\$1.82	\$1.94
Water Districts	\$1.53	<b>\$2.18</b>	<b>\$2.94</b>	\$3.82	\$4.10	\$4.38	\$4.67
<b>Non-Single-Family &amp; Irrigation</b>							
<b>Multi-Family, Non-Residential, &amp; Irrigation</b>							
Monthly Fixed Rate:							
5/8" Meter	\$19.51	<b>\$21.00</b>	<b>\$21.75</b>	\$22.39	\$25.56	\$28.32	\$30.86
3/4" Meter	\$27.82	<b>\$29.95</b>	<b>\$31.01</b>	\$31.93	\$36.44	\$40.39	\$44.01
1" Meter	\$44.45	<b>\$47.85</b>	<b>\$49.55</b>	\$51.01	\$58.22	\$64.53	\$70.32
1-1/2" Meter	\$86.01	<b>\$92.59</b>	<b>\$95.88</b>	\$98.70	\$112.66	\$124.86	\$136.06
2" Meter	\$135.89	<b>\$146.28</b>	<b>\$151.49</b>	\$155.94	\$178.00	\$197.27	\$214.97
3" Meter	\$268.90	<b>\$289.46</b>	<b>\$299.76</b>	\$308.58	\$352.23	\$390.36	\$425.38
4" Meter	\$418.54	<b>\$450.54</b>	<b>\$466.57</b>	\$480.30	\$548.24	\$607.59	\$662.10
6" Meter	\$834.21	<b>\$898.00</b>	<b>\$929.95</b>	\$957.32	\$1,092.71	\$1,211.02	\$1,319.66
8" Meter	\$1,333.00	<b>\$1,434.93</b>	<b>\$1,485.99</b>	\$1,529.71	\$1,746.06	\$1,935.11	\$2,108.70
10" Meter	\$2,081.10	<b>\$2,240.24</b>	<b>\$2,319.94</b>	\$2,388.21	\$2,725.98	\$3,021.12	\$3,292.14
12" Meter	\$2,829.39	<b>\$3,045.74</b>	<b>\$3,154.11</b>	\$3,246.93	\$3,706.15	\$4,107.41	\$4,475.88
Volume Rate per ccf:							
Multi-Family & Non-Residential	\$1.53	<b>\$1.63</b>	<b>\$1.77</b>	\$1.93	\$1.94	\$1.94	\$1.97
Irrigation	\$2.30	<b>\$2.30</b>	<b>\$2.30</b>	\$2.30	\$2.30	\$2.30	\$2.35
<b>Untreated Water</b>							
Monthly Fixed Rate:							
5/8" Meter		<b>\$16.80</b>	<b>\$17.40</b>	\$17.91	\$20.45	\$22.66	\$24.69
3/4" Meter		<b>\$23.96</b>	<b>\$24.81</b>	\$25.54	\$29.15	\$32.31	\$35.21
1" Meter		<b>\$38.28</b>	<b>\$39.64</b>	\$40.81	\$46.58	\$51.62	\$56.26
1-1/2" Meter		<b>\$74.07</b>	<b>\$76.70</b>	\$78.96	\$90.13	\$99.89	\$108.85
2" Meter		<b>\$117.02</b>	<b>\$121.19</b>	\$124.75	\$142.40	\$157.82	\$171.98
3" Meter		<b>\$231.57</b>	<b>\$239.81</b>	\$246.86	\$281.78	\$312.29	\$340.30
4" Meter		<b>\$360.43</b>	<b>\$373.26</b>	\$384.24	\$438.59	\$486.07	\$529.68
6" Meter		<b>\$718.40</b>	<b>\$743.96</b>	\$765.86	\$874.17	\$968.82	\$1,055.73
8" Meter		<b>\$1,147.94</b>	<b>\$1,188.79</b>	\$1,223.77	\$1,396.85	\$1,548.09	\$1,686.96
10" Meter		<b>\$1,792.19</b>	<b>\$1,855.95</b>	\$1,910.57	\$2,180.78	\$2,416.90	\$2,633.71
12" Meter	\$13,359.00	<b>\$2,436.59</b>	<b>\$2,523.29</b>	\$2,597.54	\$2,964.92	\$3,285.93	\$3,580.70
Volume Rate per ccf:							
0 - 296,000 ccf per Month	\$0.070			\$1.54	\$1.55	\$1.55	\$1.58
> 296,000 ccf per Month	\$0.756						
<i>Outside-City rates are 1.5 times the rates shown above.</i>							

The rate forecast shown in **Table EX-1** reflects:

- Across-the-board increases to the unmetered rate structure, based on the aggregate rate revenue increases of 9.0% in 2013, and 8.0% per year from 2014 – 2016. Based on the planned metering schedule, no customers will be in this class beyond 2016.
- Separation of water districts from other single-family customers. A review of recent water consumption patterns suggests that the water districts served by the City use water in a materially different way than the City's other metered single-family customers. These districts equate to roughly 300 homes based on the master meters that are tracked in the City's billing system, but appear to be using as much water as 2,100 homes. Consequently, the proposed rate structure improves equity by establishing a separate rate structure for these districts. Note that this study also included the development of a potential resale rate structure for future wholesale customers, which could also serve as a basis for recovering costs from these customers.
- Introduction of a customer class for newly metered customers, designed to recover approximately 65% of costs from fixed charges and 35% from volume rates. Excluding water districts from other single-family residences as discussed above, the existing metered single-family rate structure currently generates about 56% of its revenue from fixed charges – under the proposed strategy, it would gradually increase its reliance on the fixed charge until it reaches the 65% target after three years. After three years the two customer classes would be merged. This three-year transition period in which there would be two single-family metered classes moderates the increases to both groups – those who are moving from unmetered to metered, and the existing metered customers whose rates will be shifting to a greater reliance on fixed charges.
- Linking of the untreated water rate structure to the non-residential rate structure. Because roughly 20% of the revenue requirement is attributable to water treatment, the untreated water rate structure is set at 80% of the non-residential rate structure. The City's current untreated water customer will pay significantly less under this structure, which is an equitable outcome given that the existing structure is primarily a fixed rate and was based on the historical demand patterns of a different (and significantly larger) industrial customer. In addition to improving equity, this change also makes it easier to attract future customers for untreated water.

## Sewer

- ◆ Overall sewer rate revenue should be increased by 6.5% in 2013 (the increase in the previously adopted 2013 rate structure), 8.0% in 2014, 7.0% per year from 2015 – 2016, 6.0% in 2017, and 4% in 2018. The key factors driving the proposed adjustments are:
  - **O&M:** Operating costs are generally expected to increase by 2% – 5% per year.
  - **Debt:** The proposed 2013 – 2018 sewer utility capital funding strategy contemplates a total of \$32.2 million in debt proceeds (net of issuance costs and reserve requirements) to fund projected capital costs. Public Works Trust Fund (PWTF) loans are assumed to account for \$13 million of this debt, adding about \$740,000 to the sewer utility's annual debt service burden beginning in 2014. The remaining \$19.2 million is assumed to come from additional bond issuance from 2015 – 2018, which is expected to add about \$1.6 million to the sewer utility's annual debt service. As previously noted, the sewer utility's annual debt service is reduced to account for a transfer of \$5 million of bond proceeds (and related debt service obligations) to the water utility.
  - **Capital:** Consistent with prior recommendations, the forecast incorporates a policy to fund system reinvestment through sewer rates. The sewer rate study done as part of the



City’s 2009 Comprehensive Sewer Plan established an annual funding level based on annual depreciation expense, net of debt principal. For consistency with the water utility, this analysis reflects a revised benchmark, 50% of annual depreciation expense. By the end of the study period, annual transfers for system reinvestment are projected to increase to about \$2.1 million.

- **Reserve Funding:** Consistent with the prior study, this analysis reflects a policy assumption that the sewer utility maintains an operating (or “working capital”) reserve with a balance sufficient to cover 60 days of projected operating expenses. In addition, this analysis introduces a separate “rate stabilization reserve” that intends to provide additional security against revenue risk associated with volumetric revenues, preserving the City’s ability to meet its debt obligations even in low sales years. The target balance for this reserve is 50% of annual debt service. The sewer utility’s sole outstanding revenue bond allows the use of a rate stabilization reserve.
- ◆ The sewer rate schedule shown in **Table EX-2** is recommended for adoption as inside-City rates. Consistent with City policy, outside-City customers would pay rates that are 1.5 times the rates shown in **Table EX-2**.

**Table EX-2: Summary of Proposed 2013–2018 Inside-City Sewer Rates**

Sewer Rate Structure	2012	2013	2014	2015	2016	2017	2018
<b>Single-Family Residential</b>							
Monthly Flat Rate:							
Single-Family Residence	\$33.23	<b>\$33.97</b>	<b>\$35.07</b>	\$37.24	\$39.47	\$41.66	\$43.16
Unmetered Duplex	\$66.46	<b>\$67.94</b>	<b>\$70.15</b>	\$74.48	\$78.95	\$83.32	\$86.31
<b>Multiple Dwelling Units</b>							
Monthly Fixed Rate	\$33.23	<b>\$33.97</b>	<b>\$35.07</b>	\$37.24	\$39.47	\$41.66	\$43.16
Volume Rate per ccf (> 8 ccf per Month)	\$3.49	<b>\$4.09</b>	<b>\$4.66</b>	\$4.99	\$5.43	\$5.80	\$6.07
<b>Domestic-Strength Non-Residential</b>							
Monthly Fixed Rate	\$33.97	<b>\$33.97</b>	<b>\$35.07</b>	\$37.24	\$39.47	\$41.66	\$43.16
Volume Rate per ccf (> 8 ccf per Month)	\$3.82	<b>\$4.09</b>	<b>\$4.66</b>	\$4.99	\$5.43	\$5.80	\$6.07
<b>Medium-Strength Non-Residential</b>							
Monthly Fixed Rate	\$19.60	<b>\$33.97</b>	<b>\$35.07</b>	\$37.24	\$39.47	\$41.66	\$43.16
Volume Rate per ccf (> 8 ccf per Month)	\$2.45	<b>\$4.09</b>	<b>\$4.66</b>	\$4.99	\$5.43	\$5.80	\$6.07
<b>High-Strength Non-Residential</b>							
Monthly Fixed Rate	\$19.60	<b>\$33.97</b>	<b>\$44.35</b>	\$56.84	\$59.84	\$62.97	\$65.23
Volume Rate per ccf (> 8 ccf per Month)	\$2.45	<b>\$4.09</b>	<b>\$6.09</b>	\$7.83	\$8.44	\$8.98	\$9.40

The rate forecast shown in **Table EX-2** reflects:

- Creation of three strength classes for non-single-family customers.
  - Domestic-Strength Non-Residential: Includes metered duplexes, residential properties with multiple dwelling units, and the City’s current commercial customers. Based on system planning criteria in the City’s Comprehensive Sewer Plan, this class (and the single-family residential class) is assumed to generate wastewater with an average concentration of 235 mg/L of biochemical oxygen demand (BOD) and 270 mg/L of suspended solids (SS).
  - Medium-Strength Non-Residential: Includes customers that generate wastewater averaging between 250 mg/L and 500 mg/L of BOD and/or between 300 mg/L and 500 mg/L of SS. Based on average strength ratings of the customers included in this



class, this class is assumed to generate wastewater with an average strength of 355 mg/L of BOD and 155 mg/L of SS for the purpose of allocating costs.

- High-Strength Non-Residential: Includes customers that generate wastewater averaging over 500 mg/L of BOD and/or SS. Based on average strength ratings of the customers included in this class, this class is assumed to generate wastewater with an average strength of 1,131 mg/L of BOD and 235 mg/L of SS for cost allocations.

With respect to the strength standards, a customer's higher strength rating defines their class. For example, a customer generating wastewater with an average strength of 320 mg/L of BOD and 150 mg/L of SS would be grouped in the "medium-strength" class. It is worth noting that in this analysis, the "medium-strength" and "high-strength" classes only include special industrial users (SIUs) due to a lack of data identifying the business types (and related wastewater strengths) of specific commercial customers. As a future enhancement to this structure, the City should consider reviewing its commercial customer base and moving certain types of businesses to higher strength classes based on their average strength ratings. With this change, it would be prudent for the City to develop a list of best-management practices (BMPs) that customers can follow to be considered for reclassification into a lower strength class.

- Elimination of the industrial strength surcharges included in the existing SIU rate structure (\$0.19 per pound of BOD; \$0.16 per pound of SS). City staff indicated that the City has not actually been able to impose these surcharges due to an inability to directly measure BOD and SS discharges with the equipment currently in place. The proposed rate structure uses average BOD and SS discharges as the basis for developing differential fixed and volume-based rates.
- For 2013, the fixed charge for domestic-strength non-residential customers is kept at its current level. The fixed charges for single-family and multiple-dwelling-unit customers are increased to match the domestic-strength fixed charge, based on the assumption that these three classes generate wastewater of comparable strength. The SIU rates are increased to match the domestic-strength residential rates. For 2014 – 2015, the high-strength non-residential rates are phased to reflect the differential BOD and SS discharges. The other rates are adjusted accordingly to generate the targeted amount of revenue. A review of the costs allocated to the medium-strength class suggested that based on estimated BOD and SS loadings, its rates should be approximately the same as the domestic-strength rates. Consequently, the rate forecast shown in **Table EX-2** reflects the assumption that medium-strength rates are equal to domestic-strength rates through 2018. It is worth noting that the medium-strength class' wastewater characteristics may change if the City expands the class (the medium-strength class now includes only one customer), possibly warranting a separate rate structure in the future.
- ◆ Consider a more detailed review of the City's state excise tax reporting practices. A cursory review of City tax worksheets found that the City might have an opportunity to reduce its tax expenses, given various deductions and exemptions allowed under State law. This review may also provide the supporting documentation that the City would need in order to request a refund from the Department of Revenue for historical tax payments. The findings presented in this report assume the implementation of the identified refinements moving forward, but do not incorporate an assumed refund of past payments.

# SECTION 1: INTRODUCTION

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The City engaged FCS GROUP in February 2012 to perform a comprehensive study of its water and sewer rates and system development charges (SDCs).

This study has included the following elements:

- ◆ A review of water and sewer utility revenue needs incorporating:
  - A revised metering schedule reflecting the conversion of the City’s unmetered water customers to metered water service by January 22, 2017, as required by the Water Use Efficiency Rule established by the Washington State Department of Health
  - Recent trends in water demands suggesting that per capita water usage has been declining, and will continue to decline
  - Recent economic conditions that have impacted both the behavior of existing customers and the addition of new customers to the water and wastewater systems
- ◆ Development of alternative water and sewer rate structures based on the projected revenue needs of each utility
- ◆ An update of water and sewer SDCs to reflect current estimates of the City’s investment in infrastructure and system growth
- ◆ A review of the City’s cost of providing fire protection service, in response to the Washington State Supreme Court’s decision in *Lane v. Seattle*
- ◆ A review of the City’s methodology for recovering costs from Lake Whatcom Water & Sewer District (LWWSD)
- ◆ An update of rates for untreated water service
- ◆ An update of sewer rates for the City’s special industrial users (SIUs) and septic haulers
- ◆ In addition, the study addresses several policy issues identified by the City Council, including the rate impact of monthly billing, a potential expansion of the low-income discount program, and the incorporation of credit card fees into the utility’s costs.

This study developed a multi-year financial plan integrating these various elements, projecting operating and capital costs for the six-year planning period from 2013 to 2018.

This report discusses the methodology and assumptions used in the rate analysis, as well as the findings and recommendations underlying the proposed rate adjustments. We are preparing separate issue papers that discuss SDCs, the recovery of costs from LWWSD, and a wholesale rate that can be used in the event that the City decides to sell water to other communities.

## 1.1. CURRENT RATES AND FEES

The City has adjusted its water and sewer rates and SDCs as needed to keep up with anticipated costs in recent years. The ensuing sections discuss the existing structures and the adjustments that the City has made in recent years in order to arrive at these structures.

### 1.1.1. Water Rates

Adopted by the City Council on December 10, 2007, City Ordinance No. 2007-12-107 established the City’s 2008–2012 water rate structure. **Table 1-1** summarizes the City’s water rate structure:

**Table 1-1: Existing Water Rate Structure**

Single-Family Residential & Water Districts	2012	Non-Single-Family & Irrigation	2012
<b>Unmetered Single-Family</b>		<b>Multi-Family, Commercial, &amp; Irrigation</b>	
Monthly Flat Rate:		Monthly Fixed Rate:	
Single-Family Residence	\$29.96	5/8" Meter	\$19.51
Duplex	\$59.92	3/4" Meter	\$27.82
		1" Meter	\$44.45
		1-1/2" Meter	\$86.01
		2" Meter	\$135.89
		3" Meter	\$268.90
		4" Meter	\$418.54
		6" Meter	\$834.21
		8" Meter	\$1,333.00
		10" Meter	\$2,081.10
		Volume Rate per ccf:	
		Non-Single-Family	\$1.53
		Irrigation	\$2.30
<b>Metered Single-Family &amp; Water Districts</b>		<b>Untreated (Raw) Water</b>	
Monthly Fixed Rate:		<b>Untreated Water</b>	
5/8" Meter	\$11.61	Monthly Fixed Rate	\$13,359.00
3/4" Meter	\$15.97	Volume Rate per ccf:	
1" Meter	\$24.69	0 - 296,000 ccf per Month	\$0.070
1-1/2" Meter	\$46.51	> 296,000 ccf per Month	\$0.756
2" Meter	\$72.68		
3" Meter	\$142.49		
4" Meter	\$221.02		
6" Meter	\$439.16		
Volume Rate per ccf	\$1.53		

Under the existing structure,

- ◆ The unmetered residential structure includes both single-family residences and duplexes. Unmetered duplexes pay a flat rate that is twice as much as the rate for unmetered single-family residences.
- ◆ Metered single-family residences and water districts pay a fixed rate that depends on the size of their water meter. A uniform volume rate applies to all of their water usage.
- ◆ Non-single-family (multi-family, commercial, irrigation) customers pay a fixed rate that depends on the size of their water meter, and is somewhat higher than the equivalent rates applicable to single-family residential customers. For multi-family and non-residential customers, this differential is attributable to historical cost allocations that reflected the higher fire protection requirements associated with multi-family and non-residential properties; for irrigation meters, it is driven by the increased demands that irrigation meters impose on the water system during peak demand periods. The volume rate structure imposes

a uniform volume rate on all usage, pricing irrigation usage at a slightly higher rate than usage for domestic and commercial purposes.

- ◆ Customers using unmetered (raw) water currently pay a fixed charge and a volume charge that depends on monthly water usage. Usage under 296,000 ccf is charged at one rate; usage above 296,000 ccf per month is charged at a higher rate. It is worth noting that this rate structure was developed for Georgia Pacific in a stand-alone analysis that was not updated during the 2007 Study.

### 1.1.2. Sewer Rates

Adopted by the City Council on December 10, 2007, City Ordinance No. 2007-12-108 established the City’s 2008 – 2013 sewer rate structure. **Table 1-2** summarizes the City’s sewer rate structure:

**Table 1-2: Existing Sewer Rate Structure**

Sewer Rate Structure	2012
<b><u>Single-Family Residential</u></b>	
Monthly Flat Rate:	
Single-Family Residence	\$33.23
Unmetered Duplex	\$66.46
<b><u>Multiple Dwelling Units</u></b>	
Monthly Fixed Rate	\$33.23
Volume Rate per ccf (> 8 ccf per Month)	\$3.49
<b><u>Commercial, Institutional, &amp; Industrial</u></b>	
Monthly Fixed Rate	\$33.97
Volume Rate per ccf (> 8 ccf per Month)	\$3.82
<b><u>Special Industrial Users</u></b>	
Monthly Fixed Rate	\$19.60
Volume Rate per ccf (> 8 ccf per Month)	\$2.45
Industrial Strength Surcharges:	
Per Pound of Biochemical Oxygen Demand (BOD)	\$0.19
Per Pound of Suspended Solids (SS)	\$0.16

Under the existing structure,

- ◆ Single-family residential customers pay a flat rate for sewer service; unmetered duplexes pay a flat rate equal to two times the single-family flat rate.
- ◆ Metered residential buildings with multiple dwelling units (including metered duplexes) pay a fixed rate equal to the single-family flat rate, and pay a volume rate for water usage over 8 ccf per month.
- ◆ Commercial, institutional, and industrial users also pay a fixed rate and a volume rate that applies to water usage over 8 ccf per month, though the applicable rates are higher than those applicable to residential customers.
- ◆ SIUs pay a fixed rate and a volume rate for water usage over 8 ccf per month. The rate structure also includes strength surcharges for BOD and SS loadings, but the City has not been able to continuously measure and bill SIUs for their loadings. It is worth noting that the SIU rate structure currently in place was adopted by the Council in 2004 (via Ordinance 2004-10-071), and has not been updated since.

## SECTION 2: REVENUE REQUIREMENTS

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The revenue requirement is the amount of ongoing revenue that water and sewer rates must generate independently to enable the City to meet the financial obligations of each system. Consistent with City accounting policies, this analysis considers each utility to be an independent and self-supporting enterprise; each utility's revenue requirement is therefore evaluated independently. The revenue requirement analysis has two main purposes – it serves as a means of evaluating the utility's fiscal health and adequacy of current rate levels, and it sets the basis for near-term and long-term rate planning. The rate revenue requirement is defined as the net difference between total revenue needs and the revenue generated through non-rate sources. Hence, the revenue requirement analysis involves defining and forecasting both needs and resources.

### 2.1. FISCAL POLICIES

The basic framework for evaluating utility revenue needs consists of a set of fiscal policies. These policies, which can address a variety of topics including cash management, capital funding strategy, financial performance, and rate equity, are intended to promote long-term financial viability for the City's utilities.

#### 2.1.1. Utility Reserves

Reserves are a key component of any utility financial strategy, as they provide the flexibility to manage variations in costs and revenues that could otherwise have an adverse impact on ratepayers. For the purpose of financial planning for the City's water and sewer utilities, resources are separated into the following funds:

- ◆ **Operating Fund:** Operating (“working capital”) reserves provide a minimum unrestricted fund balance needed to accommodate short-term fluctuations in revenues and expenses. These reserves intend to address both anticipated and unanticipated changes in revenues and expenses by providing a “cushion” to cover cash balance fluctuations. Anticipated changes may include billing and receipt cycles, payroll cycles, and other payables; examples of unanticipated changes include the loss of a large customer or, as recently witnessed, sudden changes to the economy. For the “working capital” reserve, this analysis assumes a target minimum balance equal to 60 days (about 16%) of projected operating expenses – this policy differs from the existing policy outlined in the City's “Financial Management Guidelines” document, which specifies a minimum operating reserve balance equal to 5% of budgeted operating expenses (\$684,000 for the water utility; \$674,000 for the sewer utility). To mitigate the rate impacts associated with generating additional cash flow to meet these higher reserve targets, the utilities are allowed to phase in this reserve policy as needed. For 2012, the target minimum balances are \$1.1 million for the water utility and \$2.2 million for the sewer utility (30 and 60 days of budgeted operating expenses, respectively).
- ◆ **Watershed Reserve:** The watershed reserve is a special purpose reserve intended to track specific revenues and expenses related to watershed land acquisition. Inflows include

watershed surcharges, investment interest, and the watershed portion of SDC revenue and debt proceeds. Outflows include transfers to the operating reserve to cover watershed operating expenses, debt service, and land watershed acquisition expenditures. Per City policy, up to 30% of annual watershed surcharge revenue (net of watershed operating expenses and debt service) is available to the stormwater utility for water quality projects. Consistent with the Operating Reserve, this analysis assumes a minimum balance equal to 60 days (about 16%) of projected watershed operating expenses – based on the projected revenues and expenses, this target is initially established at about 27 days (7.5%) of expenses and phased in to reach about 55 days (15%) by the end of the study period.

- ◆ **Rate Stabilization Reserve:** The City’s 2011 Bond Ordinance established a “coverage stabilization account” for the purpose of alleviating the need for short-term rate adjustments to meet bond coverage requirements. This analysis assumes a 2012 minimum balance equal to 10% of annual debt service (excluding bonds issued prior to 2011, as the City cannot use funds in the coverage stabilization account to meet coverage requirements for those bonds), increasing to the long-term target of 50% of annual debt service by 2016.
- ◆ **Capital Fund:** This pool of resources represents the hub of the utilities’ capital activity. Inflows include interest earnings, SDCs, rate-funded transfers for system reinvestment, bond proceeds, and miscellaneous capital revenues; these funds are used to reimburse the Operating Fund for capital improvement projects. This analysis assumes a minimum balance equal to 1% of the cost of utility fixed assets, which based on current asset records would be about \$1.7 million for the water utility and \$1.5 million for the sewer utility (the utilities are assumed to phase in this reserve target over several years). This policy results in a benchmark that is lower than the amount contemplated under the City’s current policy of targeting 10% of the five-year capital plan (\$2.6 million for the water utility and \$8.8 million for the sewer utility). However, the “1% of assets” benchmark is primarily for unexpected capital needs. Cash funding for known capital needs is also provided by system reinvestment funding, which is projected to be about \$1.4 million per year for the water utility and \$2.1 million per year for the sewer utility by the end of the study period.
- ◆ **Bond Reserve Fund:** When the City issues revenue bonds to fund capital costs, it agrees to comply with the covenants established for those bonds. The City’s bond covenants include a reserve requirement set as the least of: (a) 125% of average annual debt service; (b) 100% of maximum annual debt service; or (c) 10% of outstanding bond proceeds. Given the assumed terms for new bond issuance, this analysis reflects a minimum reserve requirement equal to one year’s debt service payment.

**Table 2-1** summarizes the actual cash balances as of the beginning of 2012:

**Table 2-1: Summary of Existing Fund Balances**

Utility Fund Balances as of 1/1/12	Water	Sewer	Total
Operating Fund	\$ 1,124,233	\$ 2,214,318	\$ 3,338,551
Watershed Reserve	293,489	-	293,489
Capital Fund	8,221,236	51,133,256	59,354,492
Rate Stabilization Reserve	-	-	-
Bond Reserve	1,791,283	4,358,697	6,149,980
<b>Total</b>	<b>\$11,430,241</b>	<b>\$57,706,271</b>	<b>\$69,136,512</b>



**Table 2-1** splits the utilities’ designated and undesignated balances between the Operating Fund and the Capital Fund. The amounts shown for the Operating Funds are based on the calculated minimum balances, and the remainder is assumed to be available for capital projects. Based on the minimum balance policies described above, the sewer utility will transfer about \$228,000 into the Rate Stabilization Reserve in 2012. The water utility does not have a minimum balance requirement for the Rate Stabilization Reserve in 2012 because all of its outstanding debt was issued prior to 2011.

### 2.1.2. System Reinvestment Funding

In order to fulfill its ongoing obligation to provide municipal utility service, the City needs to provide for replacement of aging system facilities. The cost of such replacements is quite high in comparison to the cost of the original facilities due to inflation, construction conditions, and absence of grant or developer support. Because the integrated nature of system assets (mains, pump stations, etc.) increases the likelihood that that multiple assets will have to be replaced concurrently, many utilities face the issue of capital investment spikes.

The concept of system reinvestment funding intends to facilitate long-term financial viability by generating a significant source of equity funding for asset replacements. Funds generated through this mechanism are restricted for capital purposes, though not necessarily restricted for designated “repair and replacement” projects. There are a variety of benchmarks that municipal utilities can use to establish an annual level of system reinvestment funding:

- ◆ Depreciation expense as reported in financial records. This approach fully funds the decline in asset value, as measured by original construction costs, avoiding a decline in system asset value (financial integrity) by replacing physical assets with cash assets.
- ◆ Depreciation expense net of principal repayment. This approach intends to avoid concurrently charging customers for both an asset’s construction (debt service) and its replacement. It most directly relates to a financial “break even” in terms of profit or loss, and mitigates the rate impact of system reinvestment funding.
- ◆ Replacement-based depreciation expense. This approach more closely conforms to the true cost of replacing assets by basing annual system reinvestment transfers on the estimated replacement cost of system assets (which is generally higher than their original cost).

The 2007 Study assumed that the City would fund system reinvestment annually based on net depreciation expense. However, with the currently projected debt principal payments, such a policy would result in transfers that vary significantly from year to year. To stabilize the annual funding levels and make additional progress toward funding the utilities’ infrastructure replacement liability, this analysis sets the target funding level as a percentage of annual depreciation expense. **Table 2-2** summarizes the financial impacts of the assumed system reinvestment funding policy:

**Table 2-2: Projected System Reinvestment Funding Transfers**

Projected System Reinvestment Transfers	2012	2013	2014	2015	2016	2017	2018
Water:							
Projected Transfer	\$560,374	\$666,660	\$778,619	\$949,349	\$1,210,585	\$1,359,970	\$1,361,635
% of Book-Value Depreciation	25%	30%	35%	40%	45%	50%	50%
Sewer:							
Projected Transfer	\$685,070	\$729,723	\$885,990	\$1,336,238	\$1,538,022	\$1,894,324	\$2,145,910
% of Book-Value Depreciation	25%	25%	30%	35%	40%	45%	50%



It is worth noting that SDCs also contribute to cash funding for capital projects, and can help support capital replacement (as new debt can) as system expansion needs decline.

## 2.2. REVENUES & EXPENSES

The revenue requirement forecast evaluates the sufficiency of revenue levels at current rates to cover each utility's projected costs from 2012 – 2018. The key cost components are:

- ◆ Operating and Maintenance (O&M)
- ◆ Taxes
- ◆ Debt Service
- ◆ System Reinvestment Funding
- ◆ Reserve Funding

The forecast is initially based on estimates from the City's 2012 Budget and projections for 2013 and 2014, with future-year projections generally based on an escalation of those estimates.

### 2.2.1. Revenues

Following are the major types of operating revenue:

- ◆ **Rate Revenue:** Revenue derived from the City's water and sewer rates. Based on 2011 customer counts and consumption data provided by City staff, the existing water rate structure would generate about \$14.4 million and the existing sewer rate structure would generate about \$15.8 million in 2012. The revenue projections for 2012 and subsequent years incorporate anticipated growth in the number of customers and changes in demand:
  - Based on input from City staff, no growth is assumed for the customer base outside City limits. In fact, it is expected to decrease slightly due to planned annexations of the Yew and Pacific developments.
  - The metered residential customer base is assumed to grow at a rate of 0.7% – 1.3% per year, based on the projected population growth (inside City limits) specified in Table 2-9 of the 2010 Water Comprehensive Plan. Based on the City's recent experience with growth, the growth rates through 2017 are reduced by 50%. Planned annexations of the Yew and Pacific developments will also expand the metered residential class.
  - The non-residential customer base is assumed to grow at a rate of 1.2% – 2.3% per year, based on the projected growth in employment (inside City limits) specified in Table 2-10 of the 2010 Water Comprehensive Plan. Based on the City's recent experience with growth, the growth rates through 2017 are reduced by 50%.
  - An analysis of the City's recent demand history suggests that per capita water demands have been decreasing by roughly 2% – 3% per year. The forecast of water demands accounts for this decline in water demand, netting it against projected growth in the customer base to estimate future water demands.

As previously noted, SDC revenues are used to fund capital projects and are thus not included as operating revenues that would offset annual debt service costs.

The forecast of water rate revenue also assumes that the rates for untreated industrial water are set to 80% of the applicable commercial water rates, beginning in 2013. This percentage is based on an analysis that found that roughly 20% of the annual water revenue requirement is allocable to treatment, a service not provided to untreated water users. This change is expected to decrease annual water rate revenue by about \$88,000.

At this time, the forecast of sewer rate revenue assumes a tentative wholesale rate methodology for revenue received from Lake Whatcom Water & Sewer District (LWWSD). That methodology is still under development and may evolve as negotiations between the City and LWWSD continue – as a result, the LWWSD revenue projections embedded in the forecast might change.

- ◆ **Watershed Surcharge Revenue:** The water utility also generates revenue through watershed surcharges – this revenue offsets certain operating and debt service costs that are attributable to watershed land acquisition.
- ◆ **Other Revenue:** Revenue from other non-rate sources, such as late fees, investment income, and miscellaneous charges. The 2012 – 2014 projections are based on estimates from City staff; projections for subsequent years are either escalated for customer growth (customer-related fees such as late fees) or assumed to remain constant (other miscellaneous revenues). Operating Fund investment income is estimated based on the projected Operating Fund balances and an assumed investment earnings rate varying from 0.25% to 3.0%.

## 2.2.2. Expenses

The utilities' key cost components are summarized below:

- ◆ **O&M Expenses:** The O&M forecast begins with the 2012 Budget and staff projections for 2013 and 2014, both as a source of projected values and formatting. For subsequent years, most O&M expenses are escalated to reflect inflation (general cost inflation ranging from 2.2% – 3.0% per year based on the State Economic & Revenue Forecast Council's February 2012 Forecast. Salary and benefit costs are respectively escalated at 2.0% and 5.0% per year, based on assumptions used in the City's financial planning. In addition, there are other assumptions that impact the O&M forecast:
  - Variable operating costs such as electricity and chemicals are adjusted to reflect anticipated changes in water demand in addition to cost inflation.
  - Staff projections include incremental costs associated with the metering program, which is assumed to be funded through the operating budget. These costs are expected to increase the operating budget by roughly \$650,000 per year between 2012 and 2016, and are assumed to go away once the metering program has been completed.
  - Based on input from City staff, the estimated cost of allowing customers to pay utility bills with credit cards is also included in the O&M forecast. Out of a total estimated 2013 cost of \$65,000, \$23,400 (36%) is allocated to water rates, \$9,750 (15%) is allocated to watershed surcharges, and \$26,000 (40%) is allocated to sewer rates. The remaining \$5,850 (9%) is allocated to stormwater rates. This annual cost is assumed to escalate with growth in the number of customers.

The projected operating expenses are adjusted to reflect a 98% “budget realization factor” that is based on historical differences between budgeted and actual operating expenses.

- ◆ **Taxes:** The City pays taxes on the revenue that it receives from its customers:
  - **State Excise Taxes:** Water sales revenue (excluding revenue derived from irrigation and wholesale sales) is taxed at a rate of 5.029%; revenue from connection fees and miscellaneous service charges are generally taxed at the business and occupation (B&O) tax rate (currently 1.8%). Sewer sales revenue (net of payments from Lake Whatcom Water & Sewer District) is split into collection and transmission functions and taxed at 3.852% and 1.8%, respectively. The forecasts assume the implementation of the recommended revisions to the City's tax reporting practices.
  - **City Utility Taxes:** Water revenues (excluding watershed revenues) are taxed at 18.25%; watershed revenues and sewer revenues are taxed at 11.5%. The higher rate applicable to the water utility reflects an increase intended to pay for the General Fund's transfer to the water utility for the cost of fire protection.
- ◆ **Debt Service:** Existing debt service payments are established in the City's water and sewer debt repayment schedules. The water utility's annual payment for existing debt service is currently about \$2.3 million (\$1.4 million of which is attributable to watershed land acquisition and covered by watershed surcharge revenue); the sewer utility's annual payment for the 2011 Bond is about \$2.3 million. Based on the City's plans to transfer \$5 million of bond proceeds from the sewer utility to the water utility, about \$267,000 of annual debt service is assumed to shift from the sewer utility to the water utility beginning in 2013. Payments on projected debt issuance are forecasted based on the amount issued and assumed repayment terms. Public Works Trust Fund (PWTF) loans are assumed to have a 1% interest rate and a 20-year term; revenue bonds are assumed to have an interest rate of 4.5% – 5.0% and a 20-year repayment period. This forecast assumes level debt service payment schedules for future revenue bond issues.
- ◆ **System Reinvestment Transfers:** System reinvestment transfers are based on forecasted depreciation (existing depreciation plus depreciation on planned capital projects) and the phasing strategy shown in **Table 2-2**.
- ◆ **Capital Improvement Projects and Funding:** The capital improvement plan (CIP) includes a variety of capital projects that involve repairing (or replacing) existing assets and/or expanding system capacity to accommodate growth. **Table 2-3** summarizes the five-year CIP used in the revenue requirement analysis:

**Table 2-3: Summary of Capital Improvement Projects (Thousands of Dollars)**

**Water**

Capital Project Costs:	2012	2013	2014	2015	2016	2017	2018	Total
Annual Water Main Replacement Program	\$ 1,100	\$ 1,130	\$ 2,103	\$ 2,155	\$ 2,225	\$ 2,297	\$ 2,372	\$ 13,382
Bellingham Waterfront GP Hydropower Generation	\$ 200	\$ 411	\$ 1,893	\$ 862	\$ -	\$ -	\$ -	\$ 3,366
King Mt Reservoir (Cordata)	\$ -	\$ -	\$ -	\$ -	\$ 556	\$ 574	\$ 593	\$ 1,723
Kubota with Trailer	\$ 57	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 57
Kearney Road Pump Station (Cordata)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 345	\$ 4,744	\$ 5,088
King Mt Reservoir Transmission Connection (Cordata)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Future Reservoirs (7.5MG)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Future Transmission Connections	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Water Metering City-Wide Project	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Water Treatment Plant (WTP) Pre-Treatment	\$ -	\$ -	\$ 1,577	\$ 9,158	\$ -	\$ -	\$ -	\$ 10,735
Nooksack Diversion Dam Fish Screens	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,930	\$ 5,930
Nooksack Diversion Dam Main Repair	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,930	\$ 5,930
Other Projects Per Revised 2012 Budget	\$ 7,258	\$ 439	\$ 105	\$ -	\$ -	\$ -	\$ -	\$ 7,802
Watershed Land Acquisition	\$ 3,037	\$ 750	\$ 1,225	\$ 1,342	\$ 1,643	\$ 2,066	\$ 2,251	\$ 12,314
<b>Total</b>	<b>\$ 11,651</b>	<b>\$ 2,730</b>	<b>\$ 6,904</b>	<b>\$ 13,517</b>	<b>\$ 4,424</b>	<b>\$ 5,282</b>	<b>\$ 21,818</b>	<b>\$ 66,327</b>

Capital Funding Strategy:	2012	2013	2014	2015	2016	2017	2018	Total
Watershed Reserve	\$ 3,037	\$ 750	\$ 1,225	\$ 1,342	\$ 1,643	\$ 2,066	\$ 2,251	\$ 12,314
Capital Fund	\$ 8,614	\$ 1,981	\$ 5,679	\$ 625	\$ 2,781	\$ 3,216	\$ 3,506	\$ 26,401
Revenue Bonds	\$ -	\$ -	\$ -	\$ 11,550	\$ -	\$ -	\$ 16,061	\$ 27,611
<b>Total</b>	<b>\$ 11,651</b>	<b>\$ 2,730</b>	<b>\$ 6,904</b>	<b>\$ 13,517</b>	<b>\$ 4,424</b>	<b>\$ 5,282</b>	<b>\$ 21,818</b>	<b>\$ 66,327</b>

**Sewer**

Capital Project Costs:	2012	2013	2014	2015	2016	2017	2018	Total
Annual Sewer Main Replacement Program	\$ 2,000	\$ 2,055	\$ 2,103	\$ 2,155	\$ 2,225	\$ 2,297	\$ 2,372	\$ 15,207
Bellingham Waterfront Wet Weather Peak Flow Facility	\$ -	\$ -	\$ -	\$ -	\$ 1,112	\$ 1,149	\$ -	\$ 2,261
Sewer Inflow and Infiltration Projects	\$ -	\$ -	\$ -	\$ 5,387	\$ -	\$ -	\$ 5,930	\$ 11,317
Bio Diesel Service Truck	\$ 67	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 67
Roeder Lift Station Upgrade	\$ -	\$ -	\$ 1,052	\$ 1,077	\$ 14,462	\$ -	\$ -	\$ 16,591
Wastewater Comp Plan Priority 3 Projects	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Wastewater Treatment Plant Facility Expansion	\$ 6,758	\$ 32,032	\$ 5,397	\$ -	\$ -	\$ -	\$ -	\$ 44,186
Additional Projects per Revised 2012 Budget	\$ 9,705	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 9,705
<b>Total</b>	<b>\$ 18,529</b>	<b>\$ 34,087</b>	<b>\$ 8,552</b>	<b>\$ 8,619</b>	<b>\$ 17,799</b>	<b>\$ 3,446</b>	<b>\$ 8,301</b>	<b>\$ 99,333</b>

Capital Funding Strategy:	2012	2013	2014	2015	2016	2017	2018	Total
Capital Fund	\$ 18,529	\$ 21,087	\$ 8,552	\$ 5,302	\$ 3,617	\$ 3,446	\$ 6,595	\$ 67,127
PWTF Loans	\$ -	\$ 13,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 13,000
Revenue Bonds	\$ -	\$ -	\$ -	\$ 3,318	\$ 14,182	\$ -	\$ 1,706	\$ 19,206
<b>Total</b>	<b>\$ 18,529</b>	<b>\$ 34,087</b>	<b>\$ 8,552</b>	<b>\$ 8,619</b>	<b>\$ 17,799</b>	<b>\$ 3,446</b>	<b>\$ 8,301</b>	<b>\$ 99,333</b>

**Table 2-3** indicates that both the water utility and the sewer utility will require additional debt in order to fund the planned capital projects. The water utility is projected to issue \$12.8 million in bonds in 2015 to provide \$11.6 million in net proceeds to fund an expansion of the water treatment plant. In 2018, the water utility will need about \$16.1 million in net proceeds to fund improvements for the Nooksack Diversion Dam and projects in the Cordata area – however, with an additional \$16.6 million in costs projected for 2019 and 2020, the forecast contemplates a \$26.6-million water bond issue in 2018 to provide a total of \$23.9 million in net proceeds for the three-year period. The sewer utility’s capital funding strategy assumes \$13 million in PWTF loans and an additional \$21.3-million revenue bond to provide \$19.2 million in net proceeds. By the end of the study period, this new debt issuance will have increased the water utility’s annual debt service by \$3.1 million and the sewer utility’s annual debt service by \$2.4 million. It is also worth noting that the costs shown in **Table 2-3** for “additional projects per Revised 2012 Budget” include both projects that have been approved and carried over from prior years and capital asset costs included in the utilities’ operating budgets.

## 2.3. REVENUE REQUIREMENT ANALYSIS

With revenues and expenses defined and projected, the next step is to define the amount of revenue needed to meet the utilities' financial needs and policy objectives. The financial forecast defines the level of revenue needed via a series of tests:

### 2.3.1. Cash Flow Sufficiency Test

Conceptually, the cash flow test determines the amount of revenue that each utility needs to generate (independently) in order to meet its cash obligations, including:

- ◆ Operating, maintenance and administrative expenses
- ◆ Debt service payments
- ◆ Rate-funded capital expenditures
- ◆ System reinvestment funding
- ◆ Reserve funding (Operating Fund, Rate Stabilization Fund)

Offsetting these obligations are various sources of revenue, including:

- ◆ Rate revenues
- ◆ Operating Fund interest earnings
- ◆ Use of watershed surcharges to pay for watershed-related O&M and debt costs
- ◆ Transfers from the General Fund for fire protection costs
- ◆ Miscellaneous operating and non-operating revenues

To satisfy this test, each utility's rate revenue must be sufficient to meet its projected cash flow needs. A utility may have negative net cash flow in cases where an explicit decision is made to use reserves to phase or "smooth" rate increases – in this analysis, the minimum balance requirement for the Operating Fund limits how far the Operating Fund balance can be drawn down for this purpose.

### 2.3.2. Coverage Sufficiency Test

Revenue bond covenants include a bond coverage requirement in which the City agrees to collect enough revenue so that "net revenue" (defined as rate revenue plus interest earnings and miscellaneous operating revenue, less cash operating expenses) covers a multiple of annual debt service costs. Based on the City's outstanding revenue bonds, this analysis assumes a bond coverage requirement of 1.25 times annual debt service – this means that the City needs to set rates to generate enough rate revenue to cover operating expenses plus 1.25 times debt service as a minimum legal level. In addition, the City's financial management guidelines target a combined water-sewer coverage ratio of 2.00 times annual debt service.

Note that the calculation of coverage excludes system reinvestment funding, reserve funding, and PWTF Loan debt service. As it is a test of annual financial performance, it also generally precludes the use of reserves to cover shortfalls in net revenue. The Rate Stabilization Reserve is an exception to this rule, as the City's bond covenants allow its use to count toward meeting bond coverage. (However, deposits in the Rate Stabilization Reserve count as expenses for coverage calculations.)

### 2.3.3. Evaluation of Revenue Sufficiency

The cash flow and coverage sufficiency tests each provide a different perspective on how much revenue is appropriate and, while satisfying all of the defined objectives may seem daunting, doing so helps ensure that appropriate rate adjustments, if any, fulfill the utility’s near-term needs and long-term goals. Similarly, this multi-faceted approach reduces the utility’s financial risk and increases financial stability – any near-term increases which result will help to ensure lower and more stable long-term rates.

**Table 2-4** summarizes the revenue requirement analysis for both water and sewer utilities:

**Table 2-4: Revenue Requirement Summary**

<b>Water Cash Flow Sufficiency Test</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Revenues:</b>							
Rate Revenue (Before Adjustments)	\$ 14,439,429	\$ 13,935,764	\$ 13,566,549	\$ 13,410,241	\$ 13,029,564	\$ 12,773,827	\$ 12,870,484
General Fund Transfer for Fire Protection Costs	963,112	994,993	1,069,424	1,004,954	983,134	963,950	1,043,907
Other Operating Revenues	1,476,441	1,166,800	1,179,950	1,180,848	1,181,754	1,182,674	1,184,416
Interest Earnings on Operating & Bond Reserve	4,082	10,469	21,992	22,902	63,709	58,116	198,192
<b>Total</b>	<b>\$ 16,883,064</b>	<b>\$ 16,108,026</b>	<b>\$ 15,837,915</b>	<b>\$ 15,618,944</b>	<b>\$ 15,258,161</b>	<b>\$ 14,978,567</b>	<b>\$ 15,296,999</b>
<b>Operating Expenses:</b>							
Water Operating Expenses	\$ 13,678,162	\$ 14,909,054	\$ 15,527,196	\$ 15,526,328	\$ 15,802,389	\$ 15,362,668	\$ 15,963,549
Watershed Operating Expenses	867,506	1,583,045	1,096,512	1,016,660	1,020,908	1,030,947	1,085,068
Less: Use of Watershed Surcharges for O&M	(867,506)	(1,583,045)	(1,096,512)	(1,016,660)	(1,020,908)	(1,030,947)	(1,085,068)
Additions to Operating Reserve	-	-	35,645	23,631	-	46,526	-
Additions to Rate Stabilization Reserve	-	53,448	25,884	25,614	516,577	29,461	-
Water Debt Service	928,996	1,198,725	1,208,503	1,217,434	2,208,634	2,290,759	2,299,124
Watershed Debt Service	1,394,388	1,394,612	1,396,863	1,395,850	1,396,450	775,050	771,450
Less: Use of Watershed Surcharges for Debt	(1,394,388)	(1,394,612)	(1,396,863)	(1,395,850)	(1,396,450)	(775,050)	(771,450)
System Reinvestment Funding	560,374	666,660	778,619	949,349	1,210,585	1,359,970	1,361,635
<b>Total</b>	<b>\$ 15,167,533</b>	<b>\$ 16,827,887</b>	<b>\$ 17,575,847</b>	<b>\$ 17,742,357</b>	<b>\$ 19,738,186</b>	<b>\$ 19,089,384</b>	<b>\$ 19,624,308</b>
<b>Net Cash Flow Before Rate Adjustments</b>	<b>\$ 1,715,531</b>	<b>\$ (719,860)</b>	<b>\$ (1,737,932)</b>	<b>\$ (2,123,413)</b>	<b>\$ (4,480,024)</b>	<b>\$ (4,110,817)</b>	<b>\$ (4,327,309)</b>
<b>Rate Adjustment Required</b>		6.2%	10.4%	2.6%	19.1%	-3.2%	2.0%
<b>Rate Adjustment Implemented</b>	<b>0.0%</b>	<b>8.0%</b>	<b>8.0%</b>	<b>8.0%</b>	<b>8.0%</b>	<b>7.0%</b>	<b>6.0%</b>
<b>Net Cash Flow After Rate Adjustments</b>	<b>\$ 1,715,531</b>	<b>\$ 210,725</b>	<b>\$ 182,049</b>	<b>\$ 807,347</b>	<b>\$ (559,380)</b>	<b>\$ 794,830</b>	<b>\$ 1,506,921</b>
Rate Revenue After Rate Adjustments	\$ 14,439,429	\$ 15,050,625	\$ 15,824,023	\$ 16,893,041	\$ 17,726,578	\$ 18,595,156	\$ 19,860,013
General Fund Transfer After Rate Adjustments	\$ 963,112	\$ 1,070,246	\$ 1,221,803	\$ 1,240,043	\$ 1,300,182	\$ 1,356,890	\$ 1,515,701
Projected Ending Operating Fund Balance	\$ 2,839,764	\$ 2,048,828	\$ 2,230,877	\$ 3,038,224	\$ 2,478,844	\$ 3,273,674	\$ 3,936,218
Days of Operating Expenses Realized	76 Days	50 Days	52 Days	71 Days	57 Days	78 Days	90 Days
Days of Operating Expenses Required	30 Days	45 Days	49 Days	53 Days	57 Days	60 Days	60 Days

**Table 2-4 (Continued): Revenue Requirement Summary**

<b>Sewer Cash Flow Sufficiency Test</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Revenues:</b>							
Rate Revenue (Before Adjustments)	\$ 14,964,879	\$ 14,960,290	\$ 14,969,968	\$ 14,978,442	\$ 14,980,885	\$ 15,044,464	\$ 15,203,846
LWSD Revenue	800,000	900,000	807,339	884,009	894,540	906,398	935,487
Other Operating Revenues	1,112,859	1,076,850	1,119,441	1,120,082	1,120,729	1,121,382	1,122,550
Interest Earnings on Operating & Bond Reserve	140,496	115,625	41,854	42,686	107,360	98,430	288,538
<b>Total</b>	<b>\$ 17,018,234</b>	<b>\$ 17,052,765</b>	<b>\$ 16,938,603</b>	<b>\$ 17,025,219</b>	<b>\$ 17,103,514</b>	<b>\$ 17,170,673</b>	<b>\$ 17,550,421</b>
<b>Operating Expenses:</b>							
Operating Expenses	\$ 13,470,435	\$ 14,180,001	\$ 14,748,543	\$ 14,892,125	\$ 15,256,380	\$ 15,652,330	\$ 16,309,671
Additions to Operating Reserve	-	-	-	-	-	-	-
Additions to Rate Stabilization Reserve	227,949	173,998	194,929	192,903	933,059	251,443	-
Debt Service	2,279,488	2,012,585	2,747,406	2,734,186	4,215,112	4,749,304	4,740,057
System Reinvestment Funding	685,070	729,723	885,990	1,336,238	1,538,022	1,894,324	2,145,910
<b>Total</b>	<b>\$ 16,662,942</b>	<b>\$ 17,096,308</b>	<b>\$ 18,576,868</b>	<b>\$ 19,155,452</b>	<b>\$ 21,942,574</b>	<b>\$ 22,547,401</b>	<b>\$ 23,195,638</b>
<b>Net Cash Flow Before Rate Adjustments</b>	<b>\$ 355,293</b>	<b>\$ (43,542)</b>	<b>\$ (1,638,265)</b>	<b>\$ (2,130,233)</b>	<b>\$ (4,839,059)</b>	<b>\$ (5,376,727)</b>	<b>\$ (5,645,217)</b>
<b>Rate Adjustment Required</b>		<b>0.3%</b>	<b>13.0%</b>	<b>2.9%</b>	<b>18.2%</b>	<b>2.9%</b>	<b>1.4%</b>
<b>Rate Adjustment Implemented</b>	<b>0.0%</b>	<b>6.5%</b>	<b>7.0%</b>	<b>7.0%</b>	<b>7.0%</b>	<b>7.0%</b>	<b>4.0%</b>
<b>Net Cash Flow After Rate Adjustments</b>	<b>\$ 355,293</b>	<b>\$ 793,751</b>	<b>\$ 166,320</b>	<b>\$ 709,130</b>	<b>\$ (892,933)</b>	<b>\$ (225,090)</b>	<b>\$ 295,541</b>
Rate Revenue After Rate Adjustments	\$ 14,964,879	\$ 15,929,164	\$ 17,055,232	\$ 18,259,428	\$ 19,540,775	\$ 20,997,364	\$ 22,068,604
Projected Ending Operating Fund Balance	\$ 2,569,611	\$ 3,124,710	\$ 3,291,031	\$ 4,000,161	\$ 3,107,228	\$ 2,882,138	\$ 3,177,679
Days of Operating Expenses Realized	70 Days	80 Days	81 Days	98 Days	74 Days	67 Days	71 Days
<i>Days of Operating Expenses Required</i>	<i>60 Days</i>	<i>60 Days</i>	<i>60 Days</i>	<i>60 Days</i>	<i>60 Days</i>	<i>60 Days</i>	<i>60 Days</i>

<b>Water/Sewer Coverage Test</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Revenues:</b>							
Water Rate Revenue (Before Adjustments)	\$ 14,439,429	\$ 13,935,764	\$ 13,566,549	\$ 13,410,241	\$ 13,029,564	\$ 12,773,827	\$ 12,870,484
Other Water Revenue	6,422,420	8,126,031	8,199,990	8,008,003	8,091,586	8,048,592	9,709,637
Sewer Rate Revenue (Before Adjustments)	14,964,879	14,960,290	14,969,968	14,978,442	14,980,885	15,044,464	15,203,846
Other Sewer Revenue	3,059,774	3,295,768	4,104,242	4,145,377	4,384,205	4,266,435	6,306,093
<b>Total</b>	<b>\$ 38,886,502</b>	<b>\$ 40,317,852</b>	<b>\$ 40,840,750</b>	<b>\$ 40,542,063</b>	<b>\$ 40,486,240</b>	<b>\$ 40,133,318</b>	<b>\$ 44,090,060</b>
<b>Operating Expenses:</b>							
Cash Operating Expenses	\$ 28,016,103	\$ 30,672,100	\$ 31,372,251	\$ 31,435,113	\$ 32,079,677	\$ 32,045,945	\$ 33,358,288
Net Additions to Rate Stabilization Reserve	227,949	227,446	220,813	218,517	1,449,637	280,904	-
Debt Service Requiring Coverage	4,494,963	4,498,525	4,496,675	4,495,306	6,971,964	6,970,814	6,970,264
Additional Coverage Required	1,123,741	1,124,631	1,124,169	1,123,827	1,742,991	1,742,704	1,742,566
<b>Total</b>	<b>\$ 33,862,756</b>	<b>\$ 36,522,703</b>	<b>\$ 37,213,908</b>	<b>\$ 37,272,763</b>	<b>\$ 42,244,269</b>	<b>\$ 41,040,367</b>	<b>\$ 42,071,119</b>
<b>Coverage Ratio Realized Before Rate Adjustments</b>	<b>2.37</b>	<b>2.09</b>	<b>2.06</b>	<b>1.98</b>	<b>1.00</b>	<b>1.12</b>	<b>1.54</b>
<b>Coverage Ratio Realized After Rate Adjustments</b>	<b>2.37</b>	<b>2.49</b>	<b>2.88</b>	<b>3.26</b>	<b>2.13</b>	<b>2.56</b>	<b>3.23</b>

Key findings of the revenue requirement analysis (shown in **Table 2-4**) include:

- ◆ Given the utilities’ current financial condition and the assumed system reinvestment policy, coverage requirements are not expected to materially impact the utilities’ revenue needs during the study period. The joint coverage ratio is projected to fluctuate between 2.13 and 3.26 times annual debt service during the study period, which is well above the required ratio of 1.25 and above the City’s policy goal of 2.00. Hence, cash flow needs drive the near-term evaluation of revenue sufficiency.
- ◆ The water utility appears to have sufficient revenue at existing rates to cover all of its cash flow needs for 2012.
- ◆ Future-year water rate increases are triggered by:
  - Temporary increases in O&M costs associated with the metering program
  - Incremental debt service associated with the planned 2015 and 2018 bond issues, and related Rate Stabilization Reserve funding requirements
  - Increases in the annual system reinvestment funding transfers as the City phases in the recommended strategy



- ◆ The sewer utility also appears to have sufficient revenue at existing rates to cover all of its cash flow needs for 2012.
- ◆ For the sewer utility, the 6.5% increase shown for 2013, which is based on the previously adopted rates established in City Ordinance No. 2007-12-108, also appears to be adequate to cover the costs projected for 2013.
- ◆ The sewer rate increases shown for 2014 – 2018 are driven by:
  - Incremental debt service associated with the planned debt issuance in 2013 and 2015
  - Funding for the Rate Stabilization Reserve based on the recommended policy of maintaining a balance equal to at least 50% of annual debt service, both for the 2011 Bond and planned future bond issuance
  - Increases in the annual system reinvestment funding transfers as the City phases in the recommended strategy
- ◆ Both the water and sewer revenue requirement forecasts assume that the City uses reserves to “smooth” the projected rate increases. The smoothing strategy is designed to avoid rate fluctuations and sudden rate spikes. For example, in a simplified hypothetical case, if a rate forecast were to require minimum rate increases of 1%, 1%, and 17%, a “smoothed” pattern of rate increases might be 6%, 6%, and 6% for the same three years. Smoothing rate increases also provides additional financial stability in case growth continues below expected levels.

#### 2.3.4. Sensitivity Analysis

The project scope included a sensitivity analysis to gauge how varying growth assumptions would impact the findings of the revenue requirement analysis. This analysis uses Monte Carlo simulation to develop a probabilistic range of outcomes by running a repeated random sampling of data points. In contrast to “what-if” scenario analysis, Monte Carlo analysis can produce hundreds or thousands of possible outcomes, instead of a few isolated (best case, worst case) scenarios.

The key “input variables” of interest in this analysis are the annual growth rates during the study period. The annual growth rates are assumed to be independent of each other, as growth from year to year may be higher or lower than expected. The random sampling for each of these variables relies on an assumed range and probabilistic distribution:

- ◆ **Range:** Each year’s growth rate can take a value between 0.0 and 2.0 times the baseline value assumed in the analysis (on the order of 0.7% per year for residential customers, and 1.2% per year for non-residential customers). 2.0 was chosen as the upper bound because the “baseline” growth forecast is set to 50% of the growth rates based on Tables 2-9 and 2-10 in the City’s Water Comprehensive Plan, and 2 times 50% would bring the annual growth rates back up to the level contemplated in the Comprehensive Plan – this limitation intended to (a) capture a reasonable degree of variability from the “baseline” forecast and (b) avoid complications related to accelerating CIP projects due to excessive growth.
- ◆ **Distribution:** Each year’s growth rate is assumed to be normally distributed (following a “bell curve” distribution of values, where values close to the average are more likely to occur than values significantly different from the average), with an average value (mean) of 1.0 times the baseline growth rate. The standard deviation is a measure of how much variation there is from the mean – this analysis assumes a standard deviation of 0.25 times the baseline growth rate, which means that for any given iteration in the simulation:

Range	% Chance
0.00 – 0.50 × Baseline Rate	2%
0.50 – 0.75 × Baseline Rate	14%
0.75 – 1.25 × Baseline Rate	68%
1.25 – 1.50 × Baseline Rate	14%
1.50 – 2.00 × Baseline Rate	2%

For simplicity, the Monte Carlo simulation analysis makes the following assumptions:

- ◆ Within a given year, the growth rates for the various classes move together. This means that if single-family residential growth rates are cut in half or doubled, a proportionate adjustment applies to non-residential growth rates. This adjustment appears to be reasonable, as growth most often slows down or speeds up due to economic considerations that would likely affect both residential and non-residential development.
- ◆ Given that growth and related revenues can vary in this simulation, debt is issued as needed to fund capital projects. The revenue requirement analysis summarized in **Table 2-4** assumes that debt issuance is grouped into three-year amounts, to reflect how the City would likely issue debt in the future. However, those amounts may be either excessive or insufficient depending on how SDCs and other growth-related revenues vary. Compared to the “baseline” analysis, this assumption may defer rate impacts by a year or two.
- ◆ Water and sewer rates are adjusted as needed to cover current-year costs, without an adjustment for rate smoothing. This adjustment allows the estimated revenue requirement to vary automatically based on changes to the growth forecast.

The “output” variable is the cumulative rate adjustment from 2013 through 2022 – this extended range intends to account for the fact that the projected debt issuance may be pushed beyond 2018, given that proceeds are only issued as needed in this simulation. The Monte Carlo simulation produces a range of possible values on a percentile basis, as summarized in **Table 2-5**:

**Table 2-5: Growth Sensitivity Analysis**

Cumulative 2013 - 2022 Rate Adjustment	Water		Sewer	
	Cumulative	Average Annual	Cumulative	Average Annual
0th Percentile	68.58%	5.36%	37.97%	3.27%
10th Percentile	75.98%	5.82%	41.85%	3.56%
20th Percentile	77.09%	5.88%	42.67%	3.62%
30th Percentile	77.83%	5.93%	43.29%	3.66%
40th Percentile	78.51%	5.97%	43.80%	3.70%
<b>50th Percentile (Baseline)</b>	<b>79.12%</b>	<b>6.00%</b>	<b>44.30%</b>	<b>3.74%</b>
60th Percentile	79.75%	6.04%	44.83%	3.77%
70th Percentile	80.44%	6.08%	45.38%	3.81%
80th Percentile	81.25%	6.13%	46.02%	3.86%
90th Percentile	82.36%	6.19%	46.89%	3.92%
100th Percentile	88.67%	6.55%	52.07%	4.28%

The water rate revenue forecast summarized in **Table 2-4** contemplates a cumulative increase of 82.25% (averaging 6.19% per year) from 2013 – 2022, which appears to be at around the 90<sup>th</sup> percentile of outcomes shown in **Table 2-5**. Over 10,000 randomly generated iterations, the Monte Carlo simulation produced a range of values for the cumulative rate increase varying from 68.58% (averaging 5.36% per year) to 88.67% (averaging 6.55% per year) – based on this, it appears that the water utility could need an additional rate increase averaging around 0.6% per year if growth proves to be extremely low for the next several years.

The sewer rate revenue forecast summarized in **Table 2-4** contemplates a cumulative increase of 48.05% (averaging 4.00% per year) from 2013 – 2022, which appears to be slightly over the 90<sup>th</sup> percentile of outcomes shown in **Table 2-5**. The Monte Carlo simulation produced a range of values for the cumulative rate increase varying from 37.97% (averaging 3.27% per year) to 52.07% (averaging 4.28% per year) – based on this range of outcomes, the sewer utility could also require an additional rate increase (averaging around 0.5% per year on top of the increases shown in **Table 2-4**) if growth proves to be extremely low for the next several years.

It is worth noting that the assumed policy regarding use of SDC revenue affects the sensitivity of results to growth. Legally, SDC revenue can be used for either capital projects or debt service. However, debt service is a fixed ongoing cost, while capital projects typically are a series of discrete spending commitments that could, if needed, be delayed or financed through debt. This analysis assumes that SDC revenue is deposited in the Capital Fund and applied only toward capital project costs. That way, if growth is lower than projected, the City can issue more debt or defer projects until funding is available. Utilities that use SDC revenue to pay debt service are generally more sensitive to changes in growth, since a shortfall in growth would directly and more immediately require rate increases to support ongoing debt service costs.

### 2.3.5. Alternate Scenarios

At the request of City staff, two alternate revenue requirement scenarios were considered:

- ◆ **Expanded Low-Income Program:** The City’s existing reduced-rate program offers a discount (ranging from 25% to 75%) for low-income seniors and disabled customers. The current eligibility threshold for annual income is \$28,330; the discount offered to a customer depends on how far below this threshold they fall. City staff is considering the possibility of revising this standard to match Whatcom County’s property tax exemption income level (currently

\$35,000 per year), and has estimated that this change would increase participation in this program by 500 residents. The cost impact of this change is estimated as follows:

- Estimate the new income eligibility thresholds:

Discount Class	Existing Income Threshold	Revised Income Threshold
No Discount (Above Low-Income Threshold)	> \$28,330	> \$35,000
25% Discount (75% – 100% of Income Threshold)	\$21,248 – \$28,330	\$26,250 – \$35,000
50% Discount (50% – 75% of Income Threshold)	\$14,165 – \$21,247	\$17,500 – \$26,250
75% Discount (< 50% of Income Threshold)	< \$14,165	< \$17,500

- Based on the current inventory of reduced-rate customers, estimate the number of residents that would drop down into a greater discount level. Assuming that the incomes of the current participants are evenly distributed in the allowable range,
  - 47% of the customers currently in the “50% Discount” class would drop down to the “75% Discount” class
  - 71% of the customers currently in the “25% Discount” class would drop down to the “50% Discount” class
  - 500 customers currently in the “No Discount” class would drop down to the “25% Discount” class
- Adjust statistics underlying revenue projections (customer counts, demands) to estimate revenue impact. Based on the projected statistics, this expansion of the reduced-rate program would decrease water revenues by about \$50,000 per year, decrease watershed surcharge revenue by about \$20,000 per year, and decrease sewer revenues by about \$61,000 per year.
- ◆ **Conversion to Monthly Billing:** The City currently bills most of its customers on a bimonthly basis, and has been considering the possibility of converting to monthly billing for all customers. Based on estimates from City staff, this conversion would cost between \$10,000 and \$30,000 and would increase the City’s ongoing billing costs by about \$361,750 per year. This cost is allocated between the water, sewer, and stormwater utilities (35.5%, 33.8%, and 30.7%, respectively) based on the number of accounts served by each utility.

**Table 2-6** summarizes the anticipated rate impacts for these alternate scenarios:

**Table 2-6: Summary of Alternative Revenue Requirement Scenarios**

Summary of Water Rate Forecast Alternatives [1]	2013	2014	2015	2016	2017	2018	Cumulative
Baseline Forecast (Per Table 2-4)							
Annual Rate Adjustment	8.0%	8.0%	8.0%	8.0%	7.0%	6.0%	<b>54.3%</b>
Average Monthly Residential Bill @ 8 ccf	\$25.76	\$27.82	\$30.04	\$32.45	\$34.72	\$36.80	
Expanded Reduced-Rate Program							
Annual Rate Adjustment	9.0%	8.0%	8.0%	8.0%	6.0%	6.0%	<b>54.3%</b>
Average Monthly Residential Bill @ 8 ccf	\$26.00	\$28.08	\$30.32	\$32.75	\$34.71	\$36.80	
Conversion to Monthly Billing							
Annual Rate Adjustment	9.0%	9.0%	8.0%	7.0%	6.0%	6.0%	<b>54.3%</b>
Average Monthly Residential Bill @ 8 ccf	\$26.00	\$28.34	\$30.60	\$32.75	\$34.71	\$36.79	
Expanded Reduced-Rate Program & Conversion to Monthly Billing							
Annual Rate Adjustment	9.0%	9.0%	8.0%	8.0%	6.0%	6.0%	<b>55.7%</b>
Average Monthly Residential Bill @ 8 ccf	\$26.00	\$28.34	\$30.60	\$33.05	\$35.03	\$37.14	
Summary of Sewer Rate Forecast Alternatives [1]							
Baseline Forecast (Per Table 2-4)							
Annual Rate Adjustment	6.5%	7.0%	7.0%	7.0%	7.0%	4.0%	<b>45.2%</b>
Average Monthly Residential Bill @ 8 ccf	\$35.38	\$37.86	\$40.51	\$43.34	\$46.38	\$48.23	
Expanded Reduced-Rate Program							
Annual Rate Adjustment	6.5%	8.0%	7.0%	7.0%	6.0%	4.0%	<b>45.1%</b>
Average Monthly Residential Bill @ 8 ccf	\$35.38	\$38.21	\$40.89	\$43.75	\$46.37	\$48.23	
Conversion to Monthly Billing							
Annual Rate Adjustment	6.5%	8.0%	7.0%	7.0%	6.0%	4.0%	<b>45.1%</b>
Average Monthly Residential Bill @ 8 ccf	\$35.38	\$38.21	\$40.89	\$43.75	\$46.37	\$48.23	
Expanded Reduced-Rate Program & Conversion to Monthly Billing							
Annual Rate Adjustment	6.5%	8.0%	8.0%	7.0%	5.0%	4.0%	<b>45.1%</b>
Average Monthly Residential Bill @ 8 ccf	\$35.38	\$38.21	\$41.27	\$44.16	\$46.37	\$48.22	

[1] Bills are based on across-the-board adjustments to the existing structure.

**Table 2-6** suggests that:

- ◆ Even if combined, expanding the reduced-rate program and converting to monthly billing would not materially impact the cumulative near-term sewer rate forecast. The lost revenue and additional costs in this scenario could trigger a slightly higher increase in the earlier years, but that increase would offset increases needed toward the end of the study period.
- ◆ Expanding the reduced-rate program would trigger an additional water rate revenue increase of 1% in 2013 – however, this upfront increase would allow the City to increase water rate revenue by a smaller amount in subsequent years so that the cumulative 2013 – 2018 increase is consistent with the baseline scenario.
- ◆ Similarly, the additional costs associated with converting to monthly billing would cause near-term water rate revenue increases that would be neutralized by lower increases in subsequent years.
- ◆ If the City were to expand the reduced-rate program *and* convert to monthly billing, the water utility would see a slightly higher 2013 – 2018 rate increase. As shown above, this scenario would require a slightly higher overall increase than the baseline scenario.
- ◆ For a metered single-family residence using 8 ccf per month, the potential (combined) water and sewer bill impact of the alternative scenarios is estimated to be up to \$0.33 per month (0.4% of the total bill).

## SECTION 3: COST-OF-SERVICE ANALYSIS

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The revenue requirement analysis establishes the amount of rate revenue that the City must collect through water and sewer rates, but it does not address how to recover that revenue from the City’s customers. The cost-of-service analysis involves allocating the projected costs to customers based on the relative demands that they place upon the system and then designing rates to generate the required amount of revenue. Based on staff recommendations, this analysis uses the rate revenue increases shown for the “Expanded Reduced-Rate Program” scenario in **Table 2-6** to design rates.

### 3.1. COST ALLOCATIONS

This section specifically deals with the allocation of costs to customers. The American Water Works Association (AWWA) and Water Environment Federation (WEF) recommend a two-tiered approach for cost allocations:

1. Allocate costs to functions of service.
2. Allocate costs to customers based on their demand characteristics and service requirements.

The first step is to allocate costs to functions of service, which typically include:

#### Water

- ◆ **Customer:** Costs related to providing general services that do not depend on meter size or usage, such as meter reading and billing
- ◆ **Base Capacity:** Costs associated with providing capacity to meet “base” or average customer demands.
- ◆ **Extra Capacity:** Costs attributable to providing incremental capacity to meet peak demands
- ◆ **Fire Protection:** Costs incurred to provide fire protection service, including facilities directly related to fire protection (e.g. hydrants) and facilities that are oversized to accommodate fire flow (e.g. mains, tanks, pump stations)

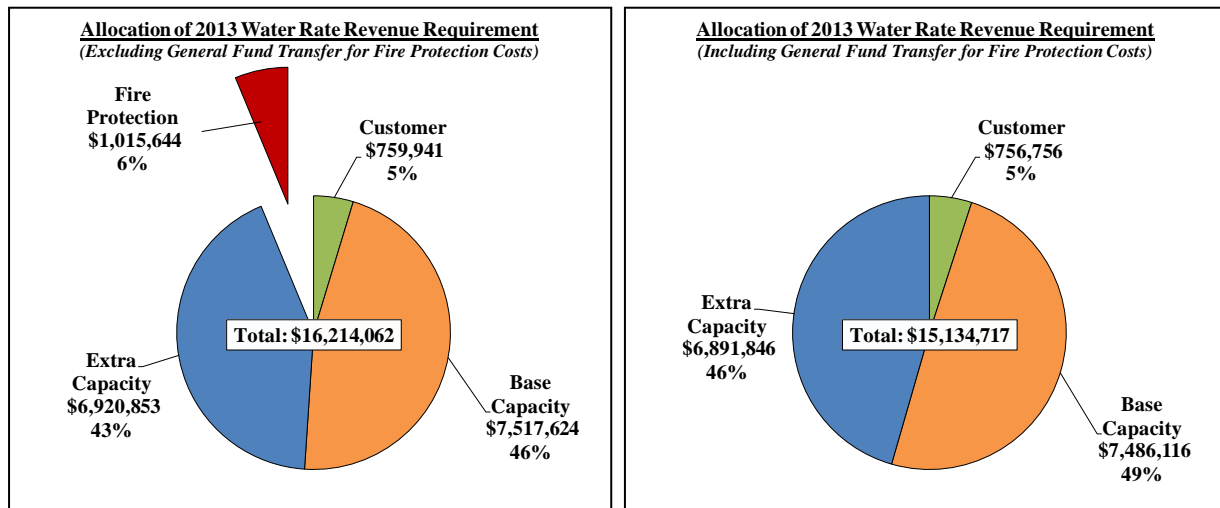
#### Sewer

- ◆ **Customer:** Costs related to providing general services that do not depend on usage, such as meter reading and billing
- ◆ **Flow:** Costs associated with conveying wastewater through the sewer system
- ◆ **Strength:** Costs incurred to provide capacity to treat wastewater discharges of varying strength, commonly measured in terms of biochemical oxygen demand (BOD) and suspended solids (SS)
- ◆ **Inflow & Infiltration (I&I):** Costs incurred to accommodate additional flows from inflow and infiltration (not directly generated by customer activities)

#### Cost Allocation to Water Functions

While fire protection costs have historically been identified for the purpose of recovering them from water utility customers based on their relative fire protection requirements, they are now identified and removed from the cost basis for water rates as mandated by the Washington State Supreme Court in *Lane v. Seattle*. **Figure 3-1** summarizes the allocation of the 2013 rate revenue requirement:

**Figure 3-1: Water Utility Functional Cost Allocation**



It is worth noting that the City has already taken action to comply with the Court’s ruling in *Lane v. Seattle*, passing Ordinance No. 2010-12-081 to remove the cost of fire protection from water rates. Based on the allocation of water utility costs to fire protection in the 2007 Study, the City increased the utility tax on its water utility from 11.5% to 18.25%. However, the scope of work for this study included a more detailed review and allocation of costs to fire protection, to determine whether the relative cost allocation from the 2007 study is consistent with the water utility’s current costs. This analysis included the following elements:

- ◆ Allocation of water system assets to fire protection, including:
  - 1.66% of reservoir costs, based on the portion of the City’s storage capacity explicitly reserved for fire suppression (0.42 out of 25.27 million gallons)
  - 29.60% of pump station costs, based on the allocation of pump capacity to fire flow
  - 8.28% of water main costs, based on the estimated replacement cost of (a) 3,227 hydrants at a cost of \$2,500 per hydrant and (b) the incremental cost of oversizing 6-inch, 8-inch, and 10-inch mains by one size (to 8-inch, 10-inch, and 12-inch mains, respectively) to accommodate fire flow

Given these allocations, about 7.54% of the water system’s assets are allocated to fire protection.

- ◆ Allocation of various components of the water revenue requirement to fire protection, based on the allocation of system assets (7.54% to fire protection):
  - Water operating costs (excluding treatment costs, administrative costs, and taxes)
  - Rate-funded capital costs (water debt service, system reinvestment funding)

With these allocations and assumptions, **Figure 3-1** shows an allocation of \$1,015,644 (about 6% of the water rate revenue requirement) to fire protection, which corresponds to an average annual cost of \$315 per public fire hydrant. This value is within a reasonable range reported by other local jurisdictions, which have reported estimates varying between \$50 and \$350 per hydrant per year.

Assuming that the General Fund must cover this cost, the incremental water utility tax rate would need to be roughly 6.1% (for a total tax rate of about 17.6%). However, a review of projected costs



over the study period found that the six-year average rate would be about 17.1%. Consequently, the transfer from the General Fund based on the current tax rate of 18.25% is slightly higher than the updated estimate of the cost of fire protection. **Figure 3-1** shows a net decrease of about \$55,000 in the water rate revenue requirement resulting from the projected General Fund transfer (at the current tax rate of 18.25%).

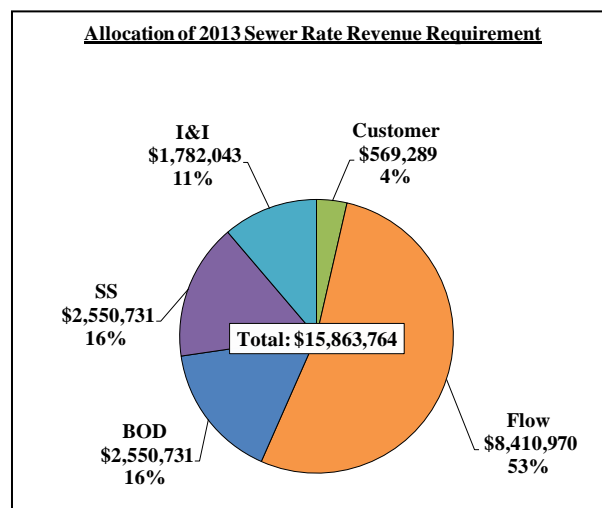
While this analysis assumes that the General Fund must cover the full cost of fire protection based on current City practice, there are options for recovering a portion of those costs from other sources:

- ◆ A portion of the cost may be attributable to Whatcom County as the general government requiring fire protection outside City limits. Given that 377 of the 3,227 public fire hydrants in the City’s service area are located outside City limits, \$118,654 of the estimated \$1,015,644 in 2013 fire protection costs could be allocated to the County. However, because legal authority to impose such a charge on Whatcom County has not yet been established, this analysis does not assume the availability of any revenue from the County that would offset system costs. If the City is able to impose charges on the County for public fire protection in the future, it would be able to decrease the utility tax rate even further. In addition, there may be non-monetary ways to recognize the benefit that the County receives from City infrastructure.
- ◆ The inventory of fire hydrants that the City provided indicates that there are 169 private fire hydrants connected to the City’s water system (not included in the 3,227 hydrants cited above). The City would be able to allocate a portion of the cost of fire protection to private fire protection services, designing a rate structure for private fire protection service based on fire line size as a measure of potential capacity needs. This approach generally requires a detailed inventory of private fire lines by size, and is consequently less often utilized by utilities where the available data is limited. The inventory of City fire lines appears to only have a limited amount of information identifying sizes of specific fire lines, possibly because the City imposes a flat rate (currently \$125 per year) for standby fire protection service.

### Cost Allocation to Sewer Functions

**Figure 3-2** summarizes the allocation of costs for the sewer utility:

**Figure 3-2: Sewer Utility Functional Cost Allocation**



### Cost Allocation to Customers

Once the revenue requirement is split into functions of service, the next step is to allocate it to customer classes. **Table 3-1** summarizes how the City’s current rate structures differentiate between several classes:

**Table 3-1: Summary of Existing Customer Class Structure**

Class	General Characteristics	Current Water Rate Structure	Current Sewer Rate Structure
<b>Single-Family Residential</b>	<ul style="list-style-type: none"> <li>◆ Relatively low average demand per home</li> <li>◆ Notable summer peaking</li> </ul>	<ul style="list-style-type: none"> <li>◆ Unmetered residences pay a flat rate for all water usage</li> <li>◆ Metered residences (including water districts) pay a fixed rate based on meter size and a volume rate for all water usage</li> </ul>	<ul style="list-style-type: none"> <li>◆ All single-family homes pay a flat rate for service</li> <li>◆ Unmetered duplexes pay twice the applicable single-family rate</li> </ul>
<b>Multiple Dwelling Units</b>	<ul style="list-style-type: none"> <li>◆ Higher overall demand than single-family residences</li> <li>◆ Generally lower peaking than other customers</li> </ul>	<ul style="list-style-type: none"> <li>◆ Combined with non-residential structure</li> <li>◆ Customers pay a fixed rate based on meter size and a volume rate for all water usage</li> </ul>	<ul style="list-style-type: none"> <li>◆ Includes metered duplexes and multi-family residential properties</li> <li>◆ Customers pay a fixed rate that includes 8 ccf per month of water usage; volume rate applies to usage over 8 ccf per month</li> </ul>
<b>Non-Residential</b>	<ul style="list-style-type: none"> <li>◆ Higher overall demand than single-family residences</li> <li>◆ Demand patterns vary by business type, but aggregate peaking is relatively low</li> </ul>	<ul style="list-style-type: none"> <li>◆ Customers pay same volume rate per ccf as single-family residences</li> <li>◆ Customers pay a fixed rate based on meter size</li> </ul>	<ul style="list-style-type: none"> <li>◆ All customers pay a fixed rate that includes 8 ccf per month of water usage</li> <li>◆ Volume rate applies to usage over 8 ccf per month</li> <li>◆ Separate rate structure for special industrial users (SIUs)</li> </ul>
<b>Irrigation</b>	<ul style="list-style-type: none"> <li>◆ Relatively low overall water use, particularly during off-peak months</li> <li>◆ Significant peaking during summer months, when most water is used</li> </ul>	<ul style="list-style-type: none"> <li>◆ Customers pay the same fixed rate (based on meter size) as non-residential customers</li> <li>◆ Volume rate reflects a higher allocation of peak capacity costs to usage during peak periods</li> </ul>	<ul style="list-style-type: none"> <li>◆ Not applicable</li> </ul>
<b>Untreated Water</b>	<ul style="list-style-type: none"> <li>◆ Relatively high overall water use overall</li> <li>◆ Demand patterns depend on the type and scale of business</li> </ul>	<ul style="list-style-type: none"> <li>◆ Rate structure includes a fixed rate and a block volume structure (two blocks; threshold of 296,000 ccf per month)</li> <li>◆ Rates originally established for Georgia Pacific based on its demand patterns</li> </ul>	<ul style="list-style-type: none"> <li>◆ Not applicable</li> </ul>

This analysis reflects several changes to the class structure embedded in the City’s current rates:

- ◆ As the City continues to meter its customers, this analysis contemplates the addition of a “transitional” single-family class. This class intends to mitigate the initial impacts of introducing usage-based rates to these customers, giving them the opportunity to see how

their water use impacts their bill and modify their behavior accordingly. This analysis assumes that these customers use more water than the currently metered single-family customer base, and will continue to do so (though there will be some convergence over the transition period).

- ◆ Based on direction from the City Council, individually metered condominiums are included in the metered single-family class. They have historically been included in the non-single-family rate structure as multiple-dwelling-unit users, but have exhibited demand patterns that are more consistent with detached single-family homes than apartment buildings.
- ◆ Water districts are being separated from the City’s single-family residential customers to enhance equity. Water districts currently pay the City’s single-family rates for the master meters that are connected to the City’s water system – because the water taken through these master meters serves multiple homes, the demands imposed by these meters is not representative of the demands of a “typical” customer. Based on typical meter equivalency ratios, the existing water district master meters would equate to roughly 300 single-family homes; **Table 3-1** indicates that on a demand basis, they equate to about 2,100 meters. The revised class structure recognizes that water districts use water differently from the City’s single-family residential customers.
- ◆ The untreated water rate structure, which has historically been reviewed independently of recent water rate studies, is being linked to the non-residential rate structure. Untreated water customers will pay 80% of the applicable non-residential rates for treated water, based on an analysis showing that treatment accounts for about 20% of the water utility’s costs. This change intends to simplify the process of deriving untreated water rates and facilitate growth in the customer base for untreated water as the waterfront property develops.
- ◆ The non-single-family sewer customer base is being divided into three groups:
  - Domestic-Strength: Includes metered duplexes, residential properties with multiple dwelling units, and the City’s current commercial customers. Based on system planning criteria in the City’s Comprehensive Sewer Plan, this class (and the single-family residential class) is assumed to generate wastewater with an average concentration of 235 mg/L of biochemical oxygen demand (BOD) and 270 mg/L of suspended solids (SS).
  - Medium-Strength: Includes customers that generate wastewater averaging between 250 mg/L and 500 mg/L of BOD and/or between 300 mg/L and 500 mg/L of SS. Based on average strength ratings of the customers included in this class, this class is assumed to generate wastewater with an average strength of 355 mg/L of BOD and 155 mg/L of SS for the purpose of allocating costs.
  - High-Strength: Includes customers that generate wastewater averaging over 500 mg/L of BOD and/or SS. Based on average strength ratings of the customers included in this class, this class is assumed to generate wastewater with an average strength of 1,131 mg/L of BOD and 235 mg/L of SS for cost allocations.

Projected 2013 statistics (based on 2011 statistics from Utility Billing, adjusted to reconcile with actual 2011 revenues reported by the City and for projected growth in accounts and changes in water usage) form the basis for allocating costs to the customer classes. Key metrics for allocating costs include the number of meters, the number of meter equivalents/ERUs, water demand, and estimated wastewater loadings (based on average wastewater characteristics and projected wastewater flows).

**Figure 3-3** summarizes the allocation of the 2013 revenue requirement among customer classes:

**Figure 3-3: Customer Class Cost Allocation**

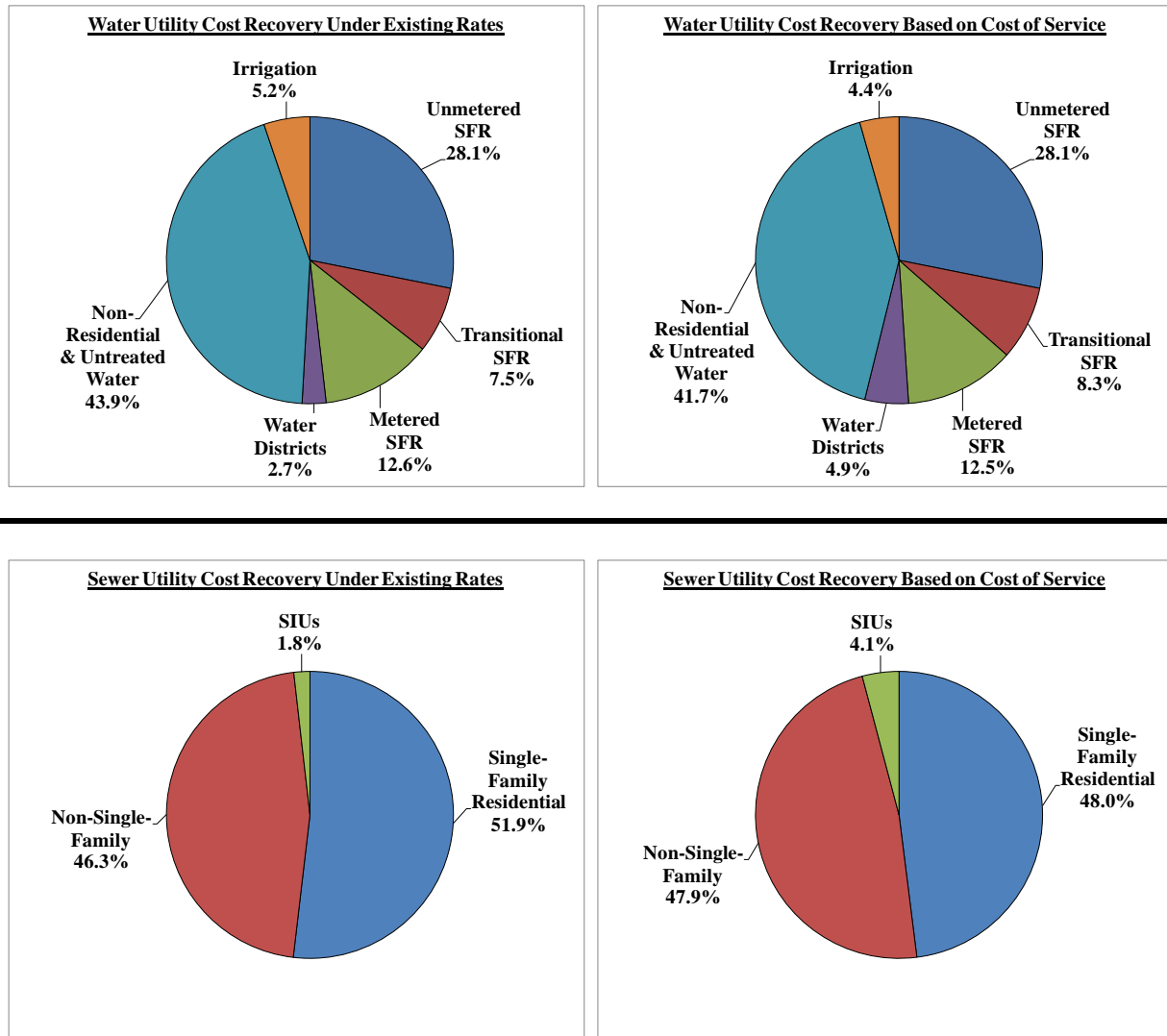


Figure 3-3 suggests that based on an updated review of the cost of providing service, some shifts in cost recovery would enhance the equity of the City’s water and sewer rate structures:

**Water**

- ◆ **Unmetered Single-Family:** Unmetered single-family residences currently account for about 28.1% of water rate revenue under existing rates; because the cost-of-service analysis assumes that unmetered water rates are adjusted across-the-board for the planned rate revenue adjustments, this share is not expected to change (but will decrease in future years as the customer base is metered).
- ◆ **Transitional Single-Family:** Compared to what these customers would pay under the current metered rate structure, the cost-of-service analysis suggests that a relative increase in their share of the total revenue requirement would be appropriate. This can be explained by the fact that these customers are assumed to use more water than the single-family residences that are currently metered.

- ◆ **Metered Single-Family:** The currently metered single-family residential customer base is generally paying for its fair share of costs, though a slight decrease in allocated costs would be appropriate. This finding is primarily attributable to the separation of water districts from other metered single-family customers.
- ◆ **Water Districts:** As previously discussed, these customers currently pay rates based on the master meters that are connected to the City's water system – because these meters supply water to multiple homes served by the water districts, standard meter equivalency ratios are inadequate to represent the demands that these meters impose on the water system. For this reason, the cost-of-service analysis suggests that a significant increase in the share of costs allocated to water districts would be appropriate.
- ◆ **Non-Residential & Untreated Water:** The cost-of-service analysis suggests that a decreased allocation of costs to these customers would be appropriate. This finding is primarily attributable to the removal of fire protection costs from water rates as required by *Lane v. Seattle*, as non-residential customers have historically been allocated a greater share of fire protection costs based on their higher fire protection requirements. Note that the cost allocations shown in **Figure 3-3** assume that the untreated water rate structure is set to 80% of the non-residential rate structure, beginning in 2013.
- ◆ **Irrigation:** The cost-of-service analysis suggests that a decreased allocation of costs to these customers would be appropriate, because of how irrigation demands have changed in recent years. The 2007 study projected that by 2012, irrigation demands would reach about 250,000 ccf per year and the irrigation class would be allocated 12% of the total revenue requirement. Based on recent demand data, the current analysis estimates irrigation demands that are on the order of 166,000 ccf per year – as shown in **Figure 3-3**, irrigation revenues only represent about 5% of water rate revenue under the current structure.

## Sewer

- ◆ **Single-Family Residential:** The cost-of-service analysis shows a notable decrease in the share of costs allocated to single-family residences. This can be explained by (a) the fact that cost allocations have not been updated since 2004 (the current rate structure is based on across-the-board adjustments to that structure), and (b) increases in the share of costs allocable to the City's other sewer customers.
- ◆ **Non-Single Family:** In aggregate, the cost-of-service suggests that an increase in the share of costs allocated to multiple-dwelling-unit and non-residential customers would be appropriate. This finding is likely a result of updated cost allocations, as the current rate structure is based on cost allocations that were most recently updated in 2004.
- ◆ **Special Industrial Users (SIUs):** The current SIU rate structure currently imposes a fixed rate, a volume rate based on wastewater flows, and industrial strength surcharges based on BOD and SS loadings. Given that the City has not been able to directly measure SIU loadings and administer the industrial strength surcharges, the cost-of-service analysis justifies a significant increase in the amount being paid by these customers.

## 3.2. RATE DESIGN

Once each customer class' cost of service has been determined, the final step is to design a set of rates that will generate the required amount of revenue from each class. There is a fair amount of

flexibility in designing the rate structure. Fixed charges ensure a relatively stable level of revenue generation, but volume charges are also integral to overall equity and the City’s longer-term water conservation goals. The ensuing sections discuss the rate design process in further detail.

### 3.2.1. Water Rates

The proposed water rate structure is based on the following principles:

- ◆ The unmetered rate structure is adjusted across-the-board.
- ◆ The “transitional” single-family rate structure is designed to target 65% of cost recovery through fixed rates. The metered single-family rate structure is adjusted to increase cost recovery through fixed rates over several years, merging with the “transitional” single-family rate structure by 2016.
- ◆ Consistent with the existing structure, water districts are assumed to have the same fixed rate structure as metered single-family customers. The volume rate applicable to water districts is allowed to vary based on the share of costs allocated to them.
- ◆ The irrigation volume rate is held at its existing level, and fixed rates are increased based on the costs allocated to the irrigation class. Consistent with the existing structure, non-residential fixed rates are set to equal the irrigation fixed rates; the non-residential volume rate is adjusted as needed to generate the targeted amount of revenue.

We developed three alternative water rate structures:

- ◆ **Alternative A – Across-The-Board (ATB) Adjustments to Existing Structure:** This alternative involves adjusting the existing rate structure across-the-board by the planned rate revenue adjustments shown in **Table 2-4**. This alternative generates enough revenue to meet each utility’s revenue requirement, but does not address shifts in cost recovery between customer classes. **Table 3-2** summarizes the water rate forecast for this alternative.
- ◆ **Alternative B – Cost-of-Service (COS) Rates:** This option implements the COS allocation shown in **Figure 3-3**. **Table 3-3** summarizes the water rate forecast for this alternative.
- ◆ **Alternative C – Phased COS Rates (Recommended):** This alternative moves toward equitable cost recovery as established in **Figure 3-3**, but phases the cost shifts over a three-year period to mitigate impacts to customers. From 2015 on, the rates for this alternative are identical to the “full cost-of-service” rates shown for Alternative B. **Table 3-4** summarizes the water rate forecast for this alternative.

It is worth noting that the cost-of-service analysis is based on 2011 data as a conservative estimate of future water demands. Given recent weather patterns and the economy, this data may not be representative of longer-term trends. In particular, discretionary demands such as irrigation may have been affected more by climate and economic conditions than basic “lifeline” demands. This further supports the use of a phased approach to shift cost recovery between customers, as it would allow the City to adjust the rate strategy to reflect future changes in demand patterns.

**Table 3-2: Water Rate Forecast – Alternative A (ATB Adjustments)**

Single-Family Residential & Water Districts	2012	2013	2014	2015	2016	2017	2018
<b>Unmetered Single-Family</b>							
Monthly Flat Rate:							
Single-Family Residence	\$29.96	\$32.66	\$35.27	\$38.09	\$41.14	<i>All Customers Are Metered</i>	
Duplex	\$59.92	\$65.31	\$70.54	\$76.18	\$82.28		
<b>Transitional Single-Family</b>							
Monthly Fixed Rate	<i>Same As Metered Single-Family Residential Rates</i>						
5/8" Meter							
3/4" Meter							
Volume Rate per ccf							
<b>Metered Single-Family &amp; Water Districts</b>							
Monthly Fixed Rate:							
5/8" Meter	\$11.61	\$12.65	\$13.67	\$14.76	\$15.94	\$16.90	\$17.91
3/4" Meter	\$15.97	\$17.41	\$18.80	\$20.30	\$21.93	\$23.24	\$24.64
1" Meter	\$24.69	\$26.91	\$29.07	\$31.39	\$33.90	\$35.94	\$38.09
1-1/2" Meter	\$46.51	\$50.70	\$54.75	\$59.13	\$63.86	\$67.69	\$71.76
2" Meter	\$72.68	\$79.22	\$85.56	\$92.40	\$99.80	\$105.78	\$112.13
3" Meter	\$142.49	\$155.31	\$167.74	\$181.16	\$195.65	\$207.39	\$219.83
4" Meter	\$221.02	\$240.91	\$260.18	\$281.00	\$303.48	\$321.69	\$340.99
6" Meter	\$439.16	\$478.68	\$516.98	\$558.34	\$603.00	\$639.18	\$677.54
Volume Rate per ccf:							
Metered Single-Family Residential	\$1.53	\$1.67	\$1.80	\$1.95	\$2.10	\$2.23	\$2.36
Water Districts	\$1.53	\$1.67	\$1.80	\$1.95	\$2.10	\$2.23	\$2.36

Non-Single-Family & Irrigation	2012	2013	2014	2015	2016	2017	2018
<b>Multi-Family, Non-Residential, &amp; Irrigation</b>							
Monthly Fixed Rate:							
5/8" Meter	\$19.51	\$21.27	\$22.97	\$24.80	\$26.79	\$28.40	\$30.10
3/4" Meter	\$27.82	\$30.32	\$32.75	\$35.37	\$38.20	\$40.49	\$42.92
1" Meter	\$44.45	\$48.45	\$52.33	\$56.51	\$61.03	\$64.70	\$68.58
1-1/2" Meter	\$86.01	\$93.75	\$101.25	\$109.35	\$118.10	\$125.19	\$132.70
2" Meter	\$135.89	\$148.12	\$159.97	\$172.77	\$186.59	\$197.78	\$209.65
3" Meter	\$268.90	\$293.10	\$316.55	\$341.87	\$369.22	\$391.38	\$414.86
4" Meter	\$418.54	\$456.21	\$492.71	\$532.12	\$574.69	\$609.17	\$645.72
6" Meter	\$834.21	\$909.29	\$982.03	\$1,060.59	\$1,145.44	\$1,214.17	\$1,287.02
8" Meter	\$1,333.00	\$1,452.97	\$1,569.21	\$1,694.74	\$1,830.32	\$1,940.14	\$2,056.55
10" Meter	\$2,081.10	\$2,268.40	\$2,449.87	\$2,645.86	\$2,857.53	\$3,028.98	\$3,210.72
12" Meter	\$2,829.39	\$3,084.04	\$3,330.76	\$3,597.22	\$3,885.00	\$4,118.10	\$4,365.18
Volume Rate per ccf:							
Multi-Family & Non-Residential	\$1.53	\$1.67	\$1.80	\$1.95	\$2.10	\$2.23	\$2.36
Irrigation	\$2.30	\$2.51	\$2.71	\$2.92	\$3.16	\$3.35	\$3.55
<b>Untreated Water</b>							
Monthly Fixed Rate:							
5/8" Meter		\$17.01	\$18.37	\$19.84	\$21.43	\$22.72	\$24.08
3/4" Meter		\$24.26	\$26.20	\$28.30	\$30.56	\$32.39	\$34.34
1" Meter		\$38.76	\$41.86	\$45.21	\$48.83	\$51.76	\$54.86
1-1/2" Meter		\$75.00	\$81.00	\$87.48	\$94.48	\$100.15	\$106.16
2" Meter		\$118.50	\$127.98	\$138.21	\$149.27	\$158.23	\$167.72
3" Meter		\$234.48	\$253.24	\$273.50	\$295.38	\$313.10	\$331.89
4" Meter		\$364.97	\$394.16	\$425.70	\$459.75	\$487.34	\$516.58
6" Meter		\$727.43	\$785.63	\$848.48	\$916.35	\$971.33	\$1,029.62
8" Meter		\$1,162.38	\$1,255.37	\$1,355.80	\$1,464.26	\$1,552.11	\$1,645.24
10" Meter		\$1,814.72	\$1,959.90	\$2,116.69	\$2,286.02	\$2,423.18	\$2,568.58
12" Meter	\$13,359.00	\$2,467.23	\$2,664.61	\$2,877.77	\$3,108.00	\$3,294.48	\$3,492.15
Volume Rate per ccf:							
0 - 296,000 ccf per Month	\$0.070	\$1.33	\$1.44	\$1.56	\$1.68	\$1.78	\$1.89
> 296,000 ccf per Month	\$0.756	\$2.01	\$2.17	\$2.34	\$2.53	\$2.68	\$2.84



**Table 3-3: Water Rate Forecast – Alternative B (COS Rates)**

Single-Family Residential & Water Districts	2012	2013	2014	2015	2016	2017	2018
<b>Unmetered Single-Family</b>							
Monthly Flat Rate:							
Single-Family Residence	\$29.96	\$32.66	\$35.27	\$38.09	\$41.14	<i>All Customers Are Metered</i>	
Duplex	\$59.92	\$65.31	\$70.54	\$76.18	\$82.28		
<b>Transitional Single-Family</b>							
Monthly Fixed Rate					<i>Combined With Metered Single-Family Residential Rates</i>		
5/8" Meter	\$11.61	\$17.53	\$18.44	\$19.35			
3/4" Meter	\$15.97	\$24.11	\$25.36	\$26.62			
Volume Rate per ccf	\$1.53	\$1.36	\$1.46	\$1.64			
<b>Metered Single-Family &amp; Water Districts</b>							
Monthly Fixed Rate:							
5/8" Meter	\$11.61	\$12.96	\$14.00	\$15.42	\$19.35	\$20.33	\$21.46
3/4" Meter	\$15.97	\$17.83	\$19.25	\$21.21	\$26.62	\$27.97	\$29.52
1" Meter	\$24.69	\$27.57	\$29.77	\$32.78	\$41.15	\$43.24	\$45.64
1-1/2" Meter	\$46.51	\$51.94	\$56.08	\$61.76	\$77.52	\$81.44	\$85.98
2" Meter	\$72.68	\$81.16	\$87.63	\$96.51	\$121.13	\$127.27	\$134.36
3" Meter	\$142.49	\$159.12	\$171.80	\$189.21	\$237.48	\$249.52	\$263.41
4" Meter	\$221.02	\$246.81	\$266.48	\$293.48	\$368.37	\$387.03	\$408.58
6" Meter	\$439.16	\$490.40	\$529.49	\$583.14	\$731.93	\$769.02	\$811.83
Volume Rate per ccf:							
Metered Single-Family Residential	\$1.53	\$1.58	\$1.63	\$1.67	\$1.72	\$1.82	\$1.94
Water Districts	\$1.53	\$3.23	\$3.51	\$3.82	\$4.10	\$4.38	\$4.67

Non-Single-Family & Irrigation	2012	2013	2014	2015	2016	2017	2018
<b>Multi-Family, Non-Residential, &amp; Irrigation</b>							
Monthly Fixed Rate:							
5/8" Meter	\$19.51	\$18.38	\$20.63	\$22.39	\$25.56	\$28.32	\$30.86
3/4" Meter	\$27.82	\$26.21	\$29.41	\$31.93	\$36.44	\$40.39	\$44.01
1" Meter	\$44.45	\$41.88	\$46.99	\$51.01	\$58.22	\$64.53	\$70.32
1-1/2" Meter	\$86.01	\$81.05	\$90.93	\$98.70	\$112.66	\$124.86	\$136.06
2" Meter	\$135.89	\$128.05	\$143.66	\$155.94	\$178.00	\$197.27	\$214.97
3" Meter	\$268.90	\$253.38	\$284.27	\$308.58	\$352.23	\$390.36	\$425.38
4" Meter	\$418.54	\$394.38	\$442.46	\$480.30	\$548.24	\$607.59	\$662.10
6" Meter	\$834.21	\$786.06	\$881.89	\$957.32	\$1,092.71	\$1,211.02	\$1,319.66
8" Meter	\$1,333.00	\$1,256.05	\$1,409.19	\$1,529.71	\$1,746.06	\$1,935.11	\$2,108.70
10" Meter	\$2,081.10	\$1,960.97	\$2,200.05	\$2,388.21	\$2,725.98	\$3,021.12	\$3,292.14
12" Meter	\$2,829.39	\$2,666.06	\$2,991.11	\$3,246.93	\$3,706.15	\$4,107.41	\$4,475.88
Volume Rate per ccf:							
Multi-Family & Non-Residential	\$1.53	\$1.75	\$1.80	\$1.93	\$1.94	\$1.94	\$1.97
Irrigation	\$2.30	\$2.10	\$2.15	\$2.30	\$2.30	\$2.30	\$2.35
<b>Untreated Water</b>							
Monthly Fixed Rate:							
5/8" Meter		\$14.70	\$16.50	\$17.91	\$20.45	\$22.66	\$24.69
3/4" Meter		\$20.97	\$23.53	\$25.54	\$29.15	\$32.31	\$35.21
1" Meter		\$33.50	\$37.59	\$40.81	\$46.58	\$51.62	\$56.26
1-1/2" Meter		\$64.84	\$72.74	\$78.96	\$90.13	\$99.89	\$108.85
2" Meter		\$102.44	\$114.93	\$124.75	\$142.40	\$157.82	\$171.98
3" Meter		\$202.70	\$227.42	\$246.86	\$281.78	\$312.29	\$340.30
4" Meter		\$315.50	\$353.97	\$384.24	\$438.59	\$486.07	\$529.68
6" Meter		\$628.85	\$705.51	\$765.86	\$874.17	\$968.82	\$1,055.73
8" Meter		\$1,004.84	\$1,127.35	\$1,223.77	\$1,396.85	\$1,548.09	\$1,686.96
10" Meter		\$1,568.78	\$1,760.04	\$1,910.57	\$2,180.78	\$2,416.90	\$2,633.71
12" Meter	\$13,359.00	\$2,132.85	\$2,392.89	\$2,597.54	\$2,964.92	\$3,285.93	\$3,580.70
Volume Rate per ccf:							
0 - 296,000 ccf per Month	\$0.070	\$1.40	\$1.44	\$1.54	\$1.55	\$1.55	\$1.58
> 296,000 ccf per Month	\$0.756	\$1.40	\$1.44	\$1.54	\$1.55	\$1.55	\$1.58

**Table 3-4: Water Rate Forecast – Alternative C (Proposed Rates)**

Single-Family Residential & Water Districts	2012	2013	2014	2015	2016	2017	2018
<b>Unmetered Single-Family</b>							
Monthly Flat Rate:							
Single-Family Residence	\$29.96	<b>\$32.66</b>	<b>\$35.27</b>	\$38.09	\$41.14	<i>All Customers Are Metered</i>	
Duplex	\$59.92	<b>\$65.31</b>	<b>\$70.54</b>	\$76.18	\$82.28		
<b>Transitional Single-Family</b>							
Monthly Fixed Rate					<i>Combined With Metered Single-Family Residential Rates</i>		
5/8" Meter	\$11.61	<b>\$16.33</b>	<b>\$17.90</b>	\$19.35			
3/4" Meter	\$15.97	<b>\$22.46</b>	<b>\$24.62</b>	\$26.62			
Volume Rate per ccf	\$1.53	<b>\$1.27</b>	<b>\$1.42</b>	\$1.64			
<b>Metered Single-Family &amp; Water Districts</b>							
Monthly Fixed Rate:							
5/8" Meter	\$11.61	<b>\$13.10</b>	<b>\$14.21</b>	\$15.42	\$19.35	\$20.33	\$21.46
3/4" Meter	\$15.97	<b>\$18.02</b>	<b>\$19.55</b>	\$21.21	\$26.62	\$27.97	\$29.52
1" Meter	\$24.69	<b>\$27.85</b>	<b>\$30.23</b>	\$32.78	\$41.15	\$43.24	\$45.64
1-1/2" Meter	\$46.51	<b>\$52.47</b>	<b>\$56.94</b>	\$61.76	\$77.52	\$81.44	\$85.98
2" Meter	\$72.68	<b>\$82.00</b>	<b>\$88.98</b>	\$96.51	\$121.13	\$127.27	\$134.36
3" Meter	\$142.49	<b>\$160.76</b>	<b>\$174.44</b>	\$189.21	\$237.48	\$249.52	\$263.41
4" Meter	\$221.02	<b>\$249.35</b>	<b>\$270.57</b>	\$293.48	\$368.37	\$387.03	\$408.58
6" Meter	\$439.16	<b>\$495.45</b>	<b>\$537.62</b>	\$583.14	\$731.93	\$769.02	\$811.83
Volume Rate per ccf:							
Metered Single-Family Residential	\$1.53	<b>\$1.58</b>	<b>\$1.63</b>	\$1.67	\$1.72	\$1.82	\$1.94
Water Districts	\$1.53	<b>\$2.18</b>	<b>\$2.94</b>	\$3.82	\$4.10	\$4.38	\$4.67

Non-Single-Family & Irrigation	2012	2013	2014	2015	2016	2017	2018
<b>Multi-Family, Non-Residential, &amp; Irrigation</b>							
Monthly Fixed Rate:							
5/8" Meter	\$19.51	<b>\$21.00</b>	<b>\$21.75</b>	\$22.39	\$25.56	\$28.32	\$30.86
3/4" Meter	\$27.82	<b>\$29.95</b>	<b>\$31.01</b>	\$31.93	\$36.44	\$40.39	\$44.01
1" Meter	\$44.45	<b>\$47.85</b>	<b>\$49.55</b>	\$51.01	\$58.22	\$64.53	\$70.32
1-1/2" Meter	\$86.01	<b>\$92.59</b>	<b>\$95.88</b>	\$98.70	\$112.66	\$124.86	\$136.06
2" Meter	\$135.89	<b>\$146.28</b>	<b>\$151.49</b>	\$155.94	\$178.00	\$197.27	\$214.97
3" Meter	\$268.90	<b>\$289.46</b>	<b>\$299.76</b>	\$308.58	\$352.23	\$390.36	\$425.38
4" Meter	\$418.54	<b>\$450.54</b>	<b>\$466.57</b>	\$480.30	\$548.24	\$607.59	\$662.10
6" Meter	\$834.21	<b>\$898.00</b>	<b>\$929.95</b>	\$957.32	\$1,092.71	\$1,211.02	\$1,319.66
8" Meter	\$1,333.00	<b>\$1,434.93</b>	<b>\$1,485.99</b>	\$1,529.71	\$1,746.06	\$1,935.11	\$2,108.70
10" Meter	\$2,081.10	<b>\$2,240.24</b>	<b>\$2,319.94</b>	\$2,388.21	\$2,725.98	\$3,021.12	\$3,292.14
12" Meter	\$2,829.39	<b>\$3,045.74</b>	<b>\$3,154.11</b>	\$3,246.93	\$3,706.15	\$4,107.41	\$4,475.88
Volume Rate per ccf:							
Multi-Family & Non-Residential	\$1.53	<b>\$1.63</b>	<b>\$1.77</b>	\$1.93	\$1.94	\$1.94	\$1.97
Irrigation	\$2.30	<b>\$2.30</b>	<b>\$2.30</b>	\$2.30	\$2.30	\$2.30	\$2.35
<b>Untreated Water</b>							
Monthly Fixed Rate:							
5/8" Meter		<b>\$16.80</b>	<b>\$17.40</b>	\$17.91	\$20.45	\$22.66	\$24.69
3/4" Meter		<b>\$23.96</b>	<b>\$24.81</b>	\$25.54	\$29.15	\$32.31	\$35.21
1" Meter		<b>\$38.28</b>	<b>\$39.64</b>	\$40.81	\$46.58	\$51.62	\$56.26
1-1/2" Meter		<b>\$74.07</b>	<b>\$76.70</b>	\$78.96	\$90.13	\$99.89	\$108.85
2" Meter		<b>\$117.02</b>	<b>\$121.19</b>	\$124.75	\$142.40	\$157.82	\$171.98
3" Meter		<b>\$231.57</b>	<b>\$239.81</b>	\$246.86	\$281.78	\$312.29	\$340.30
4" Meter		<b>\$360.43</b>	<b>\$373.26</b>	\$384.24	\$438.59	\$486.07	\$529.68
6" Meter		<b>\$718.40</b>	<b>\$743.96</b>	\$765.86	\$874.17	\$968.82	\$1,055.73
8" Meter		<b>\$1,147.94</b>	<b>\$1,188.79</b>	\$1,223.77	\$1,396.85	\$1,548.09	\$1,686.96
10" Meter		<b>\$1,792.19</b>	<b>\$1,855.95</b>	\$1,910.57	\$2,180.78	\$2,416.90	\$2,633.71
12" Meter	\$13,359.00	<b>\$2,436.59</b>	<b>\$2,523.29</b>	\$2,597.54	\$2,964.92	\$3,285.93	\$3,580.70
Volume Rate per ccf:							
0 - 296,000 ccf per Month	\$0.070	<b>\$1.30</b>	<b>\$1.42</b>	\$1.54	\$1.55	\$1.55	\$1.58
> 296,000 ccf per Month	\$0.756	<b>\$1.30</b>	<b>\$1.42</b>	\$1.54	\$1.55	\$1.55	\$1.58

### 3.2.2. Sewer Rates

The proposed sewer rate structure is based on the following principles:

- ◆ The single-family rate structure is kept as a flat rate; consistent with the existing structure, unmetered duplexes are charged two times the single-family rate. The single-family flat rate is set to equal the current non-residential fixed rate, recognizing that both groups of customers are assumed to generate “domestic-strength” wastewater (estimated to be 235 mg/L of BOD and 270 mg/L of SS, based on the per-capita loading assumption in Table 4-7 of the Comprehensive Sewer Plan).
- ◆ The rate structures applicable to other customers are derived concurrently, with strength differentials based on estimated wastewater loadings (based on average wastewater BOD and SS concentrations specified in the City’s Comprehensive Sewer Plan).

We developed three alternative sewer rate structures:

- ◆ **Alternative A – Across-The-Board (ATB) Adjustments to Existing Structure:** This alternative involves adjusting the existing rate structure across-the-board by the planned rate revenue adjustments shown in **Table 2-4**. This alternative generates enough revenue to meet each utility’s revenue requirement, but does not address shifts in cost recovery between customer classes. **Table 3-5** summarizes the sewer rate forecast for this alternative.
- ◆ **Alternative B – Cost-of-Service (COS) Rates:** This option implements the COS allocation shown in **Figure 3-3**. **Table 3-6** summarizes the sewer rate forecast for this alternative.
- ◆ **Alternative C – Phased COS Rates (Recommended):** This alternative intends to move toward equitable cost recovery as established in **Figure 3-3**, but phases the cost shifts over a three-year period to mitigate impacts to customers. The phasing begins in 2013 by bringing the “medium-strength” and “high-strength” rates to the current non-residential rates. **Table 3-7** summarizes the sewer rate forecast for this alternative.

**Table 3-5: Sewer Rate Forecast – Alternative A (ATB Adjustments)**

Sewer Rate Structure	2012	2013	2014	2015	2016	2017	2018
<b>Single-Family Residential</b>							
Monthly Flat Rate:							
Single-Family Residence	\$33.23	\$35.38	\$38.21	\$40.89	\$43.75	\$46.37	\$48.23
Unmetered Duplex	\$66.46	\$70.76	\$76.43	\$81.78	\$87.50	\$92.75	\$96.46
<b>Multiple Dwelling Units</b>							
Monthly Fixed Rate	\$33.23	\$35.38	\$38.21	\$40.89	\$43.75	\$46.37	\$48.23
Volume Rate per ccf (> 8 ccf per Month)	\$3.49	\$3.72	\$4.01	\$4.29	\$4.59	\$4.87	\$5.07
<b>Domestic-Strength Non-Residential</b>							
Monthly Fixed Rate	\$33.97	\$36.17	\$39.06	\$41.80	\$44.72	\$47.41	\$49.30
Volume Rate per ccf (> 8 ccf per Month)	\$3.82	\$4.07	\$4.39	\$4.70	\$5.03	\$5.33	\$5.54
<b>Medium-Strength Non-Residential</b>							
Monthly Fixed Rate	\$19.60	\$20.87	\$22.54	\$24.12	\$25.80	\$27.35	\$28.45
Volume Rate per ccf (> 8 ccf per Month)	\$2.45	\$2.61	\$2.82	\$3.01	\$3.23	\$3.42	\$3.56
<b>High-Strength Non-Residential</b>							
Monthly Fixed Rate	\$19.60	\$20.87	\$22.54	\$24.12	\$25.80	\$27.35	\$28.45
Volume Rate per ccf (> 8 ccf per Month)	\$2.45	\$2.61	\$2.82	\$3.01	\$3.23	\$3.42	\$3.56

**Table 3-6: Sewer Rate Forecast – Alternative B (COS Rates)**

Sewer Rate Structure	2012	2013	2014	2015	2016	2017	2018
<b>Single-Family Residential</b>							
Monthly Flat Rate:							
Single-Family Residence	\$33.23	\$32.76	\$35.07	\$37.24	\$39.47	\$41.66	\$43.16
Unmetered Duplex	\$66.46	\$65.52	\$70.15	\$74.48	\$78.95	\$83.32	\$86.31
<b>Multiple Dwelling Units</b>							
Monthly Fixed Rate	\$33.23	\$32.76	\$35.07	\$37.24	\$39.47	\$41.66	\$43.16
Volume Rate per ccf (> 8 ccf per Month)	\$3.49	\$4.20	\$4.60	\$4.99	\$5.43	\$5.80	\$6.07
<b>Domestic-Strength Non-Residential</b>							
Monthly Fixed Rate	\$33.97	\$32.76	\$35.07	\$37.24	\$39.47	\$41.66	\$43.16
Volume Rate per ccf (> 8 ccf per Month)	\$3.82	\$4.20	\$4.60	\$4.99	\$5.43	\$5.80	\$6.07
<b>Medium-Strength Non-Residential</b>							
Monthly Fixed Rate	\$19.60	\$32.99	\$35.32	\$37.49	\$39.74	\$41.93	\$43.44
Volume Rate per ccf (> 8 ccf per Month)	\$2.45	\$4.23	\$4.64	\$5.03	\$5.47	\$5.85	\$6.12
<b>High-Strength Non-Residential</b>							
Monthly Fixed Rate	\$19.60	\$50.33	\$53.63	\$56.84	\$59.84	\$62.97	\$65.23
Volume Rate per ccf (> 8 ccf per Month)	\$2.45	\$6.61	\$7.20	\$7.80	\$8.41	\$8.95	\$9.36

**Table 3-7: Sewer Rate Forecast – Alternative C (Proposed Rates)**

Sewer Rate Structure	2012	2013	2014	2015	2016	2017	2018
<b>Single-Family Residential</b>							
Monthly Flat Rate:							
Single-Family Residence	\$33.23	<b>\$33.97</b>	<b>\$35.07</b>	\$37.24	\$39.47	\$41.66	\$43.16
Unmetered Duplex	\$66.46	<b>\$67.94</b>	<b>\$70.15</b>	\$74.48	\$78.95	\$83.32	\$86.31
<b>Multiple Dwelling Units</b>							
Monthly Fixed Rate	\$33.23	<b>\$33.97</b>	<b>\$35.07</b>	\$37.24	\$39.47	\$41.66	\$43.16
Volume Rate per ccf (> 8 ccf per Month)	\$3.49	<b>\$4.09</b>	<b>\$4.66</b>	\$4.99	\$5.43	\$5.80	\$6.07
<b>Domestic-Strength Non-Residential</b>							
Monthly Fixed Rate	\$33.97	<b>\$33.97</b>	<b>\$35.07</b>	\$37.24	\$39.47	\$41.66	\$43.16
Volume Rate per ccf (> 8 ccf per Month)	\$3.82	<b>\$4.09</b>	<b>\$4.66</b>	\$4.99	\$5.43	\$5.80	\$6.07
<b>Medium-Strength Non-Residential</b>							
Monthly Fixed Rate	\$19.60	<b>\$33.97</b>	<b>\$35.07</b>	\$37.24	\$39.47	\$41.66	\$43.16
Volume Rate per ccf (> 8 ccf per Month)	\$2.45	<b>\$4.09</b>	<b>\$4.66</b>	\$4.99	\$5.43	\$5.80	\$6.07
<b>High-Strength Non-Residential</b>							
Monthly Fixed Rate	\$19.60	<b>\$33.97</b>	<b>\$44.35</b>	\$56.84	\$59.84	\$62.97	\$65.23
Volume Rate per ccf (> 8 ccf per Month)	\$2.45	<b>\$4.09</b>	<b>\$6.09</b>	\$7.83	\$8.44	\$8.98	\$9.40

### 3.2.3. Sample Water and Sewer Bills

**Table 3-8** summarizes the bill impacts to various sample customers from the proposed water and sewer rate structures:

**Table 3-8: Summary of Water/Sewer Bill Impacts**

Unmetered Single-Family Residence	2012	2013	2014	2015	2016
Water Bill	\$29.96	\$32.66	\$35.27	\$38.09	\$41.14
Watershed Surcharge	12.00	12.30	12.56	12.84	13.23
<b>Total Water Bill</b>	<b>\$41.96</b>	<b>\$44.96</b>	<b>\$47.83</b>	<b>\$50.93</b>	<b>\$54.37</b>
Sewer Bill	33.23	33.97	35.07	37.24	39.47
Utility Tax	10.67	11.28	11.91	12.71	13.57
<b>Total Water/Sewer Bill</b>	<b>\$85.86</b>	<b>\$90.21</b>	<b>\$94.81</b>	<b>\$100.88</b>	<b>\$107.41</b>
<b>Change From Prior Year</b>		<b>\$4.35</b>	<b>\$4.60</b>	<b>\$6.07</b>	<b>\$6.53</b>
<b>% Change From Prior Year</b>		<b>5.1%</b>	<b>5.1%</b>	<b>6.4%</b>	<b>6.5%</b>

Transitional SFR Metered in 2012 (5/8" Meter, Monthly Usage: 7 ccf)	2012	2013	2014	2015	2016	2017	2018
Water Bill	\$29.96	\$32.66	\$35.27	\$38.09	\$31.39	\$33.07	\$35.04
Watershed Surcharge	12.00	9.75	9.92	10.11	10.48	10.78	11.09
<b>Total Water Bill</b>	<b>\$41.96</b>	<b>\$42.41</b>	<b>\$45.19</b>	<b>\$48.20</b>	<b>\$41.87</b>	<b>\$43.85</b>	<b>\$46.13</b>
Sewer Bill	33.23	33.97	35.07	37.24	39.47	41.66	43.16
Utility Tax	10.67	10.99	11.61	12.40	11.47	12.07	12.63
<b>Total Water/Sewer Bill</b>	<b>\$85.86</b>	<b>\$87.37</b>	<b>\$91.87</b>	<b>\$97.84</b>	<b>\$92.81</b>	<b>\$97.58</b>	<b>\$101.92</b>
<b>Change From Prior Year</b>		<b>\$1.51</b>	<b>\$4.50</b>	<b>\$5.97</b>	<b>(\$5.02)</b>	<b>\$4.76</b>	<b>\$4.35</b>
<b>% Change From Prior Year</b>		<b>1.8%</b>	<b>5.2%</b>	<b>6.5%</b>	<b>-5.1%</b>	<b>5.1%</b>	<b>4.5%</b>

Metered Single-Family Residence (5/8" Meter, Monthly Usage: 6 ccf)	2012	2013	2014	2015	2016	2017	2018
Water Bill	\$20.79	\$22.58	\$23.99	\$25.44	\$29.67	\$31.25	\$33.10
Watershed Surcharge	8.84	9.09	9.25	9.43	9.77	10.05	10.34
<b>Total Water Bill</b>	<b>\$29.63</b>	<b>\$31.67</b>	<b>\$33.24</b>	<b>\$34.87</b>	<b>\$39.44</b>	<b>\$41.30</b>	<b>\$43.44</b>
Sewer Bill	33.23	33.97	35.07	37.24	39.47	41.66	43.16
Utility Tax	8.63	9.07	9.47	10.01	11.08	11.65	12.19
<b>Total Water/Sewer Bill</b>	<b>\$71.49</b>	<b>\$74.71</b>	<b>\$77.78</b>	<b>\$82.12</b>	<b>\$89.99</b>	<b>\$94.61</b>	<b>\$98.79</b>
<b>Change From Prior Year</b>		<b>\$3.22</b>	<b>\$3.07</b>	<b>\$4.33</b>	<b>\$7.87</b>	<b>\$4.62</b>	<b>\$4.18</b>
<b>% Change From Prior Year</b>		<b>4.5%</b>	<b>4.1%</b>	<b>5.6%</b>	<b>9.6%</b>	<b>5.1%</b>	<b>4.4%</b>

Water District, Outside City (6" Meter, Monthly Usage: 2,150 ccf)	2012	2013	2014	2015	2016	2017	2018
Water Bill	\$5,592.99	\$7,773.68	\$10,287.93	\$13,194.21	\$14,320.40	\$15,279.03	\$16,278.50
Watershed Surcharge	2,071.50	2,136.20	2,168.60	2,201.03	2,298.02	2,362.76	2,427.51
<b>Total Water Bill</b>	<b>\$7,664.49</b>	<b>\$9,909.87</b>	<b>\$12,456.53</b>	<b>\$15,395.24</b>	<b>\$16,618.41</b>	<b>\$17,641.79</b>	<b>\$18,706.01</b>
Utility Tax	1,258.94	1,664.36	2,126.94	2,661.06	2,877.74	3,060.14	3,249.99
<b>Total Water Bill</b>	<b>\$8,923.43</b>	<b>\$11,574.23</b>	<b>\$14,583.46</b>	<b>\$18,056.30</b>	<b>\$19,496.15</b>	<b>\$20,701.92</b>	<b>\$21,955.99</b>
<b>Change From Prior Year</b>		<b>\$2,650.79</b>	<b>\$3,009.23</b>	<b>\$3,472.84</b>	<b>\$1,439.86</b>	<b>\$1,205.77</b>	<b>\$1,254.07</b>
<b>% Change From Prior Year</b>		<b>29.7%</b>	<b>26.0%</b>	<b>23.8%</b>	<b>8.0%</b>	<b>6.2%</b>	<b>6.1%</b>

Apartment Building (1" Meter, Monthly Usage: 25 ccf)	2012	2013	2014	2015	2016	2017	2018
Water Bill	\$82.70	\$88.60	\$93.80	\$99.26	\$106.72	\$113.03	\$119.57
Watershed Surcharge	21.00	21.63	21.98	22.35	23.26	23.92	24.59
<b>Total Water Bill</b>	<b>\$103.70</b>	<b>\$110.23</b>	<b>\$115.78</b>	<b>\$121.61</b>	<b>\$129.98</b>	<b>\$136.95</b>	<b>\$144.16</b>
Sewer Bill	92.56	103.50	114.29	122.07	131.78	140.26	146.35
Utility Tax	28.15	30.56	32.79	34.72	37.31	39.51	41.48
<b>Total Water/Sewer Bill</b>	<b>\$224.41</b>	<b>\$244.29</b>	<b>\$262.86</b>	<b>\$278.40</b>	<b>\$299.07</b>	<b>\$316.72</b>	<b>\$331.99</b>
<b>Change From Prior Year</b>		<b>\$19.88</b>	<b>\$18.57</b>	<b>\$15.54</b>	<b>\$20.66</b>	<b>\$17.65</b>	<b>\$15.27</b>
<b>% Change From Prior Year</b>		<b>8.9%</b>	<b>7.6%</b>	<b>5.9%</b>	<b>7.4%</b>	<b>5.9%</b>	<b>4.8%</b>

**Table 3-8 (Continued): Summary of Water/Sewer Bill Impacts**

<b>Commercial (2" Meter, Monthly Usage: 80 ccf)</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Water Bill	\$258.29	\$276.68	\$293.09	\$310.34	\$333.20	\$352.47	\$372.57
Watershed Surcharge	56.20	57.93	58.83	59.75	62.31	64.07	65.84
<b>Total Water Bill</b>	<b>\$314.49</b>	<b>\$334.61</b>	<b>\$351.92</b>	<b>\$370.09</b>	<b>\$395.51</b>	<b>\$416.54</b>	<b>\$438.41</b>
Sewer Bill	309.01	328.45	370.59	396.52	430.43	459.26	480.20
Utility Tax	89.14	94.93	102.87	109.11	117.47	124.51	130.79
<b>Total Water/Sewer Bill</b>	<b>\$712.64</b>	<b>\$757.99</b>	<b>\$825.38</b>	<b>\$875.72</b>	<b>\$943.41</b>	<b>\$1,000.31</b>	<b>\$1,049.40</b>
<b>Change From Prior Year</b>		<b>\$45.35</b>	<b>\$67.39</b>	<b>\$50.34</b>	<b>\$67.70</b>	<b>\$56.89</b>	<b>\$49.09</b>
<b>% Change From Prior Year</b>		<b>6.4%</b>	<b>8.9%</b>	<b>6.1%</b>	<b>7.7%</b>	<b>6.0%</b>	<b>4.9%</b>

<b>Irrigation (Based on Summer Use) (1" Meter, Monthly Usage: 54 ccf)</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Water Bill	\$168.65	\$172.05	\$173.75	\$175.21	\$182.42	\$188.73	\$197.22
Watershed Surcharge	39.56	40.77	41.41	42.07	43.85	45.09	46.34
<b>Total Water Bill</b>	<b>\$208.21</b>	<b>\$212.82</b>	<b>\$215.16</b>	<b>\$217.28</b>	<b>\$226.27</b>	<b>\$233.82</b>	<b>\$243.56</b>
Utility Tax	35.33	36.09	36.47	36.81	38.33	39.63	41.32
<b>Total Water Bill</b>	<b>\$243.54</b>	<b>\$248.91</b>	<b>\$251.63</b>	<b>\$254.09</b>	<b>\$264.60</b>	<b>\$273.45</b>	<b>\$284.88</b>
<b>Change From Prior Year</b>		<b>\$5.37</b>	<b>\$2.72</b>	<b>\$2.46</b>	<b>\$10.51</b>	<b>\$8.84</b>	<b>\$11.43</b>
<b>% Change From Prior Year</b>		<b>2.2%</b>	<b>1.1%</b>	<b>1.0%</b>	<b>4.1%</b>	<b>3.3%</b>	<b>4.2%</b>

<b>Untreated Industrial Water User (12" Meter, Monthly Usage: 3,230 ccf)</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Water Bill	\$13,585.10	\$6,648.51	\$7,096.97	\$7,584.66	\$7,977.88	\$8,298.89	\$8,671.18
Watershed Surcharge	2,072.20	2,136.93	2,169.33	2,201.75	2,298.81	2,363.57	2,428.34
<b>Total Water Bill</b>	<b>\$15,657.30</b>	<b>\$8,785.44</b>	<b>\$9,266.30</b>	<b>\$9,786.41</b>	<b>\$10,276.69</b>	<b>\$10,662.46</b>	<b>\$11,099.52</b>
Utility Tax	2,717.58	1,459.10	1,544.67	1,637.40	1,720.33	1,786.36	1,861.75
<b>Total Water Bill</b>	<b>\$18,374.88</b>	<b>\$10,244.54</b>	<b>\$10,810.97</b>	<b>\$11,423.82</b>	<b>\$11,997.02</b>	<b>\$12,448.82</b>	<b>\$12,961.27</b>
<b>Change From Prior Year</b>		<b>(\$8,130.34)</b>	<b>\$566.43</b>	<b>\$612.85</b>	<b>\$573.20</b>	<b>\$451.80</b>	<b>\$512.46</b>
<b>% Change From Prior Year</b>		<b>-44.2%</b>	<b>5.5%</b>	<b>5.7%</b>	<b>5.0%</b>	<b>3.8%</b>	<b>4.1%</b>

The bills shown in **Table 3-8** reflect the watershed surcharges established by Ordinance No. 2012-02-005. Consistent with the language in that ordinance, the new watershed surcharges are adjusted annually for assumed inflation in 2013 and subsequent years. Utility tax is computed on each bill based on the current City utility tax rates (18.25% for the water bill; 11.5% for the watershed surcharge and sewer bill).

Consistent with the general findings of the cost-of-service analysis, a metered single-family residence will generally see increases that are smaller than the aggregate rate increases shown in **Table 2-4**. The newly metered residential customer in the “transitional” class actually pays less than they are currently paying under the unmetered rate structure until 2016, suggesting that there is a financial incentive for customers with moderate water usage to convert to metered water service.

Even with the proposed rate adjustments, the bill paid by a typical single-family home in the City’s service area (using 8 ccf per month) remains comparable with what that customer would pay in other local jurisdictions, as shown in **Table 3-9**.

**Table 3-9: Survey of Single-Family Residential Monthly Water/Sewer Bills**

Jurisdiction	Average Monthly SFR Bill @ 8 ccf			
	Water	Sewer	Tax	Total
City of Blaine	\$21.46	\$99.00	\$10.84	<b>\$131.30</b>
Lake Whatcom Water & Sewer District	\$47.67	\$65.66	\$0.00	<b>\$113.32</b>
City of Ferndale	\$32.17	\$52.06	\$5.47	<b>\$89.69</b>
City of Lynden	\$30.58	\$44.27	\$6.36	<b>\$81.21</b>
City of Nooksack	\$30.25	\$45.22	\$4.53	<b>\$80.00</b>
<i>City of Bellingham - Unmetered, Proposed (2013)</i>	<b>\$32.66</b>	<b>\$33.97</b>	<b>\$9.87</b>	<b>\$76.50</b>
City of Everson	\$25.56	\$43.00	\$4.11	<b>\$72.67</b>
<i>City of Bellingham - Unmetered, Existing (2012)</i>	<b>\$29.96</b>	<b>\$33.23</b>	<b>\$9.29</b>	<b>\$72.48</b>
City of Sumas	\$10.96	\$53.93	\$5.84	<b>\$70.73</b>
<i>City of Bellingham - Metered, Proposed (2013)</i>	<b>\$25.74</b>	<b>\$33.97</b>	<b>\$8.60</b>	<b>\$68.31</b>
<i>City of Bellingham - Metered, Existing (2012)</i>	<b>\$23.85</b>	<b>\$33.23</b>	<b>\$8.17</b>	<b>\$65.25</b>
Birch Bay Water & Sewer District	\$24.90	\$30.20	\$0.00	<b>\$55.10</b>

**Table 3-9** indicates that for both the existing and proposed rate structures, the combined monthly water/sewer bill falls near the middle of the spectrum of local jurisdictions in Whatcom County. It is important to note that it is difficult to arrive at an "apples-to-apples" comparison between the rates charged in various jurisdictions because different utilities may have different cost structures and different policies regarding reserve levels, capital reinvestment funding, and financial management.



## SECTION 4: RECOMMENDATIONS

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Recommendations from this study include:

- ◆ Adopt the proposed water rates shown in **Table 3-4**, which reflect:
  - Anticipated growth and changes in demand
  - Separation of water districts from metered single-family customers based on observed differences in water usage patterns
  - Introduction of a transitional single-family class consisting of unmetered customers that are converted to metered service through the City’s metering program
  - Linking of untreated (raw) water rates to non-residential water rates (proposed rates for untreated water are 80% of the applicable non-residential rates)
  - Phasing of shifts in cost recovery over three years to mitigate impacts to customers and facilitate a rational progression of rates over time
- ◆ Adopt the proposed sewer rates shown in **Table 3-7**, which reflect:
  - Anticipated growth and changes in demand
  - Phasing of shifts in cost recovery over three years to mitigate impacts to customers and facilitate a rational progression of rates over time
  - Continue to improve the wholesale sewer methodology and continue to meet with the Lake Whatcom Water & Sewer District, in order to develop an updated agreement that includes an equitable sharing of system costs
  - Creation of three strength classes for non-single-family customers.
    - Domestic-Strength Non-Residential: Includes metered duplexes, residential properties with multiple dwelling units, and the City’s current commercial customers. Based on system planning criteria in the City’s Comprehensive Sewer Plan, this class (and the single-family residential class) is assumed to generate wastewater with an average concentration of 235 mg/L of biochemical oxygen demand (BOD) and 270 mg/L of suspended solids (SS).
    - Medium-Strength Non-Residential: Includes customers that generate wastewater averaging between 250 mg/L and 500 mg/L of BOD and/or between 300 mg/L and 500 mg/L of SS. Based on average strength ratings of the customers included in this class, this class is assumed to generate wastewater with an average strength of 355 mg/L of BOD and 155 mg/L of SS for the purpose of allocating costs.
    - High-Strength Non-Residential: Includes customers that generate wastewater averaging over 500 mg/L of BOD and/or SS. Based on average strength ratings of the customers included in this class, this class is assumed to generate wastewater with an average strength of 1,131 mg/L of BOD and 235 mg/L of SS for cost allocations.

With respect to the strength standards, a customer's highest strength rating defines their class – for example, a customer generating wastewater with an average strength of 320 mg/L of BOD and 150 mg/L of SS would be grouped in the “medium-strength” class. It is worth noting that in this analysis, the “medium-strength” and “high-strength” classes only include special industrial users (SIUs) due to a lack of data identifying the business types (and related wastewater strengths) of specific commercial customers. As a future enhancement to this structure, the City should consider reviewing its commercial customer base and moving certain types of businesses to higher strength classes based on their average strength ratings. With this change, it would be prudent for the City to develop a list of best-management practices (BMPs) that customers can follow in order to be considered for reclassification into a lower strength class.

- Elimination of the industrial strength surcharges included in the existing SIU rate structure (\$0.19 per pound of BOD; \$0.16 per pound of SS)
- ◆ Consider a more detailed review of the City's state excise tax reporting practices. A cursory review of City tax worksheets found that the City might have an opportunity to reduce its tax expenses, given various deductions and exemptions allowed under State law. This review may also provide the supporting documentation that the City would need in order to request a refund from the Department of Revenue for historical tax payments. The findings presented in this report assume the implementation of the identified refinements moving forward, but do not incorporate an assumed refund of past payments.

It is important to note that the findings expressed in this report generally rely on a number of assumptions regarding costs, revenues, customer growth, and policy-based requirements – these assumptions and the related projections may vary from what actually happens. The City should use this rate study as a framework during future budget periods, adjusting the forecasts as appropriate to reflect any significant changes to the underlying assumptions.