



## Draft Water and Sewer Rate Study Report

# Loudoun Water Developer Initiated Community Systems Water and Sewer Rate Analysis

Prepared by



Municipal & Financial Services Group

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## 1. EXECUTIVE SUMMARY

This document was prepared to summarize the work performed by the Municipal & Financial Services Group (MFSG) during the water and wastewater cost of service study authorized by Loudoun Water.

MFSG was tasked with identifying the actual cost of service for each of the individual water and wastewater developer initiated community systems (“Community Systems”) owned and operated by Loudoun Water. The cost of service for each system includes operating and maintenance expenses, as well as capital expenses. Operating and maintenance costs were provided by Loudoun Water in the form of direct expense data and known labor costs. Capital costs were identified through existing capital projects as listed on the Loudoun Water Community Systems Capital Improvement Program (CIP) and through annual replacement reserve contributions based upon calculated costs associated with system rehabilitation and replacement. The cost of service values were then compared to the revenues collected by customers under the current rates and rate structure.

The study is predicated on the use of a cash flow analysis to support the pricing of utility services. MFSG indentified water and wastewater rate structure alternatives to meet the specific objectives identified by Loudoun Water staff and discussions with the Loudoun Water Board.

The following portion of the report summarizes the findings and recommendations developed during the course of the study.

### 1.1 Findings

- Current water rates for the community systems do not produce adequate cash revenues to cover cash requirements in FY12 or subsequent years. The current water rates do not allow for funding of any planned capital improvements or any contributions to a replacement fund. Based on projected water sales, current rates will produce revenues roughly 32% less than the required revenue in FY12 with subsequent significant shortfalls annually over the planning period.
- Current wastewater rates for the community systems do not produce sufficient cash revenue to cover cash requirements in FY 12 or subsequent years. Based on projected water sales, the current rates will produce cash revenues roughly 61% less than the required revenue in FY12 with subsequent significant shortfalls annually over the planning period.
- Due to these significant revenue shortfalls, both capital improvements and reserve fund contributions are completely unfunded in FY12 and subsequent years.
- Rate increases are necessary in order for Loudoun Water to fully cover the cost of providing water and sewer service, including addressing the necessary capital repair and replacement funding over the next ten years.

- Based on a detailed review of community system usage patterns during FY09 and FY10, it was revealed that the average winter use (representing indoor / non-discretionary use) for all community systems was 188 gallons per day.
- The current rate structure does not appropriately allocate the cost of service to various levels of water use among customers. An alternative rate structure more closely related to the Central System structure will equitably recover costs from community system customers based on usage.

## 1.2 Recommendations

- Increase water and wastewater revenues over the next three years to keep revenues in line with expenses and to fund the required capital projects identified over the planning period.
- Increase revenues to allow for Replacement Fund contributions, which should fund at least 50% of annual depreciation.
- Adopt water and sewer rates that will provide for full cost of service recovery within the community systems, thus abiding by current Loudoun Water policy that community systems should be financially self-sustaining. Phase-in of rates over a three year period is recommended to reduce the impact on customers.
- Begin billing community system customers on a monthly basis in order to allow customers to be more aware of their consumption habits and to smooth out the financial impact of water and sewer bills on individual households.
- Move forward with the proposed water and sewer rate structure identified as Alternative C in this report. The Alternative C water rate structure provides a water allocation based on industry standards. The recommended rates under Alternative C will provide a three year phase in to full cost of service recovery, and are shown in Table 1-1.

*Table 1-1: Recommended FY12-FY14 Community System Water and Sewer Rates*

	<b>FY12</b>	<b>FY 13</b>	<b>FY 14</b>
<b>Water Rates</b>			
Monthly Fixed Charge	\$10.04	\$12.09	\$14.86
Consumption Charges (per 1,000 gal.)			
Tier 1: 0 – 275 GPD (8,400 gallons monthly)	\$2.99	\$3.51	\$4.31
Tier 2: 275 – 800 GPD (8,401 – 24,400 gallons monthly)	\$7.23	\$8.51	\$10.62
Tier 3: Over 800 GPD (>24,400 monthly)	\$9.34	\$10.89	\$13.50
<b>Sewer Rates</b>			
Monthly Fixed Charge	\$11.75	\$17.75	\$26.75
Usage Charge (per 1,000 gal.)	\$6.00	\$9.10	\$13.70

## 2. BASIS FOR THE STUDY

### 2.1 Background

Loudoun Water provides public water and wastewater service for Loudoun County residents who live outside incorporated towns. The eastern portion of the water and wastewater system is considered the “Central System” and serves over 60,000 accounts. The western portion of the Loudoun Water system is rural and consists of a number of various individual community water and wastewater systems designated as “developer initiated.” These systems have been approved through the County of Loudoun, in accordance with the General Plan. Developer initiated systems are the focus of this Community Systems Water and Wastewater Rate Study Report.

In the western region of Loudoun County, Loudoun Water currently owns and operates six water and five wastewater developer initiated systems. There are four additional systems the County of Loudoun has sponsored due to health hazard conditions that Loudoun Water owns and operates. Loudoun Water also contract operates a number of systems throughout the County. Only the Developer Initiated Systems are addressed in this report and are from this point forward referred to as “community systems.”

The Loudoun Water Board is authorized to fix and revise rates, fees and other charges for water and sewer service by Section 15.2-5136 of the Virginia Code. Prior to action on proposed rates, Loudoun Water conducts a public hearing as required by this section of the Virginia Code. After approval by the Loudoun Water Board, the rates become effective on the dates specified in the Board’s action and require no further review or approval.

Community systems are currently charged for water and wastewater service through a rate structure that includes a fixed fee, a base metered rate for consumption as well as a peak rate if, during summer months, a customer’s consumption exceeds a certain level based on that customer’s average winter usage. The current rate structure is described in detail in Section 5.1 of this report. Typically, the infrastructure for these systems is contributed to Loudoun Water by a developer, in return for Loudoun Water taking operational responsibility for the systems. The water and wastewater customer rates were initially set based upon the developer’s estimated operating costs for each individual system. Due to this rate setting process, each individual community had its own rate structure until Loudoun Water consolidated the systems under a unified “community systems” rate structure in 2008. The uniform rate structure allows for economies of scale and reduced risks of significant rate impacts for major capital repairs on a small customer base.

It should be noted that the developer of a community system is responsible for paying unrecovered operating costs (plus reserve contributions for repair and replacement) experienced by Loudoun Water for developments until a system reaches 90% build-out.

The following table lists all active developer initiated community systems.

<u>Water</u>	<u>Wastewater</u>
Beacon Hill	Courtland
Elysian Heights	Elysian Heights
Lenah Run	Lenah Farms
Raspberry Falls	Raspberry Falls
Rokeby	Selma Estates
Selma Estates	

## 2.2 Scope of Work

MFSG was initially engaged by Loudoun Water in the fall of 2010 to assist with an update and review of the financial operations and cost of service related to Community Systems. The specific scope of services provided by MFSG included the following:

- **Revenue Requirements** - Determine the true cost of providing water and sewer service for community systems.
- **Cost of Service and Financial Plan** - Perform a cost of service analysis to determine appropriate cost allocations between customer classes, and develop a financial plan for the Community Systems to ensure that water and sewer rates provide adequate revenues.
- **Rate Design** - Design a water and sewer rate structure that appropriately allocates costs among the Community System customers in accordance with Loudoun Water policies.
- **Customer Impacts** - Document the impact of various rate designs on Community System customers to assist in development of a recommended rate alternative.

## 2.3 Assumptions Used in the Study

It is necessary to make several assumptions regarding future economic conditions and growth in order to project future revenue requirements and revenues from water and wastewater rates. It is assumed in this analysis that Loudoun Water will continually reinvest in the system while developing and/or maintaining reserves to provide for contingencies and unplanned expenses. Assumptions (which can be varied as needed from year to year) made regarding various items are built into the analysis:

<u>Element</u>	<u>Assumed Value</u>
Inflation Rate – Water and Sewer O&M Expenses	5.0%
Interest Rate on Borrowing	4.5%
Operating and Maintenance Reserve	90 days of operating expenses
Replacement Fund	50% of Depreciation

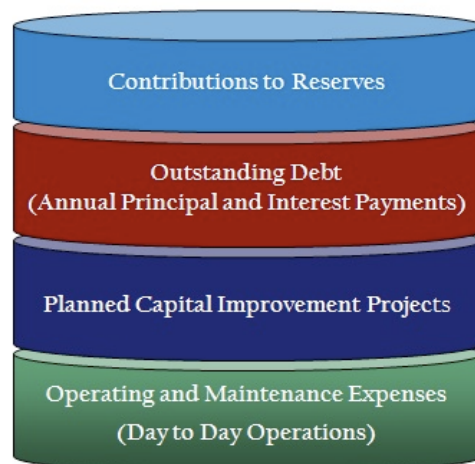
In addition to the assumptions listed, each of the individual water and wastewater systems has a projected growth rate based on projections of new connections added each year to each system. In

early years of the projection period this assumed growth is nearly 10% per year, but this growth slows to 0% as all of the communities are projected to reach buildout.

These assumptions are based on discussions with Loudoun Water staff, utilizing our experience, and the staff's knowledge of its customer base and historical costs. The growth in customers and consumption is based upon projected housing unit growth estimates provided by Loudoun Water staff. A sensitivity analysis was conducted to determine the impacts of varying each assumption. The most significant drivers are the percentages used for inflation and the customer and consumption growth rates. The study was conducted using Fiscal Year 2010 (Loudoun Water functions on a fiscal year of January 1 to December 31<sup>st</sup>) as the base year upon which forecasted figures were developed.

### 3. REVENUE REQUIREMENTS

This chapter of the report outlines the current and future cost of operating and maintaining the Community Systems, which constitute each system's revenue requirements. Our approach includes a detailed review of each of the costs incurred by Loudoun Water to ensure a true cost of service is developed. The revenue requirements can be broken down into four main categories of costs including; operating and maintenance costs, capital improvements, existing debt service and any contributions to reserves. The following section of the report describes each of the categories of expenses incurred by Loudoun Water as it provides water and sewer service to the community systems. The costs are all based on documents and data provided by Loudoun Water. The costs are forecasted as described above in Section 2.3. The day-to-day operating and maintenance (O&M) expenses for Community Systems can be broken down into three main categories, which include labor costs, lab costs, and direct system specific expenses. The actual FY 2010 expenses were used as the basis for estimating future O&M expenses.



Water and wastewater O&M expenses for the projection period are based on an assumed inflation rate of 5% per year.

#### 3.1 Operating and Maintenance Expenses

The day-to-day O&M expenses of each water and sewer system making up the Community Systems are determined using a combination of two blended hourly rates for general labor (\$75.00 per hour) and engineering labor (\$81.00 per hour). Added to these labor costs are other direct costs, including chemicals and electricity. Lab analysis fees are also billed directly to each individual system. In addition to these costs, all of which are allocated directly to each system, there are certain administrative costs that do not directly contribute to any specific system but are necessary for the operation of the community systems as a whole. These costs include customer service, metering and billing costs.

All of these costs combine to total what can be considered the day to day operating expenses of each water and sewer system. Loudoun Water invoices each individual community on a total system basis. The communities with both water and sewer systems do not receive cost data separated between the systems. In other words, if a specific system includes both a water and sewer system, one invoice is created for that community system which does not break out costs between the water system and sewer system. To appropriately allocate costs between the water system and sewer system within a community, for purposes of this rate analysis, Loudoun Water determined that 60% of total costs would be allocated to sewer and 40% to water. This allocation is consistent with what has been used in the central system. In 2012, staff will begin allocating labor expenses specifically to each water system and sewer system within a community to prepare for the possibility of de-bundling the community system rates and conversion back to individual system rates.

### 3.1.1 Water System Operating and Maintenance Expenses

Table 3-1 summarizes the projected O&M expenses of each community system with water service, broken down into the four categories by which they are invoiced. Administrative overhead is not directly invoiced to each system, but rather allocated based on each system’s proportional invoiced cost. That is, if a community’s total labor, engineering labor, direct costs and lab fees were 20% of the total before any administrative fees were added, then that community would be allocated a 20% share of the administrative cost of service.

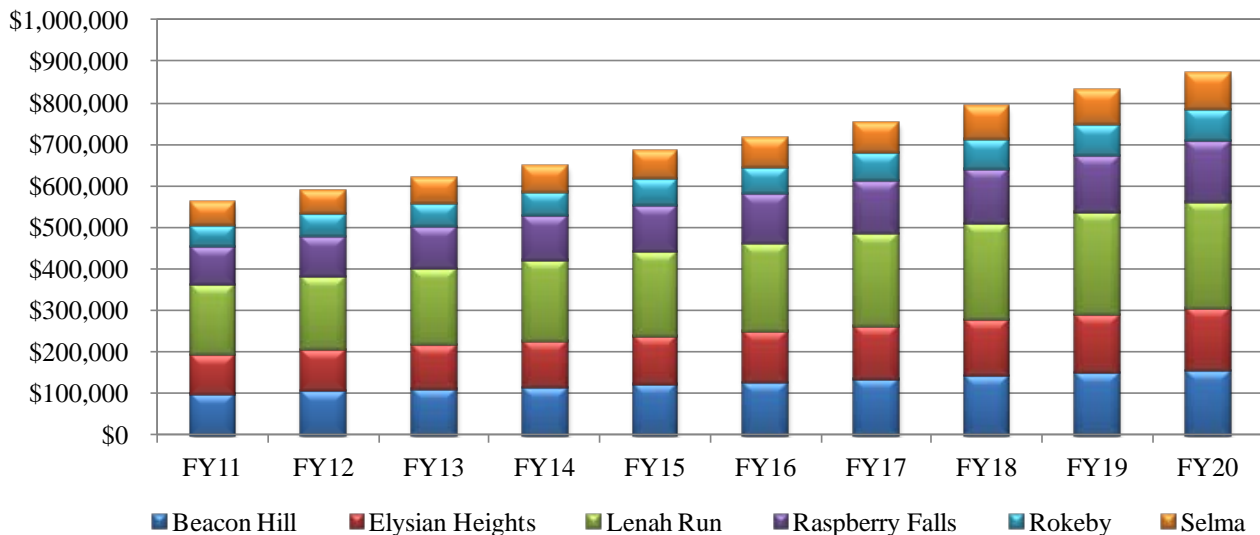
Table 3-1: Water System FY12 O&M Expense Breakdown

	Labor	Eng. Labor	Direct Costs	Lab Fees	Admin.	Total
Beacon Hill	\$41,675	\$982	\$33,690	\$293	\$29,230	<b>\$105,870</b>
Elysian Heights	\$35,007	\$112	\$37,008	\$728	\$27,786	<b>\$100,641</b>
Lenah Run	\$76,354	\$2,697	\$45,491	\$1,778	\$48,178	<b>\$174,498</b>
Raspberry	\$54,227	\$9,413	\$11,340	\$3,128	\$19,784	<b>\$97,892</b>
Rokeby	\$24,269	\$179	\$13,467	\$443	\$14,629	<b>\$52,987</b>
Selma	\$14,057	\$143	\$28,134	\$128	\$15,945	<b>\$58,407</b>
<b>Total</b>	<b>\$245,589</b>	<b>\$13,526</b>	<b>\$169,130</b>	<b>\$6,498</b>	<b>\$155,552</b>	<b>\$590,295</b>

Prior to this rate analysis, costs were split 75% to sewer and 25% to water. Should Loudoun Water choose to evaluate individual system rates in the future, allocations specific to each system will be developed.

Exhibit 3-1 shows the projected total O&M expenses of the Water Community Systems throughout the ten year projection period. The increases in O&M expenses demonstrated in the exhibit are based on the assumed inflation rate of 5% per year.

Exhibit 3-1: Forecast of Total Community Water System O&M Expenses



As demonstrated in the exhibit the total community system water O&M expenses are forecasted to increase from over \$590,000 in FY12 to over \$870,000 by FY20.

### 3.1.2 Sewer System Operating and Maintenance Expenses

Table 3-2 summarizes the projected O&M expenses of each community system with sewer service, broken down into the four categories by which they are invoiced.

Table 3-2: Sewer System FY12 O&M Expense Breakdown

	Labor	Eng. Labor	Direct Costs	Lab Fees	Admin.	Total
Courtland	\$157,726	\$3,617	\$106,376	\$3,321	\$65,834	<b>\$336,874</b>
Elysian	\$52,510	\$169	\$55,513	\$1,091	\$26,544	<b>\$135,827</b>
Lenah	\$114,531	\$4,046	\$68,237	\$2,667	\$46,024	<b>\$235,505</b>
Raspberry Falls	\$81,340	\$14,119	\$17,010	\$4,692	\$36,708	<b>\$153,869</b>
Selma	\$21,085	\$214	\$42,200	\$192	\$15,232	<b>\$78,9243</b>
<b>Total</b>	<b>\$427,192</b>	<b>\$22,165</b>	<b>\$289,336</b>	<b>\$11,963</b>	<b>\$190,342</b>	<b>\$940,998</b>

Prior to this rate analysis, costs were split 75% to sewer and 25% to water. Should Loudoun Water choose to evaluate individual system rates in the future, allocations specific to each system will be developed.

Exhibit 3-2 displays the projected O&M expenses of the community sewer systems operated by Loudoun Water. As with the water O&M forecast, future O&M expenses are increased annually by 5%.

Exhibit 3-2: Forecast of Total Community Sewer System O&M Expenses

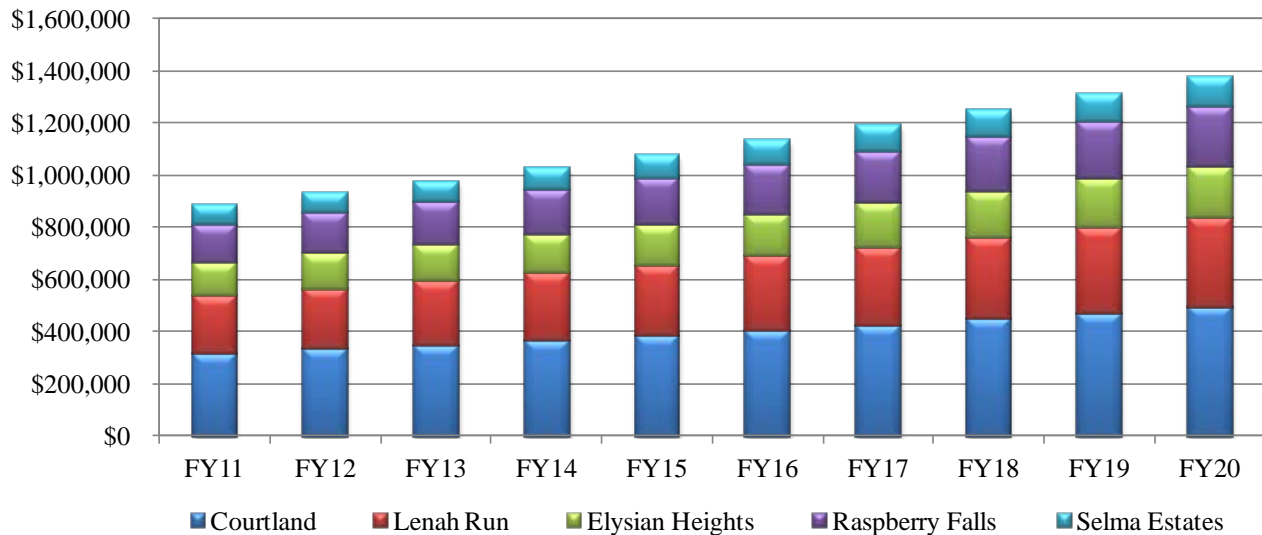


Exhibit 3-2 demonstrates that Community System sewer O&M expenses are forecasted to increase from approximately \$0.94 million in FY12 to \$1.39 million by FY20.

### 3.2 Capital Costs

The planned capital spending for the Community Systems is a significant contributing factor to the total revenue requirements each year. Each community has certain capital projects identified in Loudoun Water’s capital improvements plan (CIP) as well as projects identified that benefit all systems. The planned capital projects, their costs and how they will be funded for both the water and sewer systems are discussed in the following sections.

### 3.2.1 Water Systems Capital Expenditures

Table 3-3 outlines the planned capital projects relating to the Community Water Systems. Each project is assigned to a specific community (or all communities) and the cost of the project is listed in the year in which the project is planned to be initiated.

Table 3-3: Loudoun Water Community Systems Water CIP

Project Description	Community	2011	2012	2013	2014	2015
Install Well Pump, Replace Filter	Beacon Hill	\$20,000	-	-	\$80,000	-
SCADA Upgrades at Water Facilities	All Systems	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
New Well and RWL, UV Treatment,	Raspberry	\$600,000	\$240,000	-	-	-
UV Disinfection	Selma	\$20,000	\$80,000	-	-	-
Well House 1 – Install SCADA	Lenah	\$80,000	-	-	-	-
900 gpd Well, Storage, Booster	Lenah	\$50,000	\$250,000	-	-	-
900 gpd Well, Storage, Booster	Raspberry	\$50,000	\$250,000	-	-	-
Upgrade to Generator and Electrical	Rokeby	-	\$80,000	-		-
Misc. Projects	All Systems	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
<b>Total Water CIP</b>		<b>\$895,000</b>	<b>\$975,000</b>	<b>\$75,000</b>	<b>\$155,000</b>	<b>\$75,000</b>
<i>Total Developer Contributions (Raspberry)</i>		<i>\$600,000</i>	<i>\$240,000</i>	<i>-</i>	<i>-</i>	<i>-</i>
<b>Total CIP Funded by Users</b>		<b>\$295,000</b>	<b>\$735,000</b>	<b>\$75,000</b>	<b>\$155,000</b>	<b>\$75,000</b>

Due to the magnitude of the required funding associated with the projects shown in Table 3-3, it was assumed that the community systems would borrow the funds necessary to complete the projects. To “pay-go” or cash fund the projects from current revenues would require rate increases that would be extremely high. Community systems are generally small in size, and these projects would be extremely costly on a per-capita basis if they were to be funded through current revenues. It was assumed that community systems would borrow the funds from the central system using the same terms under which Loudoun Water currently borrows funds for the Central System (30 year maturity at an interest rate of 4.5%). Section 3.4 discusses the impact on rates of these capital improvement projects in the form of annual community water system debt service.

### 3.2.2 Sewer Systems Capital Expenditures

Just like the water systems, the community sewer systems must be maintained through annual capital spending. Table 3-4 outlines the planned capital improvements by sewer system.

Table 3-4: Loudoun Water Community Systems Sewer CIP

Project Description	Community	2011	2012	2013	2014	2015
Upgrade Drain field Control Panel	Lenah	-	-	-	-	\$50,000
Effluent SPS and FM	Raspberry	-	\$30,000	-	-	-
Replace WWTP BPV, Meter and DO	Elysian	\$10,000	-	-	-	-
VPA Permit	Courtland	-	\$50,000	-	-	-
Off-spec Storage Pond/Tank	Courtland	\$50,000	\$100,000	-	-	-
Sewer Connection to Central System	Courtland	-	\$50,000	-	-	-
Miscellaneous Projects	All Systems	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
<b>Total Sewer CIP</b>		<b>\$85,000</b>	<b>\$255,000</b>	<b>\$25,000</b>	<b>\$25,000</b>	<b>\$75,000</b>
<i>Total Developer Contribution (Courtland)</i>		<i>\$50,000</i>	<i>\$150,000</i>	-	-	-
<b>Total CIP Funded by Rates</b>		<b>\$35,000</b>	<b>\$105,000</b>	<b>\$25,000</b>	<b>\$25,000</b>	<b>\$75,000</b>

Similar to the community water systems it was assumed that the funding required to complete the sewer projects would be borrowed at the same terms as described in Section 3.2.1. The annual debt service resulting from the borrowings is discussed in the next section.

### 3.3 Debt Service

The specific annual debt service payments for both the Community Water and Sewer Systems are discussed in the sections below.

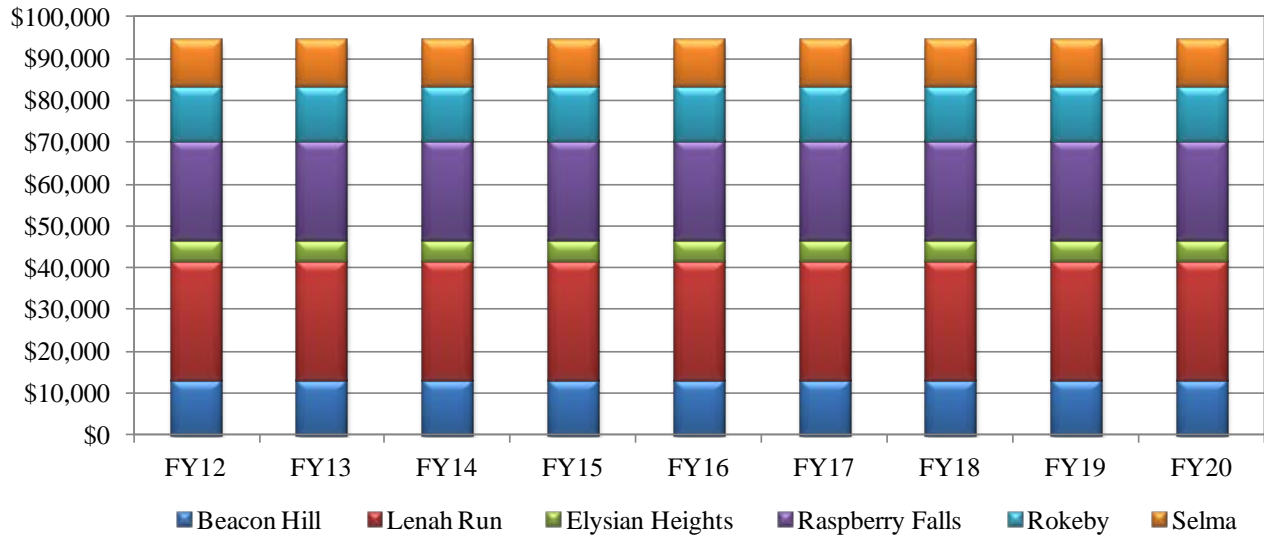
#### 3.3.1 Water System Debt Service

Based on the CIP presented in Section 3.2.1 and the debt terms (30 year maturity at 4.5%), annual debt service payments were developed for each individual water system. It was assumed that Loudoun Water would loan the funds necessary to complete all the projects listed in Table 3-3 to the community systems in FY12 and therefore the debt service payments would begin in FY12 and remain level throughout the period of repayment. The debt service payments for each individual system were determined based on the individual capital projects shown in Table 3-3. Projects that benefit all systems were allocated evenly among each of the systems. Table 3-5 and Exhibit 3-3 show the total annual debt service payments for each of the Community Water Systems.

Table 3-5: Water System Projected Debt Breakdown

Community Water System	FY12-FY41 Annual Debt Service Payment
Beacon Hill	\$13,097
Elysian Heights	\$5,116
Lenah Run	\$28,445
Raspberry	\$23,533
Rokeby	\$13,097
Selma	\$11,255
<b>Total</b>	<b>\$94,543</b>

**Exhibit 3-3: Annual Water System Debt Payments**



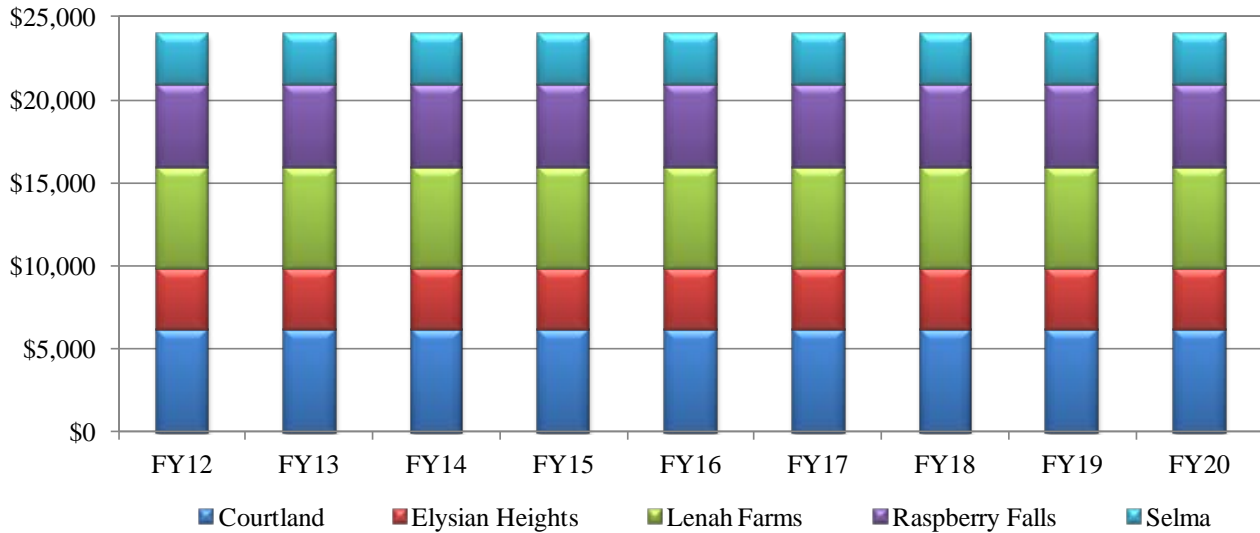
**3.3.2 Sewer System Debt Service**

The community sewer system’s debt service is calculated in exactly the same way as that of the water system. Each system is projected to repay its own capital costs, as well as its share of projects that benefit the systems equally (see Section 3.2.2). The Table 3-6 and Exhibit 3-4 show the annual debt service payment of each individual system. The annual combined sewer system debt payment is just under \$24,000.

**Table 3-6: Sewer System Projected Debt Breakdown**

Community Sewer System	FY12-FY41 Annual Debt Service Payment
Courtland	\$6,139
Elysian	\$3,683
Lenah	\$6,139
Raspberry	\$4,911
Selma	\$3,070
<b>Total</b>	<b>\$23,942</b>

**Exhibit 3-4: Annual Sewer System Debt Payments**



### 3.4 Reserve Fund

In order to ensure that Loudoun Water has the financial capability to maintain operation of both the Community Water and Sewer Systems, it is essential that the depreciation of the systems over time is accounted for. The assets of the water and sewer systems, including pumps, pipes and treatment facilities experience wear and tear on an annual basis, and because of this the assets must eventually be replaced or rehabilitated. If Loudoun Water did not factor this depreciation into its cost of service and ultimately the rates that it imposes, the revenues associated with this future replacement would either need to be raised through large rate hikes or increased borrowing, neither of which properly allocates costs to current users of the system. To address the need for system reinvestment in light of the planned capital improvements discussed in Section 3.2, MFSG recommends that Loudoun Water develop a “replacement reserve” that is funded at a rate of 50% of the calculated annual depreciation of each system. Due to the rising cost of construction, reserve contributions were inflated at 5% per year. The following sections will discuss the replacement funds of both the Water and Sewer Community Systems.

#### 3.4.1 Water System Replacement Reserve Fund

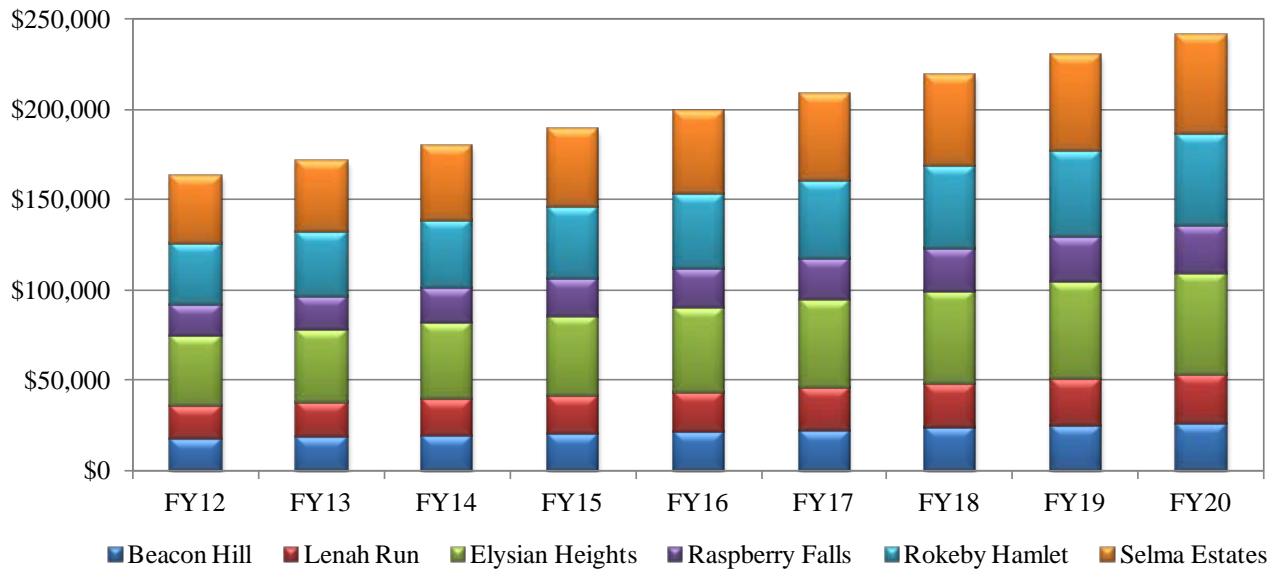
The replacement reserve fund for each water system is based on the current book value of that system. As a system’s asset depreciates over its useful life, the reserve fund contribution for that asset is determined to be 50% of depreciation. For example, if an asset’s value when new is \$1,000,000 and it has a useful life of 100 years, the annual depreciation of the asset would be \$10,000. In this example, \$5,000 per year would be contributed to a reserve fund in order to build up cash for the replacement of the asset once it has reached the end of its useful life. As assets are renewed and replaced, reserve fund contributions should be maintained based on the book value of the new assets. Table 3-7 and Exhibit 3-5 present the recommended replacement fund contributions for each of the Community Water Systems. It should be noted that the reason for the annual increases in the reserve contribution is to account for the increasing cost of replacement of assets.

As a result, contributions were escalated at 5% per year to maintain funding of the depreciation of the continually upgraded water system assets.

*Table 3-7: Water System FY12-FY14 Reserve Fund Contributions*

	FY12	FY13	FY14
Beacon Hill	\$17,788	\$18,677	\$19,611
Elysian Heights	\$38,154	\$40,062	\$42,065
Lenah Run	\$18,245	\$19,157	\$20,115
Raspberry	\$17,921	\$18,817	\$19,758
Rokeby	\$33,802	\$35,492	\$37,267
Selma	\$37,732	\$39,619	\$41,600
<b>Total</b>	<b>\$163,642</b>	<b>\$171,824</b>	<b>\$180,416</b>

*Exhibit 3-5: Water System Replacement Reserve Fund Contributions*



As shown above, the total reserve contribution for the water systems is about \$163,600 in FY12. The contribution rises to just under \$242,000 in FY20. As Loudoun Water accumulates funds in the replacement reserve, future capital projects related to repair and replacement will be funded from the reserve mitigating the need to borrow funds.

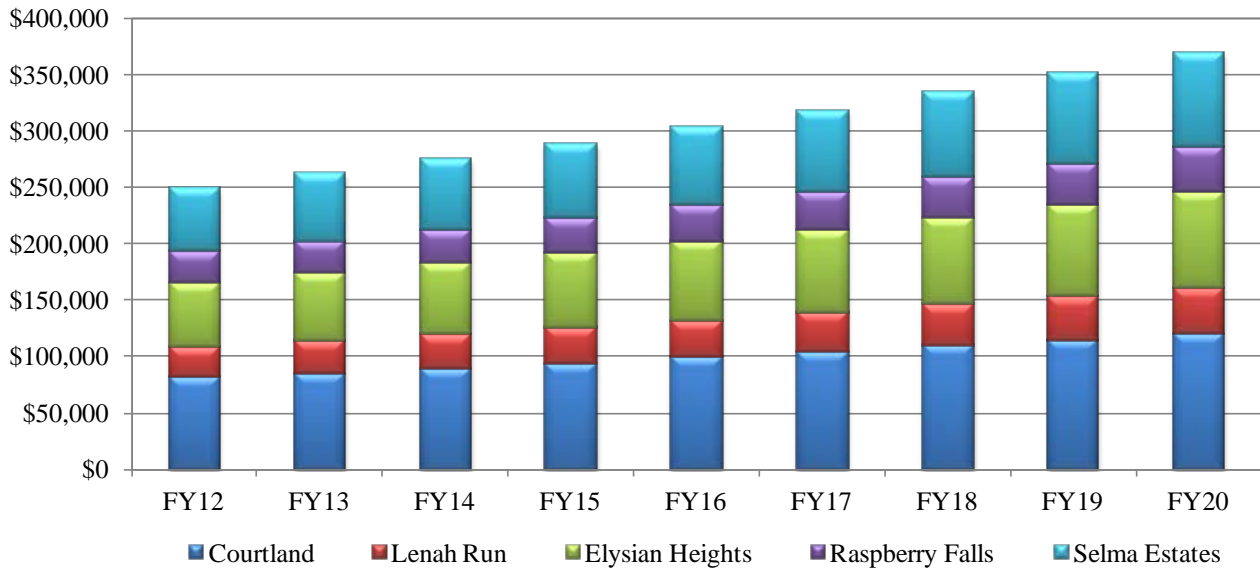
**3.4.2 Sewer System Replacement Reserve Fund**

The assets of the community sewer systems were significantly more expensive than those of the water systems. The sewer reserve fund contributions are calculated in the exact same way as the water systems, funding 50% of depreciation. Contributions were also escalated at 5% per year to maintain funding of the depreciation of the continually upgraded sewer system assets. Table 3-8 and Exhibit 3-6 show the total annual reserve contribution to each of the Community Sewer Systems.

*Table 3-8: Sewer System FY12-FY14 Reserve Fund Contributions*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Courtland	\$81,821	\$85,912	\$90,208
Elysian Heights	\$57,231	\$60,092	\$63,097
Lenah Run	\$27,368	\$28,736	\$30,173
Raspberry Falls	\$26,881	\$28,226	\$29,637
Selma	\$56,599	\$59,429	\$62,400
<b>Total</b>	<b>\$249,900</b>	<b>\$262,395</b>	<b>\$275,515</b>

*Exhibit 3-6: Sewer System Replacement Reserve Contributions*



The Community Sewer System total reserve contribution grows from approximately \$250,000 in FY12 to about \$369,000 in FY20. Similar to the Community Water System it is assumed that as funds are accumulated within the replacement reserve future capital projects related to system replacements will be funded from the reserve mitigating the need to borrow funds.

### **3.5 Total Revenue Requirements**

The summation of all of the expenses identified (O&M, capital reflected as debt payments and reserve contributions) combine to make up the total revenue requirements of each water and sewer community system. The following section provides the revenue requirements for each individual community as well as combined water and combined sewer total revenue requirements.

#### **3.5.1 Water System Revenue Requirements**

The total revenue requirements for each individual water system are shown in Tables 3-9 – 3-14 and combined in Table 3-15.

### ***Beacon Hill***

*Table 3-9: Beacon Hill Water Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
O&M Expenses	\$105,870	\$111,164	\$116,722
Projected Debt	\$13,097	\$13,097	\$13,097
Replacement Reserve Contribution	\$17,788	\$18,677	\$19,611
<b>Total Revenue Requirements</b>	<b>\$136,755</b>	<b>\$142,938</b>	<b>\$149,430</b>

### ***Elysian Heights***

*Table 3-10: Elysian Heights Water Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
O&M Expenses	\$100,641	\$105,673	\$110,957
Projected Debt	\$5,116	\$5,116	\$5,116
Replacement Reserve Contribution	\$38,154	\$40,062	\$42,065
<b>Total Revenue Requirements</b>	<b>\$143,911</b>	<b>\$150,851</b>	<b>\$158,138</b>

### ***Lenah Run***

*Table 3-11: Lenah Run Water Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
O&M Expenses	\$174,498	\$183,223	\$192,384
Projected Debt	\$28,445	\$28,445	\$28,445
Replacement Reserve Contribution	\$18,245	\$19,157	\$20,115
<b>Total Revenue Requirements</b>	<b>\$221,188</b>	<b>\$230,825</b>	<b>\$240,944</b>

### ***Raspberry Falls***

*Table 3-12: Raspberry Falls Water Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
O&M Expenses	\$97,892	\$102,786	\$107,925
Projected Debt	\$23,533	\$23,533	\$23,533
Replacement Reserve Contribution	\$17,921	\$18,817	\$19,758
<b>Total Revenue Requirements</b>	<b>\$139,346</b>	<b>\$145,136</b>	<b>\$151,216</b>

### ***Rokeby***

*Table 3-13: Rokeby Water Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
O&M Expenses	\$52,987	\$55,636	\$58,418
Projected Debt	\$13,097	\$13,097	\$13,097
Replacement Reserve Contribution	\$33,802	\$35,492	\$37,267
<b>Total Revenue Requirements</b>	<b>\$99,886</b>	<b>\$104,225</b>	<b>\$108,782</b>

## Selma

Table 3-14: Selma Water Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
O&M Expenses	\$58,407	\$61,326	\$64,392
Projected Debt	\$11,255	\$11,255	\$11,255
Replacement Reserve Contribution	\$37,732	\$39,619	\$41,600
<b>Total Revenue Requirements</b>	<b>\$107,394</b>	<b>\$112,200</b>	<b>\$117,247</b>

## Total Community Water System

Table 3-15: Total Water Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
O&M Expenses	\$590,295	\$619,808	\$650,798
Projected Debt	\$94,543	\$94,543	\$94,543
Replacement Reserve Contribution	\$163,642	\$171,824	\$180,416
<b>Total Revenue Requirements</b>	<b>\$848,480</b>	<b>\$886,175</b>	<b>\$925,757</b>

### 3.5.2 Sewer System Revenue Requirements

The total revenue requirements for each individual sewer system are shown in Tables 3-16 - 3-20 and combined in Table 3-21.

## Courtland

Table 3-16: Courtland Sewer Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
O&M Expenses	\$336,874	\$353,718	\$371,404
Projected Debt	\$6,139	\$6,139	\$6,139
Replacement Reserve Contribution	\$81,821	\$85,912	\$90,208
<b>Total Revenue Requirements</b>	<b>\$424,834</b>	<b>\$445,769</b>	<b>\$467,751</b>

## Elysian Heights

Table 3-17: Elysian Heights Sewer Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
O&M Expenses	\$135,827	\$142,618	\$149,749
Projected Debt	\$3,683	\$3,683	\$3,683
Replacement Reserve Contribution	\$57,231	\$60,092	\$63,097
<b>Total Revenue Requirements</b>	<b>\$196,741</b>	<b>\$206,393</b>	<b>\$216,529</b>

## Lenah Run

Table 3-18: Lenah Run Sewer Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
O&M Expenses	\$235,505	\$247,280	\$259,644
Projected Debt	\$6,139	\$6,139	\$6,139
Replacement Reserve Contribution	\$27,368	\$28,736	\$30,173
<b>Total Revenue Requirements</b>	<b>\$269,012</b>	<b>\$282,155</b>	<b>\$295,956</b>

## Raspberry Falls

Table 3-19: Raspberry Falls Sewer Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
O&M Expenses	\$153,869	\$161,564	\$169,642
Projected Debt	\$4,911	\$4,911	\$4,911
Replacement Reserve Contribution	\$26,881	\$28,226	\$29,637
<b>Total Revenue Requirements</b>	<b>\$185,661</b>	<b>\$194,701</b>	<b>\$204,190</b>

## Selma

Table 3-20: Selma Sewer Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
O&M Expenses	\$78,923	\$82,870	\$87,013
Projected Debt	\$3,070	\$3,070	\$3,070
Replacement Reserve Contribution	\$56,599	\$59,429	\$62,400
<b>Total Revenue Requirements</b>	<b>\$138,592</b>	<b>\$145,369</b>	<b>\$152,483</b>

## Total Sewer System Revenue Requirements

Table 3-21: Total Sewer System Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
O&M Expenses	\$940,998	\$988,050	\$1,037,452
Projected Debt	\$23,942	\$23,942	\$23,942
Replacement Reserve Contribution	\$249,900	\$262,395	\$275,515
<b>Total Revenue Requirements</b>	<b>\$1,214,840</b>	<b>\$1,274,387</b>	<b>\$1,336,909</b>

## 3.6 Net Revenue Requirements

In order to determine the revenue adequacy of the current Community System water and sewer rates, certain miscellaneous revenues need to be taken into account. Four of Loudoun Water's Community Systems have agreements with developers that require certain contributions based on projected operating shortfalls in those communities. Courtland (sewer only), Elysian Heights (water and sewer), Raspberry (water and sewer) and Selma (water and sewer) all have such agreements with developers. These communities will receive operating subsidies from these developers until they reach at least 90% buildout. It should be noted that this covers operating expenses and reserve

contributions for repair and replacement, so rates in these communities must be maintained to fully fund capital/debt spending and the reserve contributions of the systems.

As with operating expenses, the developer’s contribution is allocated 40% to the water system and 60% to the sewer system in all cases except Courtland, which only operates a sewer system. A summary of projected developer contributions for both the water and sewer systems are shown in Tables 3-22 and 3-23.

*Table 3-22: Water System Developer Contributions FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Elysian Heights	\$33,578	\$23,067	\$12,555
Raspberry Falls	\$8,000	\$8,000	\$8,000
Selma Estates	\$32,847	\$24,748	\$16,649
<b>Total</b>	<b>\$74,425</b>	<b>\$55,815</b>	<b>\$37,204</b>

*Table 3-23: Sewer System Developer Contributions FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Courtland	\$40,301	\$ -	\$ -
Elysian Heights	\$50,367	\$34,600	\$18,833
Raspberry Falls	\$12,000	\$12,000	\$12,000
Selma Estates	\$49,271	\$37,122	\$24,973
<b>Total</b>	<b>\$151,939</b>	<b>\$83,722</b>	<b>\$55,806</b>

These developer contributions are subtracted from the total revenue requirement when applicable to arrive at the net revenue requirements for each system. The sections below outline the net revenue requirements and revenue projections at current rates for each water and sewer community, as well as the Water and Sewer Community Systems as a whole.

### ***3.6.1 Water Systems Net Revenue Requirements***

The comparison of net revenue requirements with the revenues generated from current water and sewer rates provides insight into the sufficiency of current rates to cover system revenue requirements. Tables 3-22 to 3-27 present the anticipated annual surplus or shortfall for each individual water system and the resulting required breakeven increase in revenue to cover the revenue requirements. It should be noted that the breakeven increase in revenues is not cumulative. Additionally the revenues shown in the Tables are based on current rates and projected customer and usage growth. The revenues assume no changes in rates.

### ***Beacon Hill***

*Table 3-22: Beacon Hill Water Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Total Revenue Requirements	\$136,755	\$142,938	\$149,430
Developer Subsidy	\$ -	\$ -	\$ -
<b>Net Revenue Requirement</b>	<b>\$136,755</b>	<b>\$142,938</b>	<b>\$149,430</b>
Revenue Under Current Rates	\$51,085	\$51,085	\$51,085
<b>Surplus / (Deficit)</b>	<b>(\$85,670)</b>	<b>(\$91,853)</b>	<b>(\$98,345)</b>
<i>Breakeven % Rate Increase</i>	<i>168%</i>	<i>180%</i>	<i>193%</i>

### ***Elysian Heights***

*Table 3-23: Elysian Heights Water Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Total Revenue Requirements	\$143,911	\$150,851	\$158,138
Developer Subsidy	\$33,578	\$23,067	\$12,555
<b>Net Revenue Requirement</b>	<b>\$110,333</b>	<b>\$127,784</b>	<b>\$145,583</b>
Revenue Under Current Rates	\$80,729	\$94,634	\$108,539
<b>Surplus / (Deficit)</b>	<b>(\$29,604)</b>	<b>(\$33,150)</b>	<b>(\$37,044)</b>
<i>Breakeven % Rate Increase</i>	<i>37%</i>	<i>35%</i>	<i>34%</i>

### ***Lenah Run***

*Table 3-24: Lenah Run Water Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Total Revenue Requirements	\$221,188	\$230,825	\$240,944
Developer Subsidy	\$ -	\$ -	\$ -
<b>Net Revenue Requirement</b>	<b>\$221,188</b>	<b>\$230,825</b>	<b>\$240,944</b>
Revenue Under Current Rates	\$142,651	\$142,651	\$142,651
<b>Surplus / (Deficit)</b>	<b>(\$78,537)</b>	<b>(\$88,174)</b>	<b>(\$98,293)</b>
<i>Breakeven % Rate Increase</i>	<i>55%</i>	<i>62%</i>	<i>69%</i>

### Raspberry Falls

Table 3-25: Raspberry Falls Water Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
Total Revenue Requirements	\$139,346	\$145,136	\$151,216
Developer Subsidy	\$8,000	\$8,000	\$8,000
<b>Net Revenue Requirement</b>	<b>\$131,346</b>	<b>\$137,136</b>	<b>\$143,216</b>
Revenue Under Current Rates	\$112,095	\$112,778	\$112,785
<b>Surplus / (Deficit)</b>	<b>(\$19,251)</b>	<b>(\$24,358)</b>	<b>(\$30,431)</b>
<i>Breakeven % Rate Increase</i>	<i>17%</i>	<i>22%</i>	<i>27%</i>

### Rokeby

Table 3-26: Rokeby Water Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
Total Revenue Requirements	\$99,886	\$104,225	\$108,782
Developer Subsidy	\$ -	\$ -	\$ -
<b>Net Revenue Requirement</b>	<b>\$99,886</b>	<b>\$104,225</b>	<b>\$108,782</b>
Revenue Under Current Rates	\$43,533	\$43,533	\$43,533
<b>Surplus / (Deficit)</b>	<b>(\$56,353)</b>	<b>(\$60,692)</b>	<b>(\$65,249)</b>
<i>Breakeven % Rate Increase</i>	<i>129%</i>	<i>139%</i>	<i>150%</i>

### Selma

Table 3-27: Selma Water Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
Total Revenue Requirements	\$107,394	\$112,200	\$117,247
Developer Subsidy	\$32,847	\$24,748	\$16,649
<b>Net Revenue Requirement</b>	<b>\$74,547</b>	<b>\$87,452</b>	<b>\$100,598</b>
Revenue Under Current Rates	\$54,171	\$74,699	\$95,227
<b>Surplus / (Deficit)</b>	<b>(\$20,376)</b>	<b>(\$12,753)</b>	<b>(\$5,371)</b>
<i>Breakeven % Rate Increase</i>	<i>38%</i>	<i>17%</i>	<i>6%</i>

Tables 3-22 to 3-27 demonstrate that none of the water systems will be able to cover the annual net revenue requirements during FY12–FY14. Table 3-28 presents the combined water system net revenue requirements and the total water system revenues with current rates.

**Total Community Water System**

**Table 3-28: Total Water System Revenue Requirements, FY12 – FY14**

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Total Revenue Requirements	\$848,480	\$886,175	\$925,757
Developer Subsidy	\$74,425	\$55,815	\$37,204
<b>Net Revenue Requirement</b>	<b>\$774,055</b>	<b>\$830,360</b>	<b>\$888,553</b>
Revenue Under Current Rates	\$484,264	\$519,380	\$553,820
<b>Surplus / (Deficit)</b>	<b>(\$289,791)</b>	<b>(\$310,980)</b>	<b>(\$334,733)</b>
<i>Breakeven % Rate Increase</i>	<i>60%</i>	<i>60%</i>	<i>60%</i>

As demonstrated in Table 3-15 and Table 3-28, the total water revenues from the Community Water Systems will not be sufficient in FY12 or subsequent years to fund the costs of operating and maintaining the water systems. No revenues will be available for capital or replacement fund contributions. Exhibit 3-7 presents a comparison of the FY12 revenues and the various components of the revenue requirements.

**Exhibit 3-7: Water Revenues and Shortfalls Under Current Rates**

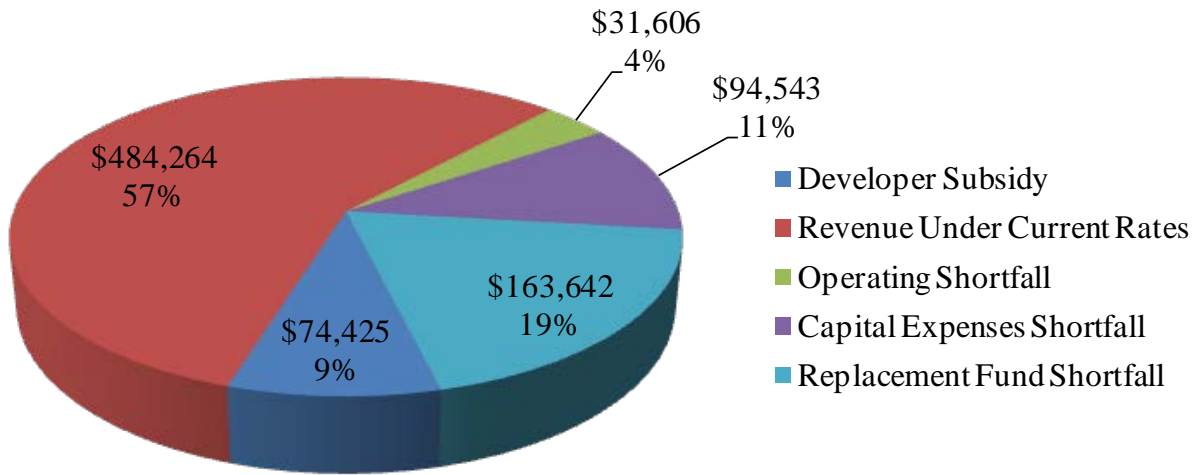


Exhibit 3-7 shows that revenues with current rates and the developer subsidies are almost able to fully fund the water systems O&M expenses (there is a small operating shortfall). However, the current rates combined with the developer subsidies are not able to fund any capital expenses (in the form of debt service) or contributions to the replacement fund.

**3.6.2 Sewer System Net Revenue Requirements**

Tables 3-29 – 3-33 present the anticipated annual surplus or shortfall for each individual sewer system and the resulting required breakeven increase in revenue to cover the revenue requirements.

Similar to the water system, the sewer system revenues are based on current rates and any increases in revenues are due to growth in customers and usage.

### ***Courtland***

*Table 3-29: Courtland Sewer Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Total Revenue Requirements	\$424,834	\$445,769	\$467,751
Developer Subsidy	\$40,301	\$ -	\$ -
<b>Net Revenue Requirement</b>	<b>\$384,533</b>	<b>\$445,769</b>	<b>\$467,751</b>
Revenue Under Current Rates	\$77,672	\$84,607	\$84,611
<b>Surplus / (Deficit)</b>	<b>(\$306,861)</b>	<b>(\$361,162)</b>	<b>(\$383,140)</b>
<i>Breakeven % Rate Increase</i>	<i>395%</i>	<i>427%</i>	<i>453%</i>

### ***Elysian Heights***

*Table 3-30: Elysian Heights Sewer Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Total Revenue Requirements	\$196,741	\$206,393	\$216,529
Developer Subsidy	\$50,367	\$34,600	\$18,833
<b>Net Revenue Requirement</b>	<b>\$146,374</b>	<b>\$171,793</b>	<b>\$197,696</b>
Revenue Under Current Rates	\$62,710	\$73,512	\$84,313
<b>Surplus / (Deficit)</b>	<b>(\$83,664)</b>	<b>(\$98,281)</b>	<b>(\$113,383)</b>
<i>Breakeven % Rate Increase</i>	<i>133%</i>	<i>134%</i>	<i>134%</i>

### ***Lenah Run***

*Table 3-31: Lenah Run Sewer Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Total Revenue Requirements	\$269,012	\$282,155	\$295,956
Developer Subsidy	\$ -	\$ -	\$ -
<b>Net Revenue Requirement</b>	<b>\$269,012</b>	<b>\$282,155</b>	<b>\$295,956</b>
Revenue Under Current Rates	\$96,650	\$96,650	\$96,650
<b>Surplus / (Deficit)</b>	<b>(\$172,362)</b>	<b>(\$185,505)</b>	<b>(\$199,306)</b>
<i>Breakeven % Rate Increase</i>	<i>178%</i>	<i>192%</i>	<i>206%</i>

### Raspberry Falls

Table 3-32: Raspberry Falls Sewer Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
Total Revenue Requirements	\$185,661	\$194,701	\$204,190
Developer Subsidy	\$12,000	\$12,000	\$12,000
<b>Net Revenue Requirement</b>	<b>\$173,661</b>	<b>\$182,701</b>	<b>\$192,190</b>
Revenue Under Current Rates	\$63,486	\$63,873	\$63,877
<b>Surplus / (Deficit)</b>	<b>(\$110,175)</b>	<b>(\$118,828)</b>	<b>(\$128,313)</b>
<i>Breakeven % Rate Increase</i>	<i>174%</i>	<i>186%</i>	<i>201%</i>

### Selma

Table 3-33: Selma Sewer Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
Total Revenue Requirements	\$138,592	\$145,369	\$152,483
Developer Subsidy	\$49,271	\$37,122	\$24,973
<b>Net Revenue Requirement</b>	<b>\$89,321</b>	<b>\$108,247</b>	<b>\$127,510</b>
Revenue Under Current Rates	\$33,153	\$41,286	\$47,972
<b>Surplus / (Deficit)</b>	<b>(\$56,168)</b>	<b>(\$66,961)</b>	<b>(\$79,538)</b>
<i>Breakeven % Rate Increase</i>	<i>169%</i>	<i>162%</i>	<i>166%</i>

Tables 3-29 – 3-33 demonstrate that none of the sewer systems will be able to cover the annual net revenue requirements during FY12 - FY14 or during the remainder of the forecast period. The tables also demonstrate that the annual shortfalls are more significant than for the water system resulting in the need for more substantial revenue increases. Table 3-34 presents the combined sewer system net revenue requirements and the total sewer system revenues with current rates.

**Total Sewer System Revenue Requirements**

*Table 3-34: Total Sewer System Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Total Revenue Requirements	\$1,214,840	\$1,274,387	\$1,336,909
Developer Subsidy	\$151,939	\$83,722	\$55,806
<b>Net Revenue Requirement</b>	<b>\$1,062,901</b>	<b>\$1,190,665</b>	<b>\$1,281,103</b>
Revenue Under Current Rates	\$333,671	\$359,928	\$377,423
<b>Surplus / (Deficit)</b>	<b>(\$729,230)</b>	<b>(\$830,737)</b>	<b>(\$903,680)</b>
<i>Breakeven % Rate Increase</i>	<i>219%</i>	<i>231%</i>	<i>239%</i>

As demonstrated in Table 3-21 and Table 3-34, the total sewer revenues from the Community Sewer Systems will not be sufficient in FY12 or subsequent years to fund the costs of operating and maintaining the sewer systems. Exhibit 3-8 presents a comparison of the FY12 revenues and the various components of the revenue requirements.

**Exhibit 3-8: Sewer Revenues and Shortfalls Under Current Rates**

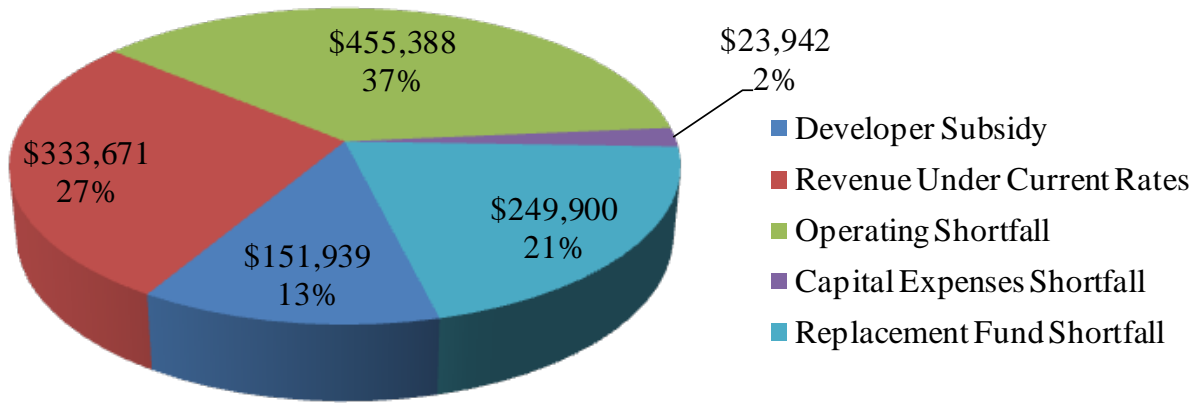


Exhibit 3-8 shows that revenues with current rates and the developer subsidies are not able to fund O&M expenses. No revenues are available to fund capital expenses (in the form of debt service payments) or contributions to a replacement fund.

### 3.6.3 Total System Net Revenue Requirements

The following section of the report presents the total revenue requirements (water and sewer combined) for those systems with both services. Systems that provide only water or only sewer are repeated herein for consistency and to allow for a demonstration the total community system revenue requirements.

#### Beacon Hill

Table 3-35: Beacon Hill Total Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
Total Revenue Requirements	\$136,755	\$142,938	\$149,430
Developer Subsidy	\$ -	\$ -	\$ -
<b>Net Revenue Requirement</b>	<b>\$136,755</b>	<b>\$142,938</b>	<b>\$149,430</b>
Revenue Under Current Rates	\$51,085	\$51,085	\$51,085
<i>Surplus / (Deficit)</i>	<i>(\$85,670)</i>	<i>(\$91,853)</i>	<i>(\$98,345)</i>
<i>Breakeven % Rate Increase</i>	<i>168%</i>	<i>180%</i>	<i>193%</i>

#### Elysian Heights

Table 3-36: Elysian Heights Total Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
Total Revenue Requirements	\$340,652	\$357,244	\$374,667
Developer Subsidy	\$83,945	\$57,667	\$31,388
<b>Net Revenue Requirement</b>	<b>\$256,707</b>	<b>\$299,577</b>	<b>\$343,279</b>
Revenue Under Current Rates	\$143,439	\$168,146	\$192,852
<i>Surplus / (Deficit)</i>	<i>(\$113,268)</i>	<i>(\$131,431)</i>	<i>(\$150,427)</i>
<i>Breakeven % Rate Increase</i>	<i>79%</i>	<i>78%</i>	<i>78%</i>

#### Lenah Run

Table 3-37: Lenah Run Total Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
Total Revenue Requirements	\$490,200	\$512,980	\$536,900
Developer Subsidy	\$ -	\$ -	\$ -
<b>Net Revenue Requirement</b>	<b>\$490,200</b>	<b>\$512,980</b>	<b>\$536,900</b>
Revenue Under Current Rates	\$239,301	\$239,301	\$239,301
<i>Surplus / (Deficit)</i>	<i>(\$250,899)</i>	<i>(\$273,679)</i>	<i>(\$297,599)</i>
<i>Breakeven % Rate Increase</i>	<i>105%</i>	<i>114%</i>	<i>124%</i>

### Raspberry Falls

Table 3-38: Raspberry Falls Total Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
Total Revenue Requirements	\$325,007	\$339,837	\$355,406
Developer Subsidy	\$20,000	\$20,000	\$20,000
<b>Net Revenue Requirement</b>	<b>\$305,007</b>	<b>\$319,837</b>	<b>\$335,406</b>
Revenue Under Current Rates	\$175,581	\$176,651	\$176,662
<b>Surplus / (Deficit)</b>	<b>(\$129,426)</b>	<b>(\$143,186)</b>	<b>(\$158,744)</b>
<i>Breakeven % Rate Increase</i>	<i>74%</i>	<i>81%</i>	<i>90%</i>

### Rokeby

Table 3-39: Rokeby Total Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
Total Revenue Requirements	\$99,886	\$104,225	\$108,782
Developer Subsidy	\$ -	\$ -	\$ -
<b>Net Revenue Requirement</b>	<b>\$99,886</b>	<b>\$104,225</b>	<b>\$108,782</b>
Revenue Under Current Rates	\$43,533	\$43,533	\$43,533
<b>Surplus / (Deficit)</b>	<b>(\$56,353)</b>	<b>(\$60,692)</b>	<b>(\$65,249)</b>
<i>Breakeven % Rate Increase</i>	<i>129%</i>	<i>139%</i>	<i>150%</i>

### Selma

Table 3-40: Selma Total Revenue Requirements, FY12 – FY14

	FY12	FY13	FY14
Total Revenue Requirements	\$245,986	\$257,569	\$269,730
Developer Subsidy	\$82,118	\$61,870	\$41,622
<b>Net Revenue Requirement</b>	<b>\$163,868</b>	<b>\$195,699</b>	<b>\$228,108</b>
Revenue Under Current Rates	\$87,324	\$115,985	\$143,199
<b>Surplus / (Deficit)</b>	<b>(\$76,544)</b>	<b>(\$79,714)</b>	<b>(\$84,909)</b>
<i>Breakeven % Rate Increase</i>	<i>88%</i>	<i>69%</i>	<i>59%</i>

**Courtland**

*Table 3-41: Courtland Total System Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Total Revenue Requirements	\$424,834	\$445,769	\$467,751
Developer Subsidy	\$40,301	\$ -	\$ -
<b>Net Revenue Requirement</b>	<b>\$384,533</b>	<b>\$445,769</b>	<b>\$467,751</b>
Revenue Under Current Rates	\$77,672	\$84,607	\$84,611
<b>Surplus / (Deficit)</b>	<b>(\$306,861)</b>	<b>(\$361,162)</b>	<b>(\$383,140)</b>
<i>Breakeven % Rate Increase</i>	<i>395%</i>	<i>427%</i>	<i>453%</i>

**Total Community System Water and Sewer Revenue Requirements**

*Table 3-42: Total Community System Revenue Requirements, FY12 – FY14*

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Total Revenue Requirements	\$2,063,320	\$2,160,562	\$2,262,666
Developer Subsidy	\$226,364	\$139,537	\$93,010
<b>Net Revenue Requirement</b>	<b>\$1,836,956</b>	<b>\$2,021,025</b>	<b>\$2,169,656</b>
Revenue Under Current Rates	\$817,935	\$879,308	\$931,243
<b>Surplus / (Deficit)</b>	<b>(\$1,019,021)</b>	<b>(\$1,141,717)</b>	<b>(\$1,238,413)</b>
<i>Breakeven % Rate Increase</i>	<i>125%</i>	<i>130%</i>	<i>133%</i>

## 4. USAGE, DEMAND AND SYSTEM CHARACTERISTICS

To complete the cost of service and rate study it is necessary to gain an understanding of the make-up of the customer base served within the Community Systems including the number of customers by type and customer usage patterns. The following section provides an overview of this analysis.

### 4.1 Customer Counts

The customer counts for each individual community system were reviewed and forecasted over the projection period based on anticipated growth within each community. The current and forecasted customer counts for the community water and sewer systems are presented below.

#### 4.1.1 Water System Customers

Table 4-1 presents current (at time of study plus projection to year-end) and projected number of customers in the community water systems. The table also presents the total projected build-out number of connection by system.

*Table 4-1: Water System FY11-FY14 Customer Counts*

	<b>Current FY11</b>	<b>Projected FY12</b>	<b>Projected FY13</b>	<b>Projected FY14</b>	<b>Build-out</b>
Beacon Hill	95	95	95	95	96
Elysian Heights	179	209	245	281	324
Lenah Run	255	255	255	255	260
Raspberry	145	157	158	158	187
Rokeby	80	80	80	80	81
Selma	59	95	131	167	277
<b>Total</b>	<b>813</b>	<b>891</b>	<b>964</b>	<b>1036</b>	<b>1255</b>
<i>% Increase (Total System)</i>	-	10%	8%	7%	

Each community system has its own growth projections, ranging from flat (no growth) to over 10% growth over the projection period. Newer communities such as Elysian Heights and Selma are projected to have the most growth in customers as they approach build-out.

### 4.1.2 Sewer System Customers

Table 4-2: Sewer System FY12-FY14 Customer Counts

	<b>Current FY11</b>	<b>Projected FY12</b>	<b>Projected FY13</b>	<b>Projected FY14</b>	<b>Build-out</b>
Courtland	186	222	242	242	244
Lenah Run	255	255	255	255	260
Elysian Heights	179	209	245	281	324
Raspberry Falls	145	157	158	158	187
Selma	59	95	131	167	277
<b>Total</b>	<b>824</b>	<b>938</b>	<b>1031</b>	<b>1103</b>	<b>1292</b>
<i>% Increase (Total System)</i>	-	14%	10%	7%	

### 4.2 Consumption Data and Usage Patterns

The Community Water Systems delivered approximately 83 million gallons of water to customers located in the systems during 2010. Wastewater production for the Community Sewer Systems with metered consumption data for the same time period was 64 million gallons (capped at 48 million gallons for billing purposes). It should be noted that actual consumption data for FY 09 and FY 10 were used in the analysis. At the time of completion of the analysis, FY11 data was not yet available as the analysis was completed primarily during the summer of 2011.

In order to project future water demand and wastewater production, historical demand and production numbers were reviewed. Loudoun Water Community Systems customers, on average use about 9,200 gallons per month compared to the national average household at about 5,000 gallons a month. Many new communities may have skewed water consumption data due to the high water use required when initially installing grass and landscaping. However, in many of the communities where consumption data has been available for multiple years, water use significantly above the national average is common place.

The following sections offer brief descriptions of the consumption profiles of each of the Water and Sewer Community Systems.

### 4.2.1 Water System Consumption Data

This section offers brief descriptions of the consumption profiles for each of the water community systems. Unless otherwise noted, usage is expressed in gallons per day (GPD).

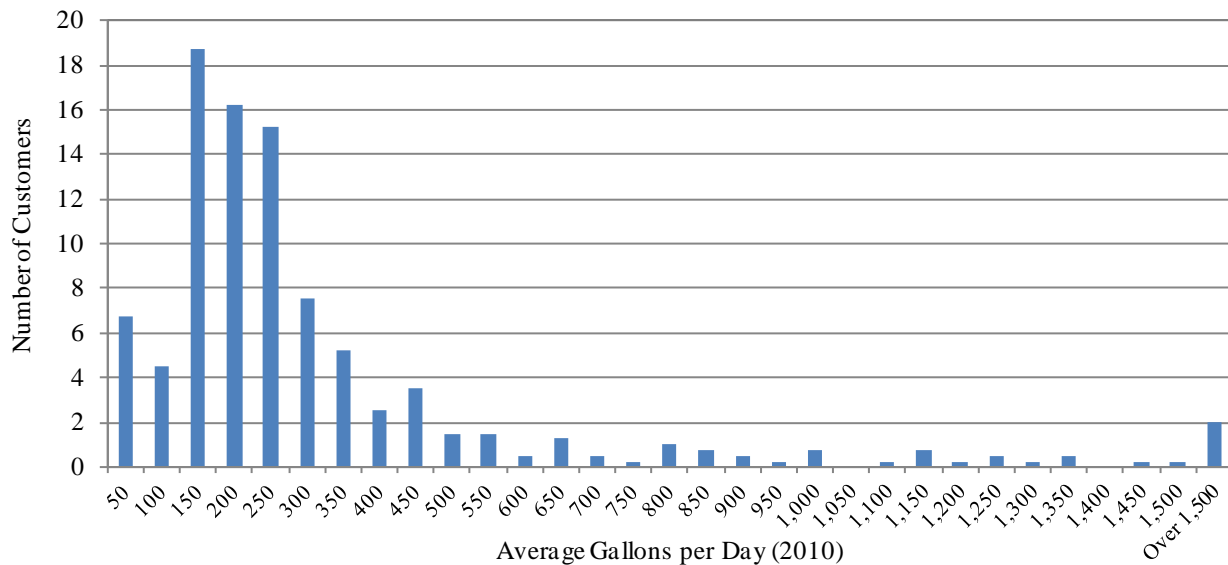
#### Beacon Hill

Beacon Hill's 2010 consumption information is as follows:

- Billed Usage: 10.25 million gallons
- Summer GPD: 495
- Winter GPD: 169
- 2010 Average GPD: 332
- Percent of customers averaging less than:
  - 250 GPD: 65%
  - 800 GPD: 90%

Exhibit 4-1 shows the daily average usage distribution of Beacon Hill customers in 50 GPD increments for the year 2010. It should be noted that the exhibit presents the daily average for the entire year (which includes summer usage).

**Exhibit 4-1: Beacon Hill Consumption Histogram**



Due to the fact that Beacon Hill is not expected to add any connections over the course of the projection period, the consumption habits of this community's customers are not projected to change significantly.

## *Elysian Heights*

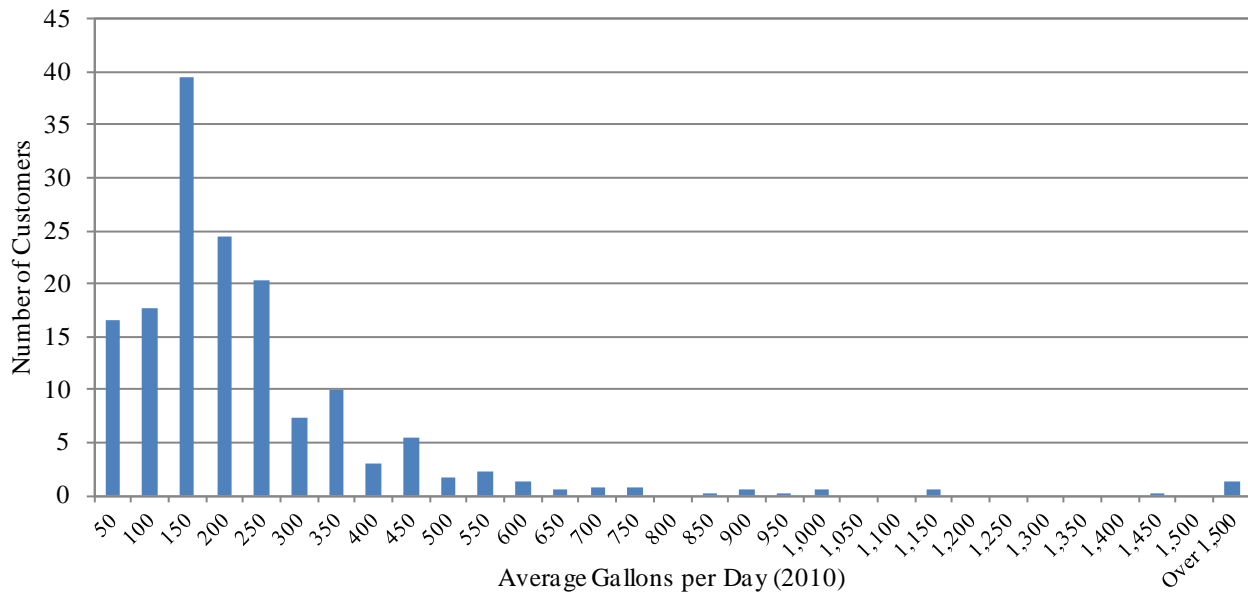
Elysian Heights is one of the communities that is expected to see significant consumption growth over the course of the projection period. In 2010, the Elysian Heights community was only at 48% of build-out, so it is possible that as the community expands the consumption patterns of its customers may change.

Elysian Heights' 2010 consumption information is as follows:

- Billed Usage: 11.65 million gallons
- Summer GPD: 331
- Winter GPD: 136
- 2010 Average GPD: 234
- Percent of customers averaging less than:
  - 250 GPD: 75%
  - 800 GPD: 95%

Exhibit 4-2 shows the consumption pattern of Elysian Heights customers in 2010.

***Exhibit 4-2: Elysian Heights Consumption Histogram***



Over 95% of customers in Elysian Heights consume less than 800 GPD and over 75% consume less than 250 GPD on average. This pattern of consumption was projected to continue over the projection period even as the community adds customers. An annual review of the consumption patterns in Elysian Heights would be advisable until the community approaches its build-out number of customers in order to update the community's consumption patterns if necessary.

## ***Lenah Run***

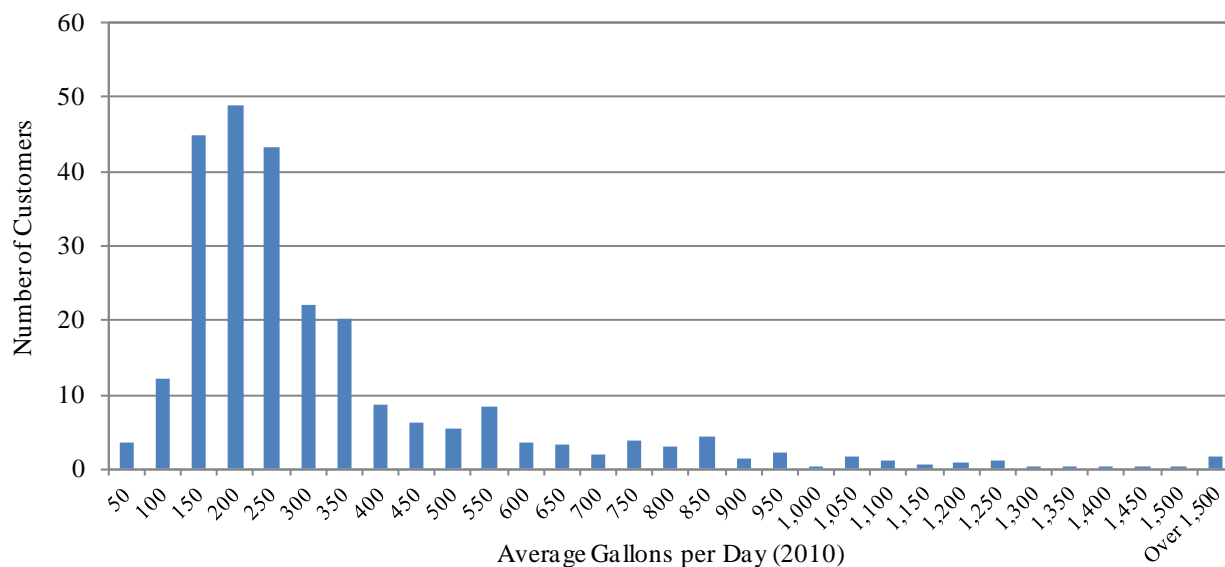
Lenah Run is the largest of the community water systems with just over 250 customers. Therefore, customers in Lenah Run consume more water than any other community in total, but their consumption patterns do not differ significantly from the other communities. Lenah Run is not expected to have any growth in customers or consumption over the projection period.

Lenah Run's 2010 consumption information is as follows:

- Billed Usage: 29.24 million gallons
- Summer GPD: 494
- Winter GPD: 191
- 2010 Average GPD: 343
- Percent of customers averaging less than:
  - 250 GPD: 60%
  - 800 GPD: 92%

Exhibit 4-3 presents the consumption patterns of Lenah Run customers in 2010.

***Exhibit 4-3: Lenah Run Consumption Histogram***



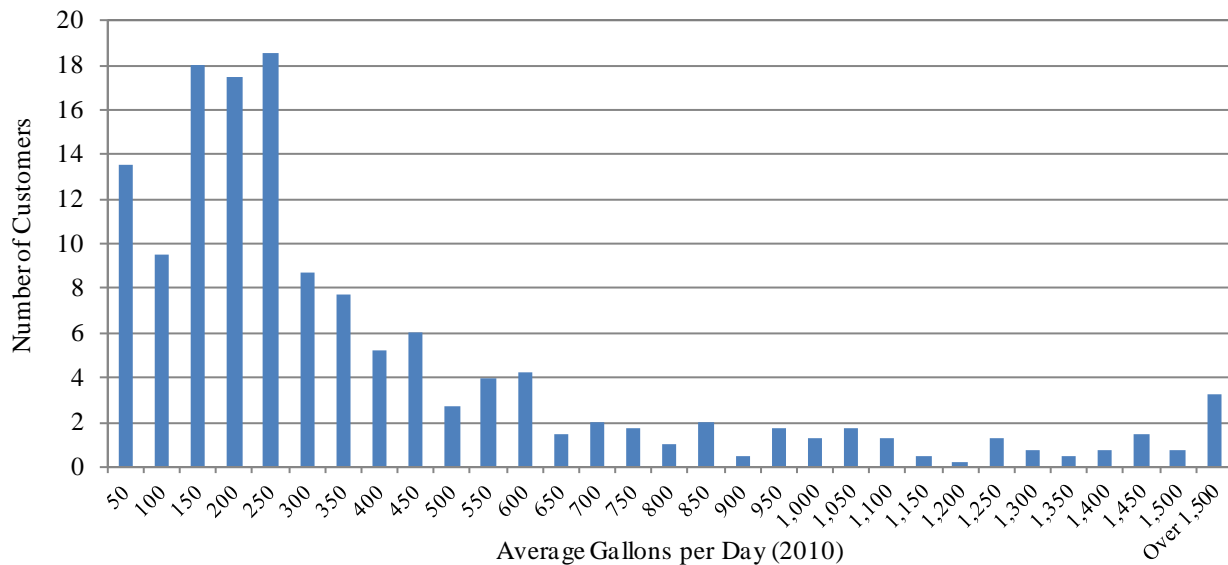
## Raspberry Falls

Raspberry Falls is a mid-size community with 140 connections in 2010, and it is expected to see moderate growth over the projection period, reaching 158 connections in 2013. This can be seen by the general distribution of the consumption histogram shown in Exhibit 4-4.

Raspberry Falls' 2010 consumption information is as follows:

- Billed Usage: 19.27 million gallons
- Summer GPD: 587
- Winter GPD: 220
- 2010 Average GPD: 377
- Percent of customers averaging less than:
  - 250 GPD: 55%
  - 800 GPD: 87%

**Exhibit 4-4: Raspberry Falls Consumption Histogram**



## Rokeby

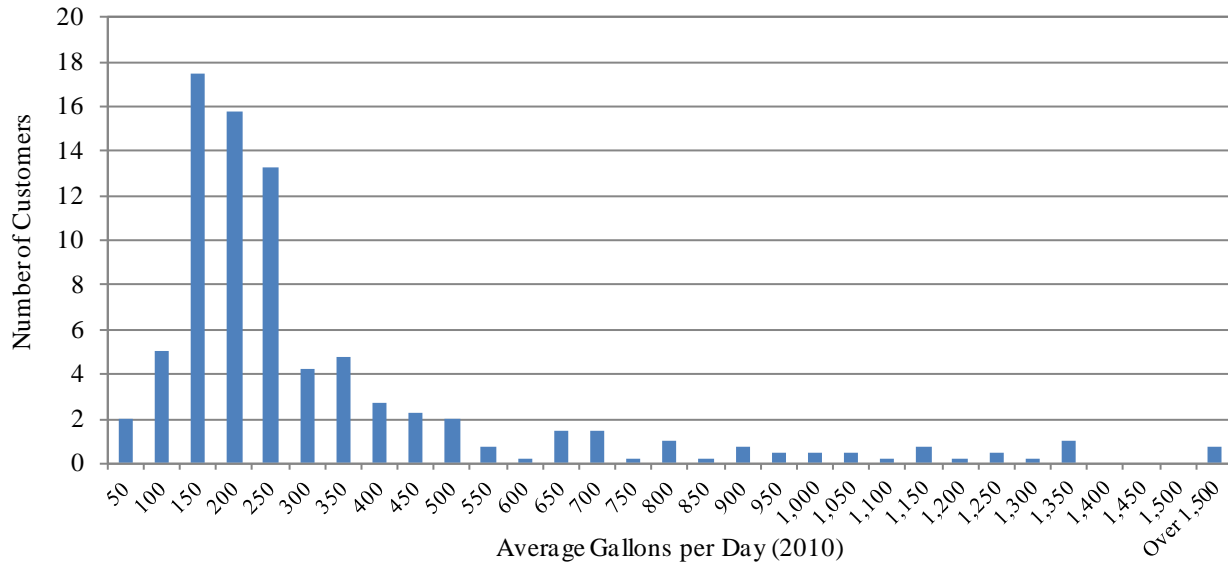
The Rokeby system is one of the smaller community water systems and has relatively low GPD consumption in 2010. Rokeby is not projected to see an increase in customers throughout the projection period, so its consumption patterns were held constant.

Rokeby's 2010 consumption information is as follows:

- Billed Usage: 8.86 million gallons
- Summer GPD: 457
- Winter GPD: 165
- 2010 Average GPD: 310
- Percent of customers averaging less than:
  - 250 GPD: 66%
  - 800 GPD: 90%

Exhibit 4-5 shows the consumption pattern of Rokeby customers in 2010.

**Exhibit 4-5: Rokeby Consumption Histogram**



## Selma

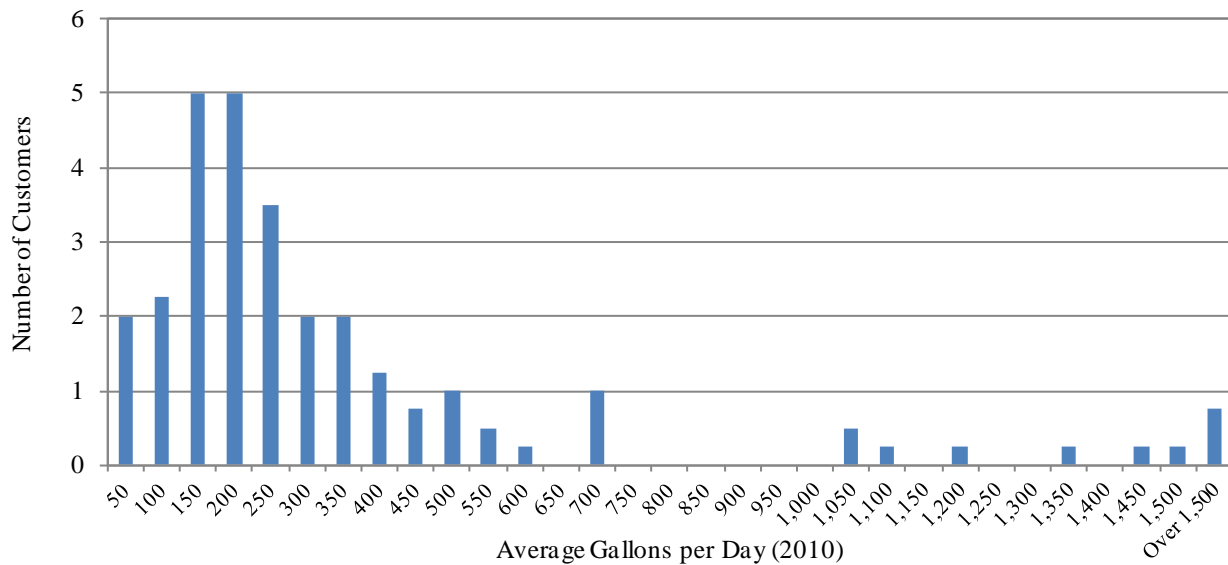
Selma is the newest community system and therefore is projected to experience a high level of growth during the projection period. In 2010 the system had only 29 connections of the possible 277 build-out connections. As the community grows, the consumption levels will grow and possibly the consumption patterns of the system's users will evolve.

Selma's 2010 consumption information is as follows:

- Billed Usage: 7.10 million gallons
- Summer GPD: 462
- Winter GPD: 245
- 2010 Average GPD: 354
- Percent of customers averaging less than:
  - 250 GPD: 61%
  - 800 GPD: 91%

Exhibit 4-6 shows the distribution of Selma's water consumption in 2010.

**Exhibit 4-6: Selma Consumption Histogram**



The consumption distribution for Selma is relatively the same as that of most other community systems, indicating that as the community grows the consumption patterns will not differ significantly from the other systems. The consumption pattern in Selma should be analyzed annually in order to determine the evolving patterns of Selma's consumption.

### ***Total Water System***

The following table summarizes the consumption projections for the community water systems for FY11-FY14.

*Table 4-3: Water System FY11-FY14 Consumption Totals*

<i>(in 1,000 gallons)</i>	<b>FY11</b>	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Beacon Hill	10,249	10,249	10,249	10,249
Elysian Heights	13,453	15,707	18,413	21,119
Lenah Run	29,941	29,941	29,941	29,941
Raspberry	20,918	22,570	22,708	22,709
Rokeby	8,863	8,863	8,863	8,863
Selma	7,155	11,521	15,887	20,253
<b>Total</b>	<b>90,579</b>	<b>98,851</b>	<b>106,061</b>	<b>113,134</b>
<i>% Increase (Total System)</i>		9%	7%	7%

Table 4-4 demonstrates the overall community water system patterns in 2009 and 2010.

*Table 4-4: Customer and Usage Patterns 2009 and 2010*

<i>Usage Level</i>	<b>Percentage of Customers Using</b>		<b>Percentage of Total Usage</b>	
	<b>2009</b>	<b>2010</b>	<b>2009</b>	<b>2010</b>
0 – 275 gallons per day	78%	68%	78%	64%
276 – 800 gallons per day	18%	25%	16%	24%
Over 800 gallons per day	4%	7%	6%	12%

Table 4-4 shows that during 2009 and 2010, 78% and 68% of customers, respectively, used an average of 275 gallons per day or less. It is important to note that this include summer usage. The average winter usage for all systems in 2009 was 190 gallons per day (gpd) and in 2010 was 187 gpd. Table 4-4 also shows that of the 4% of customers that used over 800 gallons per day in 2009, they account for 6% of total usage and similarly in 2010 the 7% of customers using over 800 gallons per day account for 12% of total usage.

### ***4.2.2 Sewer System Consumption Data***

The five communities that operate sewer systems are charged for sewer service based on their metered water consumption. Each account is charged sewer rates on either the actual metered water usage or, in summer months, up to 3,000 gallons over that account’s established winter quarter usage. If an account has not yet established a winter usage, the charge for sewer service is based on 24,000 gallons a quarter. Table 4-5 presents a summary of the projected amount of billable sewer usage for FY11 - FY14.

Table 4-5: Sewer System FY11-FY14 Consumption Totals

<i>(in 1,000 gallons)</i>	<b>FY11</b>	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Courtland	11,923	14,206	15,474	15,475
Lenah Run	18,252	18,252	18,252	18,252
Elysian Heights	9,262	10,814	12,677	14,539
Raspberry Falls	11,173	12,055	12,129	12,129
Selma	4,313	6,078	7,273	8,107
<b>Total</b>	<b>54,923</b>	<b>61,404</b>	<b>65,805</b>	<b>68,502</b>
<i>% Increase (Total System)</i>	-	12%	7%	4%

In 2011, 77% of metered water use was projected to be charged as sewer use. Due to the fact that sewer charges are based on winter water use, it was assumed that as these systems grow, the general pattern of water use will remain constant and sewer use will grow accordingly.

## 5. RATE ALTERNATIVES

The current rate design methodology and cost allocations were evaluated to determine if they reasonably reflect how costs are currently incurred by community systems. As described in sections 3 and 4, the projected revenue requirements coupled with the consumption projections indicate that at current rates, major shortfalls will result in 2012 and beyond for both the water and sewer systems. As a result additional revenues must be generated to fund the operations of these systems.

To examine alternative rate structures, it is necessary to determine the principal pricing goals and objectives for the structure. Based on our industry experience, there are a number of common goals and objectives related to the pricing of water service.

The most common considerations include the following:

- Cost of Service Recovery
- Revenue Stability
- Ease of Updating
- Water Conservation
- Economic Development
- Equitably Cost Allocation
- Minimizing Customer Impacts
- Affordability
- Rate Stability
- Ease of Understanding
- Ease of Implementation
- Legality

Based on discussions with the Loudoun Water staff all of these pricing goals and objectives were deemed important and were considered in the rate development but the primary goal identified was the need to meet the Loudoun Water policy related to community systems rate setting which states that:

*“Rates associated with Community Systems shall be such as to permit the system to be financially self sustaining, with all operation, maintenance and replacement costs being paid by the users and/or owners of all properties in the service area served by or capable of being served by the system(s).”*

This policy statement supports the County of Loudoun’s Comprehensive Plan, which states that Community Systems must be operated to be financially self-sustaining. Given the financial forecasts developed in Section 3, to meet this goal of cost of service recovery, water and sewer rates will need to be increased substantially.

Three other pricing goals were identified as of primary importance in the rate structure development including:

- Water Conservation – The rate structure must recognize the costs incurred by Loudoun Water as it provides peak capacity and should encourage the wise use of resources.
- Minimize Customer Impacts – The rate structure should limit the one-time customer cost impact.

- Equitable Cost Allocation – The rate structure should allocate costs based on those incurred by Loudoun Water, this includes allocation of costs required to meet peak system demands.

The rate structures developed during the study all address water conservation by pricing peak use at a higher rate than base non-discretionary use. To minimize the cost impact on community system customers, the rate alternatives were developed to phase in rate increases to reach full funding of all revenue requirements in the community systems over three years, thereby reaching the goal of financially self-sustaining rates by FY14. The following sections of the report outline the current and alternative rate structures developed during the course of the study.

### 5.1 Current Rate Design for Community Systems

Community Systems current water rate design is composed of a quarterly fixed charge with a base volume charge. During summer months there is also an additive peak volume charge assessed for every 1,000 gallons in excess of 6,000 gallons of a customer’s previous winter usage or 1.3 times that usage, whichever is higher. The current sewer rate design also consists of a quarterly minimum charge and flat rate volume charge. All customers are charged sewer rates on their metered water consumption during winter months and, during summer months, up to 3,000 gallons over their winter usage. The current rates are detailed in tables 5-1 and 5-2.

*Table 5-1: Current FY11 Community System Water Rate Structure*

	<b>Current FY11</b>
Quarterly Fixed Charge	\$26.50
Base Volume Charge	\$2.55
Peak Volume Charge*	\$3.82

\*Note: Peak charge is additive: Total Peak rate is \$6.37

*Table 5-2: Current FY11 Community System Sewer Rate Structure*

	<b>Current FY11</b>
Quarterly Fixed Charge	\$23.27
Base Volume Charge (per 1,000 gallons)	\$4.00

### 5.2 Rate Alternatives

As part of MFSG’s scope of work, several water and sewer rate alternatives were developed. Each alternative adequately distributed costs among the Community System customers; however each alternative was designed with different goals in mind. Below is a brief summary of each alternative developed as a part of this water and sewer rate study.

#### 5.2.1 Alternative A

This alternative maintains the current rate structure and includes an “across the board” percentage rate increase to both water and sewer rates over a three year phase-in that would recover all necessary revenues to cover O&M, Capital and Replacement costs by FY14. The three year phase-in rates for Alternative A are shown in Table 5-3.

Table 5-3: Projected Alternative A Community System Water Rates

	<b>Current FY11</b>	<b>Proposed FY12</b>	<b>Proposed FY13</b>	<b>Proposed FY14</b>
Quarterly Fixed Charge	\$26.50	\$30.87	\$35.97	\$41.90
Base Volume Charge	\$2.55	\$2.97	\$3.46	\$4.03
Peak Volume Charge*	\$3.82	\$4.45	\$5.19	\$6.04
<b>% Annual Increase</b>		<b>16.5%</b>	<b>16.5%</b>	<b>16.5%</b>

\*Note: Peak charge is additive.

In light of the pricing goals and objectives Alternative A would provide for cost of service recovery by FY14 and ensures that the community systems are self-supporting. The structure does encourage water conservation with the peak volume charge. The structure also reduces customer impacts by phasing in the rates to full cost recovery by year three. The only objective that is not meet under Alternative A is the equitable allocation of costs pertaining to the water rate structure. The current rate structure does not allocate the costs of meeting peak capacity to the peak volume rate.

The proposed sewer rates under Alternative A would not alter the current sewer rate structure, but would increase rates over the course of three years to full cost of service recovery. Table 5-4 shows the proposed Alternative A sewer rates.

Table 5-4: Projected Alternative A Community System Sewer Rates

	<b>Current FY11</b>	<b>Proposed FY12</b>	<b>Proposed FY13</b>	<b>Proposed FY14</b>
Quarterly Fixed Charge	\$23.27	\$35.20	\$53.20	\$80.30
Base Volume Charge	\$4.00	\$6.00	\$9.10	\$13.70
<b>% Annual Increase</b>		<b>51.0%</b>	<b>51.0%</b>	<b>51.0%</b>

The proposed sewer rates under Alternative A would maintain the current structure and, by FY14, cover the full cost of providing sewer service to community system customers. This rate structure would meet all of the goals and objectives identified.

### **5.2.2 Alternative B**

This alternative considered a scenario in which the Community Systems were combined with the central system and charged central system water and sewer rates, which would be increased for all Loudoun customers in order to cover the new “total system” revenue requirements. The methodology used to develop the Alternative B rates included projecting the cost of service shortfalls in the community systems that would result if community system customers were charged current central system rates. The central system rates were then adjusted for all Loudoun Water customers (both community and central systems) in order to cover the calculated shortfalls. Table 5-5 shows the current central system rates as well as the Alternative B rates for fiscal years 2012 through 2014.

Table 5-5: Projected Alternative B Total System Water Rates

	Current FY12	Proposed FY12	Proposed FY13	Proposed FY14
Quarterly Fixed Charge	\$28.02	\$28.30	\$28.32	\$28.34
Tier 1: 0 – 275 GPD (8,250 per month)	\$2.04	\$2.06	\$2.06	\$2.06
Tier 2: 275 – 550 GPD (8,251 – 16,500 per month)	\$5.69	\$5.75	\$5.75	\$5.75
Tier 3: Over 550 GPD (>16,500 per month)	\$7.62	\$7.70	\$7.70	\$7.71
<b>% Annual Increase</b>		<b>1.0%</b>	<b>0.1%</b>	<b>0.1%</b>

As shown in Table 5-5, the central system rate structure charges customers a quarterly fixed charge and three tiers of usage charges. The tiered rates apply to every 1,000 gallons of consumption within the three ranges of quarterly consumption shown in Table 5-5. The use of this rate structure would minimize community system customer impacts to the greatest extent of any of the alternatives considered. However, Alternative B would require central system customers to provide financial support to community systems. This violates Loudoun Water policy in the respect that the community systems would not be financially self sustaining. Even after the system wide rate increases, the projected consumption of the community systems would not allow for the full funding of the revenue requirements of the systems. Essentially, under Alternative B, the community systems would be subsidized on an annual basis by the central system customers. Additionally, the cost allocations to the tiers are not based on the cost of providing capacity at each of the usage levels.

The sewer rates under Alternative B were calculated in exactly the same way as the water rates. The central system sewer rates were applied to the billable sewer use of the community systems, and the resulting shortfalls were used to adjust rates in order for the system to be fully funded. Table 5-6 shows the proposed rates for fiscal years 2012 through 2014 under Alternative B.

Table 5-6: Projected Alternative B Total System Sewer Rates

	Current FY12	Proposed FY12	Proposed FY13	Proposed FY14
Quarterly Fixed Charge	\$27.99	\$28.74	\$28.84	\$28.91
Base Volume Charge	\$4.02	\$4.13	\$4.14	\$4.15
<b>% Annual Increase</b>		<b>2.7%</b>	<b>0.3%</b>	<b>0.2%</b>

The result of Alternative B’s sewer rates is the same as that of the water rates. The community systems would not be financially self sustaining, even after the rate adjustments in FY12.

### 5.2.3 Alternative C

Alternative C proposes a change to the community system water rate structure from a base/peak structure to a three tiered variable charge structure, similar to central system. However this structure unlike Alternative B would provide self-supporting rates and not require a subsidy from the central system customers. The tiers were set at levels that reflected indoor, outdoor and excessive use. Specifically the first tier is set at 275 gpd which matches the central system tier one and provides a 30% allowance above the average winter water use (representative of indoor/non-discretionary use). The average winter usage within the community systems over the last two years has been approximately 189 gpd. The second tier provides an allowance for outdoor water use. The allowance was developed based on evaluation of the average lot size within the community systems and the amount of water required to provide a quarter of an inch of water per week on an average property (one inch per month). The final or third tier represents water use over the outdoor allowance and therefore termed excessive water use. Lastly, the Alternative C water rate structure allocates costs to the three tiers based on the cost of providing service at each level of use.

Table 5-7 shows the proposed FY12-FY14 water rates under Alternative C.

*Table 5-7: Projected Alternative C Community System Water Rates*

	<b>Proposed FY12</b>	<b>Proposed FY13</b>	<b>Proposed FY14</b>
Quarterly Fixed Charge	\$30.12	\$36.27	\$44.58
Tier 1: 0 – 275 GPD (8,400 per month)	\$2.99	\$3.51	\$4.31
Tier 2: 275 – 800 GPD (8,401 – 24,400 per month)	\$7.23	\$8.51	\$10.62
Tier 3: Over 800 GPD (>24,400 per month)	\$9.34	\$10.89	\$13.50
<b>% Average Increase</b>		<b>18.2%</b>	<b>23.7%</b>

The Alternative C water rates would meet all of the pricing goals and objectives. The structure encourages water conservation, provides a phase-in to minimize customer impacts, provide full cost recovery by FY14, ensures community system are self-supporting and allocates costs based on costs incurred.

The sewer structure under Alternative C would remain the same; however percentage increases are included to meet revenue requirements. Therefore, the sewer rates of Alternative C are the same as those proposed in Alternative A. These rates are shown in Table 5-8.

*Table 5-8: Projected Alternative C Community System Sewer Rates*

	<b>Current FY11</b>	<b>Proposed FY12</b>	<b>Proposed FY13</b>	<b>Proposed FY14</b>
Quarterly Fixed Charge	\$23.27	\$35.20	\$53.20	\$80.30
Base Volume Charge	\$4.00	\$6.00	\$9.10	\$13.70
<b>% Annual Increase</b>		<b>51.0%</b>	<b>51.0%</b>	<b>51.0%</b>

### 5.2.4 Alternative D

This alternative combines the community systems with the central system under the central system rate structure, but includes a surcharge on central system rates for community system customers only. This surcharge would cover the operating deficit of the community systems that would be the result of the systems being charged the central system rates. Essentially, central system rates alone would cover the capital and reserve costs of the community systems, but not the full operating and maintenance costs. By charging community system customers a surcharge, the burden of these costs would fall on the community system customers only, not the system as a whole as in Alternative B. The proposed rates for Alternative D are shown in Table 5-9.

Table 5-9: Projected Alternative D Community System Water Rates

	Proposed FY12	Proposed FY13	Proposed FY14
Quarterly Fixed Charge	\$30.12	\$36.26	\$44.57
Tier 1: 0 – 275 GPD (8,400 per month)	\$3.04	\$4.04	\$5.54
Tier 2: 275 – 550 GPD (8,401 – 16,500 per month)	\$6.69	\$7.69	\$9.19
Tier 3: Over 500 GPD (>16,500 per month)	\$8.62	\$9.62	\$11.12
<b>% Average Annual Increase</b>		<b>20.0%</b>	<b>23.8%</b>

The Alternative D water rates would meet the majority of the pricing goals and objectives. The only objective that it does not address is the allocation of costs based on cost of service. Additionally, the usage tiers under the central system rate structure are not tailored to the specific usage patterns as described in Alternative C which provides a greater allowance within Tier 2 for outdoor water use.

The sewer rates would also require a surcharge under Alternative D, phased in to cover all sewer costs by FY14. The methodology used to calculate the sewer surcharge was the same as that used to calculate the water surcharge. The proposed sewer rates for community systems are shown in table 5-10.

Table 5-10: Projected Alternative D Community System Sewer Rates

	Proposed FY12	Proposed FY13	Proposed FY14
Quarterly Fixed Charge	\$35.20	\$53.20	\$80.30
Base Volume Charge	\$6.00	\$9.10	\$13.70
<b>% Average Annual Increase</b>		<b>51.0%</b>	<b>51.0%</b>

### 5.2.5 Recommended Alternative

The various rate structures were reviewed with the Loudoun Water Board and Staff. Based on the discussions and in light of the pricing goals and objectives, Alternative C was selected as the recommended alternative rate structure. The rate structure ensures that the community systems reach full cost recovery by FY14 and would allow for the community system to be self-supporting.

The structure also encourages water conservation and allocates costs equitably to the various tiers based on the cost of providing water service at each tier.

The recommended three year phase-in of Alternative C rates is shown in Table 5-11. It should be noted that Loudoun Water plans to implement monthly billing during FY12 and therefore the rates are presented on a monthly basis.

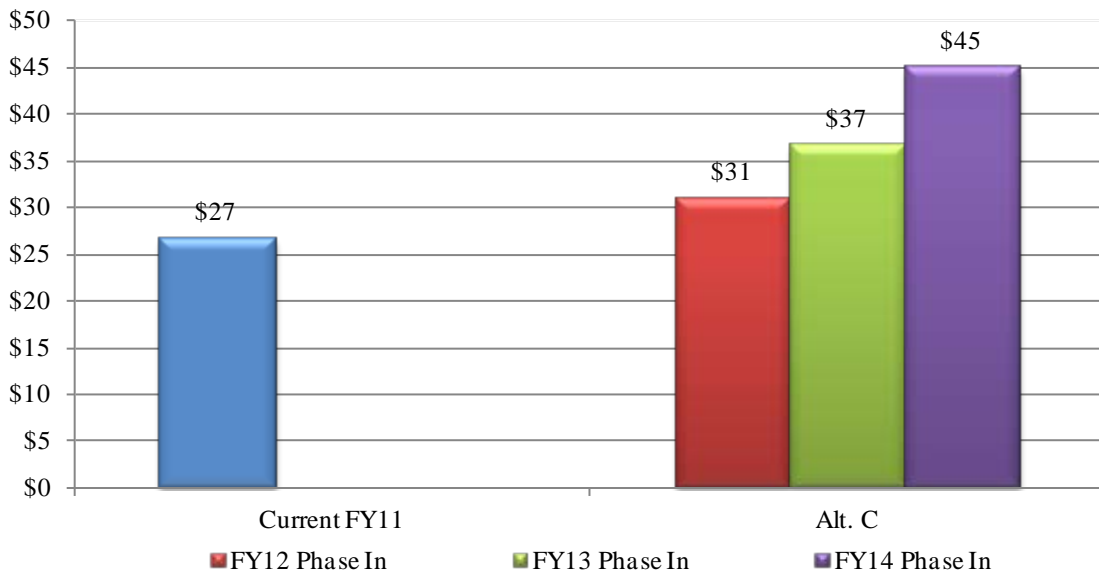
*Table 5-11: Recommended FY12-FY14 Community System Water and Sewer Rates*

	FY12	FY 13	FY 14
<b>Water Rates</b>			
Monthly Fixed Charge	\$10.04	\$12.09	\$14.86
Consumption Charges (per 1,000 gal.)			
Tier 1: 0 – 275 GPD (8,400 per month)	\$2.99	\$3.51	\$4.31
Tier 2: 275 – 800 GPD (8,401 – 24,400 per month)	\$7.23	\$8.51	\$10.62
Tier 3: Over 800 GPD (>24,400 per month)	\$9.34	\$10.89	\$13.50
<b>Sewer Rates</b>			
Monthly Fixed Charge	\$11.75	\$17.75	\$26.75
Usage Charge (per 1,000 gal.)			
	\$6.00	\$9.10	\$13.70

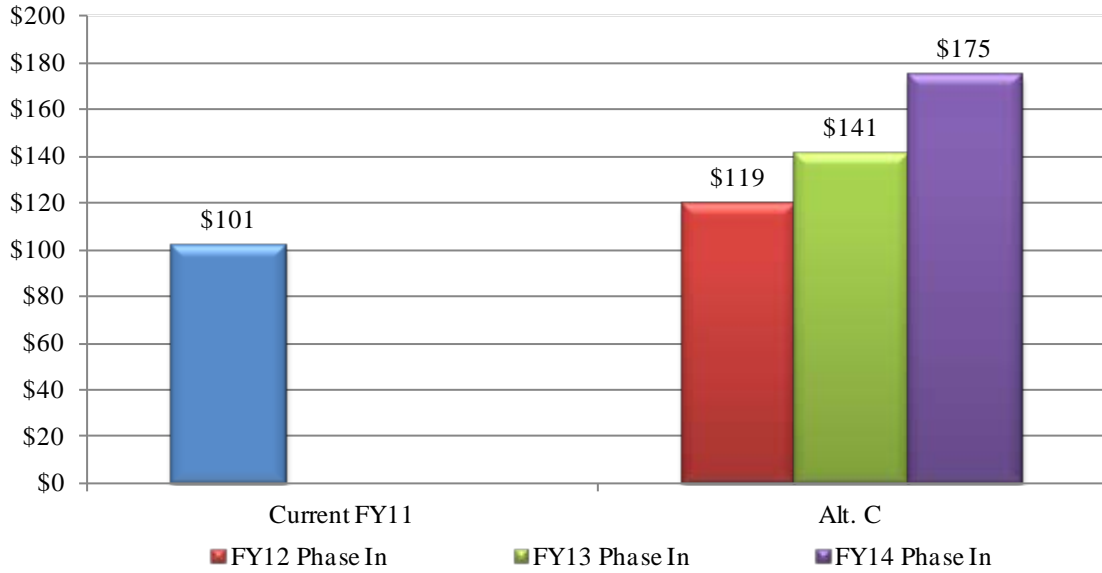
### 5.3 Sample Bills

The following exhibits present sample water and sewer bills for an average and high water using customer for fiscal years 2012 through 2014 under the current FY11 rates and the recommended Alternative C water and sewer rates phased in over the next three years.

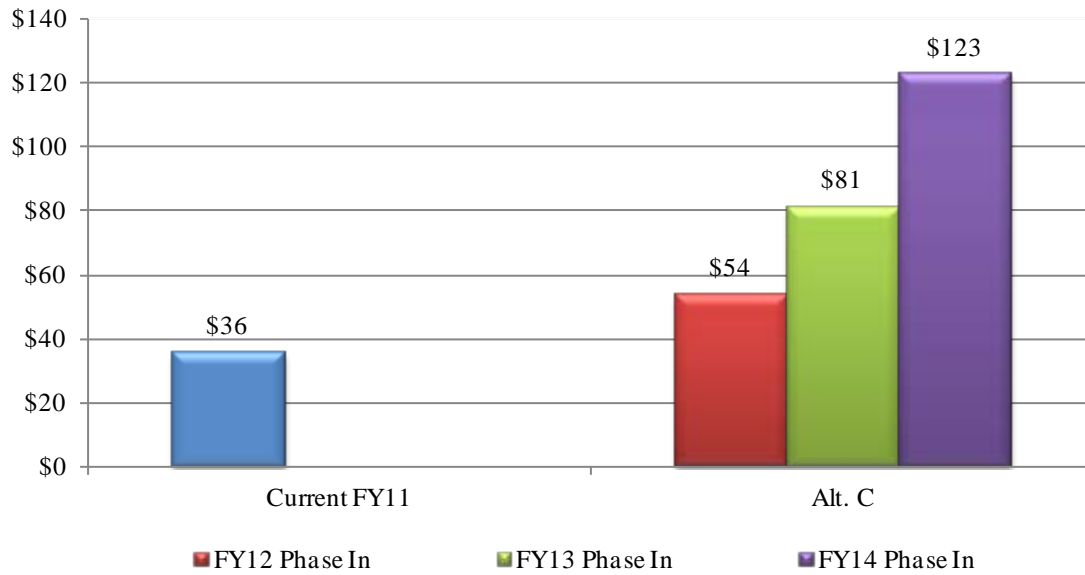
*Exhibit 5-1: Monthly Water Bills, 7,000 Gallons/month*



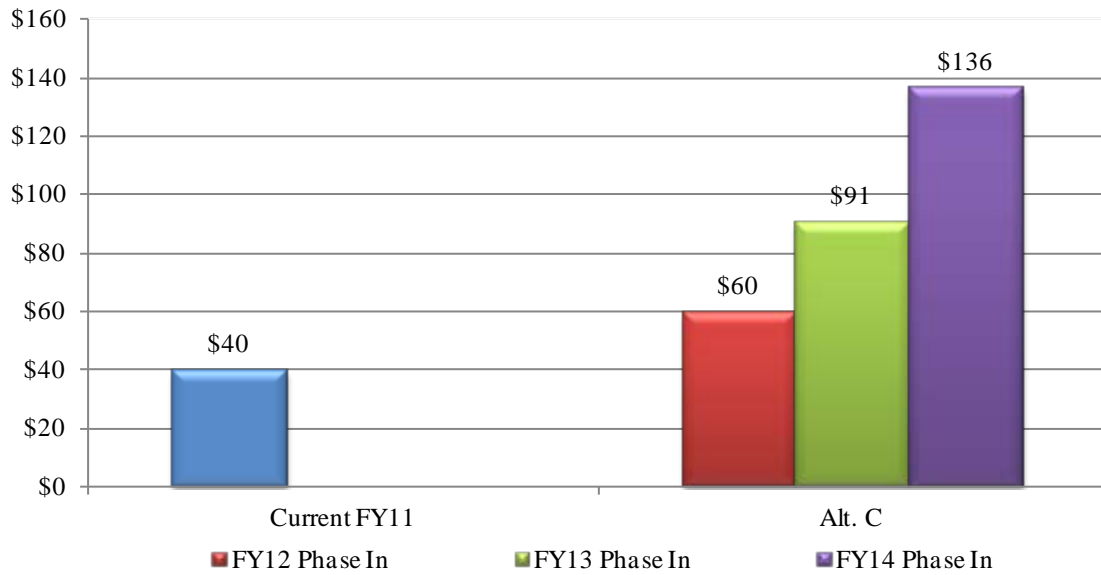
**Exhibit 5-2: Monthly Water Bills, 20,000 Gallons/month**



**Exhibit 5-3: Monthly Sewer Bill, 7,000 Gallons/month**



**Exhibit 5-4: Monthly Sewer Bill, 20,000 Gallons/month\***



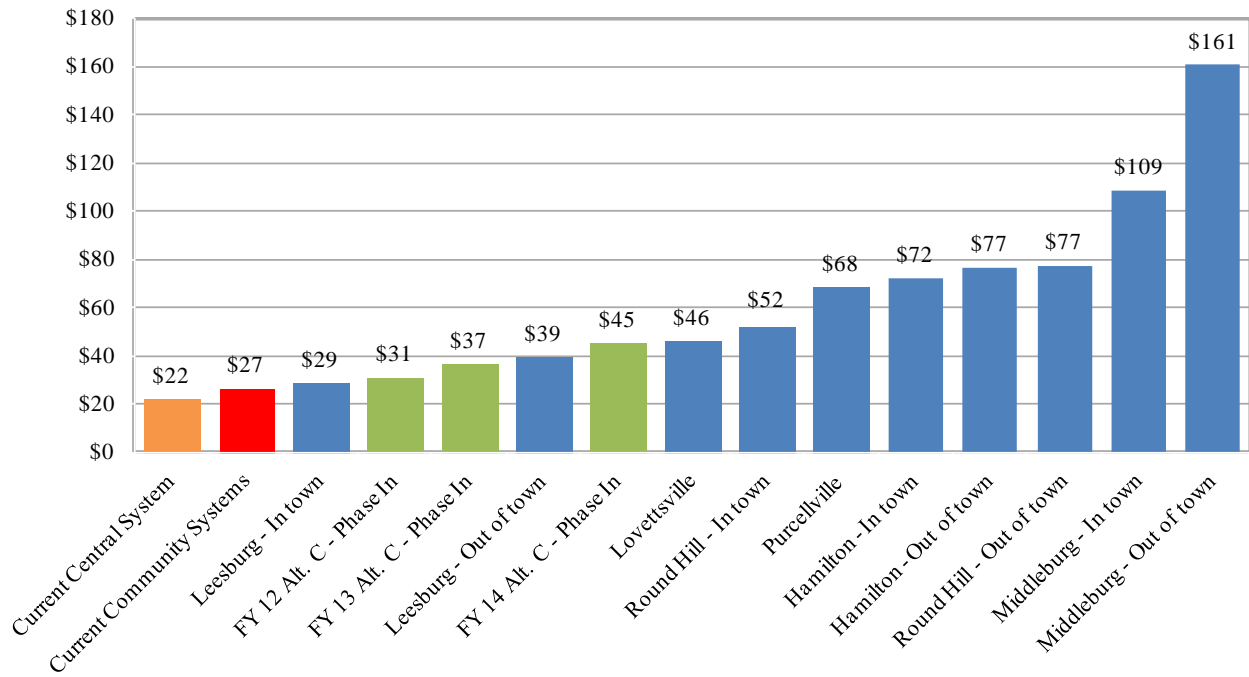
\* Note: Sewer Use Capped at 10,000 gallons (Assumed winter use of 7,000 gallons)

As demonstrated in the exhibits, the increases in the water and sewer bills under the proposed rates will be substantial but required in order for the community systems to be self sustaining.

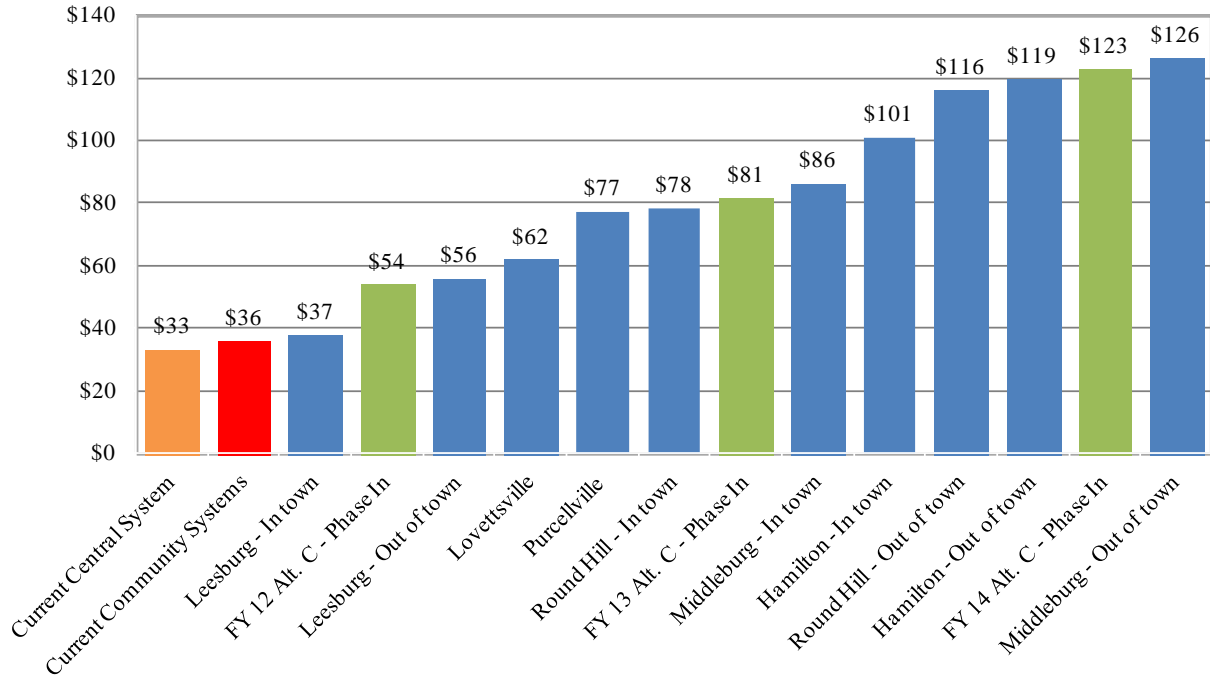
## 6. UTILITY BILL COMPARISONS

In light of the recommended water and sewer rates, it is useful to compare the projected monthly bills of community systems customers with sample bills from surrounding and similar utilities to provide insight into whether the bills are competitive and/or comparable. The following exhibits represent a comparison of a monthly bill for example customers who use 7,000 and 20,000 gallons per month for various water and wastewater municipalities in the same geographical area as Loudoun Water and in some cases with systems similar in size to the community systems. It is important to note that the most current rates for surrounding jurisdictions were used in the comparison and therefore the bills do not reflect unknown water and sewer rate increases within the comparison utilities. As a result the comparison does not provide a true “apples to apples” comparison, particularly in future years. In addition, assumptions were made to convert other jurisdiction’s rates to a monthly basis. The following exhibits present the FY 2012 through 2014 sample bills for water and wastewater users at the proposed rates, as well as current central system and current community system sample bills for comparison.

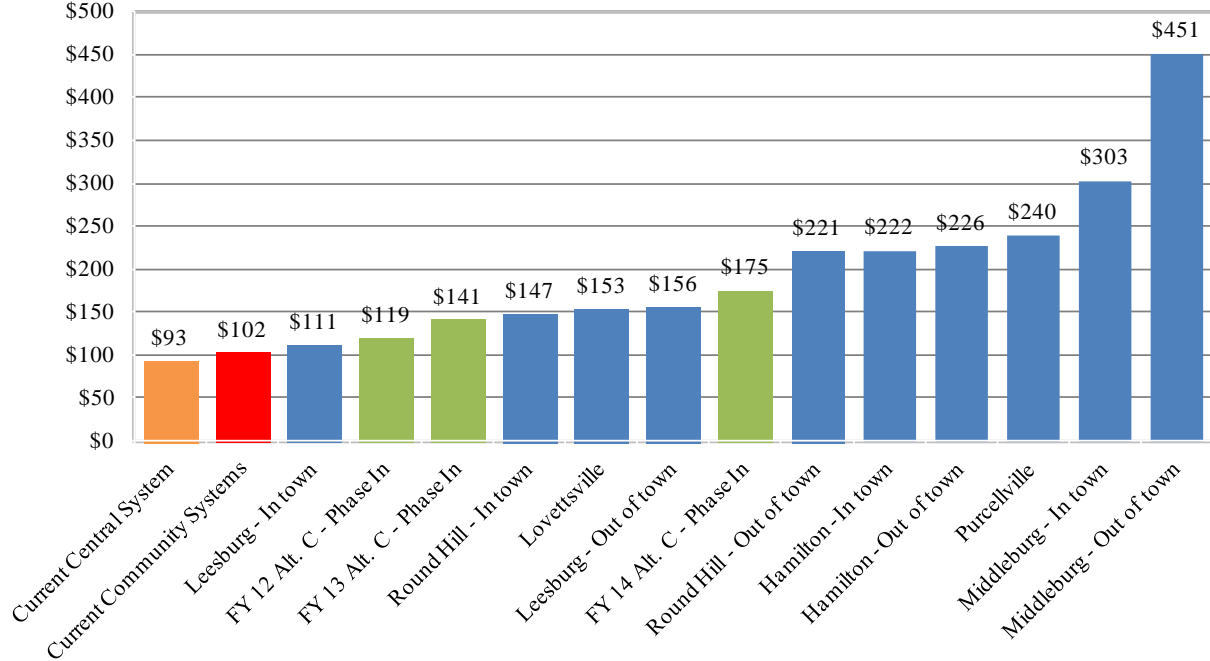
***Exhibit 6-1: Monthly Water Bill Comparisons (7,000 gal/mo)***



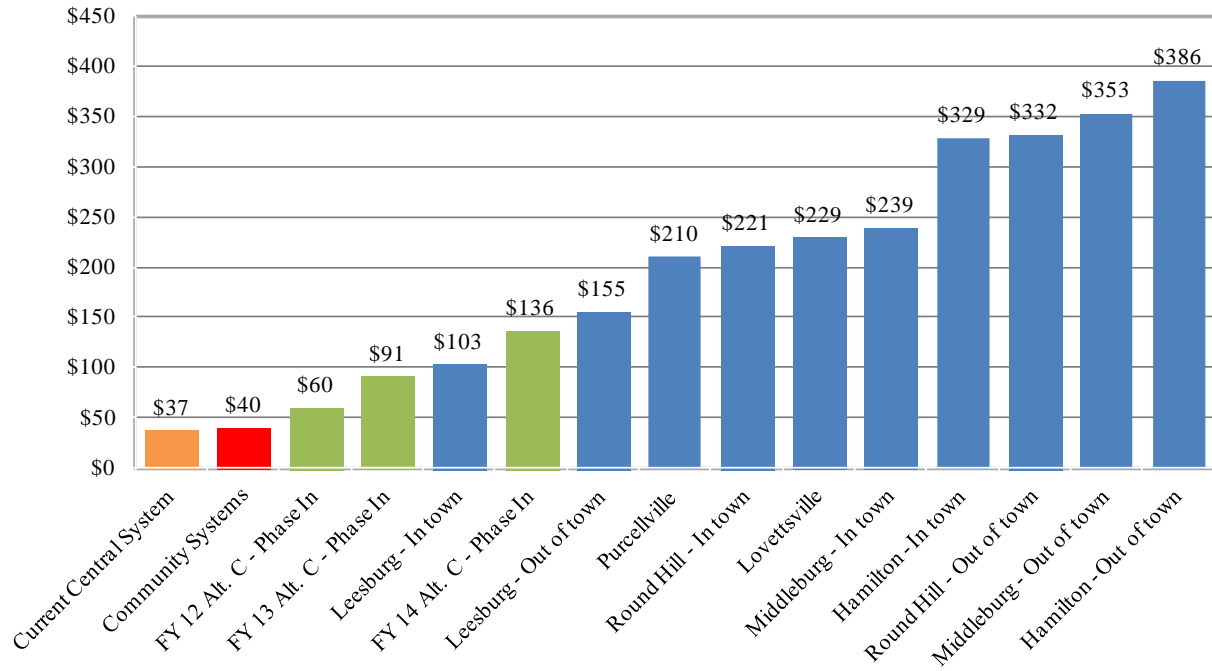
**Exhibit 6-2: Monthly Sewer Bill Comparisons (7,000) gal/mo)**



**Exhibit 6-3: Monthly Water Bill Comparisons (20,000) gal/mo)**



**Exhibit 6-4: Monthly Sewer Bill Comparisons (20,000 gal/mo)**



The exhibits demonstrate that even after phased-in increases over the next three years, in most cases, the community system water and sewer bills will be at the lower end of the range of comparable utilities at those jurisdiction’s current rates.

## 7. CONCLUSIONS

Based on our financial review and analysis of the Community Systems it is imperative that Loudoun Water take action to adjust water and sewer rates to ensure that the Community Systems remain financially viable. Specifically, based on projected water sales, current water rates will produce revenues roughly 32% less than the required revenue in FY12 with subsequent significant shortfalls annually over the planning period. The situation is even more concerning for wastewater operations, where current sewer rates will produce cash revenues roughly 61% less than the required revenue in FY12 with subsequent significant shortfalls annually over the planning period. Without significant adjustments to water and sewer rates, funds will not be available to fund necessary capital projects nor will they be available to fund system replacement. To allow for full recovery of the cost of providing service to the Community Systems, water and sewer rates should be increased substantially over the next three years. The increases will ensure that the Community Systems operate in a manner that is self sustaining in line with Loudoun Water's policy related to these systems.

The review of the current water rate structure revealed that the current water rate structure does not appropriately allocate the cost of service to various levels of water use among customers. As a result Loudoun Water should adopt a tiered rate structure for the Community Systems similar to the structure used for the central system. The tiered rate structure provides specific usage allowances per tier tied to specific usage patterns for Community Systems and prices the water usage at each tier based on the expenditures required to meet the associated demand. While alternative rate structure were considered, that would reduce the impact on Community System customers, such as combining these systems with the central system, these alternative would violate the Board's policy that these system should be self-sustaining. A combining with the central system would transfer some of the costs of operating and maintaining these systems to central system customers.

While the increases to water and sewer rates that are required to ensure full cost recovery are substantial, the water and sewer bills that Community System customers will pay over the next three years will remain below those of surrounding similar systems.