

FINAL REPORT

Water, Sewer, and Stormwater Fees and Rate Study Update

Prepared for

Sterling Ranch Community Authority Board

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1.0 Introduction

This 2016 Rate Study Update (2016 Rate Study Update) documents the water, sewer, and stormwater tap fees and rates for the Sterling Ranch Community Authority Board (CAB) in support of its water, sewer, and stormwater enterprises. In addition, the 2016 Rate Study Update included analysis of the water and sewer tap fees and rates for Dominion Water and Sanitation District (Dominion or DWSD), a wholesale water and sanitation district. The prior *System Development Charge and Cost-of-Service Water Rates Study* (2014 Rate Study) for CAB and Dominion was prepared by Honey Creek Resources, Inc. In the 2014 Rate Study, Honey Creek Resources recommended the initial tap fees, as well as the initial water and sewer rates and associated rate structures.

Financial projections included in this study are provided for a near-term forecast period (2016-2020). In addition, the fees and rate analysis is consistent with the CAB's long-term business plan through buildout (2040). Forecasted revenues and expenditures are expressed in current 2016 dollars for ease of comparison.

1.1 Scope of Services

The CAB provides water, sewer, and stormwater services to the residents as well as nonresidential users of Sterling Ranch (Sterling Ranch), a 3,400-acre planned development located in northwest Douglas County, Colorado. The CAB purchases wholesale water from DWSD, and DWSD charges seasonal rates for the water delivered to the CAB. DWSD also provides sewer collection and treatment services for the CAB, for which a wholesale sewer rate is assessed. The CAB is responsible for all services related to the collection and storage of stormwater. The CAB is DWSD's largest retail customer.

Three rate models were built for this study to analyze the various CAB and DWSD enterprises through buildout. Since CAB and DWSD are dependent on each other, the water and sewer rate models each include a financial analysis of the respective CAB and DWSD enterprises. The stormwater rate model is simpler in that stormwater services are provided through the CAB, and therefore only one entity is modeled.

1.2 Structure of Funds

CAB manages six funds in total: the CAB Water Capital Fund and Operating Fund, the CAB Wastewater Capital Fund and Operating Fund, and the CAB Stormwater Capital Fund and Operating Fund. The general structure of the Capital and Operating funds is briefly discussed below:

- **CAB Capital Funds** – These funds include capital expenditures related to water, sewer, or stormwater infrastructure owned by CAB. The source of revenue for the capital funds are generated through the collection of CAB tap fees at the time new taps are purchased. Interest income on cash reserves is also accrued in this fund.
- **CAB Operating Funds** – The operating funds include management of operations and maintenance (O&M) and labor expenditures for the water, sewer, or stormwater systems. As each system approaches buildout, non-growth capital expenditures related to the existing systems will also be managed out of these funds. Revenue for this fund is generated through service fees and charges, investment income, and other miscellaneous revenue.

The projected tap fee revenue generated for the capital funds are based on development projections discussed herein and the 2016 tap fees discussed in the following section. Operating Fund revenue generated through water, sewer, and stormwater user charges is projected based on the assumptions

and analysis discussed in the following sections.

1.3 Sterling Ranch Community Authority Board Customers

Sterling Ranch is currently in the initial stages of development with infrastructure development of the first filing beginning in late 2015. The CAB customers will be comprised of both residential and non-residential classes, with residential customers currently accounting for over 95 percent of all customers. CAB is scheduled to begin delivering water and sewer services to customers toward the end of the year 2016. Under the current development plan provided by Sterling Ranch, approximately 9,700 residential units will be built by 2035. It should be noted that Sterling Ranch has zoning entitlements for over 12,000 units and that development plans will change as buildout continues. The CAB and DWSD should review their rates and fees annually as development assumptions change. The customer characteristics of the development are discussed below.

1.3.1 Customer Classes

The following major customer classes are anticipated for the CAB water, sewer, and stormwater utilities:

- Single Family Detached – Traditional single family residential, detached from adjacent homes
- Single Family Attached – Single family residential with zero-lot lines or otherwise attached to adjacent homes
- Medium Density Multi-Family Residential
- High Density Multi-Family Residential
- Commercial or non-residential
- Irrigation (Water Customer Only)
- Construction (Water Customer Only)

1.3.2 Number of Customers and Meter Equivalents

A total of 9,700 residential units are currently projected at buildout within Sterling Ranch. The anticipated number of residential customers in each customer class was provided by Sterling Ranch, by year, through buildout. It should also be noted that prior to this 2016 Rate Study Update, total non-residential demand (acre-feet/year [AFY]) was estimated by Element Water Consulting, Inc. (Element), but not the number of non-residential customers. For this analysis, it has been assumed that the breakdown of non-residential demand by customers and meter size is proportionately similar to that of Castle Rock Water (serving the Town of Castle Rock, Colorado). Similarly, the number of irrigation customers was not estimated prior to this 2016 Rate Study Update, but rather the expected number of irrigated acres was used by Element to compute a total irrigation demand. An assumption of the number of irrigation customers was made in order to estimate the total number of customers within the development.

Meter equivalents were calculated using meter size capacity ratios as a proxy for water demand and capacity requirements. Meter equivalents are expressed in terms of single family residential equivalent units, which are typically characterized by a 3/4" x 3/4" connection. Older single family residences and multi-family units tend to use smaller meters, 5/8" x 3/4" or 5/8" x 5/8".

For Sterling Ranch, it was assumed that all single family residences, whether attached or detached, will have 3/4" x 3/4" meters, with each 3/4" meter representing one single family equivalent unit. All multi-family units are assumed to have 5/8" x 5/8" meters, with each representing 0.75 single family units, or

Equivalent Residential Units (EQR). The EQRs for commercial and irrigation customers were estimated based on an assumed distribution of meter sizes. The expected year-end number of customers, equivalent meters, and anticipated annual billable water usage is summarized by customer class, for years 2016 through 2020 in Table A-1 (Appendix A). The anticipated breakdown at buildout of customers by meter sizes and corresponding equivalent meters, or EQRs, is provided in Table A-2 (Appendix A). After applying the breakdown of meter sizes and the equivalent meter factors, the projected total number of EQRs reaches 9,536 by buildout.

It should be noted that the Chatfield Valley Framework Entities (CVE) customers are included in the summary of residential customers. The CVE customers are customers outside of Sterling Ranch that may potentially be served by DWSD. Since the financial modeling between CAB and DWSD is so closely related, the CVE customers are included in the summary tables of number customers and equivalent meters, but CVE customers are only included in calculations for DWSD fees and rates.

1.4 General Rate Development Methodology

The water, sewer, and stormwater fees and rates summarized in this document include one-time System Development Charges (SDC), or tap fees, for new construction, and estimated monthly usage charges.

The process for estimating rates and charges follows Colorado State law for determining tap fees and American Water Works Association (AWWA) M1 guidelines for calculating user fees, summarized in the following steps:

1. Estimating the amount and timing of anticipated capital expenditures necessary to develop the systems required to serve the project
2. Identifying and estimating the type and number of customers and determining the estimated number of EQRs
3. Calculating the SDCs based on anticipated future capital expenditures and the anticipated number of EQRs
4. Developing a long-term Financial Plan that incorporates projected tap fee revenues, expenditures, financing, and fund balances available for expenditures in future periods
5. From the Financial Plan, determining revenue requirements that identify how much revenue needs to be generated through monthly usage charges to customers to fund O&M and other expenses
6. Identifying and classifying the anticipated customer base in terms of numbers by class
7. Allocating Revenue Requirements across the various customer classes
8. Designing rates that are equitable and that generate sufficient revenues from each customer class to sustain the District through buildout and beyond

The steps listed above were followed in the 2014 Rate Study in order to develop the water and wastewater rate structures. This 2016 update maintains essentially the same rate structure but with updated rates and charges that reflect current assumptions regarding the pace of development, capital plans, water supply sources, agreements with other entities, etc.

1.5 Organization of Report

This report includes the development of the CAB fees and rates. The DWSD fees and rates are documented in a separate TM. By their nature, utility rate studies are table intensive, and supporting text is easily lost by the reader. In order to present the rate study findings with more clarity, the text and supporting tables have been separated. Summary tables providing the recommended CAB 2016 fees and

rates are included within the body of the report, but the supporting tables are included in the appendices. This allows the reader to view both the tables and text side-by-side. A brief description of the report section and corresponding appendices is as follows:

Section 1 – Introduction: Discussion of CAB’s services and customer characteristics, and description of the general rate development methodology. The tables corresponding to the customer characteristics discussion are provided in Appendix A – Customer Characteristics.

Section 2 – CAB Tap Fees: Discussion of the methodology and calculation of tap fees for the water, sewer, and stormwater enterprises. The tables corresponding to the calculation of the tap fees are included in Appendix B – CAB Tap Fees

Section 3 – Water Rate Development: Discussion of rate development for the water system. The tables corresponding to the water rate development are included in Appendix C – Water Rate Development.

Section 4 – Sewer Rate Development: Discussion of rate development for the sewer system. The tables corresponding to the sewer rate development are included in Appendix D – Sewer Rate Development.

Section 5 - Stormwater Rate Development: Discussion of rate development for the stormwater system. The tables corresponding to the stormwater rate development are included in Appendix E – Stormwater Rate Development.

2.0 Community Authority Board (CAB) Tap Fees

This section presents recommended 2016 tap fees CAB will charge new customers within the Sterling Ranch Development. Tap fees are intended to recover the capital cost of the water, sewer, and stormwater infrastructure. The tap fee could equivalently be termed an SDC, impact fee, connection fee, or other terms intended to account for the up-front cost of joining the utility. Tap fees typically have two components:

- A buy-in, or equity, component requiring new customers to reimburse existing customers for available capacity in the existing system
- A growth, or improvement, component to recover the cost of additional capacity needed to serve new customers, on the basis that "growth pays for growth"

A buy-in component is not developed for CAB because it's a relatively new development with few assets to buy into. As a result, all capital costs will be allocated to growth.

There are two components to the Sterling Ranch tap fee. The first is the tap fee required to recover the DWSD water and sewer system capital costs, and the second is the tap fee required to recover CAB capital costs. The total of these two comprise the Sterling Ranch Development tap fee.

Based on CH2M's review and analysis of the customer characteristics and capital improvement costs, tap fees were calculated for the water and sewer systems. The 2016 tap fees are based the current capital plans provided by CAB and DWSD and construction of construction single family and multi-family customers (9,700 total), commercial customers, and irrigation customers, totaling 9,536 EQRs through buildout. The calculation for the CAB tap fees is discussed below.

2.1 Capital Improvement Program

The CAB Capital Improvement Program (CIP) includes the acquisition, development, and construction of all major capital assets needed through the build-out of the water, sewer and stormwater systems. These expenditures are anticipated to be incurred during the period 2016-2040 and include costs for water transmission and distribution, sewer collection and transmission, and stormwater collection within the Sterling Ranch Development.

CAB has either invested, or plans to invest, approximately \$9.0 million for water system infrastructure, \$4.0 million for sewer infrastructure, and \$40.0 million for stormwater infrastructure (measured in 2016 dollars) through buildout. The vast majority of these expenditures will occur within the next 10 years. In order to complete its infrastructure investment program, near-term financing will be required. As a result, financing costs are a component of the tap fees and of user rates and charges.

2.2 Residential Equivalent Units and Build-out

Since the CIP includes costs through build-out, the calculated tap fees are based on the buildout number of EQRs.¹ Currently, it is estimated there will be approximately 9,536 EQRs, as described in the Customer Service Characteristics section of this report.

2.3 CAB Tap Fees

Tap fees are simply the result of the total capital investment divided by the number of EQRs at buildout. The initial calculation does not include any contingencies or financing costs. The second calculation adds financing costs to the initial tap fee calculation. Several of the capital assets for each system will be financed, and the growth-related financing costs will be recovered through tap fees. The 2016 tap fees are provided in Table 2-1 for each customer class. The 2016 tap fees include the cost of financing a portion of the capital improvement projects. The tables detailing the tap fee calculation for each enterprise are provided in Appendix B.

Table 2-1
CAB Tap Fees

Description	2015 Tap Fees	2016 Tap Fees
Residential		
Single Family Water Tap (per EQR)	N/A	\$1,500
Single Family Sanitary Sewer Tap (per EQR)	N/A	\$700
Multi-Family Water Tap, per unit	N/A	\$1,125
Multi-Family Sanitary Sewer Tap, per unit	N/A	\$525
Non-Residential		
Indoor Water Tap (per EQR)	N/A	\$1,500
Irrigation		
5/8"	N/A	\$1,005
3/4"	N/A	\$1,500
1"	N/A	\$2,505
1-1/2"	N/A	\$4,995
2"	N/A	\$10,005
3"	N/A	\$25,005
Sanitary Sewer Tap (per EQR)	N/A	\$700
Residential Stormwater Tap (per unit)	N/A	\$4,500
Non-Residential Stormwater Tap	N/A	**

**Calculated on a case-by-case basis dependent on impervious area.

¹ An equivalent residential unit (EQR) is a method of normalizing capacity measures across customer classes. For instance, a 3/4" metered single family residence is typically considered 1 EQR. Multi-family housing units are expressed in fractions of EQR, such as 0.625 EQR/unit, and commercial customers are expressed as multiples of EQRs. Most commonly these equivalents are based on the hydraulic capacity of their meter size relative to 3/4".

The CAB capital assets were included in the original calculation of tap fees as listed in the CAB Rules and Regulations. For this rate study, the CAB assets were separated from the DWSD assets in order to calculate separate tap fees for each entity. A new stormwater tap fee is also established for 2016. The Sterling Ranch Development tap fees are the sum of the DWSD tap fees and the CAB tap fees (above). The Sterling Ranch Development 2015 and 2016 tap fees are provided in Table 1-2.

Table 1-2
Sterling Ranch Development Tap Fees

Description	2015 Tap Fees	2016 Tap Fees
Residential		
Single Family Water Tap (per EQR)	\$25,000	\$24,000
Single Family Sanitary Sewer Tap (per EQR)	\$7,500	\$8,000
Multi-Family Water Tap, per unit	\$18,750	\$18,000
Multi-Family Sanitary Sewer Tap, per unit	\$5,625	\$6,000
Pool Tap	\$12,500	\$12,500
Non-Residential		
Indoor Water Tap (per EQR)	\$25,000	\$24,000
Irrigation		
5/8"	\$16,667	\$16,080
3/4"	\$25,000	\$24,000
1"	\$41,667	\$40,080
1-1/2"	\$83,333	\$79,920
2"	-	\$160,080
3"	At least \$204,840 for non-residential indoor and \$138,240 for irrigation only	\$400,080
Sanitary Sewer Tap (per EQR)	\$7,500	\$8,000
Residential Stormwater Tap (per unit)	N/A	\$4,500
Non-Residential Stormwater Tap	N/A	**

**Calculated on a case-by-case basis dependent on impervious area.

The 2016 the tap fees result in increases across all customer classes when including financing costs and establishes a new CAB stormwater tap fee. The majority of this increase is due to the new stormwater tap fee. As Sterling Ranch continues to develop, these tap fees should be revisited each year to capture changes in development assumptions.

3.0 Water Rate Development

3.1 Introduction

This section provides the recommend rates for the CAB water enterprise. The revenue requirements include estimates of O&M expenditures, capital costs, and financing assumptions. These revenue requirements were used to update the 2015 rates to ensure the costs are recovered and consistent with the long-term financial plan.

3.2 Revenue Requirements

Revenue requirements define the annual revenue needed to operate the water enterprise while meeting all operating, maintenance, and capital expenses. User charge revenue requirements define the revenue needed from water rates, net of other sources of revenue. These costs will be recovered from the water system customers of various classes using the base-extra capacity cost allocation method, as developed in the 2014 Rate Study. The revenue requirements for the CAB water enterprise are discussed as follows.

3.2.1 Operation and Maintenance Expenditures

CAB is responsible for operating and maintaining the water distribution system within the Sterling Ranch Development, which consists primarily of water distribution lines to deliver water from DWSD infrastructure to CAB's retail customers. CAB is also responsible for the billing system and other district administrative expenses. Due to a lack of historical data concerning O&M expenses, other sources were relied upon to estimate their future values. It was assumed annual O&M expenses were two percent of CAB's capital costs. Administration expenses for DWSD and CAB were estimated by DWSD as a whole, meaning administration expenses included the costs for DWSD Water and Sewer, and CAB Water, Sewer, and Stormwater enterprises. These administration expenses were proportioned to the various entities, and it was assumed CAB Water administration was approximately 45 percent of the total for all of the DWSD and CAB enterprises.

Since water is supplied by DWSD, the largest component of CAB O&M expenses is wholesale water purchases from DWSD. Therefore, CAB's annual O&M expenses are highly dependent on the wholesale water rates charged by DWSD. The majority of water purchased will be for residential and non-residential uses for which CAB will charge retail water rates to recover costs. However, CAB is also responsible for irrigation of the parks and other common areas. In the first filing, the number of irrigated acres is approximately 35, and by buildout, it was assumed the total number of irrigated acres for the development will be approximately 163 acres. Estimated water use per irrigated acre was provided by Element, which is assumed to be 2 AFY/acre. The costs associated with irrigating parks and open spaces were assumed to benefit all customers, so these costs are recovered through the rates of all retail customers.

Estimated annual O&M expenditures are shown in Table C-1 (Appendix C) for the years 2016 through 2020.

3.2.2 Capital-Related Expenditures

For purposes of financial planning, capital expenditures are organized in a separate fund, the CAB Water Capital Fund. Capital fund revenues include tap fees, proceeds from debt issuance, interest income on reserves, potential transfers from the Operating Fund, and other miscellaneous sources. Uses of capital

funds include annual CIP expenditures and transfers to the Operating Fund to cover some portion of debt service. Transfers to the Operating Fund are restricted for the repayment of advances from the developer and are not used for payment of operating expenses. The structure of the CAB Water Capital Fund and the cash flow projections for 2016 through 2020 are shown in Table C-2 (Appendix C).

3.2.2.1 Irrigation Taps

In addition to the capital infrastructure of the water system, CAB is responsible for purchasing irrigation taps from DWSD for common areas within the development. It was assumed these expenses would be recovered through water rates, and are therefore shown in the Operating Fund Cash Flow (Table C-3, Appendix C).

3.2.2.2 Debt Service

Approximately \$3.6 million is needed to fund CAB capital expenditures in the early years of the development, which is shown as financing proceeds in 2016 in the Capital Fund cash flow table. The assumptions for this financing are a 25-year term at an interest rate of 7 percent with issuance costs of 2 percent of principal, and delayed repayment of 2 years. The annual debt service for this financing is funded through tap fee revenue, and a portion of these financing costs are included in the tap fee as discussed above.

3.3 Water Cost of Service Analysis

Since essentially the same rate structure is maintained from the 2014 Rate Study, the revenue requirements as discussed above were updated, as well as the water usage assumptions as discussed in the following sections.

3.3.1 Annual Billable Usage

Water use for the Sterling Ranch Development was estimated by Element by customer class for buildout. This estimate was used along with the development schedule provided by Sterling Ranch to estimate the annual water usage. The estimated annual water usage by customer class, in AFY, is shown in Table A-1 (Appendix A) for 2016 through 2020. It is important to note that this is customer usage at the meter and would form the basis for calculating water charges. Overall system demands would also include transmission and distribution system losses.

3.3.2 Monthly Water Usage

The estimated monthly water usage by customer class is demonstrated in Table C-4 (Appendix C). Water use is delineated between indoor and outdoor since both will be metered for each customer. The usage factors were developed with the assistance of Element.

3.4 Rate Design

Rate design addresses how customer class revenue requirements are recovered within each class, that is, how much of the cost is recovered from the customer through fixed monthly charges and how much is recovered through volume charges on a \$/1,000-gallon basis. The rate structure proposed in the 2014 Rate Study was adopted in the 2015 Rules and Regulations. The adopted rate structure incorporates tiered rates that attempt to manage water usage through a combination of cost of service principles and conservation incentives. The rate structure includes a base fixed monthly charge plus indoor and outdoor tiered volumetric usage charges. This rate structure was maintained for this rate study, and the base and volumetric charges were evaluated against the revenue requirements using the water usages assumptions discussed in the previous section.

3.4.1 Recommended 2016 Water Rates

Recommended water rates will ultimately be cost of service-based, but in order to encourage water stewardship, rates within most customer classes are tiered, with each successive tier charged at a higher price per unit. As a result, cost of service drives the overall customer class cost allocation. Each customer class pays their fair share of costs, but within the customer class, some latitude is given to rate designs that accomplish water usage goals.

It is important to note that water service customers will have two water meters, one for water used indoors and one for water used outdoors. Considering this, tiered rates will need to be developed in a manner that ensures customers are not encouraged to use outdoor-metered water indoors and vice versa. It is also important to note that there is likely an infinite number of combinations of tiers and tier prices. The analyst needs to simultaneously consider the overall costs allocated to the customer classes, the "elasticity," or responsiveness, of water demand to water price, and the water charges for nearby benchmark utilities.

A water budget approach is used to develop water usage tiers unique to each water user. However, since there are not yet customers in the system nor data regarding individual customer water usage, tiered rates are based upon monthly water usage estimates presented earlier.

The CAB water rates include a monthly Water Service Availability Charge and tiered Water Consumption Charges for indoor and outdoor use. The Water Service Availability charges include both the indoor and outdoor meters required for single family homes. As previously discussed, the costs associated with purchasing whole sale water from DWSD were incorporated into CAB's revenue requirements. The existing and proposed water retail rates are provided in Table 3-1 by customer class.

Table 3-1
CAB Current and Proposed Retail Water Service Availability Charge

Description	Current (2015)	Proposed (2016)
Residential		
Single Family (\$/month, per unit)	\$55.00	\$56.00
Multifamily (\$/month, per unit)	\$40.00	\$42.00
Non-Residential		
3/4"	\$55.00	\$56.00
1"	\$55.00	\$66.00
1-1/2"	\$70.00	\$71.50
2"	\$108.00	\$110.00
3"	\$243.00	\$248.00
4"	\$486.00	\$496.00
Irrigation		
3/4"	N/A	\$56.00
1"	N/A	\$66.00
1-1/2"	N/A	\$71.50
2"	N/A	\$110.00
3"	N/A	\$248.00
4"	N/A	\$496.00

The proposed water service availability charge is unchanged from 2015, but charges for irrigation customers is established for 2016.

The water consumption rates were developed for indoor and outdoor water use. The current indoor water consumption rate is an increasing block structure. The rate structure assumes an individualized water budget using the average winter consumption (AWC). The AWC is the customer's actual water use for the months of December, January, and February. This approach can be used for all customer classes and is based on a customer's individual water consumption characteristics. The current and proposed rates are provided in Table 3-2.

Table 3-2
CAB Current and Proposed Indoor Consumption Charge

Current (2015)		Proposed (2016)	
Tier	Fee per 1,000 gallons	Tier	Fee per 1,000 gallons
Indoor Tier 1 Single Family: Up to 4,000 gal./month Multi-Family: Up to 3,500 gal./month	\$4.00	<100% of AWC	\$6.65
Indoor Tier 2 All: Up to 6,000 gal./month	\$6.00	100 to 120% AWC	\$8.20
Indoor Tier 3 All: Up to 8,000 gal./month	\$10.00	>120% of allocated budget	\$12.25

The changes in the water rates proposed for 2016 reflect the use of individualized water budgets for indoor water use. Accounts without an AWC history will be assigned 8,000 gallons per month as an initial AWC.

The current and proposed outdoor consumption charge is summarized in Table 3-3.

Table 3-3
CAB Current and Proposed Outdoor Consumption Charge

Current (2015)		Proposed (2016)	
Tier	Current Fee per 1,000 gallons	Tier	Proposed Fee per 1,000 gallons
Annual Water Allotment 80%	\$6.00	Annual Water Allotment <100%	\$8.20
Annual Water Allocation 80 - 100%	\$8.00	Annual Water Allotment 100 - 120%	\$12.25
Annual Water Allocation 100 - 120%	\$12.00	Annual Water Allotment 120 - 140%	\$16.35
Annual Water Allocation 120 - 140%	\$16.00	Annual Water Allotment >140%	\$20.00

The proposed changes to the outdoor consumption charge include an adjustment to the lowest tier to include 100% of the outdoor water budget and establishes a fourth tier for water usage over 140% of the outdoor water budget. These conservation-based rates generate sufficient revenue to meet costs over the full period of analysis, but in any given year costs may exceed revenue and vice versa.

3.4.1.1 Revenue and Cash Flow

The Operating Fund cash flow is provided in Appendix C (Table C-3), which summarizes rate revenue at the proposed rates. An annual rate increase, consistent with other regional districts, in future years is expected and has been included in the financial model. In the early years of the development, the revenue from the small number of customers will not be sufficient to fully recover operating expenses, as shown on the Operating Fund Cash Flow table. The developer will likely finance the operating shortfall through advances, but other financing sources may be used.

3.4.1.2 Residential Monthly Bills at 2016 Rates

The residential monthly bill for the average single-family resident is estimated to be \$81.27 per month for indoor use or winter use. During summer months, such as June, July, or August, when outdoor usage tends to be at its peak, the monthly bill is estimated to be \$133.67, which includes both indoor and outdoor usage. This calculation assumes AWC of 3,800 gallons per month and outdoor consumption of 6,390 gallons per month.

4.0 Sewer Rate Development

4.1 Introduction

This section provides the recommend rates for the CAB sewer enterprise. The revenue requirements have been updated to include estimates of O&M expenditures, capital costs, and financing assumptions. These revenue requirements were used to update the 2015 rates to ensure the costs are recovered and consistent with CAB’s long-term business plan.

4.2 Revenue Requirements

Revenue requirements define the annual revenue needed to operate the CAB Sewer enterprise while meeting all operating, maintenance, and capital expenses. User charge revenue requirements define the revenue needed from sewer rates, net of other sources of revenue. These costs will be recovered from the sewer system customers of various classes. The revenue requirements for the CAB sewer enterprise are discussed as follows.

4.2.1 Operation and Maintenance Expenditures

CAB is responsible for operating and maintaining the sewer collection system within the Sterling Ranch Development, which is primarily collection lines that convey wastewater to the DWSD lift stations. CAB is also responsible for the billing system and other administrative expenses. Due to a lack of historical data concerning O&M expenses, other sources are relied upon to estimate their future values. Annual O&M expenditures on collection lines within the development were assumed at 2 percent of the capital costs. Administration expenses for DWSD and CAB were estimated by DWSD as a whole, meaning administration expenses included the costs for DWSD Water and Sewer, and CAB Water, Sewer, and Stormwater enterprises. These administration expenses were proportioned to the various entities, and it was assumed CAB Sewer administration was approximately 25 percent of the total for all of the DWSD and CAB enterprises.

Similar to CAB Water enterprise, the CAB Sewer enterprise receives sewer services such as sewer transmission and treatment from DWSD. CAB is charged a wholesale sewer rate by DWSD based on the estimated plant influent measured at the sewer treatment plant as estimated by Element. At buildout, Element estimated the plant influent to be approximately 1,555 AFY. The build-out plant influent was scaled based on the development plan provided by Sterling Ranch to determine the annual plant influent expected between 2016 through buildout. The DWSD charges to CAB for sewer services was determined by multiplying the annual plant influent by the DWSD wholesale sewer rate. Estimated O&M expenditures are shown in Table D-1 (Appendix D) for the years 2016 through 2020.

4.2.2 Capital-Related Expenditures

For the purposes of financial planning, sewer capital expenditures are organized in a separate fund, the CAB Sewer Capital Fund. The Capital Fund has revenues and expenditures. Revenues include tap fees, proceeds from debt issuance, interest income on reserves, potential transfers from the Operating Fund, and other miscellaneous sources. Uses of funds include annual CIP expenditures and transfers to the Operating Fund to cover some portion of debt service. Transfers to the Operating Fund are restricted for the repayment of advances from the developer and are not used for payment of operating expenses. The structure of the CAB Sewer Capital Fund is demonstrated in Table D-2 (Appendix D).

4.2.2.1 Debt Service

Approximately \$1.1 million is needed to fund CAB capital expenditures in early years, which is shown as

financing proceeds in 2016 in the Capital Fund cash flow table. The assumptions for this financing are a 25-year term at an interest rate of 7 percent, with issuance costs of 2 percent of principal, and delayed repayment of 2 years. The annual debt service for this financing is funded through tap fee revenue, and a portion of these financing costs are included in the tap fee as discussed above.

4.3 Sewer Rate Design

Sewer rate structures can vary from fixed flat rates, charges based on a percentage of water use, or charges based on annual indoor water usage estimates. From the 2014 Rate Study effort, a preliminary sewer rate structure was proposed, which was adopted in the 2015 CAB Rules and Regulations. The rate structure includes a base fixed monthly charge plus a volumetric usage charge. This rate structure was maintained for this rate study, and the fixed charge and volumetric charges were evaluated against the revenue requirements discussed in the previous section.

4.3.1 Recommended 2016 Sewer Rates

CAB Sewer has three customer classes, Single Family Residential, Multi-Family Residential, and Non-Residential. For each class, the sewer charges are comprised of a monthly base fixed charge plus a volumetric usage charge. Since indoor water use will be metered separate from outdoor water use, the sewer usage charge is calculated using only the metered indoor water use. The current and 2016 proposed sewer charges are summarized by customer class in Table 4-1.

Table 4-1
CAB Current and Proposed Sewer Charge

Customer Class	Current (2015)		Proposed (2016)	
	Base Fixed Charge	Fee per 1,000 gallons of Indoor Use	Base Fixed Charge	Fee per 1,000 gallons of Indoor Use
Single Family	\$30.00	\$4.00	\$31.00	\$6.65
Multi Family	\$30.00	\$4.00	\$31.00	\$6.65
Non-Residential	\$50.00	\$5.00	\$52.00	\$7.15

The proposed rates are established to ensure that the CAB can recover the cost of the wholesale sewer services provided by DWSD as well as ongoing O&M expenses. User charge revenue is the sum of the base fixed revenue and the revenue generated from the volumetric charge. The annual base fixed revenue is determined by multiplying the base fixed charge to each customer by 12 months. The annual volumetric user charge revenue is determined by multiplying the indoor water use, as developed in the water model, by the fee per 1,000 gallons.

4.3.1.1 Revenue and Cash Flow

The Operating Fund cash flow is provided in Appendix D (Table D-3), which summarizes rate revenue at the proposed rates. An annual rate increase, consistent with other regional districts, in future years is expected and has been included in the financial model. In the early years of the development, the revenue from the small number of customers will not be sufficient to fully recover operating expenses, as shown on the Operating Fund Cash Flow table. The developer will likely finance the operating shortfall through advances, but other financing sources may be used.

4.3.1.2 Residential Monthly Bills at 2016 Rates

The residential monthly bill is calculated for the average single-family resident as \$56.27 per month. This calculation assumes indoor consumption of 3,800 gallons per month.

5.0 Stormwater Rate Development

5.1 Introduction

The stormwater system is owned, operated, and maintained by CAB, without additional stormwater services provided by DWSD. Therefore, the CAB Stormwater rates are based on O&M costs, capital costs, and financing costs of the stormwater system. Monthly flat fees for stormwater rates were adopted in 2015 for the residential, multi-family residential, and non-residential customer classes. The proposed rate structure is for an annual flat fee.

5.2 Revenue Requirements

Revenue requirements define the annual revenue needed to operate the CAB Stormwater enterprise while meeting all operating, maintenance, and capital expenses. User charge revenue requirements define the revenue needed from stormwater rates, net of other sources of revenue. These costs will be recovered from the stormwater customers of various classes. The revenue requirements for the CAB water enterprise are discussed as follows.

5.2.1 Operation and Maintenance Expenditures

CAB is responsible for operating and maintaining the stormwater system within the Sterling Ranch Development, which consists primarily of drainage channels and detention ponds. CAB is also responsible for the billing system and other administrative expenses related to the stormwater system. Due to a lack of historical data concerning O&M expenditures, other sources are relied upon to estimate their future values. Annual O&M expenditures within the development were assumed at 1 percent of the stormwater capital costs. Administration expenses for DWSD and CAB were estimated by DWSD as a whole, meaning administration expenses included the costs for DWSD Water and Sewer, and CAB Water, Sewer, and Stormwater enterprises. These administration expenses were proportioned to the various entities, and it was assumed CAB Stormwater administration was approximately 5 percent of the total for all of the DWSD and CAB enterprises. Given the nature of stormwater systems, administration and O&M were considered minor compared to the water and sewer systems. Estimated O&M expenditures are shown in Table E-1 (Appendix E) for the years 2016 through 2020.

5.2.2 Capital-Related Expenditures

For the purposes of financial planning, capital expenditures are organized in a separate fund, the CAB Stormwater Capital Fund. The Capital Fund sources of revenue include tap fees, interest income on reserves, potential transfers from the Operating Fund, and other miscellaneous sources. Uses of capital funds include annual CIP expenditures and transfers to the Operating Fund to cover some portion of debt service and to provide for rate stabilization when necessary. Transfers to the Operating Fund are restricted for the repayment of advances from the developer, and are not used for payment of operating expenses. The structure of the Capital Fund is demonstrated in Table E-2 (Appendix E) with an estimate of the total expenditures for CAB's major stormwater enterprise assets.

5.2.2.1 Debt Service

Approximately \$17.1 million is needed to fund CAB capital expenditures in the early years, which is shown as financing proceeds in 2016 in the Capital Fund cash flow table. The assumptions for this financing are a 25-year term at an interest rate of 7 percent, with issuance costs of 2 percent of principal, and delayed repayment of 2 years. The Stormwater tap fee, as discussed in Section 2, does not cover the full cost of financing the Stormwater CIP. Therefore, a portion of the financing costs associated

with the CAB stormwater capital plan are included in the revenue requirements for the stormwater rates. This is reflected in the table by transfers into the Capital Fund from the Operating Fund as shown in Table E-2 (Appendix E). The percentage of the capital fund debt service paid by rates increases over time as more customers are added to the development.

5.3 Rate Design

The stormwater rate structure adopted in the 2015 Rules and Regulations is a flat monthly fee per customer class. The proposed rate structure is for an annual stormwater charge, and the stormwater rates were evaluated to meet the revenue requirements as discussed above.

5.3.1 Recommended 2016 Stormwater Rates

The current and proposed stormwater monthly charges are summarized by customer class in Table 5-1.

Table 5-1
CAB Current and Proposed Stormwater Charge

Customer Class	Current (2015) Monthly Charge	Proposed (2016) Annual Charge
Single Family	\$10.00 (\$120.00 annual)	\$150.00
Multi Family	\$10.00 (\$120.00 annual)	\$150.00
Non-Residential	\$25.00 (\$300.00 annual)	\$363.60

As Sterling Ranch continues to develop, a rate structure that considers impervious area should be considered for the non-residential customer class. The current rate design methodology will be further refined in future rate study updates.

5.3.1.1 Revenue and Cash Flow

The Operating Fund cash flow is provided in Appendix E (Table E-3), which summarizes rate revenue at the proposed rates. An annual rate increase, consistent with other regional districts, in future years is expected and has been included in the financial model. In the early years of the development, the revenue from the small number of customers will not be sufficient to fully recover operating expenses, as shown on the Operating Fund Cash Flow table. The developer will likely finance the operating shortfall through advances, but other financing sources may be used.

5.3.1.2 Residential Monthly Bills at 2016 Rates

Given the nature of the stormwater rate structure, calculation of the residential bill is simple. The annual residential obligation for stormwater is \$150.00 per residential customer.

6.0 Conclusions and Recommendations

This rate study update included developing tap fees for CAB water, sewer, and stormwater assets. The tap fees as developed in the 2014 Rate Study included both Dominion and CAB assets. The CAB tap fees are added to the DWSD tap fees to arrive at the total Sterling Ranch Development tap fee. The total tap fee for a single-family resident, including water, sewer, and stormwater, increased from \$32,500 to \$36,500. Annual fee increases, consistent with other regional districts, in future years is expected and has been included in the financial models. The large majority of the increase in taps is the addition of a stormwater tap fee.

The CAB water, sewer, and stormwater rates were also updated as a part of this study. The rate structures of each of the enterprises are generally consistent with the 2014 Rate Study and the CAB Rules and Regulations adopted in 2015. The water rates include both an indoor and outdoor rate, and are based on individualized water budgets using either the customer's irrigated area (outdoor irrigation) or the customer's AWC (indoor use). The outdoor budget will depend on approved landscaping plans. The sewer rate consists of a fixed monthly charge and volumetric rates based on indoor usage, and the stormwater rate is a fixed annual charge. The 2016 proposed changes to the rates included inflationary increases to each of the monthly or annual fixed charges and the volumetric usage rates. Annual rate increases, consistent with what other regional districts have been imposing, in future years is expected and has been included in the financial model.

It is recommended that CAB review all tap fees and rates each year. This is especially important in the early years of development, as assumptions change regarding enterprise CIPs, development assumptions, water supply sources, etc.

Appendix A

Customer Characteristics

**Table A-1
Dominion Water and Sanitation District and Community Authority Board
Customers, Equivalent Meters, and Annual Water Usage**

Description	2016 Projected	2017 Projected	2018 Projected	2019 Projected	2020 Projected
Customers (cumulative)					
Single family detached	15	241	616	967	1,297
Single family attached	10	90	178	257	337
MF Attached (Medium Density MF)	-	-	140	340	520
MF Attached (High Density MF)	-	-	-	-	80
Commercial			6	17	36
Irrigation	3	7	11	15	19
Chatfield Valley Framework (CFE) Customers					5
Total Customers, Ex. CFE	28	338	951	1,596	2,289
Total Customers, Inc. CFE	28	338	951	1,596	2,294
Equivalent meters (cumulative)					
Single family detached	15	241	616	967	1,297
Single family attached	10	90	178	257	337
MF Attached (Medium Density MF)	-	-	94	228	348
MF Attached (High Density MF)	-	-	-	-	54
Commercial	-	-	13.91	41	87
Irrigation	12	27	43	58	74
CFE	-	-	-	-	5
Total EQRs, Ex. CVE	37	358	944	1,551	2,197
Total EQRs, Inc. CVE	37	358	944	1,551	2,202
Annual usage (acre-feet)					
Single family detached	4	70	179	280	376
Single family attached	2	18	36	51	67
MF Attached (Medium Density MF)	-	-	15	37	57
MF Attached (High Density MF)	-	-	-	-	6
Commercial	-	-	5	16	33
Irrigation	-	70	70	70	86
Construction Water	500	500	250	250	250
CFE	-	-	-	-	1
Total billable AF usage (Exc. CFE and Construction)	6	158	305	455	626
Total billable AF usage (Inc. CFE and Construction)	506	658	555	705	878

Table A-2
Dominion Water and Sanitation District and Community Authority Board
Anticipated Meters by Customer Class

Customer class	5/8" x 3/4"	3/4"	1"	1 1/2"	2"	3"	Total	% of total
Single family detached		4,924					4,924	48%
Single family attached		1,154					1,154	11%
MF Attached (Medium Density MF)	1,772						1,772	17%
MF Attached (High Density MF)	1,850						1,850	18%
Non-residential units		146	84	55	30	7	322	3%
Irrigation			21	21	21		63	1%
CFE		100					100	1%
Total	3,622	6,324	105	76	51	7	10,185	100%

Equivalent meters	5/8" x 3/4"	3/4"	1"	1 1/2"	2"	3"	Total	% of total
<i>Equivalent meter factor</i>	<i>0.67</i>	<i>1.00</i>	<i>1.67</i>	<i>3.33</i>	<i>6.67</i>	<i>16.67</i>		
Single family detached	-	4,924	-	-	-	-	4,924	51%
Single family attached	-	1,154	-	-	-	-	1,154	12%
MF Attached (Medium Density MF)	1,187	-	-	-	-	-	1,187	12%
MF Attached (High Density MF)	1,240	-	-	-	-	-	1,240	13%
Non-residential units	-	146	140	183	200	117	786	8%
Irrigation	-	-	35	70	140	-	245	3%
CFE	-	100	-	-	-	-	100	1%
Total	2,427	6,324	175	253	340	117	9,636	100%

Appendix B

CAB Tap Fees

**Table B-1
Community Authority Board, Water Enterprise
Calculated Tap Fee (2016 dollars)**

Total capital investment	\$	8,907,000
Equivalent residential units (EQR)		9,536
Calculated Water Tap Fee, not inc. financing costs, \$/EQR	\$	900
Financing Costs included in tap fee (\$/EQR)		\$600
Calculated Water Tap Fee, with financing costs, \$/EQR	\$	1,500

**Table B-2
Community Authority Board, Wastewater Enterprise
Calculated Tap Fee (2016 dollars)**

Total capital investment	\$	3,969,000
Equivalent residential units (EQR)		9,536
Calculated Wastewater Tap Fee, not inc. financing costs, \$/EQR	\$	400
Financing Costs included in tap fee (\$/EQR)	\$	300
Calculated Wastewater Tap Fee, with financing costs, \$/EQR	\$	700

**Table B-3
Community Authority Board, Stormwater Enterprise
Calculated Tap Fee (2016 dollars)**

Total capital investment	\$	39,883,000
Equivalent residential units (EQR)		9,536
Calculated Stormwater Tap Fee, non inc. financing costs, \$/EQR	\$	4,200
Financing Costs included in tap fee (\$/EQR)	\$	300
Calculated SDC, with financing costs, \$/EQR	\$	4,500

Appendix C

Water Rate Development

**Table C-1
 CAB, Water Enterprise
 Estimated O&M Expenditures (2016 Dollars)**

Description	2016 Projected	2017 Projected	2018 Projected	2019 Projected	2020 Projected
Operations and maintenance expenditures					
Distribution System O&M	\$ 19,969	\$ 31,888	\$ 43,185	\$ 43,505	\$ 43,505
Administration	\$ 360,000	\$ 378,000	\$ 397,000	\$ 417,000	\$ 438,000
Billing		\$ 30,000	\$ 42,000	\$ 42,000	\$ 54,000
Water Service from DWSD					
Water service Payment to DWSD - Residential	\$ 8,932	\$ 132,564	\$ 455,592	\$ 876,443	\$ 1,307,602
Water service Payment to DWSD - Commercial	\$ -	\$ -	\$ 7,693	\$ 31,104	\$ 73,638
Water service Payment to DWSD - Irrigation	\$ -	\$ 205,317	\$ 209,423	\$ 213,612	\$ 267,686
Water service Payment to DWSD - Construction	\$ 977,700	\$ 977,700	\$ 498,627	\$ 508,600	\$ 518,772
Water Service Payments to DWSD	\$ 986,632	\$ 1,315,581	\$ 1,171,335	\$ 1,629,758	\$ 2,167,698
Total annual O&M expenditures	\$ 1,366,601	\$ 1,725,469	\$ 1,611,521	\$ 2,090,263	\$ 2,649,204

**Table C-2
CAB, Water Enterprise Capital
Fund (2016 Dollars)**

Description	2016 Projected	2017 Projected	2018 Projected	2019 Projected	2020 Projected
Sources of funds					
Water System Tap Fee Revenue	\$ -	\$ 493,500	\$ 910,500	\$ 967,500	\$ 1,015,500
Financing proceeds	\$ 1,900,000	\$ 893,940	\$ 847,290	\$ 8,400	
Other sources					
Interest earnings					
Total sources	\$ 1,900,000	\$ 1,387,440	\$ 1,757,790	\$ 975,900	\$ 1,015,500
Uses of funds					
Water CIP	\$ 1,497,660	\$ 893,940	\$ 847,290	\$ 24,000	\$ -
Debt Service	\$ -	\$ -	\$ 163,040	\$ 239,749	\$ 312,456
Financing Issuance Cost	\$ 38,000	\$ 17,879	\$ 16,946	\$ 168	\$ -
Transfer to Operating Fund	\$ -	\$ -	\$ -	\$ -	\$ -
Transfer from Operating Fund	\$ -	\$ -	\$ -	\$ -	\$ -
Total uses	\$ 1,535,660	\$ 911,819	\$ 1,027,276	\$ 263,917	\$ 312,456
Annual Surplus/(Deficiency)	\$ 364,340	\$ 475,621	\$ 730,514	\$ 711,983	\$ 703,044
Beginning Fund Balance	\$ -	\$ 364,340	\$ 839,961	\$ 1,570,475	\$ 2,282,458
Ending Fund Balance	\$ 364,340	\$ 839,961	\$ 1,570,475	\$ 2,282,458	\$ 2,985,502

Table C-3
CAB, Water Enterprise
Operating Fund Cash Flow (2016 Dollars)

	2016 Projected	2017 Projected	2018 Projected	2019 Projected	2020 Projected
Operating Revenue					
Water service charges (Retail Rate Revenue)	\$ 16,419	\$ 239,594	\$ 850,222	\$ 1,690,124	\$ 2,560,692
Construction Water Revenue	\$ 977,700	\$ 977,700	\$ 498,627	\$ 508,600	\$ 518,772
Non-rate revenues	-	-	-	-	-
Total Operating Revenue	\$ 994,119	\$ 1,217,294	\$ 1,348,849	\$ 2,198,724	\$ 3,079,464
Operation and maintenance					
Distribution System (O&M)	\$ 19,969	\$ 31,888	\$ 43,185	\$ 43,505	\$ 43,505
CAB Administration	\$ 360,000	\$ 378,000	\$ 397,000	\$ 417,000	\$ 438,000
Customer Billing	\$ -	\$ 30,000	\$ 42,000	\$ 42,000	\$ 54,000
Water Service Payments to DWSD	\$ 986,632	\$ 1,315,581	\$ 1,171,335	\$ 1,629,758	\$ 2,167,698
Total Expenses	\$ 1,366,601	\$ 1,755,469	\$ 1,653,521	\$ 2,132,263	\$ 2,703,204
Other Inflows/(Outflows)					
Financing Proceeds	\$ -	\$ -	\$ -	\$ -	\$ -
Financing Repayment	\$ -	\$ -	\$ -	\$ -	\$ -
Irrigation Tap Fees to DWSD	\$ (262,575)	\$ (404,560)	\$ (404,560)	\$ (404,560)	\$ (404,560)
Cash funded capital expenditures	-	-	-	-	-
Transfers to Capital Fund	-	-	-	-	-
Transfers from Capital Fund	-	-	-	-	-
Total Other Inflows/(Outflows)	(262,575)	(404,560)	(404,560)	(404,560)	(404,560)
Annual Surplus/(Deficiency)	\$ (635,057)	\$ (942,735)	\$ (709,232)	\$ (338,100)	\$ (28,300)
Beginning Fund Balance	\$ -	\$ (635,057)	\$ (1,577,793)	\$ (2,287,024)	\$ (2,625,124)
Ending Fund Balance	\$ (635,057)	\$ (1,577,793)	\$ (2,287,024)	\$ (2,625,124)	\$ (2,653,424)

**Table C-4
CAB, Water Enterprise
Billable Monthly Usage**

Outdoor Demand Curve	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	0.0%	0.0%	0.7%	4.1%	11.3%	18.4%	24.5%	20.3%	14.0%	6.2%	0.7%	0.0%	100.0%
***Demands at the Point of Use, not WTP													
Single Family Detached (SFD) Residential													
Indoor usage, acre feet/year	0.163												
Outdoor usage, ac-ft/yr	0.127												
Monthly breakdown	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days	31	28.25	31	30	31	30	31	31	30	31	30	31	365.25
Total indoor usage (gallons)	4,509	4,109	4,509	4,363	4,509	4,363	4,509	4,509	4,363	4,509	4,363	4,509	53,122
Total outdoor usage (gallons)	-	-	271	1,706	4,658	7,596	10,129	8,384	5,784	2,550	310	-	41,389
Total monthly usage (gallons)	4,509	4,109	4,780	6,069	9,167	11,959	14,638	12,892	10,148	7,059	4,673	4,509	94,511
Indoor usage below or at threshold (gallons)	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	48,000
Indoor usage above threshold (gallons)	509	109	509	363	509	363	509	509	363	509	363	509	5,122
Outdoor usage below or at first tier threshold (gallons)	-	-	271	1,706	4,658	5,000	5,000	5,000	5,000	2,550	310	-	29,496
Outdoor usage above first tier (gallons)	-	-	-	-	-	2,596	5,129	3,384	784	-	-	-	-
Outdoor usage within second tier (gallons)	-	-	-	-	-	2,596	5,129	3,384	784	-	-	-	11,893
Outdoor usage in third tier (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Monthly Usage													94,511
***Demands at the Point of Use, not WTP													
Single Family Attached (SFA) Residential													
Indoor usage, ac-ft/yr	0.120												
Outdoor usage, ac-ft/yr	0.080												
Monthly breakdown	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days	31	28.25	31	30	31	30	31	31	30	31	30	31	365.25
Total indoor usage (gallons)	3,319	3,025	3,319	3,212	3,319	3,212	3,319	3,319	3,212	3,319	3,212	3,319	39,108
Total outdoor usage (gallons)	-	-	171	1,075	2,934	4,785	6,381	5,281	3,644	1,606	195	-	26,072
Total monthly usage (gallons)	3,319	3,025	3,490	4,287	6,254	7,997	9,700	8,600	6,856	4,926	3,408	3,319	65,180
Indoor usage below or at threshold (gallons)	3,319	3,025	3,319	3,212	3,319	3,212	3,319	3,319	3,212	3,319	3,212	3,319	39,108
Indoor usage above threshold (gallons)	-	-	171	1,075	2,934	4,785	6,381	5,281	3,644	1,606	195	-	26,072
	3,319	3,025	3,490	4,287	6,254	7,997	9,700	8,600	6,856	4,926	3,408	3,319	65,180
Outdoor usage below or at first tier threshold (gallons)	3,319	3,025	3,319	3,212	3,319	3,212	3,319	3,319	3,212	3,319	3,212	3,319	39,108
Outdoor usage above first tier (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-
Outdoor usage below or at first tier threshold (gallons)	-	-	171	1,075	2,934	4,785	5,000	5,000	3,644	1,606	195	-	24,410
Outdoor usage within second tier (gallons)	-	-	-	-	-	-	1,381	281	-	-	-	-	1,662
Outdoor usage in third tier (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Monthly Usage													65,180
***Demands at the Point of Use, not WTP													
Multi-Family Residential, Medium Density													
Indoor usage, ac-ft/yr	0.090												
Outdoor usage, ac-ft/yr	0.020												

Monthly breakdown	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days	31	28.25	31	30	31	30	31	31	30	31	30	31	365.25
Total indoor monthly usage (gallons)	2,489	2,269	2,489	2,409	2,489	2,409	2,489	2,489	2,409	2,489	2,409	2,489	29,331
Total outdoor monthly usage (gallons)	-	-	43	269	734	1,196	1,595	1,320	911	402	49	-	6,518
Total monthly usage (gallons)	2,489	2,269	2,532	2,678	3,223	3,605	4,085	3,810	3,320	2,891	2,458	2,489	35,849
Indoor usage below or at threshold (gallons)	2,489	2,269	2,489	2,409	2,489	2,409	2,489	2,489	2,409	2,489	2,409	2,489	29,331
Indoor usage above threshold (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-
Outdoor usage below or at threshold (gallons)	-	-	43	269	734	1,196	1,595	1,320	911	402	49	-	6,518
Outdoor usage above threshold (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-
													Total Monthly Usage
													35,849

***Demands at the Point of Use, not WTP

Indoor usage, gal/capita/day
Outdoor usage, ac-ft/yr

0.065
0.010

Multi-Family Residential, High Density

Monthly breakdown	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days	31	28.25	31	30	31	30	31	31	30	31	30	31	365.25
Total indoor monthly usage (gallons)	1,798	1,638	1,798	1,740	1,798	1,740	1,798	1,798	1,740	1,798	1,740	1,798	21,184
Total outdoor monthly usage (gallons)	-	-	21	134	367	598	798	660	455	201	24	-	3,259
Total monthly usage (gallons)	1,798	1,638	1,819	1,874	2,165	2,338	2,596	2,458	2,195	1,999	1,764	1,798	24,443
Indoor usage below or at threshold (gallons)	1,798	1,638	1,798	1,740	1,798	1,740	1,798	1,798	1,740	1,798	1,740	1,798	21,184
Indoor usage above threshold (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-
Outdoor usage below or at threshold (gallons)	-	-	21	134	367	598	798	660	455	201	24	-	3,259
Outdoor usage above threshold (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-
													Total Monthly Usage
													24,443

Appendix D
Sewer Rate Development

**Table D-1
 CAB, Sewer Enterprise
 Estimated O&M Expenditures (2016 Dollars)**

Description	2016 Projected	2017 Projected	2018 Projected	2019 Projected	2020 Projected
Operations and maintenance expenditures					
DSWD Charges	\$ 4,940	\$ 72,813	\$ 257,242	\$ 507,700	\$ 774,907
Collection System O&M	\$ 11,571	\$ 15,841	\$ 22,436	\$ 22,436	\$ 23,655
District Administration					
All admin cost allocated to WW	\$ 200,000	\$ 210,000	\$ 221,000	\$ 232,000	\$ 243,000
Total annual O&M expenditures	\$ 216,511	\$ 298,654	\$ 500,678	\$ 762,136	\$ 1,041,562

Table D-2
CAB, Sewer Enterprise
Capital Fund Cash Flow (2016 Dollars)

Description	2016 Projected	2017 Projected	2018 Projected	2019 Projected	2020 Projected
Sources of funds					
Sewer System Tap Fee Revenue	\$ 112,700	\$ 112,700	\$ 424,900	\$ 451,500	\$ 473,900
Financing proceeds	\$ 578,556	\$ 213,480	\$ 329,754	\$ -	\$ -
Transfer from Operating Fund	\$ -	\$ -	\$ -	\$ -	\$ -
Interest earnings					
Total sources	\$ 691,256	\$ 326,180	\$ 754,654	\$ 451,500	\$ 473,900
Uses of funds					
Wastewater CIP	\$ 578,556	\$ 213,480	\$ 329,754	\$ -	\$ 60,960
Debt Service	\$ -	\$ -	\$ 49,646	\$ 67,965	\$ 96,261
Financing Issuance Cost	\$ 11,571	\$ 4,270	\$ 6,595	\$ -	\$ -
Transfer to Operating Fund	\$ -	\$ -	\$ -	\$ -	\$ -
Total uses	\$ 590,127	\$ 217,750	\$ 385,995	\$ 67,965	\$ 157,221
Annual Surplus/(Deficiency)	\$ 101,129	\$ 108,430	\$ 368,659	\$ 383,535	\$ 316,679
Beginning Fund Balance	\$ -	\$ 101,129	\$ 209,559	\$ 578,218	\$ 961,753
Ending Fund Balance	\$ 101,129	\$ 209,559	\$ 578,218	\$ 961,753	\$ 1,278,432

Table D-3
CAB, Sewer Enterprise
Operating Fund Cash Flow (2016 Dollars)

	2016 Projected	2017 Projected	2018 Projected	2019 Projected	2020 Projected
<u>Operating Revenue</u>					
Wastewater service revenue	\$ 5,000	\$ 70,000	\$ 269,000	\$ 612,000	\$ 1,035,000
Non-rate revenues					
Total Revenue	\$ 5,000	\$ 70,000	\$ 269,000	\$ 612,000	\$ 1,035,000
<u>Operation and maintenance</u>					
DSWD Charges	\$ 5,000	\$ 73,000	\$ 257,000	\$ 508,000	\$ 775,000
Collection System O&M	\$ 12,000	\$ 16,000	\$ 22,000	\$ 22,000	\$ 24,000
Administration	\$ 200,000	\$ 210,000	\$ 221,000	\$ 232,000	\$ 243,000
Total O&M Expenses	\$ 217,000	\$ 299,000	\$ 500,000	\$ 762,000	\$ 1,042,000
<u>Other Inflows/(Outflows)</u>					
Financing Proceeds					
Financing Repayment					
Cash funded capital expenditures	\$ -	\$ -	\$ -	\$ -	\$ -
Transfers (to) Capital Fund					
Transfers from Capital Fund	\$ -	\$ -	\$ -	\$ -	\$ -
Total Other Inflows/(Outflows)	\$ -	\$ -	\$ -	\$ -	\$ -
Annual Surplus/(Deficiency)	\$ (212,000)	\$ (229,000)	\$ (231,000)	\$ (150,000)	\$ (7,000)
Beginning Fund Balance	0	\$ (212,000)	\$ (441,000)	\$ (672,000)	\$ (822,000)
Ending Fund Balance	\$ (212,000)	\$ (441,000)	\$ (672,000)	\$ (822,000)	\$ (829,000)

Appendix E

Stormwater Rate Development

**Table E-1
 CAB, Stormwater Enterprise
 O&M Expenses (2016 Dollars)**

Description	2016 Projected	2017 Projected	2018 Projected	2019 Projected	2020 Projected
Operations and Maintenance expenditures					
Infrastructure O&M	\$ 45,938	\$ 69,825	\$ 141,163	\$ 148,800	\$ 148,800
District Administration	\$ 40,000	\$ 42,000	\$ 44,000	\$ 46,000	\$ 49,000
Total Annual O&M Expenditures	\$ 85,938	\$ 111,825	\$ 185,163	\$ 194,800	\$ 197,800

**Table E-2
CAB, Stormwater Enterprise
Capital Fund (2016 Dollars)**

Description	2016 Projected	2017 Projected	2018 Projected	2019 Projected	2020 Projected
Sources of funds					
Stormwater System Development Fee (SDF)	\$ -	\$ 724,500	\$ 2,731,500	\$ 2,902,500	\$ 3,046,500
Financing proceeds	\$ 5,700,000	\$ 2,866,500	\$ 8,560,500		
Other sources					
Interest earnings					
Transfer from Operating Fund	\$ -	\$ -	\$ -	\$ -	\$ -
Total sources	\$5,700,000	\$3,591,000	\$11,292,000	\$2,902,500	\$3,046,500
Uses of funds					
Stormwater CIP expenditures	\$ 5,512,500	\$ 2,866,500	\$ 8,560,500	\$ 916,500	\$ -
Financing Issuance Cost	\$ 114,000	\$ 57,330	\$ 171,210	\$ -	\$ -
Debt Service	\$ -	\$ -	\$ 489,120	\$ 735,096	\$ 1,469,677
Transfer to Operating Fund					
Total uses	\$ 5,626,500	\$ 2,923,830	\$ 9,220,830	\$ 1,651,596	\$ 1,469,677
Annual Surplus/(Deficiency)	\$ 73,500	\$ 667,170	\$ 2,071,170	\$ 1,250,904	\$ 1,576,823
Beginning Fund Balance		\$ 73,500	\$ 740,670	\$ 2,811,840	\$ 4,062,744
Ending Fund Balance	\$ 73,500	\$ 740,670	\$ 2,811,840	\$ 4,062,744	\$ 5,639,568

**Table E-3
CAB, Stormwater Enterprise
Operating Fund (2016 Dollars)**

	2016 Projected	2017 Projected	2018 Projected	2019 Projected	2020 Projected
<u>Operating Revenue</u>					
Stormwater service charges	\$ 1,875	\$ 26,700	\$ 96,869	\$ 195,301	\$ 303,293
Non-rate revenues					
Total Revenue	\$ 1,875	\$ 26,700	\$ 96,869	\$ 195,301	\$ 303,293
<u>Operation and Maintenance Expenses</u>					
Infrastructure O&M	\$ 45,938	\$ 69,825	\$ 141,163	\$ 148,800	\$ 148,800
District Administration	\$ 40,000	\$ 42,000	\$ 44,000	\$ 46,000	\$ 49,000
Total O&M Expenses	\$ 85,938	\$ 111,825	\$ 185,163	\$ 194,800	\$ 197,800
<u>Other Inflows/(Outflows)</u>					
Financing Proceeds	\$ -	\$ -	\$ -	\$ -	\$ -
Financing Repayment	\$ -	\$ -	\$ -	\$ -	\$ -
Transfer to Capital Fund	\$ -	\$ -	\$ -	\$ -	\$ -
Transfers from Capital Fund					
Total Inflows/(Outflows)	\$ -	\$ -	\$ -	\$ -	\$ -
Surplus/(Deficiency)	\$ (84,063)	\$ (85,125)	\$ (88,293)	\$ 501	\$ 105,493
Beginning Fund Balance	\$ -	\$ (84,063)	\$ (169,188)	\$ (257,481)	\$ (256,980)
Ending Fund Balance	\$ (84,063)	\$ (169,188)	\$ (257,481)	\$ (256,980)	\$ (151,487)