2018
RATES AND FEES STUDY

VOLUME 2 OF 2

SYSTEM DEVELOPMENT FEES

Prepared by Castle Rock Water
Business Solutions

Final Report

September 2018

Table of Contents

Executive Summary

On an annual basis, Castle Rock Water (CRW) conducts a comprehensive rates and fees study for the water, water resources, wastewater, and stormwater funds. The purpose of this study is to provide the Town with a comprehensive and updated review of its System Development Fees (SDFs) and the underlying assumptions that are used to calculate the 2019-2023 fees.

For the second year in a row, CRW contracted with Stantec Consulting Services, Inc. to provide oversight and guidance with the study. Stantec was chosen based on the company's knowledge and experience in the industry, and the ability to provide industry best practices. They have reviewed our models and reports and provided their recommendations for the study.

Methodology

For calculating SDFs there are two commonly accepted methodologies. They are the equity buy-in approach and the incremental cost (or improvement) approach. A third approach that is also acknowledged by the American Water Works Association (AWWA) and the Water Environment Federation (WEF) is the combined or hybrid approach. This hybrid method is used to calculate CRW's water, water resources and wastewater SDFs, which is summarized below.

For stormwater, the incremental cost approach is used to identify additional capacity needed to serve growth. It is assumed that CRW's existing infrastructure and replacements are specifically serving existing developments and capital improvements are needed to provide runoff capacity for new customers.

Equity Buy-In Approach

The equity buy-in approach is most appropriate in situations where new customers can be served by the existing system. Under this method, new customers pay a proportionate share of the value of the existing infrastructure. AWWA recommends that the equity method is best used within systems that have adequate capacity to serve both existing and future customers without major system expansions.

Incremental Cost (Improvement) Approach

The incremental cost approach is most appropriate when the existing system is at or near its maximum capacity and new customers cannot be served without significant investment in infrastructure. Under the incremental cost approach, new customers pay a proportionate share of the expansion related costs of the new infrastructure.

Combined Approach

The combined approach often is the most appropriate approach because new customers tend to use capacity available in the existing infrastructure (buy-in) as well as new capacity that the utility must build in order to accommodate growth and the additional units to be served (incremental cost). This method best conforms to “growth pays for growth” policies, which is also the Town’s policy. The SDF is calculated using capital improvement plans (CIPs) developed in CRW’s master planning process.

With the combined approach, the equity buy-in method and incremental cost method are essentially combined so that new customers of the utility pay for their share of the existing system equity as well as their share of the capacity expansion costs. The equity portion of the connection fee is called the buy-in component and the incremental cost portion of the fee is referred to as the improvement component.

The combined approach as follows for water, water resources and wastewater SDFs complies with the criteria for impact fees required in the Colorado Revised Statutes (CRS) 29-20-104.5. This statute requires that SDFs and impact fees are:

- Legislatively adopted
- Applied to a broad class of property
- Recover the costs imposed by proposed development

The incremental cost approach for the stormwater development impact fees also complies with CRS 29-20-104.5.

Capacity Definitions

Defining capacity in both the existing infrastructure and new capital improvements is a critical step in determining SDFs. Moreover, defining capacity required by a single-family equivalent user is required for each of the SDFs and the stormwater development impact fee. For CRW, the following assumptions on capacity definitions apply:

1. A single-family equivalent (SFE) is a measure of the amount of water/wastewater flow required to meet potential demand of a single-family detached residence.
2. For the water and water resources systems, one SFE is assumed to require 400 gallons per day (gpd).
3. For the wastewater systems, one SFE is assumed to require 220 gpd of flow capacity.
4. For stormwater capacity, one SFE equals 3,255 square feet (sq. ft.) of impervious area.

Equivalency Schedule

Out of the various available equivalency schedules, CRW chooses two different schedules to look at in order to establish its rates and fees. The first is the hydraulic capacity method which is based on the relative capacity of different meter sizes and meter types utilized to deliver water. These can also be based on the relative potential demands of different customers. Based on the characteristic hydraulic demands, a single family meter size of ¾” is designated as the base for one SFE. The maximum flow rate or water through the meter in gallons per minute (gpm) becomes the unit of comparison. The maximum flow rate demanded by new customers is compared to the base demand in order to determine the equivalency ratio. For example, if the base single family residential customer requires 30 gpm and a commercial customer requires 200 gpm, the equivalency ratio equals 6.67 (200/30=6.67). These are shown in Table 1 below.

The second method is the actual use equivalency schedule, which is based on the relative average monthly water usage of CRW's customers. Average monthly use per account by meter size was calculated using a 2015 to 2017 three-year average of monthly consumption data from the customer characteristics analysis, which was obtained from the core billing system. The average usage of a single family residential meter size is designated as the base. The average usage of larger meter sizes is divided by the base usage to calculate equivalency ratios. Estimating existing demands on CRW's systems determines remaining capacity to serve new customers, therefore, the actual use equivalency schedule is what was used to calculate existing SFEs for the water, water resources and wastewater SDFs. These ratios are shown in Table 2 below.

Table 1
Hydraulic Capacity Equivalency Ratios

Meter Size	Equivalent Meter Ratios
5/8" x ¾"	0.67
¾"	1.00
1"	1.67
1.5"	3.33
2" C2	6.67
2" T2	8.33
3" C2	16.67
3" T2	21.67
4" C2	33.33
4" T2	41.67
6" C2	66.67
6" T2	83.33

Table 2 Calculated Meter Equivalency Ratios	
Meter Size	**Equivalent Meter Ratios**
5/8” x ¾”	0.79
¾”	1.00
1”	4.29
1.5”	9.48
2” C2	10.21
2” T2	29.49
3” C2	16.87
3” T2	45.03
4” C2	69.39
4” T2	82.78
6” C2	100.61

2018 Adopted vs 2019 Proposed SDFs by Fund

Castle Rock Water’s 2018 adopted versus proposed SDFs for 2019 are listed below in Tables 3 through 6. For water, water resources and wastewater the primary drivers of the SDF calculations include:

- Changes in net fixed asset value and construction work in progress.
- Updated capacity in existing and future facilities.
- Growth in SFEs.
- Updated capital improvement plans.
- An increase in wastewater due to the treatment plant expansion at Plum Creek Water Reclamation Authority (PCWRA).

Stormwater development impact fees are assessed based on impervious area by development type. The costs for stormwater capital improvements for new development are proportioned across the planned developments by type:

- Single Family Detached
- Single Family Attached
- Multifamily
- Commercial (Retail/Office)

The stormwater fees are also split for properties located within the Cherry Creek Basin and the Plum Creek Basin.

Updates to the stormwater fees calculations include:

- Decrease in the number of developable acres by land use type.
- Updated costs for the stormwater capital improvement plan.

Single family and multifamily development impact fees are per dwelling unit. Units for commercial (retail/office) development are per 1,000 square feet of building space.

Table 3
Water Fund
2018 Adopted vs 2019 Proposed SDFs

Meter Size	2018 Adopted SDFs	2019 Proposed SDFs
5/8” x ¾”	$2,352	$2,383
¾”	$3,510	$3,557
1”	$5,862	$5,940
1.5”	$11,688	$11,845
2” C2	$23,412	$23,725
2” T2	$29,238	$29,630
3” C2	$58,512	$59,295
3” T2	$76,062	$77,080
4” C2	$116,988	$118,555
4” T2	$146,262	$148,220
6” C2	$234,012	$237,145
6” T2	$292,488	$296,405

Table 4 Water Resources Fund 2018 Adopted vs 2019 Proposed SDFs		
Meter Size	2018 Adopted SDFs	2019 Proposed SDFs
5/8” x ¾”	$10,216	$11,411
¾”	$15,248	$17,031
1”	$25,464	$28,442
1.5”	$50,776	$56,713
2” C2	$101,704	$113,597
2” T2	$127,016	$141,868
3” C2	$254,184	$283,907
3” T2	$330,424	$369,062
4” C2	$508,216	$567,643
4” T2	$635,384	$709,682
6” C2	$1,016,584	$1,135,457
6” T2	$1,270,616	$1,419,193

Table 5 Wastewater Fund 2018 Adopted vs 2019 Proposed SDFs		
Meter Size	2018 Adopted SDFs	2019 Proposed SDFs
5/8” x ¾”	$2,653	$2,695
¾”	$3,959	$4,023
1”	$6,612	$6,718
1.5”	$13,183	$13,397
2” C2	$26,407	$26,833
2” T2	$32,978	$33,512
3” C2	$65,997	$67,063
3” T2	$85,792	$87,178
4” C2	$131,953	$134,087
4” T2	$164,972	$167,638
6” C2	$263,947	$268,213
6” T2	$329,903	$335,237

Table 6 Stormwater Fund 2018 Adopted vs 2019 Proposed Development Impact Fees		
Plum Creek Basin	**2018 Adopted DIFs**	**2019 Proposed DIFs**
Single Family Detached	$1,317	$1,317
Single Family Attached	$880	$880
Multifamily	$798	$798
Commercial (Retail/Office) per 1,000 sq. ft.	$594	$594
Cherry Creek Basin	**2018 Adopted DIFs**	**2019 Proposed DIFs**
Single Family Detached	$843	$843
Single Family Attached	$563	$563
Multifamily	$511	$511
Commercial (Retail/Office) per 1,000 sq. ft.	$380	$380

Proposed SDFs for 2019 Through 2023

CRW reviews the SDFs each year and adjusts based on the updated CIP and fixed asset costs. As new projects are added to serve growth and as projects are completed the SDF is adjusted accordingly. Costs for capital improvements are maintained at 2018 dollars. In order to maintain SDF revenues to match increases in capital costs over time, the SDFs and development impact fees are escalated for the study period 2019-2023, using 2019 as the base year and escalating at an average of 3.0% per year beginning in 2020. The escalation represents future costs escalation expectations based on the average Engineering News Record (ENR) index using the Construction Cost Index (CCI) from first quarter 2018. Tables 7 through 10 show the projected system development fees for 2019 through 2023.

Table 7 Water Fund Proposed System Development Fees 2019-2023					
Meter Size	**FY2019**	**FY2020**	**FY2021**	**FY2022**	**FY2023**
5/8” x ¾”	$2,383	$2,455	$2,529	$2,604	$2,683
¾”	$3,557	$3,664	$3,774	$3,887	$4,004
1”	$5,940	$6,119	$6,303	$6,491	$6,687
1.5”	$11,845	$12,201	$12,567	$12,944	$13,333
2” C2	$23,725	$24,439	$25,173	$25,926	$26,707
2” T2	$29,630	$30,521	$31,437	$32,379	$33,353
3” C2	$59,295	$61,079	$62,913	$64,796	$66,747
3” T2	$77,080	$79,399	$81,783	$84,231	$86,767
4” C2	$118,555	$122,121	$125,787	$129,554	$133,453
4” T2	$148,220	$152,679	$157,263	$161,971	$166,847
6” C2	$237,145	$244,279	$251,613	$259,146	$266,947
6” T2	$296,405	$305,321	$314,487	$323,904	$333,653

Table 8 Water Resources Fund Proposed System Development Fees 2019-2023					
Meter Size	**FY2019**	**FY2020**	**FY2021**	**FY2022**	**FY2023**
5/8” x ¾”	$11,411	$11,753	$12,106	$12,469	$12,843
¾”	$17,031	$17,542	$18,068	$18,610	$19,168
1”	$28,442	$29,295	$30,174	$31,079	$32,011
1.5”	$56,713	$58,415	$60,166	$61,971	$63,829
2” C2	$113,597	$117,005	$120,514	$124,129	$127,851
2” T2	$141,868	$146,125	$150,506	$155,021	$159,669
3” C2	$283,907	$292,425	$301,194	$310,229	$319,531
3” T2	$369,062	$380,135	$391,534	$403,279	$415,371
4” C2	$567,643	$584,675	$602,206	$620,271	$638,869
4” T2	$709,682	$730,975	$752,894	$775,479	$798,731
6” C2	$1,135,457	$1,169,525	$1,204,594	$1,240,729	$1,277,931
6” T2	$1,419,193	$1,461,775	$1,505,606	$1,550,771	$1,597,269

Table 9 Wastewater Fund Proposed System Development Fees 2019-2023					
Meter Size	**FY2019**	**FY2020**	**FY2021**	**FY2022**	**FY2023**
5/8” x ¾”	$2,695	$2,776	$2,860	$2,945	$3,034
¾”	$4,023	$4,144	$4,268	$4,396	$4,528
1”	$6,718	$6,920	$7,128	$7,341	$7,562
1.5”	$13,397	$13,800	$14,212	$14,639	$15,078
2” C2	$26,833	$27,640	$28,468	$29,321	$30,202
2” T2	$33,512	$34,520	$35,552	$36,619	$37,718
3” C2	$67,063	$69,080	$71,148	$73,281	$75,482
3” T2	$87,178	$89,800	$92,488	$95,261	$98,122
4” C2	$134,087	$138,120	$142,252	$146,519	$150,918
4” T2	$167,638	$172,680	$177,848	$183,181	$188,682
6” C2	$268,213	$276,280	$284,548	$293,081	$301,882
6” T2	$335,237	$345,320	$355,652	$366,319	$377,318

Table 10 Stormwater Fund Proposed Development Impact Fees 2019-2023					
Plum Creek Basin	**FY2019**	**FY2020**	**FY2021**	**FY2022**	**FY2023**
Single Family Detached	$1,317	$1,357	$1,398	$1,440	$1,483
Single Family Attached	$880	$906	$933	$961	$990
Multifamily	$798	$822	$847	$872	$898
Commercial (Retail/Office)	$594	$612	$630	$649	$668
Cherry Creek Basin	**FY2019**	**FY2020**	**FY2021**	**FY2022**	**FY2023**
Single Family Detached	$843	$868	$894	$921	$949
Single Family Attached	$563	$580	$597	$615	$633
Multifamily	$511	$526	$542	$558	$575
Commercial (Retail/Office)	$380	$391	$403	$415	$427

Study Purpose

The purpose of the water, water resources and wastewater system development fees and stormwater development impact fee study update is to provide CRW with a thorough review of its SDFs and the underlying assumptions. The intent is to update assumptions from prior years and provide updated fees for 2019-2023.

System Development Fee Overview

The term system development fee (SDF) is used interchangeably with other similar terms in the water and wastewater utility industry to describe any fee or charge that recovers capital costs associated with system growth. Also known as tap fees, impact fees, system investment charges, plant investment fees and other terms; these fees are designed to recover the capital costs of growth from those causing the growth to occur, rather than from the utility's existing customer base. Figure 1 below details the combined SDF methodology.

Figure 1: System Development Fee Methodology

When properly designed, an SDF should be a one-time charge to new connections to the system that recovers the utility's investment to provide capacity to new growth, either as a capital improvement or an infrastructure expansion. At any given moment, a utility will have a certain amount of capacity in its system that is available to serve new customers while at the same time, it will have plans for new capital improvements and/or facilities expansions to serve anticipated growth in demand. To the extent that the system has available capacity, it can be said that the utility has already made an investment in new capital improvements and/or facilities expansions whose cost remains unrecovered.

Without recovering investments in new capital improvements/facilities expansion, the utility would effectively be subsidizing growth at the expense of existing rate payers. For this reason, both existing and proposed investments in capacity are examined in calculating SDFs. The rational nexus for such fees is always the unrecovered investment in available capacity, whether that capacity is existing or proposed.

In charging new customers for both past and new investments in capacity, the SDF, like other such fees, promotes a concept in utility rate making called intergenerational equity. The term intergenerational equity means that existing customers do not subsidize new customers and vice versa. In many communities this is often referred to as “growth pays for growth.”
SDFs can be designed to avoid the subsidization of new growth. If such a policy is desired by a community, the SDF can include two components: a buy-in component for past investments in system capacity that remains available to serve the new connections and an improvement component for planned future investments to make additional capacity available to serve new customers. Deficiency remediation or in-kind replacement in the existing system should not be included in the fee calculations.

System Development Fees Methodology

There are a number of ways to calculate SDFs. The American Water Works Association (AWWA) describes two methodologies for calculation of such fees, called the equity buy-in approach and the incremental cost approach. The AWWA also acknowledges that a hybrid of both approaches may be most appropriate which is referred to as the combined method.

Equity Buy-In Approach

The equity buy-in method is most appropriate in situations where new customers can be served by the existing system. Under this method, new customers pay a proportionate share of the value of the existing facilities. The buy-in method determines the value of the existing system assets and divides it by the current total single family equivalents (SFEs) that can be served by the system. The result is one SDF per SFE. The AWWA recommends that the buy-in approach is best employed within systems that have adequate capacity to serve both existing and future customers without major system expansions and where existing facilities are not scheduled for replacement and/or upgrades in the short term.

Incremental Cost (Growth) Approach

The incremental cost method is most appropriate when the existing system is at or near its maximum capacity and new customers cannot be accommodated without significant investment in facilities. Under the incremental cost method new customers pay a proportionate share of the expansion related costs of the new facilities. The system investment charge is calculated using capital improvement programs (CIPs) maintained by staff. Total CIP dollars for growth are divided by total new SFEs able to be served to calculate the system investment charge per SFE.

Combined Approach

The combined approach can be the most appropriate method because new customers tend to use capacity available in the existing facilities (buy-in) as well as new capacity that the utility must build in order to accommodate growth and the additional units or service (incremental cost). This method best conforms to “growth pays for growth” policies. To calculate the combined SDF per SFE, a weighted average of the fee calculated under the buy-in method and the fee calculated under the incremental cost is computed. This is the approach used for this study.

Valuation Approaches

The first step in developing the SDF under the equity buy-in method is to calculate the amount of existing system equity. Equity, as defined by generally accepted accounting principles (GAAP), is equal to total assets minus total liabilities of the system. However, because the accounting convention typically depreciates the system’s long-term assets (i.e. utility plant in service) under various depreciation techniques and because those techniques sometimes have little bearing on the actual condition or value of the utility’s assets, questions arise as to what is a fair valuation of the system’s existing assets.

Several approaches exist to estimate the value of the utility’s assets.

Original Cost Approach

The original cost approach is taken straight from the utility’s asset records. The original cost is that price paid for the asset at the time it was acquired and placed into service. The original cost is not adjusted for inflation or market revaluation.

Book Value Approach

The book value approach is also a direct descendant of the asset record. Book value is the value of the asset that remains once it has been adjusted for depreciation. Accumulated depreciation is deducted from the original cost of the asset to determine its book value as reported on the utility’s balance sheet.

Replacement Cost New Approach

The replacement cost new approach (RCN) revalues the original cost of the assets at today’s value, this taking into account inflation and market forces. To calculate the replacement cost of assets, the construction cost index (CCI) and, where applicable, the building cost index (BCI) provided by the Engineering News Record (ENR) database may be used instead of more exhaustive engineering studies. These indices are commonly used within the industry to restate the value of existing assets in current dollars. To use the CCI index, divide the current year index value by the index value for the year the particular asset was placed into service.

Replacement Cost New Less Depreciation Approach

The last method used is the replacement cost new less deprecation approach, or RCNLD. Under the RCNLD method, the replacement cost, calculated as described above, is adjusted for accumulated depreciation. The accumulated depreciation used in the RCNLD method is not the same amount as that used in the net book value method described earlier. Instead, accumulated depreciation is expressed as a percentage of net book value such that the percentage of remaining asset value under RCNLD is equivalent to the percentage of remaining asset value as reported under the net book value method. This approach is used for the Town's study to reflect the value of the existing assets in today's dollars while acknowledging the depreciation that has occurred in the system.

Capacity Definitions for Buy-In Component

In the buy-in method, the next step is to define the capacity in the existing system. Typically, this is represented in million gallons per day (mgd) or similar measure. The capacity is then converted into the number of SFEs that can be served by the existing system. SFEs are defined based on the utility's policies. Total SFEs that can be served by the existing system less current SFEs actually using the system equals the capacity available for growth or new SFEs.

For purposes of this study, the existing users in the system were updated by utility staff to reflect changes in requirements in the existing system. Please see the individual sections for the assumptions used in this year's study.

Multi-Purpose Project Cost Allocations

When calculating the improvement component of the SDF, the first step is to review the CIP and allocate the project costs between growth and non-growth.

A portion of any utilities capital improvement is planned for replacements and betterments to the existing utility plant. Capital improvements that benefit existing customers are not considered necessary for construction or expansion of facilities to serve new customers, and therefore are not properly included in the improvement portion of the SDF. To separate those improvements required for system growth and those that benefit only the existing utility customers, the utility has to allocate its CIP into growth-related portions.

Capacity Definitions for the Improvement Component

Unlike the calculation of existing SFEs for the buy-in portion, the improvement component focuses only on new utility connections. In order to project new utility connections, it is necessary for the utility to make an engineering assessment to determine the new capacity available to the system once the growth-related CIP projects are placed into service.

For purposes of this report, new SFEs able to be served by the growth-related CIP are based on Master Plan assumptions of capacity requirements per SFE and capacities of individual projects.

Assessment Schedule Development

SDFs are normally assessed based on the number of equivalent units a new customer represents. An equivalent unit equates different hydraulic demands, often represented by different sizes and types of meters, to a common denominator. For this study the common denominator is rated maximum flow of 30 gpm. Other demands calculated for new customers are used to calculate the appropriate number of SFEs by dividing those demands by the 30 gpm.

An assessment schedule based on this calculation of SFEs is used for this study. CRW may adjust its approach to match a particular meter size with a known hydraulic capacity. For this study, the assessment schedules for water, water resources and wastewater SDFs are presented for a set of meter sizes and types that are based on maximum manufacturer rated flow for those particular meters. Any different assumptions on hydraulic capacity will change the calculated SDF.

Equivalency Schedules

Equivalency schedules are used to determine the number of SFEs represented by different meter sizes. Equivalency schedules are used for several purposes, such as for calculating SDFs and monthly service charges by meter size. This section defines the equivalency schedules used in this study. Equivalency schedules are established to determine the water, water resources, and wastewater SDFs a new connection must pay, based on their representative SFE requirement for new capacity.

Schedule for SFEs

Water meters are sized to deliver a maximum amount of water. Therefore, the water meter hydraulic capacity reflects the potential demands a customer may place on the system. The actual use equivalency is calculated based on the average use per account by meter size for 2015-2017 three year average of monthly consumption data. The calculation of existing SFEs for assessing SDFs for this study is based on the ratio of the actual use equivalency. The capacity required by a new connection is determined by a fixture count for residential connections and engineering calculations for commercial and irrigation connections.

Review of fixture counts for the typical single-family residential property indicates that the hydraulic capacity required is, on average, 30 gallons per minute (gpm) for a ¾" meter size. Since 2010 it has been determined that one SFE equals 30 gpm of maximum flow. The existing equivalency schedule for determining SFEs for SDF purposes is presented in Table 11 below.

Table 11 Actual Calculated Meter Equivalency Ratios	
Meter Size	**Equivalent Meter Ratios**
5/8" x ¾"	0.79
¾"	1.00
1"	4.29
1.5"	9.48
2" C2	10.21
2" T2	29.49
3" C2	16.87
3" T2	45.03
4" C2	69.39
4" T2	82.78
6" C2	100.61

Water System Development Fees

This section outlines the steps and assumptions used to calculate the water SDFs using the combined approach, which was described above.

Equity Buy-In Component

The buy-in component is based on the equity buy-in approach and requires three steps:

1. Fixed Asset Valuation
2. Capacity Definition
3. Assessment Schedule Development

Fixed Asset Valuation

The value of the water fixed assets is based on an estimate of RCNLD, including construction work in progress for the current year that have capacity remaining to serve new customers. An estimate of the value of assets contributed by developers was excluded from the SDF calculation. In addition, the value was adjusted by the amount of principal on outstanding debt. Existing debt will be repaid through rates and therefore is ineligible for repayment with water system development fees.

CRW's system is designed to meet the needs of its customers and provide safe and reliable water service throughout its service area. The system consists of individual components that serve a specific function. The model uses 11 different functions that each asset is assigned to. These include:

1. Source of supply
2. Treatment
3. Pumping
4. Transmission
5. Distribution
6. Storage
7. Buildings/Improvements
8. Administration
9. Tools/Equipment
10. Exclude from SDF
11. Meters/Services

Table 12 summarizes the asset values attributed to each function. Based on the analysis, the total value of the water system assets including construction work in progress for SDF purposes in fiscal year ending 2017 is $256.4 million. Many assets used in the distribution system are typically contributed by developers and thus excluded from the calculation of the buy-in component. To explicitly show the value of the excluded assets, the value of assets assigned to this function that is estimated to be contributed by developers was reassigned to the Exclude from SDF function. Of the total RCNLD value, $151.1 million is excluded from the SDF. The water system value, net of outstanding debt, used to calculate the buy-in component of SDFs is $105.3 million.

Table 12 Water Fund RCNLD System Value by Function	
Function	**RCNLD**
Source of Supply	$43,310,800
Treatment	$22,991,608
Pumping	$3,448,395
Transmission	$7,453,382
Distribution	$12,466,697
Storage	$11,768,731
Buildings/Improvements	$3,428,255
Administration	$166,165
Tools/Equipment	$249,663
Exclude from SDF	$151,080,751
Meters/Services	$19,203
Total	**$256,383,651**

Capacity Definition

The next step in determining the buy-in component is to define the system capacity. Under this approach the capacity is based on the unused capacity of the system for each function identified above. This data is provided by CRW engineers.

Table 13 lists the current capacities of each water system function. It also presents an estimate of the capacity in the existing system that is available for growth. The assumption in this table is that one SFE requires 400 gallons of water per day for source of supply, treatment and storage on an average day basis and 540 gallons of water per day for pumping, transmission and distribution. Capacity in SFEs includes assumptions of peaking factors provided by the Engineering Manager and Public Works Design Guidelines. Peak day requirements are 2.2 times the average requirements of 400 gpd. Peak hour requirements are 5.5 times the average of 540 gpd.

The final step in calculating the buy-in component is to determine the schedule of fees by meter size. SDFs are assessed based on the actual use equivalency factors. The following table presents meter size equivalency ratios. The result being 29,583 SFEs for the water fund.
The number of existing SFEs is typically based on the number of meters by size and the associated equivalency factors. The equivalency factors are calculated based on average actual use by meter size. The number of meters by meter size for FY2017 and meter equivalency factors that result in the current number of SFEs are presented in Table 14 below at 29,583.

Table 13 Water Fund System Component Capacities						
Function	**Capacities**	**Unit**	**Projected SFEs Available**	**Used Capacity (SFEs)**	**Unused Capacity (SFES)**	**Remaining Capacity**
Source of Supply	16.30	MGD	18,523	18,523	0	0.00%
Treatment	27.61	MGD	31,375	18,807	12,568	40.06%
Pumping	44.56	MGD	37,512	13,931	23,581	62.86%
Transmission	80.58	MGD	27,133	15,005	12,128	44.70%
Distribution	80.58	MGD	29,583	15,005	14,578	49.28%
Storage	36.02	MG	40,932	18,807	22,125	54.05%
Buildings/Improvements	37,500	SFE	37,500	29,583	7,917	21.11%
Administration	0	N/A	0	N/A	0	0.00%
Tools/Equipment	0	N/A	0	N/A	0	0.00%
Exclude from SDF	0	N/A	0	N/A	0	0.00%
Meters/Services	0	N/A	0	N/A	0	0.00%

Table 14 Water Fund FY2017 Existing Water SFEs			
Meter Size	**Number of Meters**	**Equivalency Factor**	**Number of SFEs**
5/8” x ¾”	940	0.79	743
¾”	18,509	1.00	18,509
1”	378	4.29	1,622
1.5”	404	9.48	3,830
2” C2	128	10.21	1,307
2” T2	78	29.49	2,300
3” C2	20	16.87	337
3” T2	8	45.03	360
4” C2	3	69.39	208
4” T2	2	82.78	166
6” C2	2	100.61	201
Total	**20,472**		**29,583**

The number of SFE's that can be served by each function is calculated using the assumptions and capacities for each function as shown in the tables above.

Buy-In Component Calculation

The total costs to be recovered from the buy-in component of the water SDF are based on the percentage of remaining capacities by function calculated in Table 13 and the total system asset values shown in Table 15. Table 16 represents the total buy-in amount by function. The total amount attributable to the buy-in component is $27.9 million. Table 16 also calculates the buy-in component per SFE at $1,369.

It is important to note that each of the two components of the water SDF assumes a weighted average of the system capacities by function. To calculate the buy-in component, the dollars by function were divided by the sum of the capacities of the existing system and capital improvements. The purpose of weighting the cost by the sum of capacities available is to calculate the combined fee. A new customer pays for one unit of capacity, rather than one unit of existing capacity and one unit of new capacity, hence the weighted average calculation.

Table 15
Water Fund
Calculation of Buy-In Totals

Function	System Value RCNLD	Remaining Capacity	Cost of Available Capacity RCNLD
Source of Supply	$43,310,800	0.0%	$0
Treatment	$22,991,608	40.1%	$9,209,967
Pumping	$3,448,395	62.9%	$2,167,735
Transmission	$7,453,382	44.7%	$3,331,578
Distribution	$12,466,697	49.3%	$6,143,506
Storage	$11,768,731	54.1%	$6,361,388
Buildings/Improvements	$3,428,255	21.1%	$723,789
Administration	$166,165	0.0%	$0
Tools/Equipment	$249,663	0.0%	$0
Exclude from SDF	$151,080,751	0.0%	$0
Meters/Services	$19,203	0.0%	$0
Total	**$256,383,651**		**$27,937,962**

Table 16 Water Fund Calculation of Buy-In Component per SFE			
Function	**Cost of Available Capacity RCNLD**	**Total Capacity Available (SFEs)**	**Buy-In per SFE**
Source of Supply	$0	8,545	$0
Treatment	$9,209,967	12,568	$733
Pumping	$2,167,735	52,907	$41
Transmission	$3,331,578	43,569	$76
Distribution	$6,143,506	23,901	$257
Storage	$6,361,388	29,511	$216
Buildings/Improvements	$723,789	15,834	$46
Total	**$27,937,962**	**186,837**	**$1,369**

Improvement Component

The improvement component is based on CRW's updated CIP for the 2018 study. The total CIP from 2019 through 2055 for the water fund is approximately $138.5 million as shown in Table 17.

Table 17 Water Fund CIP Costs 2019-2055	
Function	**CIP Costs 2019-2055**
Source of Supply	$11,438,007
Treatment	$0
Pumping	$5,125,000
Transmission	$17,461,000
Distribution	$2,478,000
Storage	$7,725,609
Buildings/Improvements	$1,403,641
Administration	$0
Tools/Equipment	$0
Exclude from SDF	$92,871,000
Total	**$138,502,257**

To calculate an improvement component based on the incremental cost approach, the following three tasks must be completed:

1. Multi-Purpose Project Allocations
2. Capacity Definitions
3. Assessment Schedule Development

Multi-Purpose Project Allocations

Allocating the costs of multi-purpose projects is an integral part of calculating an improvement fee. A multi-purpose project is an improvement that will serve both growth and address existing needs. Few projects are designed and built exclusively to serve growth or solve an existing deficiency. Rather, projects are designed to maximize economies of scale in design and construction. Therefore, projects serving both growth and rehabilitation/upgrade (i.e., multi-purpose projects) are allocated to growth and non-growth.

In some cases, two or more capital projects are part of an improvement of a particular system function. To avoid potential double-counting of added capacities, all projects were first assigned to functions and then grouped into a project group. Table 18 shows the result of determining only the growth-related costs of the CIP after this project allocation step. Out of the $138.5 million CIP, $43.1 million is included in the improvement component calculation.

Table 18
Water Fund
Growth-Related CIP Costs for Improvement Component

Function	Cost of New Capacity
Source of Supply	$11,438,007
Pumping	$3,949,408
Transmission	$17,461,000
Distribution	$2,244,253
Storage	$7,725,609
Buildings/Improvements	$296,343
Exclude from SDF	$0
Total	**$43,114,619**

Capacity Definition

Table 19 summarizes the system capacities added for growth-related CIP projects by function. It also represents the estimated number of SFEs available for growth by function.

Table 19 Water Fund System Capacities for System Improvements			
Function	**New Capacities Added**	**Unit**	**Added SFEs**
Source of Supply	7.52	MGD	8,545
Pumping	34.84	MGD	29,327
Transmission	93.38	MGD	31,441
Distribution	27.69	MGD	9,323
Storage	6.50	MG	7,386
Buildings/Improvements	7,917.17	SFE	7,917

Assessment Schedule

As with the buy-in component, the improvement component portion of the proposed SDF is based on meter size. The same assessment schedule presented in Table 14 shows the number of SFEs for each meter size.

Improvement Component Calculation

The improvement component is calculated based on the cost of the growth-related capital projects and the total available capacities estimated by these processes. As with the buy-in fee component, the additional capacities have been calculated by summing the capacities from the existing system and the capital improvements by function. Table 20 summarizes the improvement component by system function. Based on the CIP developed by CRW in 2018, the improvement component per SFE is $2,188.

Table 20 Water Fund Improvement Fee Component per SFE			
Function	**Cost of New Capacity**	**Total Capacity Available (SFEs)**	**Improvement per SFE**
Source of Supply	$11,438,007	8,545	$1,338
Treatment	$0	12,568	$0
Pumping	$3,949,408	52,907	$75
Transmission	$17,461,000	43,569	$401
Distribution	$2,244,253	23,901	$94
Storage	$7,725,609	29,511	$262
Buildings/Improvements	$296,343	15,834	$19
Total	**$43,114,619**	**186,837**	**$2,188**

Results and Proposed Water SDF for 2019

As shown in Tables 16 and 20, the total buy-in and improvement components are calculated to be $1,369 and $2,188 per SFE respectively, for a total water SDF of $3,557 per SFE for 2019, which is a 1.33% increase from 2018.

Table 21 represents the existing and proposed schedule of SDFs by meter size.

Table 21 Water Fund 2019 Proposed SDF by Meter Size		
Meter Size	Adopted 2018 SDF	Proposed 2019 SDF
5/8" x ¾"	$2,352	$2,383
¾"	$3,510	$3,557
1"	$5,862	$5,940
1.5"	$11,688	$11,845
2" C2	$23,412	$23,725
2" T2	$29,238	$29,630
3" C2	$58,512	$59,295
3" T2	$76,062	$77,080
4" C2	$116,988	$118,555
4" T2	$146,262	$148,220
6" C2	$234,012	$237,145
6" T2	$292,488	$296,405

Water Resources System Development Fees

This section outlines the steps and assumptions used to calculate the water resources SDFs using the combined approach, which was described above in the water fund sections.

Equity Buy-In Component

The buy-in component is based on the equity buy-in approach and requires the same three steps as described above in the water system development fees section.

Fixed Asset Valuation

The fixed assets for water resources is based on the same calculation as the water system development fees above, including the same 10 functions. Table 22 summarizes the asset values attributed to each function. Based on the analysis, the total value of the water resources system assets including construction work in progress for SDF purposes in fiscal year ending 2017 is $194.5 million. Assets used in the system that are contributed are excluded from the buy-in calculation. The value of assets to be contributed by developers was assigned to the Exclude from SDF function. Of the total RCNLD value, $58.1 million is excluded from the SDF calculation. For the buy-in component, the RCNLD value is approximately $136.4 million.

Table 22 Water Resources Fund RCNLD System Value by Function	
Function	**RCNLD**
Source of Supply	$43,892,571
Treatment	$32,040,386
Pumping	$34,727
Transmission	$2,210,642
Distribution	$540,698
Storage	$55,010,603
Buildings/Improvements	$1,841,805
Administration	$862,550
Exclude from SDF	$58,082,102
Total	**$194,516,085**

Capacity Definition

The next step is to define system capacity based on the same functions used for fixed assets. Table 23 lists the current capacities of each water resources system function. It also presents an estimate of the capacity in the existing system that is available for growth. One assumption used in the table is that one SFE requires 400 gallons of water per day on an average day basis. The peak day factor used is 2.2 and was derived by CRW's Engineering Manager and Public Works Design Guidelines. These numbers are both true for source of supply, treatment, pumping and transmission capacities. The amount of storage required per SFE is 0.45 acre feet per day, which is derived from the Town's Public Works Design Guidelines. Storage capacity is represented as acre feet (AF) in the table.

Using the assumptions and the capacities for each function summarized in Table 23, the number of SFEs that can be served by each function is calculated. Subtracting the number of SFEs currently served by the utility generates the number of SFEs available for growth. A fundamental assumption regarding the SFEs currently served and the SFEs available for growth is that 40 percent of the SFEs that can be served are existing users and 60 percent are new users. This assumption was established in the initial water resources SDF study and is still valid based on the capacity calculations in Table 23. CRW determined its renewable water resources program was to be allocated based on the proportion of the then-existing SFEs to the expected SFEs in 2055.

The number of existing SFEs is typically based on the number of meters by size and the associated equivalency factors as discussed above in the water system development fee calculation. The inventory of meters by meter size and equivalency factors that result in the current number of SFEs are presented in Table 24.

Table 23
Water Resources Fund
System Component Capacities

Function	Capacities	Unit	Projected SFEs Available	Used Capacity (SFEs)	Unused Capacity (SFES)	Remaining Capacity
Source of Supply	4.10	MGD	4,648	1,859	2,789	60.00%
Treatment	6.00	MGD	6,818	2,727	4,091	60.00%
Transmission	14.60	MGD	16,591	6,636	9,955	60.00%
Storage	8,614	AF	19,142	7,657	11,485	60.00%
Buildings/Improvements	37,500	SFE	37,500	29,271	8,229	21.90%

Table 24
Water Resources Fund
FY2017 Existing Water Resources SFEs

Meter Size	Number of Meters	Equivalency Factor	Number of SFEs
5/8" x ¾"	939	0.79	742
¾"	18,512	1.00	18,512
1"	377	4.29	1,617
1.5"	399	9.48	3,783
2" C2	128	10.21	1,307
2" T2	73	29.49	2,153
3" C2	20	16.87	337
3" T2	7	45.03	315
4" C2	2	69.39	139
4" T2	2	82.78	166
6" C2	2	100.61	201
Total	**20,461**		**29,271**

In order to assess SDFs, the number of SFEs a new customer represents is determined by an assessment of that customer's potential capacity needs.

Buy-In Component Calculation

The total costs to be recovered from the buy-in component of the water resources SDF are based on the percentage of remaining capacities by functions calculated in Table 23 and the total system asset values shown in Table 25. Table 26 represents the total buy-in amount by function. The total amount attributable to the buy-in component is $80.3 million. Table 26 calculates the buy-in component per SFE for each of the functions. The total capacity number in Table 26 is the sum of existing and new capacities which is used for purposes of weighing the buy-in and improvement components in the calculations. The total buy-in component per SFE is $3,889.

Table 25
Water Resources Fund
Calculation of Buy-In Totals

Function	System Value RCNLD	Remaining Capacity	Cost of Available Capacity RCNLD
Source of Supply	$43,892,571	60.0%	$26,335,543
Treatment	$32,040,386	60.0%	$19,224,232
Pumping	$34,727	0.0%	$0
Transmission	$2,210,642	60.0%	$1,326,385
Distribution	$540,698	0.0%	$0
Storage	$55,010,603	60.0%	$33,006,362
Buildings/Improvements	$1,841,805	21.9%	$404,142
Administration	$862,550	0.0%	$0
Exclude from SDF	$58,082,102	0.0%	$0
Total	**$194,516,085**		**$80,296,664**

Table 26 Water Resources Fund Calculation of Buy-In Component per SFE			
Function	**Cost of Available Capacity RCNLD**	**Total Capacity Available (SFEs)**	**Buy-In per SFE**
Source of Supply	$26,335,543	15,185	$1,734
Treatment	$19,224,232	62,457	$308
Pumping	$0	24,675	$0
Transmission	$1,326,385	103,198	$13
Storage	$33,006,362	18,240	$1,810
Buildings/Improvements	$404,142	16,457	$25
Total	**$80,296,664**		**$3,889**

Improvement Component

The improvement component is based on the updated water resources CIP from the updated planning process in 2018 and the review of renewable water supply projects. The total CIP from 2019-2055 is approximately $419.1 million as shown in Table 27.

Table 27 Water Resources Fund CIP Costs 2019-2055	
Function	**CIP Costs 2019-2055**
Source of Supply	$138,875,283
Treatment	$110,322,268
Pumping	$36,657,180
Transmission	$96,037,494
Storage	$36,612,022
Buildings/Improvements	$627,940
Total	**$419,132,187**

To calculate an improvement component based on the incremental cost approach, the following three tasks must be completed:

1. Multi-Purpose Project Allocations
2. Capacity Definitions
3. Assessment Schedule Development

Multi-Purpose Project Allocations

Similar to the water system, the water resources capital improvement projects were first assigned to functions and then grouped into project groups. Table 28 shows the result of determining only the growth-related costs of the CIP after this project allocation step. Out of the $419.1 million CIP, $348.4 million is included in the improvement component calculation.

Table 28
Water Resources Fund
Growth-Related CIP Costs for Improvement Component

Function	Cost of New Capacity
Source of Supply	$129,950,637
Treatment	$75,571,274
Pumping	$29,379,780
Transmission	$89,464,126
Storage	$23,860,062
Buildings/Improvements	$137,787
Total	**$348,363,666**

Capacity Definition

Table 29 summarizes the system capacities added for growth-related CIP projects by function. It also represents the estimated number of SFEs available for growth by function.

Table 29 Water Resources Fund System Capacities for System Improvements	
Function	**Added SFEs**
Source of Supply	12,396
Treatment	58,366
Pumping	24,675
Transmission	93,243
Storage	6,755
Buildings/Improvements	8,229
Total	**203,664**

Assessment Schedule

As with the buy-in component, the improvement component portion of the proposed SDF is based on meter size.

Improvement Component Calculation

The improvement component is calculated based on the cost of the growth-related capital projects and the total available capacities estimated for these processes, both existing and new. Table 30 summarizes the water resources system improvement component by system function. Based on the CIP, the improvement component per SFE is $13,142.

Table 30 Water Resources Fund Improvement Fee Component per SFE			
Function	**Cost of New Capacity**	**Total Capacity Available (SFEs)**	**Improvement per SFE**
Source of Supply	$129,950,637	15,185	$8,558
Treatment	$75,571,274	62,457	$1,210
Pumping	$29,379,780	24,675	$1,191
Transmission	$89,464,126	103,198	$867
Storage	$23,860,062	18,240	$1,308
Buildings/Improvements	$137,787	16,457	$8
Total	**$348,363,666**		**$13,142**

Results and Proposed Water Resources SDF for 2019

As shown in Tables 26 and 30, the total buy-in and improvement components are calculated to be $3,889 and $13,142 per SFE respectively, for a total water resources SDF of $17,031 per SFE for 2019.

Table 31 represents the existing and proposed schedule of SDFs by meter size. An 11.7% change in the water resources SDF is proposed for 2019.

Table 31
Water Resources Fund
Proposed SDF by Meter Size

Meter Size	Adopted 2018 SDF	Proposed 2019 SDF
5/8” x ¾”	$10,216	$11,411
¾”	$15,248	$17,031
1”	$25,464	$28,442
1.5”	$50,776	$56,713
2” C2	$101,704	$113,597
2” T2	$127,016	$141,868
3” C2	$254,184	$283,907
3” T2	$330,424	$369,062
4” C2	$508,216	$567,643
4” T2	$635,384	$709,682
6” C2	$1,016,584	$1,135,457
6” T2	$1,270,616	$1,419,193

Wastewater System Development Fees

This section outlines the steps and assumptions used to calculate the wastewater SDFs using the combined approach, which was described previously.

Equity Buy-In Component

The buy-in component is based on the equity buy-in approach and requires the same three steps as described above in the water system development fees section.

Fixed Asset Valuation

The fixed assets for wastewater are based on the same calculation as the water system development fees above.

The wastewater system is designed to collect wastewater from its customers and provide safe and reliable wastewater service throughout its service area. It is Plum Creek Water Reclamation Authority's (PCWRA's) responsibility to treat the wastewater for CRW. CRW's wastewater system includes individual components that serve 8 specific functions. To estimate the value of assets related to each function, the RCNLD value of each asset is allocated to one or more of these functions, typically referred to in wastewater systems as unit processes. However, note that the PCWRA Treatment Plant component is handled separately. In this step to calculate the buy-in component for the wastewater component, assets considered under the Treatment Plant unit process are CRW's share of cash-funded improvements at the Treatment Plant. The wastewater unit processes are:

1. Collection System
2. Interceptor System
3. Treatment Plant
4. Lift Station
5. Buildings/Improvements
6. Administration
7. Tools/Equipment
8. Exclude from SDF

Table 32 summarizes the asset values attributed to each unit process. The total value of the wastewater system assets including construction work in progress for SDF purposes in fiscal year ending 2017 is $84.7 million. Many assets used in the collection system are typically contributed by developers and thus included in the exclude from SDF section of the buy-in component. Of the total RCNLD value, the majority or $56.6 million is excluded from the SDF. For establishing a buy-in SDF, the Town's wastewater system, net of outstanding debt is valued at approximately $28.1 million.

Table 32 Wastewater Fund RCNLD System Value by Function	
Unit Process	**RCNLD**
Collection System	$17,715,122
Interceptor System	$5,503,375
Treatment Plant	$673,440
Lift Station	$2,339,455
Buildings/Improvements	$1,739,582
Administration	$3,866
Tools/ Equipment	$127,038
Exclude from SDF	$56,585,032
Total	**$84,686,909**

Capacity Definition

The next step is to define system capacity based on the same functions used for fixed assets. Table 33 lists the current capacities of each wastewater system function, excluding PCWRA's treatment component. This table also represents an estimate of the capacity in the existing system that is available for growth. The interceptor system capacity required per SFE is approximately 220 gallons per day on a wet-weather peak capacity basis. This value is derived from CRW's master plan and the aggregate gpd peaking factor of 2.1 for interceptors.
Using these assumptions and the capacities for each function summarized in Table 33, the number of SFEs that can be served by each unit process is calculated. Subtracting the number of SFEs currently served generates the number of SFEs available for growth. A description of how the number of SFEs currently served by the wastewater system is estimated is shown below.

The number of SFEs currently using the wastewater system is based on different approaches depending on the system component. First, used capacity is based on the number of meters by size and the associated equivalency factor. The number of meters by meter size for 2017 and equivalency factors that result in the current number of SFEs are presented in Table 34. It is estimated that the number of wastewater SFEs is 24,560.

Table 33 Wastewater Fund System Component Capacities						
Unit Process	Capacities	Unit	Projected SFEs Available	Used Capacity (SFEs)	Unused Capacity (SFES)	Remaining Capacity
Interceptor System	8.8	MGD	19,071	17,143	1,929	10.11%
Treatment Plant	4.6	MGD	20,714	0	0	0.00%
Lift Station	11.55	MGD	10,504	2,691	7,813	74.38%
Buildings/Improvements	37,500	SFE	37,500	24,560	12,940	34.51%

Table 34 Wastewater Fund FY2017 Existing Wastewater SFEs			
Meter Size	Number of Meters	Equivalency Factor	Number of SFEs
5/8" x ¾"	917	0.79	724
¾"	18,132	1.00	18,132
1"	271	4.29	1,163
1.5"	274	9.48	2,598
2" C2	124	10.21	1,266
2" T2	0	29.49	0
3" C2	20	16.87	337
3" T2	0	45.03	0
4" C2	2	69.39	139
4" T2	0	82.78	0
6" C2	2	100.61	201
Total	**19,742**		**24,560**

The currently used capacity for the Interceptor System and Lift Station components are determined based on actual flow data obtained from CRW's Engineering Manager.

The capacities have been reviewed for the wastewater system to ensure that the values used are appropriate.

1. The collection system capacity is set at 0 since these are contributed assets and have no available capacity to absorb additional growth.
2. The interceptor system is split between the two primary interceptors that receive wastewater from the collection system and convey it to the water reclamation facility for treatment. The Plum Creek Interceptor conveys approximately two-thirds of the wastewater generated by the Town for treatment. This interceptor serves all parts of Town in the Plum Creek basin except for the Meadows. Capacity is a function of pipe diameter, pipe material and slope of the pipe, and this interceptor capacity is rated at 6.23 mgd based on the critical reach in this pipeline. The Meadows Interceptor conveys approximately one-third of the wastewater generated by the Town for treatment. This interceptor serves all the Meadows development. This interceptor capacity is rated at 2.58 mgd based on the critical reach in this pipeline.
3. Lift station capacity is the sum of all the individual lift station capacities and is collectively rated at 11.55 mgd. Used capacity reflects the sum of maximum daily flows observed in the lift stations.
4. Treatment system capacity is based on the Town’s capacity in the PCWRA and the Pinery. PCWRA is rated for 4.6 mgd. The Town will add an additional 3.00 mgd of capacity to meet growth demands thru the plant expansion in 2019.

Buy-In Component Calculation

The total costs to be recovered from the buy-in component of the wastewater SDF are based on the percentage of remaining capacities by functions calculated in Table 35 and the total system asset values shown in Table 35. Table 36 represents the total buy-in amount by function. The total amount attributable to the buy-in component is $2.9 million. Table 36 calculates the buy-in component per SFE for each of the functions. The total buy-in component per SFE is $253.

Table 35 Wastewater Fund Calculation of Buy-In Totals			
Unit Process	**System Value RCNLD**	**Remaining Capacity**	**Cost of Available Capacity RCNLD**
Collection System	$17,715,122	0.00%	$0
Interceptor System	$5,503,375	10.11%	$556,521
Treatment Plant	$673,440	0.00%	$0
Lift Station	$2,339,455	74.38%	$1,740,114
Buildings/Improvements	$1,739,582	34.51%	$600,273
Administration	$3,866	0.00%	$0
Tools/ Equipment	$127,038	0.00%	$0
Exclude from SDF	$56,585,032	0.00%	$0
Total	**$84,686,909**		**$2,896,907**

Table 36 Wastewater Fund Calculation of Buy-In Component per SFE			
Unit Process	**Cost of Available Capacity RCNLD**	**Total Capacity Available (SFEs)**	**Buy-In per SFE**
Collection System	$0	13,182	$0
Interceptor System	$556,521	73,963	$8
Lift Station	$1,740,114	7,813	$223
Buildings/Improvements	$600,273	25,880	$23
Total	**$2,896,907**		**$253**

Treatment Fee Component

Part of the existing wastewater system serving CRW's customers is the treatment process and associated assets provided by PCWRA. The calculation of the treatment fee component was updated in 2017 to reflect all debt issues obtained by PCWRA for treatment plant improvements, costs associated with the cash payment for Ditch Number 3 and the two PCWRA capacity expansions and Ditch 3 at PCWRA. Table 37 represents the calculation and shows the total principal on debt for the treatment plant expansions. Capacity for new customers allows for approximately 17,210 SFEs. By dividing the cost of expansion-related capacity by 17,210 SFEs, the treatment fee component calculates to be $3,693 per SFE.

Table 37
Wastewater Fund
Treatment Fee per SFE

Unit Process	Cost of PCWRA Treatment Plant	Growth Percentage	Growth Portion of Treatment Cost	Added SFEs	Treatment Component per SFE
Treatment Component	$66,580,161	89.9%	$63,561,266	17,210	$3,693

Improvement Component

The improvement component is based on the updated CIP from an engineering review in 2018. The total CIP through 2055 is approximately $84.1 million as shown in Table 38.

Table 38
Wastewater Fund
CIP Costs 2019-2055

Unit Process	CIP Costs 2019-2055
Collection System	$845,000
Interceptor System	$4,199,950
Treatment Plant	$35,133,339
Buildings / Improvements	$588,308
Exclude from SDF	$43,286,550
Total	**$84,053,147**

To calculate an improvement component based on the incremental cost approach the same steps are taken as in water and water resources and are shown below.

Multi-Purpose Project Allocations

Similar to the water system, only growth-related portions of projects can be included in the calculation. Projects were allocated serving both growth and rehabilitation/upgrade (i.e., multi-purpose projects) as either growth or non-growth. Out of $84.1 million of capital improvements, only $2.9 million is included in the improvement component calculation. The treatment plant CIP costs of $35.1 million are included in the Treatment fee component calculation in Table 37 rather than the improvement fee component.

Table 39
Wastewater Fund
Growth-Related CIP Costs for Improvement Component

Unit Process	Cost of New Capacity
Collection System	$510,521
Interceptor System	$2,234,923
Buildings / Improvements	$203,006
Total	**$2,948,450**

Capacity Definition

Table 40 summarizes the system capacities added by function. It also represents the estimated number of SFEs available for growth by unit process.

Table 40
Wastewater Fund
System Capacities for System Improvements

Unit Process	New Capacities Added	Units	Added SFEs
Collection System	2.90	MGD	13,182
Interceptor System	33.28	MGD	72,035
Treatment Plant	3.00	MGD	6,818
Lift Station	0.00	MGD	0
Buildings / Improvements	12,940	SFE	12,940
Total			**104,975**

Assessment Schedule

As with the buy-in component, the improvement component portion of the proposed SDF is based on meter size. Table 40 shows the number of SFEs by unit process.

Improvement Component Calculation

The improvement component is calculated based on the cost of the growth related capital projects and the total available capacities estimated for these processes. Table 41 summarizes the wastewater system improvement component by system unit process. Based on the CIP, the improvement component per SFE is $77.

Table 41
Wastewater Fund
Improvement Fee Component per SFE

Unit Process	Cost of New Capacity	Total Capacity Available (SFEs)	Improvement per SFE
Collection System	$510,521	13,182	$39
Interceptor System	$2,234,923	73,963	$30
Lift Station	$0	7,813	$0
Buildings / Improvements	$203,006	25,880	$8
Total	**$2,948,450**	**120,838**	**$77**

Results and Proposed Wastewater SDF for 2018

As shown in Tables 36, 37 and 41, the total buy-in, treatment and improvement components are calculated to be $253, $3,693 and $77 per SFE respectively, for a total rounded wastewater SDF of $4,023 per SFE for 2019. This will be a 1.62% increase for 2019.

Table 42 represents the existing and proposed schedule of SDFs by meter size.

Table 42 Wastewater Fund Proposed SDF by Meter Size		
Meter Size	**Adopted 2018 SDF**	**Proposed 2019 SDF**
5/8” x ¾”	$2,653	$2,695
¾”	$3,959	$4,023
1”	$6,612	$6,718
1.5”	$13,183	$13,397
2” C2	$26,407	$26,833
2” T2	$32,978	$33,512
3” C2	$65,997	$67,063
3” T2	$85,792	$87,178
4” C2	$131,953	$134,087
4” T2	$164,972	$167,638
6” C2	$263,947	$268,213
6” T2	$329,903	$335,237

Stormwater Development Impact Fees

Stormwater development impact fees (DIFs) were developed differently than the previous SDFs. The nature of stormwater improvements is such that with existing system improvements it is difficult to identify remaining capacity to serve growth; therefore, the incremental or improvement cost method was applied in the analysis. Additional capacity to serve growth also varies by drainage basin in CRW’s service area. Values are presented for both Cherry Creek Basin and Plum Creek Basin.

The assessment of stormwater DIFs also differs from the other funds. Stormwater flow is based on runoff and impervious area; therefore assessment of stormwater DIFs is based on assumptions of runoff characteristics for different development types, i.e., single family detached, single family attached, multifamily, and commercial.

Stormwater Development Impact Fee Data

Four data elements are essential to calculating stormwater DIFs following the incremental cost methodology:

1. Capital Improvement Program (CIP)
2. Developable acres

3. Percent imperviousness by acre
4. Units per acre

The most recent assumptions of capital projects from the stormwater planning process in 2017 are used in this analysis. These improvements are divided among non-growth related, growth related and developer's contribution costs. The value of improvements included in the stormwater DIF is $38.8 million and is represented in Table 43.

Table 43
Stormwater Fund
Capital Improvement Cost Allocations

Item	CIP Costs 2019-2055
Total Non-Growth Related Cost	$47,422,030
Total Growth Related Improvement Costs	$38,763,507
Developer's Contribution	$19,979,305
Total Capital Improvement Costs	**$106,164,842**
Growth Related Improvement Costs	
Total Cherry Creek Basin	$5,514,971
Total Plum Creek Basin	$33,248,537
Total Growth Related Improvement Costs	**$38,763,507**

Acres available to be developed by land use type were reduced to reflect construction anticipated through 2018. Table 44 represents developable acreage by land use type.

Table 44
Stormwater Fund
Acreage to be Developed

Land Use Type	Cherry Creek Basin	Plum Creek Basin
Single Family Detached	876	2,320
Single Family Attached	18	47
Multifamily	254	993
Commercial (Retail/Office)	252	1,436
Open Spaces	460	1,600
Total	**1,861**	**6,396**

Imperviousness percentages by land use type were based on the Urban Drainage and Flood Control District (UDFCD) Criteria Manual. For single family residential detached units, the percent imperviousness was determined based on the following assumptions:

- Density of 3 units per acre
- Typical two-story homes
- Average home size of 2,100 square feet (sq. ft.)

Using these assumptions and Figure RO-5 from the UDFCD Criteria Manual, single family residential detached percentage imperviousness was estimated to be 33 percent.

Table 45
Stormwater Fund
Percentage of Imperviousness by Acre

Land Use Type	Cherry Creek Basin	Plum Creek Basin
Single Family Detached	33%	33%
Single Family Attached	75%	75%
Multifamily	80%	80%
Commercial (Retail/Office)	80%	80%
Open Spaces	2%	2%

Units per acre are needed to determine the actual stormwater DIF per unit. Single family detached, single family attached and multifamily DIFs are assessed per dwelling unit, whereas commercial and industrial DIFs are assessed per 1,000 sq. ft. of building space. The units per acre were obtained from:

- Single family residential detached density of 3 units per acre from the water design criteria section of the Town of Castle Rock-public Works Regulations-February 12,1999
- Actual density in the Town as of July 2010 for single family residential attached (townhomes) and multifamily land use types
- Average Floor Area Ratio (FAR) for office space in Castle Rock from the Douglas County Community Planning and Sustainable Development Department for commercial/industrial land use. FAR is defined as a measure of development density. It is calculated as the building square footage divided by the building lot square footage.

Stormwater Development Impact Fee Equation

The equation below represents the calculation of stormwater DIFs:

$$C = \frac{[(DA*IMP)/TIA]*CIP}{DA}$$

DIF = C/U

Where:

C = Stormwater Capital Cost per Acre

DIF = Stormwater Development Impact Fee per Unit

DA = Developable Acres

IMP = Percent Imperviousness

TIA = Total Impervious Acres

CIP = Growth-Related Capital Improvement Plan Costs

U = Units per Acre

Steps to Calculate the Stormwater Fee

Step 1: Proportionate Share of Capital Costs

The first step in the fee calculation is to determine each land use type's proportionate share of capital costs. Developable acres by land use type and percent imperviousness are used to estimate the impervious acreage by land use type. The cost of stormwater improvements for new development is then apportioned across land use types by the percentage share of total impervious are of development. Tables 46 and 47 demonstrate the allocation of capital costs across land use types.

Table 46
Stormwater Fund
Allocation Factor of Capital Costs

	Impervious Acreage		Proportionate Share	
Land Use Type	**Cherry Creek Basin**	**Plum Creek Basin**	**Cherry Creek Basin**	**Plum Creek Basin**
Single Family Detached	289	766	40.29%	27.59%
Single Family Attached	14	35	1.93%	1.27%
Multifamily	203	794	28.33%	28.62%
Commercial (Retail/Office)	202	1,148	28.16%	41.38%
Open Spaces	9	32	1.28%	1.15%
Total	**717**	**2,776**	**100.00%**	**100.00%**

Table 47 Stormwater Fund Capital Cost by Class		
Land Use Type	**Cherry Creek Basin**	**Plum Creek Basin**
Single Family Detached	$2,222,166	$9,171,980
Single Family Attached	$106,526	$422,315
Multifamily	$1,562,557	$9,514,097
Commercial (Retail/Office)	$1,552,932	$13,756,810
Open Spaces	$70,790	$383,335
Total	**$5,514,971**	**$33,248,537**

Step 2: Capital Costs per Acre

The next step in the fee calculation is to calculate the capital cost per acre by land use type. The allocated costs by land use type are divided by the developable acres for this step. Table 48 shows the result of this step.

Table 48 Stormwater Fund Capital Cost per Acre		
Land Use Type	**Cherry Creek Basin**	**Plum Creek Basin**
Single Family Detached	$2,538	$3,953
Single Family Attached	$5,767	$8,984
Multifamily	$6,152	$9,583
Commercial (Retail/Office)	$6,152	$9,583
Open Spaces	$154	$240

Step 3: Stormwater DIF per Unit

The last step in the fee calculation is to calculate the stormwater development impact fee per unit of development. A unit is defined as a residential dwelling unit or 1,000 sq. ft. of retail/office/industrial development. The capital cost per acre for each land use type is presented in Table 48. The dollar amounts allocated to each land use type are divided by the number of units per acre to determine the fee per unit for each development type.
Single family detached and single family attached units per acre are 3 and 10, respectively. Multifamily development in the Town average 12 units per acre. For commercial/industrial

development, the FAR from the Douglas County database shows that one acre of development has an average FAR of 0.37. This average FAR was verified with the projected non-residential development data from the Town's Development Services Department. Applying the average FAR is the most conservative approach to minimizing the overall increases to the stormwater development impact fees.

By multiplying one acre (43,560 square feet) by the FAR of 0.37, the result is 16,117 sq. ft. for each commercial/industrial building. The development impact fee for commercial and industrial development is based on each 1,000 sq. ft. of building space; therefore, the number of units per acre for commercial/industrial development is 16.1. Dividing the capital cost per acre for each land use type by the number of units per acre results in the stormwater development impact fee per unit.

Table 49 shows the units per acre assumed for each land use type. Table 50 presents the recommended DIF per unit by land use type. Note that actual calculated DIFs per unit differ by minimal amounts. To minimize small fluctuations in DIFs, CRW recommends maintaining the 2018 adopted DIFs.

Table 49
Stormwater Fund
Number of Units per Acre

Land Use Type	Cherry Creek Basin	Plum Creek Basin
Single Family Detached	3	3
Single Family Attached	10	10
Multifamily	12	12
Commercial (Retail/Office)	16,117	16,117

Table 50
Stormwater Fund
DIF per Unit

Land Use Type	Cherry Creek Basin	Plum Creek Basin
Single Family Detached	$843	$1,317
Single Family Attached	$563	$880
Multifamily	$511	$798
Commercial (Retail/Office)	$380	$594

Summary

The purpose of this study was to provide CRW with a thorough review of its SDFs and the underlying assumptions and provide updated fees for 2019 through 2023. The review is based on development fee approaches that are acceptable to the industry and to the State of Colorado's impact fee legislation. Annual review of growth, capital improvements and use of revenues from SDFs continue to be made to allow CRW to proactively make changes if needed.

Recommended SDFs for 2019-2023

The report shows how the fixed assets and CIP costs were calculated to determine the needed SDFs and DIFs for the funds for 2019-2023. Costs for capital improvements were maintained at 2018 dollars. In order to maintain SDF revenues to match increases in capital costs over time, the SDFs for water, water resources and wastewater are escalated for the study period 2019-2023. It is recommended that the stormwater DIFs for the Plum Creek and Cherry Creek basin remain the same for 2019 as the adopted fees for 2018. See the charts in the executive summary for these amounts and recommendations.

For a copy of the supporting data analysis, please contact Castle Rock Water at 720-733-6000.

Recommendations

As part of the 2018 Rates and Fees Study, Stantec Consulting Services, Inc. reviewed CRW's methodology and findings and recommends Castle Rock Water do the following:

- Implement the proposed 2019 SDFs for water, water resources, and wastewater as well as stormwater DIFs.
- Consider including the financing amount on the growth-related cost for Treatment Fee Component calculations. CRW customers pay principal and interest for debt incurred by PCWRA for plant improvements. The growth-related financing costs are currently borne by existing customers and could be reasonably added to the fee calculations. In addition, CRW's buy-in component assumes replacement costs less depreciation for its assets. The Treatment Fee Component holds constant at the value of principal payments. Including interest payments would allow for the recovery of costs due to inflation.
- Continue routine updates of customer characteristics data and apply average actual usage by meter size to accurately assess capacity available to serve new customers. Continue to use hydraulic capacity meter ratios in assessing SDFs that reflect the potential demands by meter size and type

Please see Appendix C for study review letter from Stantec Consulting Services, Inc.

Appendix A

List of Acronyms

The following provides a list of acronyms used throughout the report and its meaning:

- AF: Acre Feet
- CIP: Capital Improvement Program
- DIF: Development Impact Fee
- ENR: Engineering News Record
- FAR: Floor Area Ratio
- FY: Fiscal Year
- GPD: Gallons Per Day
- GPM: Gallons Per Minute
- I&I: Inflow and Infiltration
- KGAL: Thousand (1,000) Gallons
- O&M: Operations and Maintenance
- PCWRA: Plum Creek Water Reclamation Authority
- PCWPF: Plum Creek Water Purification Facility
- RCNLD: Replacement Cost New Less Depreciation
- SDF: System Development Fee
- SFE: Single Family Equivalent
- Sq. Ft.: Square Feet

Appendix B

Definitions

The following are definitions used in this study:

- SDFs are one-time fees charged to new customers that are intended to recover the costs of investments in infrastructure and projects designed to provide capacity for new customers. These fees are calculated in a manner consistent with the Colorado Revised Statute (CRS) 29-20-104.5.
- SFEs or single-family equivalents define the relative size or demand of a specific account. One residential account equals one SFE. A multi-family or commercial account represents a multiple of residential accounts or SFEs, typically defined by water demand or wastewater flow. Town Municipal Code 13.02.10 defines an SFE as a relative measure of demand placed on the water, sewer and/or irrigation capital plant by an average single-family residential unit.
- Equivalency schedules are a set of calculated ratios, based on a ¾" Meter being 1 SFE, which help to define how many SFEs are represented by the different meter sizes. Equivalency schedules are also used to calculate the monthly service charges for water, water resources and wastewater service.
- Hydraulic equivalency schedules are based on the relative capacity of different meter sizes and meter types utilized to deliver water. Hydraulic equivalencies can also be based on relative potential demands of different customers. Based on characteristic hydraulic demands, a single-family meter size of ¾" x ¾" is designated as the base for one SFE. The maximum flow rate of water through the meter in gallons per minute (gpm) becomes the unit of comparison. The maximum flow rate demanded by new customers is compared to the base demand in order to determine the equivalency ratio. For example, if the base single-family residential customer requires 30 gpm and a commercial customer requires 200 gpm, the equivalency ratio equals 6.67.
- Actual use equivalency schedules are based on the relative average monthly water usage of the Town's customers. Average monthly use per account by meter size was calculated using a 2015 to 2017 three-year average of monthly consumption data. The average usage of a single-family residential meter size is designated as the base. The average usage of larger meter sizes is divided by the base usage to calculate equivalent ratios.

Appendix C

Stantec Consulting Services Inc. Study Review Letter

Stantec

Stantec Consulting Services Inc.
370 Interlocken Boulevard Suite 300, Broomfield CO 80021-8012

August 10, 2018

Attention: Anne Glassman, Business Solutions Manager
Castle Rock Water
175 Kellogg Ct.
Castle Rock, CO 80109

Dear Anne,

Reference: Stantec Financial Review Services for Castle Rock Water's 2018 Rates and Fees Study, Volume 2 of 2, System Development Fees

As part of the 2018 Rates and Fees Study, Stantec Consulting Services Inc. (Stantec) was engaged by Castle Rock Water (CRW) as a third-party reviewer of CRW's methodology and findings. In preparing review comments and recommendations, Stantec has relied on the information and data presented by CRW without independent verification. The intent of our review was to provide an outside perspective of CRW's work products and models, as well as financial policies, based on our experience and best practices in the industry.

The approaches followed by CRW in calculating the water, water resources, and wastewater system development fees (SDFs), and the stormwater development impact fee (DIF), adhere to industry best practices. Both the American Water Works Association (AWWA) and Water Environment Federation (WEF) endorse these methods as acceptable approaches to calculating growth-related fees. By applying the hybrid approach for three of the four SDFs (water, wastewater, and water resources), CRW ensures new connections are paying for their share of existing available capacity (buy-in approach), in addition to paying for capital projects intended to provide additional capacity for new connections (incremental approach). This approach achieves intergenerational equity by placing new and existing customers on even footing in terms of equity in CRW's systems. This approach also complies with the Colorado Revised Statutes on impact fees (CRS 29-20-104.5).

CRW has followed a consistent approach to calculating its SDFs and DIFs for many years. In determining the Treatment Fee Component of the Wastewater SDF, the methodology has used the growth-related component of investments made in the Plum Creek Water Reclamation Authority (PCWRA) treatment plant. These investments are based on borrowed funds to expand and improve the system and are adjusted only when new investments are made to expand or improve the plant. CRW may wish to include the growth-related financing costs of these investments in future calculations of the Treatment Fee Component as a means to recover inflationary costs of the plant.

Finally, CRW's routine update of the Customer Characteristics report continue to provide clarity as to appropriate meter equivalency factors, thereby promoting intraclass equity.

Stantec's specific recommendations for CRW's SDFs and DIF are found in the Summary of the Volume 2 of 2 System Development Fees Report.

Reference: **Stantec Financial Review Services for Castle Rock Water's 2018 Rates and Fees Study, Volume 2 of 2, System Development Fees**

We enjoyed the opportunity to work with you and your staff on this study. Please contact me at (330) 271-9125 if you have any questions.

Regards,

Carol Malesky
Principal Financial Consultant

Phone: 330-271-9125
carol.malesky@stantec.com