



WATER RATES STRUCTURE

TOWN OF KEENESBURG

WATER RATES STRUCTURE,
2019 UPDATE
KEENESBURG, COLORADO

PEC PROJECT NO. 635-197056-000-8880

NOVEMBER 2019

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Water Rates Structure 2019 Update

Table of Contents

1.0	Introduction	1-1
2.0	Background	2-1
3.0	Objectives	3-1
4.0	Methods	4-1
5.0	Results and Recommendations	5-1

List of Tables

Table 1:	2018/2019 Town of Keenesburg Water Rates	2-1
Table 2:	Collected Water Revenue Compared to Projected Revenue, 2014 through 2018	2-2
Table 3:	Proposed Base Fee	5-1
Table 4:	Proposed 2020 Town of Keenesburg Water Rates, All Accounts.....	5-1
Table 5:	Proposed Increases in Average Monthly Charges Based User Types.....	5-2
Table 6:	Water Charges Comparison, July Usage.....	5-2

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Water Rates Structure 2019 Update

1.0 Introduction

Professional Engineering Consultants (PEC) has completed an evaluation of the existing Town of Keenesburg (Town) monthly water rates structure as a 2019 update to the rates established in 2015 following a rate study prepared by Telesto Solutions, Inc. (Telesto, 2015). This letter report summarizes the background to this update, objectives for establishing water rates, and methods used in analyzing the existing and alternative water rate structures and provides a recommendation for Town consideration.

Water Rates Structure 2019 Update

2.0 Background

On August 17, 2015 the Town Board of Trustees approved Resolution 2015-17 – Water and Sewer Rate Increase in large part based on the recommendations provided by Telesto in its April 2015 “Water and Sewer Rate Study.” The study recommended new rates at a specific level deemed adequate to fund annual operations and maintenance, administration, capital expense and debt service on the Town’s existing water infrastructure, including wells, pumps, supply pipelines, treatment, storage, and distribution. The approved water rates included a rate structure with a fixed component, or base fee, and multiple tiers with increasing usage-based rates on a per-thousand-gallons-used basis.

The new rate structure went into effect on January 1, 2016. Each year adjustments to the rates have been considered prior to July 1st for implementation on November 1st. Upward rate adjustments were made in 2017 and 2018. Rates were not raised for 2019. The current (2018/2019) water rates are summarized in Table 1.

Table 1: 2018/2019 Town of Keenesburg Water Rates

Water Usage Tier	Water Rate Charge
0 to 6,000 gallons	\$34.01 minimum charge
6,001 to 10,000 gallons	\$2.62 per each additional thousand gallons
10,001 to 20,000 gallons	\$3.79 per each additional thousand gallons
20,001 to 40,000 gallons	\$4.67 per each additional thousand gallons
40,001 to 60,000 gallons	\$5.83 per each additional thousand gallons
60,001 or more gallons	\$7.00 per each additional thousand gallons

Collected water rates revenues typically vary in inverse proportion to annual precipitation: dry years typically result in more collected revenue as water customers use more water for outdoor irrigation, and wet years result in less revenue. The variability in precipitation year by year consequently produces a similar variability in collected water revenue. Table 2 summarizes projected and actual revenue from water usage from Town data for 2014 through 2018, not including miscellaneous water or bulk water sales revenue. Included in Table 2 are annual precipitation totals as recorded at Denver International Airport, which has an average annual precipitation of 14.30 inches.

Water Rates Structure 2019 Update

Table 2: Collected Water Revenue Compared to Projected Revenue, 2014 through 2018

Yea	Annual Precipitation (in.)	Projected Revenue	Actual Revenue	Difference
2014	20.59	\$270,000	\$221,736	-\$48,264
2015	18.31	\$250,000	\$235,469	-\$14,531
2016	11.85	\$235,000	\$265,622	\$30,622
2017	11.69	\$275,000	\$299,045	\$24,045
2018	8.53	\$295,000	\$326,888	\$31,888
Sum		\$1,325,000	\$1,348,760	+\$23,760

Over the five-year period from 2014 through 2018 actual water sales revenues based on monthly water usage fell short of projections in 2014 and 2015 and exceeded projections from 2016 through 2018. The net result was the collection of \$23,760 more in revenue than projected, or approximately 1.8% more than projected. Through the end of October 2019, precipitation has been slightly above average, and we would expect that water rates revenues will be somewhat below average for 2019.

Nineteen water customers in the Town have a single tap that serves multiple independent users. These include, for example, apartment buildings or commercial buildings with included residential apartments. For these customers, the Town adopted a multiplier system to account for the number of independent customers drawing water from the single tap. Thus, an address with four apartments has historically been billed according to a 4.0 multiplier; the water charge for the addressee was billed as if each of the four units had its own independent tap. This multiplier system pre-dated the 2015 Telesto study, was evaluated by Telesto, and remained in place with the adoption of Resolution 2015-17.

Water Rates Structure 2019 Update

3.0 Objectives

This 2019 update, prepared four years after the adoption of the current rate structure, was performed to determine whether adjustments to that structure may be warranted. The two primary objectives for the Town's, or any municipality's, water rates program are fairness and sufficiency. Water rates should be equitable for all users based on the demands that each individual user places upon the Town's existing water infrastructure. And rates should be sufficient to fund the Town's costs for that infrastructure.

As secondary objectives, this update considered whether the rate structure encouraged water conservation and whether the structure is relatively simple and easy for the customer to understand. When users conserve their use of water, they typically place an overall smaller impact on the demand for raw water acquisition, treatment, storage and delivery. Customers need to readily understand how their monthly water use is reflected in the charge shown on their bill.

In addition, as a market-based check on the Town's water rates, we evaluated a handful of similar Colorado communities to confirm methods for rate establishment and to compare rate levels.

Water Rates Structure 2019 Update

4.0 Methods

Research. PEC researched trends in water rates for Colorado municipalities and water districts with the following trends observed:

- Most water utility providers include a fixed rate component that increases with increasing meter size
- Most providers use fewer tiers than the six used by the Town
- Tiers are generally established based on typical household use, average outdoor irrigation use, and with a higher or surcharge rate established for water use above these average levels
- Some, but not all, providers differentiate rates for residential and non-residential users. However, when differentiated, there was not an observed consensus whether non-residential users' rates should be higher or lower.

Evaluation. We evaluated potential adjustments to the rate structure using the Town's billing schedule for all customers for September 2019, which reflects up-to-date Town water use, including the recent opening of the Williams Gas Plant on County Road 398. We noted that September 2019 usage was higher than normal due to below average precipitation in August and September 2019. We created a spreadsheet which normalized the September 2019 data to average use conditions. We extended the average of September to the other months to create a synthetic average year by using the typical ratios of other monthly usages relative to September. This synthetic average year thus considered usage by all current customer accounts as it would occur during an average precipitation year.

We varied spreadsheet inputs to evaluate the following three conditions:

1. Existing rates with multipliers
2. Existing rates without multipliers
3. Potential new rate structures to result in the desired 2020 water sales revenue

We compared the existing rates with and without multipliers based on actual September 2019 usage. Water sales revenues from September 2019 usage, with multipliers, was \$34,483.99, exclusive of bulk water sales. Actual September 2019 usage, if billed under the current rate structure without applied multipliers, would have resulted in a usage-based revenue of \$34,270, only a 0.6% difference. It should be noted that the same exercise applied to other months would likely produce different results. For non-irrigation months, where the fixed rate component yields a greater proportion of the revenue, the use of multipliers would result in a greater revenue difference.

We evaluated the annual water sales revenue for the synthetic average year without the use of multipliers, but with the current rate structure. This allowed a check on the reasonableness of the

Water Rates Structure 2019 Update

synthetic average year and to confirm whether the omission of multipliers in the rate structure would still produce the desired revenue. Our evaluation indicated that the average 2019 would have produced approximately \$341,000 in revenue without multipliers and with the current rate structure. This value is very close to the budgeted revenue for 2019, which assumed average conditions, of \$340,000.

We then evaluated multiple different rate levels to meet the objectives summarized in Section 2.0. A target revenue of \$387,000 was selected to meet the Town's ongoing objectives for a fund that meets administration, operation and maintenance, capital expense, and debt service for the existing water system. The selected rate structure included the following:

- Inclusion of a base fee, a fixed rate component that varies with meter size to account for the greater overall impact on managing the entire water system (raw water acquisition, pumping, treating, storing and distributing) that larger water users create
- Application of a variable rate, per each thousand gallons of water used, starting with the first gallon used, rather than the current structure which starts the variable charges above 6,000 gallons
- Use of fewer than the six current tiers to create a simpler structure that is tied to rational tier thresholds. We started our analysis with three residential tiers and two non-residential tiers and, at the end of our analysis, propose four tiers for both types of users. The four tiers correspond to household use, outdoor irrigation use, and two surcharge tiers.

Evaluation of various rates was performed with the following 6 steps:

1. Build off the 2019 actual water usage data for each of the 470 Town water accounts
2. Normalize the higher than average September 2019 usage to an average condition
3. Use typical monthly ratios, each compared to average monthly usage, to establish a synthetic average year
4. Select a rate structure to result in \$387,00 in revenue
5. Through a trial and adjust method, vary the rate structure until increases are generally balanced across different user classifications.
6. Compare resulting charges for the Town to other representative communities.

Water Rates Structure 2019 Update

5.0 Results and Recommendations

Spreadsheet modeling of the 470 Town accounts for the synthetic average year using the selected rate structure summarized above resulted in an estimated revenue of \$388,000 and billing increases that are generally balanced across different user classifications. The discussion below summarizes the selected rate structure.

Almost all of the existing 470 water sales accounts are for customers with $\frac{3}{4}$ " meters. However, the Town has users with 1", 2" and 3" meters as well. Data indicate that 9 accounts have meters larger than $\frac{3}{4}$ ". Table 3 summarizes the proposed base fee for various meter sizes.

Table 3: Proposed Base Fee

Meter Size	Meter Size Factor	Base Fee
$\frac{3}{4}$ "	1.0	\$27
1"	1.4	\$38
1-1/2"	2.5	\$68
2"	3.5	\$95
3"	6.0	\$162

Table 4 summarizes the proposed tiers and rates for both residential and non-residential water customers. The first tier corresponds to an indoor usage calculated as 65 gallons per person per day, with an average of 3 persons/household. The second tier corresponds to outdoor irrigation by supplementing the average 14" of precipitation with 22" of irrigation from mid-April through mid-October and applied over 6000 square feet of outdoor area. The last two tiers apply different rates for two surcharge levels.

Table 4: Proposed 2020 Town of Keenesburg Water Rates, All Accounts

Water Usage Tier	Water Rate Charge
Base Fee	\$27.00 for $\frac{3}{4}$ " meter
0 to 6,000 gallons	\$2.75 per each thousand gallons
6,001 to 20,000 gallons	\$3.50 per each additional thousand gallons
20,001 to 40,000 gallons	\$4.50 per each additional thousand gallons
More than 40,000 gallons	\$7.75 per each additional thousand gallons

Implementation of the proposed rates would result in an increase of revenue of 14% more than projected for the two-year 2017/2018 period. Table 5 summarizes the average monthly water bill for 6 different user classifications for the rates shown in in Table 4.

Water Rates Structure 2019 Update

Table 5: Proposed Increases in Average Monthly Charges Based User Types

User Type	Typical July Usage, Gals	Percent of Users	Existing Charge	Proposed Charge	Percent Increase
Residential - Low	7,500	45	\$34.52	\$38.77	12
Residential – Medium	19,000	23	\$47.70	\$58.76	23
Residential – High	25,000	17	\$59.59	\$71.70	20
Multi-Family	450,000	4	\$1,587	\$1,872	18
Commercial – Low	5,000	8	\$34.01	\$34.40	1
Non-Residential - High	600,000	3	\$2,306	\$2,656	15

To check whether the proposed water rates for the Town generally fall within monthly water rates charged for similar communities, we looked at the rates for Parker and Castle Rock, both of which use groundwater supplies, and for Fort Lupton and Westminster, north metro-Denver area communities. Table 6 provides this comparison. We note that the Town’s rates are similar to, or less than, the comparison communities.

Table 6: Water Charges Comparison, July Usage

July Usage, Gals	Keenesburg	Parker	Castle Rock	Westminster	Fort Lupton
7,800	\$49.78	\$52.87	\$36.79	\$51.40	\$73.49
19,100	\$89.35	\$102.14	\$101.65	\$134.46	\$135.66
25,300	\$121.85	\$153.71	\$152.19	\$202.66	\$182.34
452,000	\$3,460	\$1,084	\$1,301	\$3,269	\$3,519
5,000	\$40.63	\$48.14	\$27.82	\$60.24	\$59.55
640,000	\$4,928	\$3,943	\$3.184	\$4,606	\$4,989

We recommend adoption of the water rate changes summarized in Tables 3 through 5. These rates propose a base fee as a function of meter size, simplify the tier structure, eliminate the multiplier system, would raise desired revenue in an average precipitation year, and generally balance the impact of the increase among the various water user types.