TOWN OF FRISCO
COLORADO

WATER EFFICIENCY PLAN

January 2018

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Developed in partnership with:

HIGH COUNTRY CONSERVATION CENTER

brendle GROUP

1 EXECUTIVE SUMMARY

In 2017, High Country Conservation Center and five water providers in Summit County (Copper Mountain Consolidated Metropolitan District, Town of Breckenridge, Town of Dillon, Town of Frisco, and Town of Silverthorne) partnered together for the development of water efficiency plans. A diverse stakeholder group developed a vision statement to guide efforts in the Blue River Watershed towards regional water efficiency:

Our vision is for water providers to continue supplying reliable, high quality water to the residents and visitors of Summit County while also:

- *Protecting the natural environment upon which our economy and prosperity are based.*
- *Ensuring the sustainability of our mountain lifestyle for current and future generations.*
- *Fostering a culture of environmental and social responsibility through education and actions.*
- *Inspiring collaboration and responsible stewardship of water resources across the State of Colorado.*

This water efficiency plan (the first that has been developed for the Town) serves to document the Town's existing and planned actions to ensure system reliability and the efficient use of available water supplies.

1.1 Where We Are Now

The Town of Frisco is supplied by both groundwater and surface water sources. Over the past five years, about two-thirds of the Town's water supply has come from groundwater supplies, while one-third has been supplied by surface water diversions. The Town is committed to maintaining environmentally beneficial minimum flows in the rivers and adjusts operations accordingly during dry conditions.

Since 1996, the Town has experienced an average decline of 1% year-over-year in annual water production volumes, with 691 ac-ft in total production in 2015. Normalizing for service population, the year-over-year decrease is also around 1% on average. In 2015, system-wide water use was 105 gallons per capita per day.

The Town sells water for residential uses (53% of annual production), commercial uses (28%), and snowmaking (4%). The remaining 15% of water production goes to non-revenue water uses, which include municipal use (i.e., park irrigation, government buildings, snowmaking), firefighting, hydrant flushing, and system leaks.

Outdoor water use represents 19% of annual demands on average, doubling system demands during the months of June-August. Small increases in water demands occur in November-March and are driven by the influx of transient residents and day visitors during ski season.

The Town has achieved past reductions in water use through the implementation of various demand management activities, including:

- An advanced metering infrastructure system installed in 2017
- A system-wide leak detection program, started in 2005, that includes a system audit and repairs every three years
- An inclining block rate structure, adopted in 2003, that provides some incentive for conservation

- Tap fees tied to building size to encourage water efficiency
- A voluntary outdoor water conservation ordinance since 2003
- Improved indoor water efficiency through local plumbing codes, State fixture requirements, and a voluntary ordinance for water use in restaurants
- Public outreach and education efforts

1.2 Where We Want to Go

This water efficiency plan was developed using a 2025 planning horizon, providing enough time to gain traction on new efficiency activities, and with an emphasis on successful implementation. Over the period 2018-2025, the Town aims to implement additional water efficiency activities to supplement existing activities to achieve the following goals:

- Overcome growth in service population and stabilize demands, with essentially no change in production volumes through 2025.
- Achieve 475 ac-ft in water savings over the period 2018-2025, compared to the business-as-usual forecast.
- Reduce peak demands during the summer associated with outdoor water use.

1.3 How We Will Get There

New water efficiency activities were selected using multiple factors that included utility priorities, stakeholder input, opportunities for water savings, technical feasibility, and implementation capacity. When feasible, the efficiency activities were quantified in terms of their potential for water savings, customer sectors and end-uses impacted by the measure, and implementation costs.

Water Efficiency Activities	Sectors Impacted	Implementation Period	Projected Water Savings in 2025
Foundational Activities			
Billing Upgrades	All Customers	2021-Ongoing	Not Quantified
Advanced Metering Infrastructure and Enhanced Water Loss Control	All Customers	2018-Ongoing	41 ac-ft/yr
Conservation-Oriented Rates	All Customers	2018-Ongoing	44 ac-ft/yr
Institutional Collaboration	Utility	2017-Ongoing	Not Quantified
Targeted Technical Assistance and Incentives			
Indoor Water Efficiency	Residential	2018-Ongoing	Not Quantified
Outdoor Water Efficiency	Residential & HOA	2019-Ongoing	1 ac-ft/yr
Ordinances and Regulations			
Land Use Planning	All Customers	2017-Ongoing	Not Quantified
Education Activities			
Education and Outreach	All Customers	2018-Ongoing	Not Quantified
Total Savings in 2025 (ac-ft/yr)			**86 ac-ft/yr**

1.4 How We Will Stay on Track

This water efficiency plan includes implementation action plans for the planned water efficiency activities to help the Town achieve its goals. The action plans specify goals, strategies, action items, timelines, and resources for each activity


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2 ACKNOWLEDGEMENTS

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3 INTRODUCTION

In 2011, the Town of Frisco (Town) updated its community master plan, which identifies common community values and establishes shared quality of life policy statements to "connect, sustain, and create the future of the Town" (TOF 2011). In support of the Community Services and Natural Environment policies, the Town seeks to:

- Provide high quality, reliable community services
- Protect the natural environment
- Promote cost-effective sustainable practices
- Conserve resources
- Protect water quality and water quantity

3.1 WHY A WATER EFFICIENCY PLAN?

The Water Conservation Act of 2004 (HB04-1365) requires all covered entities, defined as retail water providers that sell more than 2,000 ac-ft/yr, to have a State-approved water efficiency plan. Although the Town is well below this threshold, the Town, along with neighboring water providers, looks to set an example for other mountain communities in preserving the natural environment and promoting conservation values. This water efficiency plan serves to describe the Town's history of water saving activities and future plans. The Town also seeks to leverage regional partnerships to effect change and encourage all residents and visitors to reduce water use.

3.2 The Planning Process

In 2017, High Country Conservation Center, Middle Park Conservation District, and five water providers in Summit County (Copper Mountain Consolidated Metropolitan District, Town of Breckenridge, Town of Dillon, Town of Frisco, and Town of Silverthorne) partnered together for the development of a regional water efficiency plan. Water efficiency plans were also developed for four of the individual water providers (excluding Town of Silverthorne) to represent the unique needs and opportunities for each service area. The regional water efficiency plan developed for the Blue River Watershed within Summit County elevates common themes and water saving opportunities outside of the participating service areas. Plan development was supported through a combination of grant funding from the Colorado Water Conservation Board (CWCB) under the Water Conservation Planning grant program, and cash and in-kind contributions from the participating providers.

The water efficiency plans were developed in accordance with the State of Colorado's *Municipal Water Efficiency Plan Guidance Document* (CWCB 2012). The plans were drafted using information and guidance provided by utility and planning staff in each community. Additionally, a diverse stakeholder group was formed to provide input on water savings goals, water efficiency activities, and implementation actions. In 2017, more than 30 stakeholders participated in a series of four planning workshops (baseline review, draft goals and efficiency activities, revised goals and efficiency activities, and implementation). Upon completion, the plans underwent a series of reviews by utility staff, the stakeholder group, the public, and CWCB staff. Finally, plans were submitted to the appropriate governing entity (town council or District board, as appropriate) for adoption.

3.3 Our Water Vision

The stakeholder group developed a vision statement to guide efforts in the Blue River Watershed towards regional water efficiency.

VISION STATEMENT

Our vision is for water providers to continue supplying reliable, high quality water to the residents and visitors of Summit County while also:

- Protecting the natural environment upon which our economy and prosperity are based.
- Ensuring the sustainability of our mountain lifestyle for current and future generations.
- Fostering a culture of environmental and social responsibility through education and actions.
- Inspiring collaboration and responsible stewardship of water resources across the State of Colorado.

4 Service Area Characteristics

4.1 Boundaries

The Town of Frisco is located in Summit County, a county whose economy is dominated by winter sports and water activities. The Town encompasses 3 sq mi on the southwest shores of Dillon Reservoir (**Figure 1**). The Town was founded in 1873 and quickly grew during the mining boom, which lasted until 1918. Today, the Town is a popular destination for skiers and summer recreationalists.

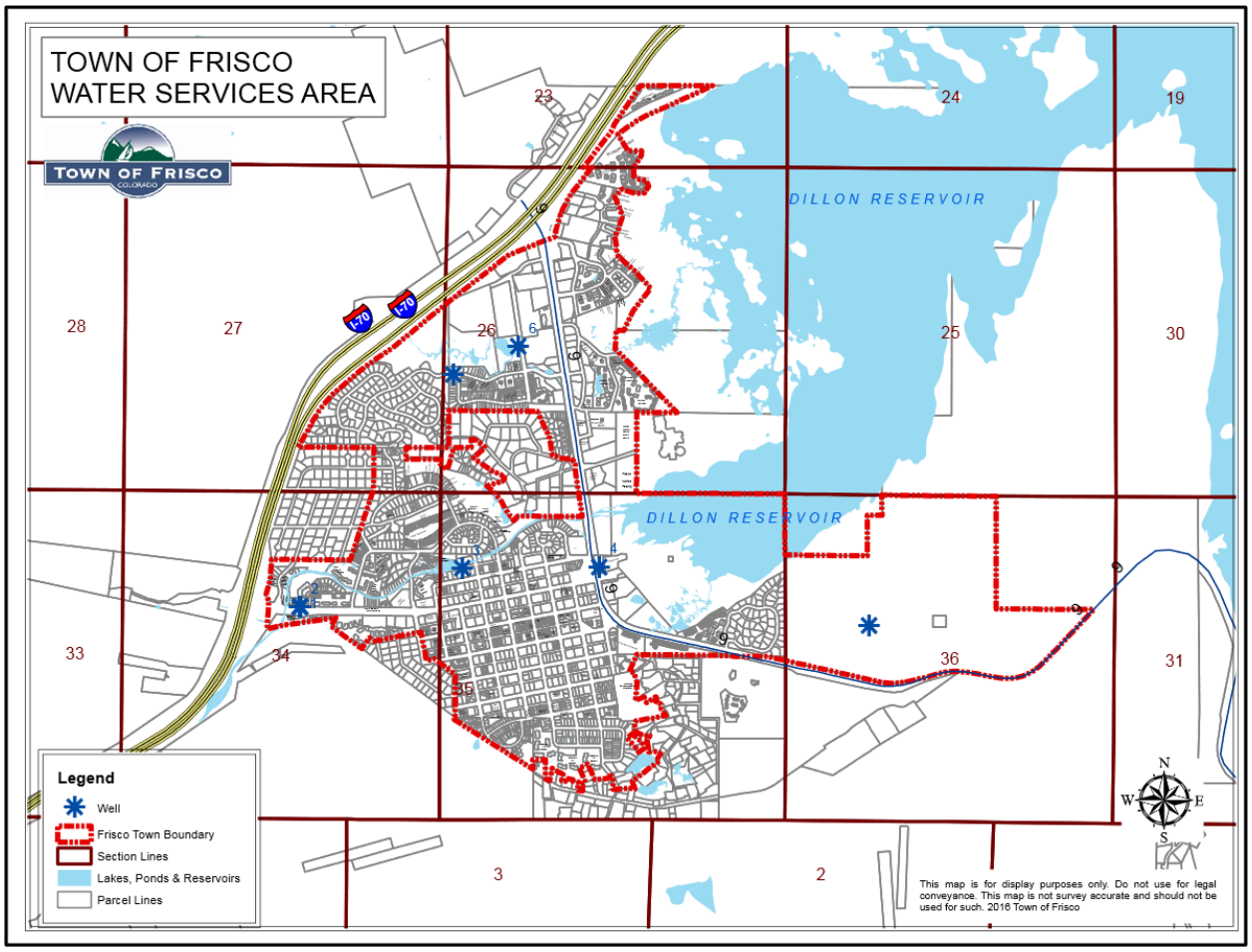

Figure 1: Town of Frisco Water Service Area

The Town provides water services for all the properties located within the incorporated boundaries. The Town also serves neighboring unincorporated areas, as shown in **Figure 1**.

Due to the proximity of federal lands and Dillon Reservoir, there is limited potential for the Town to expand its borders. Projected growth is expected from infill and redevelopment rather than expansion.

4.2 POPULATION

The Town of Frisco is close to world-class ski resorts, including Breckenridge, Copper Mountain, Keystone, and Arapahoe Basin. As such, tourism in the area introduces a high degree of seasonality and variability into the service population. Since 2011, the permanent population served by the Town's water system has grown from 2,800 to almost 3,000 people, an average growth rate of 1.4% year-over-year (**Table 1**). The Town estimates that the average annual visiting population served is 1,800 people, although the daily peak population served can be much higher. Looking forward, the Town assumes that the permanent service population will increase on average by 1.4% per year, while the average visiting population served will grow on average by 1.6% per year.

Table 1. Population History

Year	Permanent Population Served[1]	Average Non-Resident Population Served[2]	Average Annual Service Population
2011	2,794	1,800	4,594
2012	2,832	1,800	4,632
2013	2,871	1,800	4,671
2014	2,914	1,800	4,714
2015	2,954	1,800	4,754

[1]Population estimates include Town population served plus population served in unincorporated areas.

[2]Colorado Department of Public Health and Environment Public Water System Information Sheet

4.3 RESIDENTIAL SECTOR

Housing in the Town reflects the characteristics of a recreational destination. Approximately 65% of the available housing units are designated as multifamily housing (ACS 2015). The remaining housing units are single-family detached (14%), single-family attached (20%), and a small number of mobile homes (<1%). The average building age dates to the late 1980s and early 1990s. Approximately 60% of the housing units in the Town are not occupied year-round. The median household income is almost $71,000, well above the State median income of $61,000 (USCB 2017).

Older buildings in the Town represent an opportunity for indoor water savings through the replacement of indoor fixtures and appliances. The high proportion of multifamily units and the transient population represent challenges for water education and outreach efforts. The Town aims to engage and influence the visiting population to effect long-lasting water savings.

The Town has been considering the possible implications of the Lake Hill housing project, which sits on Summit County land to the east of the current Town boundary. If the Lake Hill development is completed per the 2017 Master Plan, it could include up to 430 housing units and approximately 1,000 residents. There are other unincorporated residential areas adjacent to the Town, but as these areas are self-supplied by wells or are already served by the Town's system, they are expected to have little impact on the water system.

4.4 Commercial and Industrial Sector

The Town of Frisco supports 1,943 jobs, 88% of which are in the private sector (ACS 2015). The remaining jobs represent government employment (10%) and self-employment (2%). The largest employment sectors are recreation, accommodation, and food services associated with the tourism industry, followed by retail, education, and health care. The Town is home to several schools and Summit County's main medical and government facilities.

5 Existing Water and Wastewater System

5.1 Raw Water Supplies

The Town of Frisco is supplied by both groundwater and surface water sources, with the right to divert up to 1,413 ac-ft/yr. The Town has the right to divert up to 2.5 cfs from North Tenmile Creek, Additionally, the Town has seven groundwater supply wells along Tenmile Creek and Meadow Creek (**Figure 1**), from which the Town has the rights to pump up to a combined 748 gpm (1,207 ac-ft/yr). Currently, Wells 5 and 6 are the main groundwater supply wells. Wells 1 and 2 have been discontinued due to water contamination; Wells 6 and 7 were drilled as replacements. Well 3 was last used in the summer of 2013 to supplement the Town's water supply, and emergency Well 4 has not been used in recent memory. Well 7 will be brought on-line by Spring 2018.

Over the past five years, about two-thirds of the Town's water supply has come from groundwater supplies and one-third has been supplied from surface water diversions (**Figure 2**). The Town prefers to use surface water supplies because they require less energy to pump. However, during dry conditions, the water level in North Tenmile Creek drops too low to allow the Town to draw water. Further constraining operations, the Town has agreed to a minimum bypass at the North Tenmile Creek diversion point and uses the Meadow Creek wells (Wells 5 and 6) first whenever flow in Tenmile Creek (at the present gage) drops below 7 cfs (NWCCOG 2004). The Town is committed to maintaining environmentally beneficial minimum flows in these river reaches.

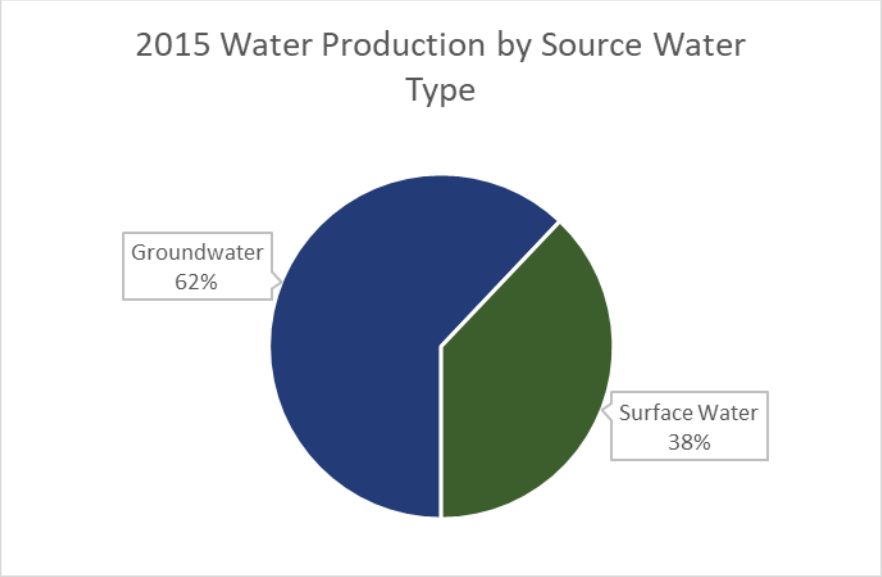

Figure 2. 2015 Treated Water Production by Source Water Type

Under current development projections, the Town estimates that water demands at buildout would be 1,975 ac-ft/yr, of which 1,811 ac-ft/yr would be used for indoor use and 164 ac-ft/yr would be used for outdoor use (NWCCOG 2004). Outdoor use is expected to decrease from changes to the Town's development standards, which are expected to support more efficient water use. The Town would need to procure additional water rights to adequately supply any future large development initiatives.

5.2 Treatment and Distribution

The Town owns and operates one surface water treatment plant (WTP) that was built in 1982 and has a capacity of 1 MGD. In 2009, the water treatment process was upgraded from conventional filtration to microfiltration and to increase the chlorine contact time used for disinfection. The Town operates the WTP during most of the year, except during spring and early summer when surface water quality is poor due to snowmelt runoff.

The Town uses groundwater supplies year-round to supplement the WTP production. When the WTP is not operating, wells are the primary water supply source. Groundwater supplies are high quality and require only disinfection to meet drinking water standards. All water produced by the Town is treated to drinking water standards – the Town does not currently distribute raw, non-potable, or reclaimed water supplies.

Treated water is distributed through 24 miles of ductile iron piping. The system is gravity fed, with no pump stations. Since the Town is relatively flat, there is only one pressure zone. The water pressure varies between 45-80 psi. **Figure 3** presents a map of the water distribution system.

The Town has a total treated water storage capacity of 2.53 MG in three storage tanks: an inground tank with a capacity of 1.2 MG; an aboveground tank with a capacity of 0.83 MG; and a 0.5-MG tank located at the WTP.

Figure 3: Town of Frisco Water Distribution System

5.3 Water Sales and Non-Revenue Water Uses

The Town of Frisco sells water for residential, commercial, and snowmaking uses. Non-revenue water uses include municipal use (i.e., park irrigation, government buildings, snowmaking), firefighting, hydrant flushing, and system leaks. Historically, the Town's irrigation use has not been metered. While water meters are installed in municipal buildings, the meters have not been read or tracked. The Town is in the process of installing irrigation meters and tracking the Town's water use to better account for these uses and to look for conservation opportunities.

5.4 Water Rates and Billing

In 2010, the Town adopted an inclining block rate structure to discourage excessive water use (**Table 2**). Rate studies are done every five years (the next one is scheduled for 2018) and rates are increased every year to match inflation. The pricing structure is based on equivalent residential units (EQR) and does not differentiate between commercial and residential customers. The Town calculates EQR values for buildings based on total area and usage patterns after reviewing the building plans. Customers are billed quarterly for their water use.

Table 2. 2017 Water Rates

Pricing Tier	Pricing Rate (per EQR per quarter)
Baseline Price	$40.33
18,001 – 35,000 gallons	$3.38/ 1,000 gallons
> 35,000 gallons	$4.74/ 1,000 gallons

5.5 Wastewater Collection and Treatment

The Town's sewage flows are treated by the Frisco Sanitation District, a special district that is independent of the Town of Frisco.

5.6 System Reliability, Limitations, and Future Needs

5.6.1 Reliability

The Town's water system is highly reliable. The Town has never suffered from a loss of water supply or a failure to meet system demands, even during the significant droughts that occurred in 2002 and 2012. The mix of surface water and groundwater supplies is the Town's most powerful tool for ensuring system reliability.

For planning purposes, the Town has evaluated the firm yield of the current water supply system to be 1,100 gpm (1,775 ac-ft/yr), which represents more than double the current system demands. **Table 3** presents a summary of the firm yield estimates by water supply source.

Table 3. Firm Yield Estimates

Water Supply Source	Firm Yield (gpm)
Surface water diversions	700
Well 3	400
Well 4	200
Well 5	550
Well 6	550
Well 7	500[e]
TOTAL	1,100

[e]=*estimated*

In addition to current alternate water sources, the Town's augmentation plan allows for additional wells to be drilled, direct pumping of water from Dillon Reservoir, or pumping of treated effluent from the Frisco Sanitation District wastewater treatment plant for non-potable use to be developed in the future (NWCCOG 2004).

5.6.2 Vulnerabilities

5.6.2.1 Service Disruptions

The Town periodically experiences power outages, so the Water Department has installed backup generators to maintain reliable water supply services throughout the power outages.

5.6.2.2 Wildfire

The Town's surface water supplies are vulnerable to the effects of wildfires. When they do occur, wildfires create a triple threat to surface water quality:

- They increase the amount of rainfall during subsequent storm events that is available for runoff. Wildfires burn vegetation whose canopy would normally intercept rainfall and whose roots would uptake water.
- They increase pollutant loads during subsequent storm events. Wildfires leave large amounts of debris and surface disturbances in their wake. In addition to the debris and sediment loads clogging intake infrastructure, source waters often experience spikes in turbidity, coliforms, total organic carbon, iron, manganese, and ammonia.

- They increase the surface runoff that occurs from subsequent storm events. Wildfires affect topsoil properties, making ground surfaces hydrophobic, so that water runs off rather than being infiltrated.

Wildfires can also affect the available quantity of water, if debris constricts water flow or alters the river channel.

In the event of surface water contamination, the Town has the ability to switch to groundwater supplies and continue to provide adequate and safe drinking water.

5.6.2.3 Drought

Summit County has experienced significant periods of drought six times in the past 35 years, with the most recent occurring in 2002 and 2012 (AMEC 2013). While the Town has been able in the past to provide sufficient water supplies to meet demands, the droughts have highlighted the need for utility planning to avoid shortages in the future, particularly if a severe, multi-year drought were to occur.

During the drought of 2002, the Town of Frisco had to shut down the WTP for approximately seven months due to low water levels in North Tenmile Creek. The Town found that the groundwater supply wells were relatively unaffected by the drought and could serve the system demands. This experience was a motivating factor for adding redundancy in the Town's groundwater supplies through the addition of Well 7.

In 2003, the Town passed a water conservation ordinance that includes permanent voluntary water use restrictions and a three-phased drought response plan. This ordinance is described in more detail in Section 6.2.4.

5.6.3 Future Needs

Well 7 was drilled in 2006, developed and improved in 2017, and is expected to be on-line in 2018, with a production rate of at least 500 gpm.

6 Historical Water Demands and Demand Management

6.1 Historical Water Demands

The Town tracks several measures of system production, system efficiency, and water use patterns. The following sections present information that describes historical systemwide demands. All readily available information is presented; it should be noted that the period of available data varies among metrics. **Appendix A** contains a summary of all data presented in this plan.

6.1.1 Annual Treated Water

Annual treated water production volumes for the period 1996-2015 are shown in **Figure 4**. These data have not been normalized for weather or other factors that affect water demands from year to year. The Town has experienced an average decline of -1% year-over-year in annual treated water production volumes over this period.

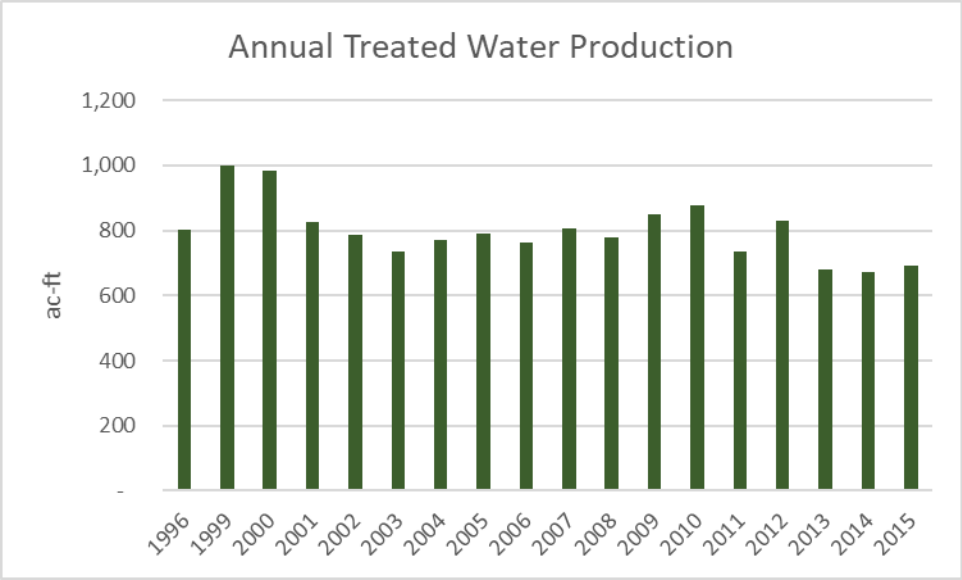

Figure 4. Annual Treated Water Production (1996-2015) – data for 1997-98 are not available

The Town tracks water sales in three sectors: residential, commercial, and snowmaking. **Figure 5** presents a breakdown of treated water production by sector for 2015. Residential sales represent more than half of the total water use in Frisco. There are no industrial water users in the Town's service area. The largest water users in the commercial sector include the hospital, commercial laundry facilities, restaurants, and breweries. Water used for snowmaking is limited to 30 ac-ft/yr, must be sourced from groundwater wells, and must be used between November and February of each year, per the Town's water rights. It's important to note that the ski resorts have their own water rights used for snowmaking, irrigation, and other uses that are independent of the Town's supplies.

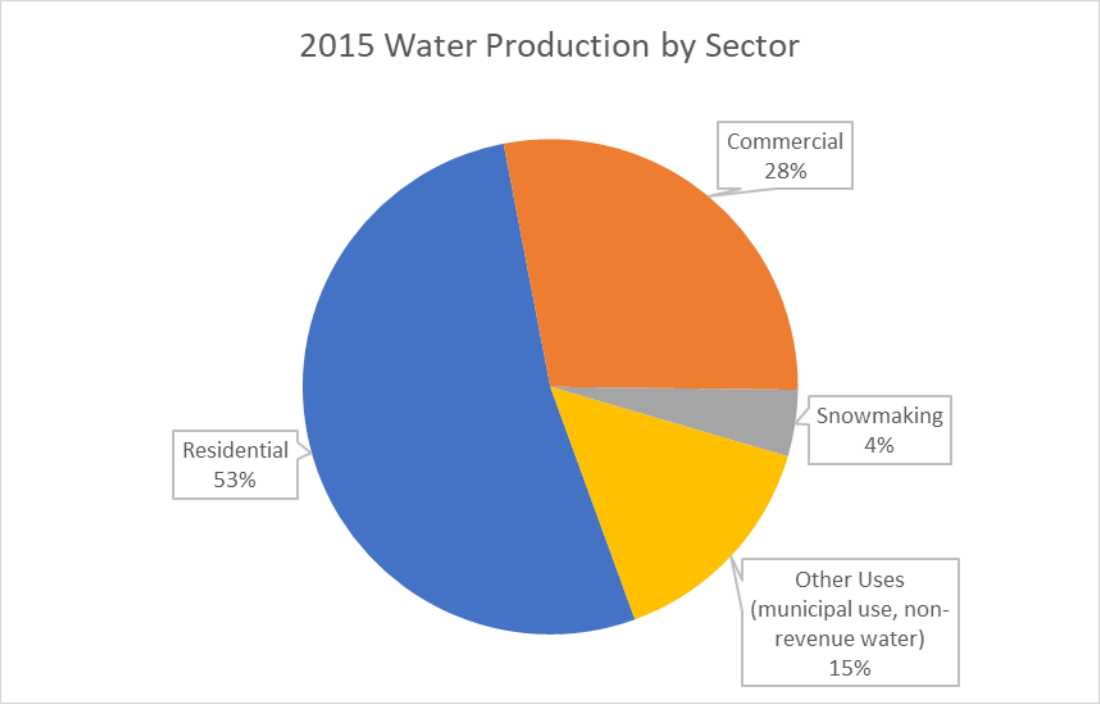

Figure 5: 2015 Treated Water Production by Sector

6.1.2 Monthly Treated Water

Over the period 1996-2015, outdoor water use has represented an average of 19% of annual demands, based on an analysis of monthly water production data (**Figure 6**). Outdoor use nearly doubles system demands during the months of June-August. Small increases in water use that occur November-March are driven by the influx of transient residents and day visitors during ski season.

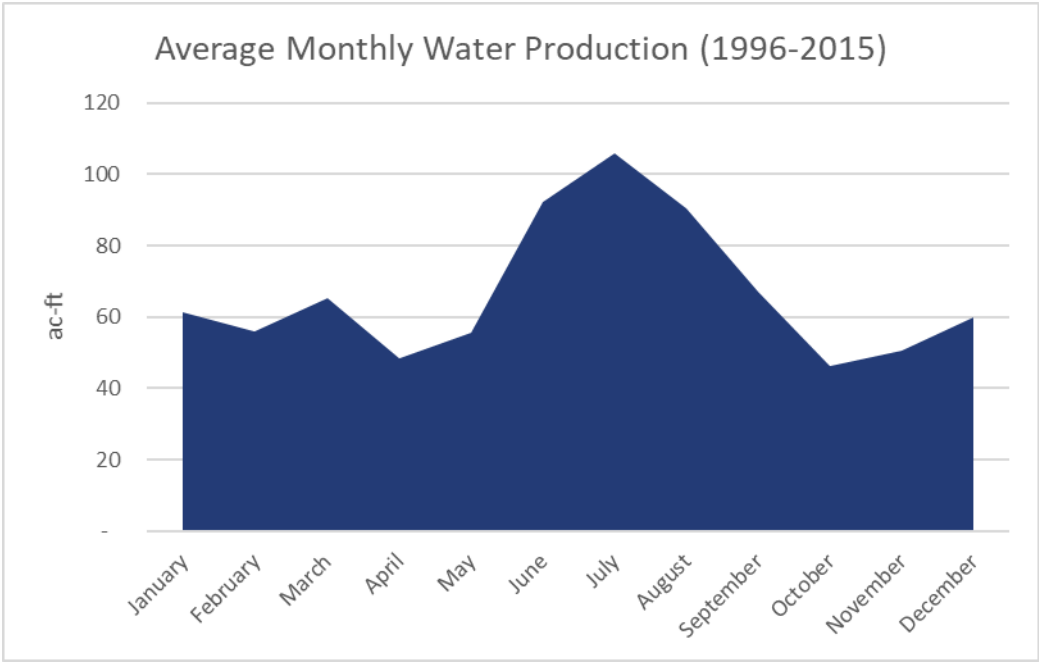

Figure 6: Average Monthly Water Production (1996-2015)

6.1.3 System-Wide Water Use Metrics

The Town uses system-wide per capita demands as one measure of system efficiency. The Town calculates system-wide per capita water use values using residential and commercial water sales and the average annual population served, which includes both the permanent and visiting population. As the metric is currently calculated, it excludes non-revenue water, so is useful for assessing water use patterns and water conservation outcomes for the service population.

Over the past five years, the Town has experienced average system-wide per capita demands of 105 gpcd (**Figure 7**). Over this period, the average population served increased by 1% on average year-over-year while per capita water use declined by 1% on average year-over-year, showing a net gain in efficiency.

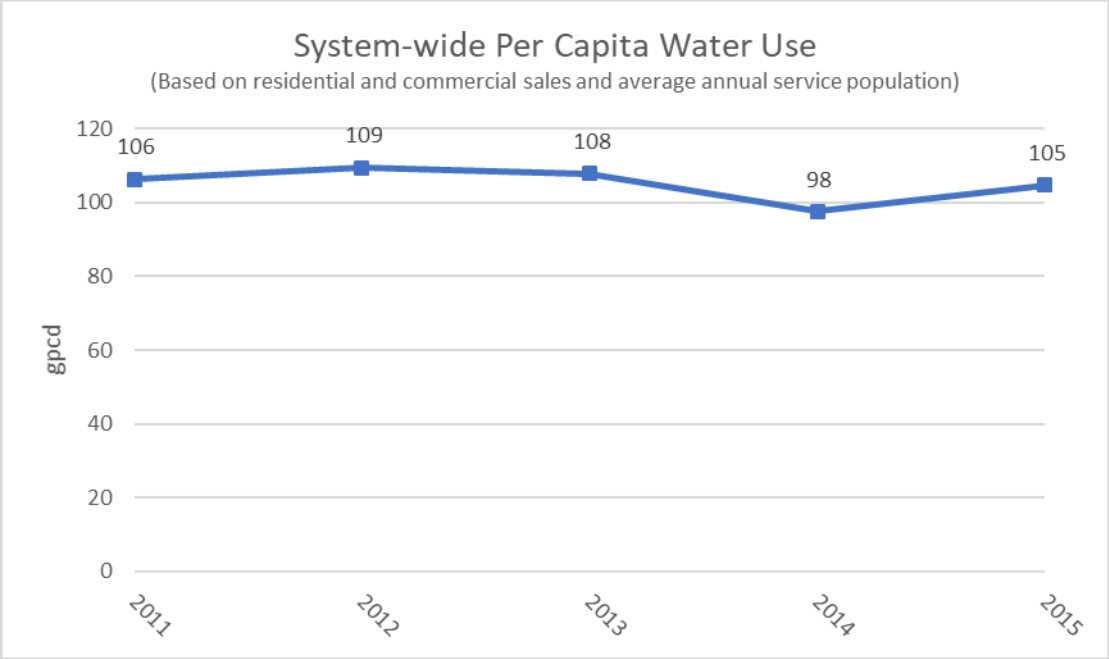

Figure 7. System-wide Per Capita Water Use (2011-2015)

Per capita metrics are most useful for assessing trends internal to a system rather than comparing across water providers. As noted in the Municipal Water Efficiency Plan Guidance document (CWCB 2012):

[Per capita water use metrics] should not be used as a means to compare water usage between other providers. This is partially attributed to […] the fact that there are many other factors that can skew the data, negating an "apples-to-apples" comparison. Such factors include large commercial and industrial sectors that can significantly influence system-wide per capita water demands. Additionally, resort communities can experience difficulties in developing representative annual per capita water demands. The numbers of visitors often vary seasonally (e.g. ski season) and are also impacted by economic conditions and weather.

6.1.4 Residential Water Use Metrics

The Town's primary metric for assessing residential water use is per capita water use. The Town calculates per capita water use values using residential sales and the permanent service population. The metric values as calculated do not account for the number of visitors served.

Figure 8 presents the residential per capita water use values for the period 2011-2015. Over this period, the Town has experienced a decline of 3% on average year-over-year in these values.

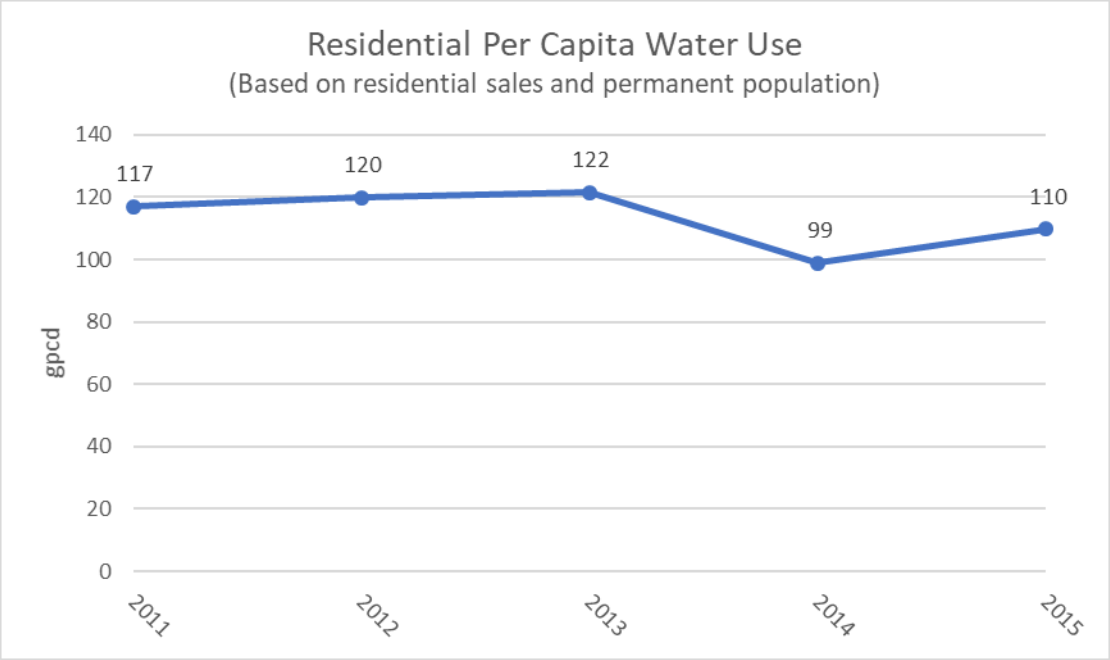

Figure 8. Residential Per Capita Water Use (2011-2015)

6.2 Past and Current Demand Management Activities

6.2.1 Metering and Data Collection

Historically, water meters in the Town have been read quarterly to correspond with the billing cycle. In 2017, the Town installed an advanced metering infrastructure (AMI) system that allows the Town to collect daily (or even twice daily) water use readings.

The Town has three additional initiatives that are ongoing to improve water metering and data collection:

- Since 2009, new buildings have been equipped with separate indoor and outdoor water meters.
- Beginning in 2017, municipal irrigation meters were installed. At the same time, water use in municipal buildings started being tracked.

6.2.2 System Water Loss Management and Control

Since 2005, the Town has implemented a system-wide leak detection program that includes a system audit and repairs every three years. A three-year cycle has been implemented because repairs can take 1-2 years to complete after issues have been detected. While significant leaks were found early in the program, only one minor leak was detected and repaired in the last survey conducted in 2015.

Prior to 2017, the Town evaluated customer leaks quarterly based on bills that were abnormally high. The new AMI system sends automated alerts to staff if abnormal usage is detected. Because the Town has many short-term rental units and homes that are not occupied year-round, the new system allows residential water leaks to be detected more quickly than in the past, helping to reduce water waste and property damage. Customer billing remains quarterly.

6.2.3 Efficiency-Oriented Rates and Tap Fees

As discussed previously in Section 5.4, the Town has adopted an inclining block rate structure to encourage water efficiency. The Town's water tap fees are also structured to encourage efficiency by using building size to determine the total tap fee. In 2017, the water tap fee is set at $4,430 per EQR.

6.2.4 Water Use Regulations

6.2.4.1 Outdoor Water Use

In 2003, the Town of Frisco adopted a water conservation ordinance that implements permanent voluntary water use restrictions (TOF 2003). The ordinance also defines three levels of mandatory water use restrictions during times of drought. The drought response levels are triggered based on streamflows in North Tenmile Creek and yields from the Town's groundwater supply wells:

- Phase One: Voluntary Water Use Restrictions
    - Phase One restrictions are always in effect, but voluntary.
    - Lawn irrigation is limited to three days/week between 6-9 am or 6-9 pm.
    - Watering of decorative plants, bushes, and trees is not limited if they are watered by drip irrigation or by hand using a watering can or hose with a shut-off valve.
    - When washing structures, cars, or boats, residents are required to use a hose with an automatic shut-off valve.
    - Washing of paved areas is not allowed.
- Phase Two: Mandatory Water Use Restrictions
    - Phase Two restrictions go into effect when the streamflow in North Tenmile Creek is less than 0.75 cfs above the mandated bypass flow.
    - Phase One water use restrictions become mandatory.
- Phase Three: Mandatory Water Use Restrictions
    - Phase Three restrictions go into effect when the conditions for Phase Two are met and the average yield of the Town's wells is between 20-40% less than the average yield of the wells in 2002.
    - Phase One restrictions are mandatory, and the number of days when irrigation is permitted is reduced from three days/week to two days/week.
- Phase Four: Mandatory Water Use Restrictions
    - Phase Four restrictions go into effect when the streamflow in North Tenmile Creek is less than the mandated bypass flow and the average yield of the Town's wells is at least 40% less than the average yield in 2002.
    - Phase Three restrictions are mandatory, and all irrigation use is banned.

Fines for violating the mandatory water restrictions are set at $100 for the first offense of the season, $250 for the second, and $500 for each subsequent violation (TOF 2003).

6.2.4.2 Indoor Water Use

The Town encourages indoor water use efficiency through local and State regulations:

- The Town's water conservation ordinance addresses water use in restaurants as follows (TOF 2003):
  - Phase One: Voluntary Water Use Restrictions - Restaurants are requested to serve water to customers by request only.
  - Phases Two-Four: Mandatory Water Use Restrictions - Restaurants are required to serve water to customers by request only.
- The Town adopted the 2012 Edition of the International Plumbing Code. The International Plumbing Code specifies maximum flow rate requirements for water fixtures installed during new construction or major redevelopment. The Town has adopted the plumbing codes to apply to any alternation, repair, or replacement of existing systems.
- Additionally, in 2016, the State of Colorado passed SB14-103, also known as Colorado's Indoor WaterSense Fixture Requirement, requiring that only certified WaterSense fixtures be sold in the State of Colorado.

6.2.5 Public Outreach and Education

Every fall, the Town encloses information about leak detection in the third quarter water bills. Additionally, staff have developed brochures and offered tours upon request to help educate the public about water conservation.

6.2.6 Historical Water Savings

Since the 1990s, the Town has experienced a decrease in average annual water production from 900-1,000 ac-ft/yr to 600-700 ac-ft/yr that is attributable to the water conservation efforts described above.

7 Water Efficiency Goals and Demand Forecasts

The Town of Frisco is currently looking at water efficiency plans through the year 2025. As part of the preparation of this water efficiency plan, three demand forecasts were developed:

- ***High growth.*** This forecast was developed using the following assumptions (**Figure 9**):
  - A baseline system-wide per capita water use value of 130 gpcd, based on 2015 total water production volumes and annual average population served.
  - A 1.5% increase in per capita water use each year.
  - A 1.4% increase in permanent population served each year.
  - A 1.6% increase in the average visiting population served each year.
- ***Business-as-usual:*** This forecast accounts for population growth as well as the trend of historically declining water demands.
- ***Active efficiency measures*.** With additional efficiency activities implemented in the future, the Town anticipates that growth could be overcome to stabilize demands at recent levels.

The demand forecasts diverge in 2018, when implementation of new efficiency activities is assumed to begin.

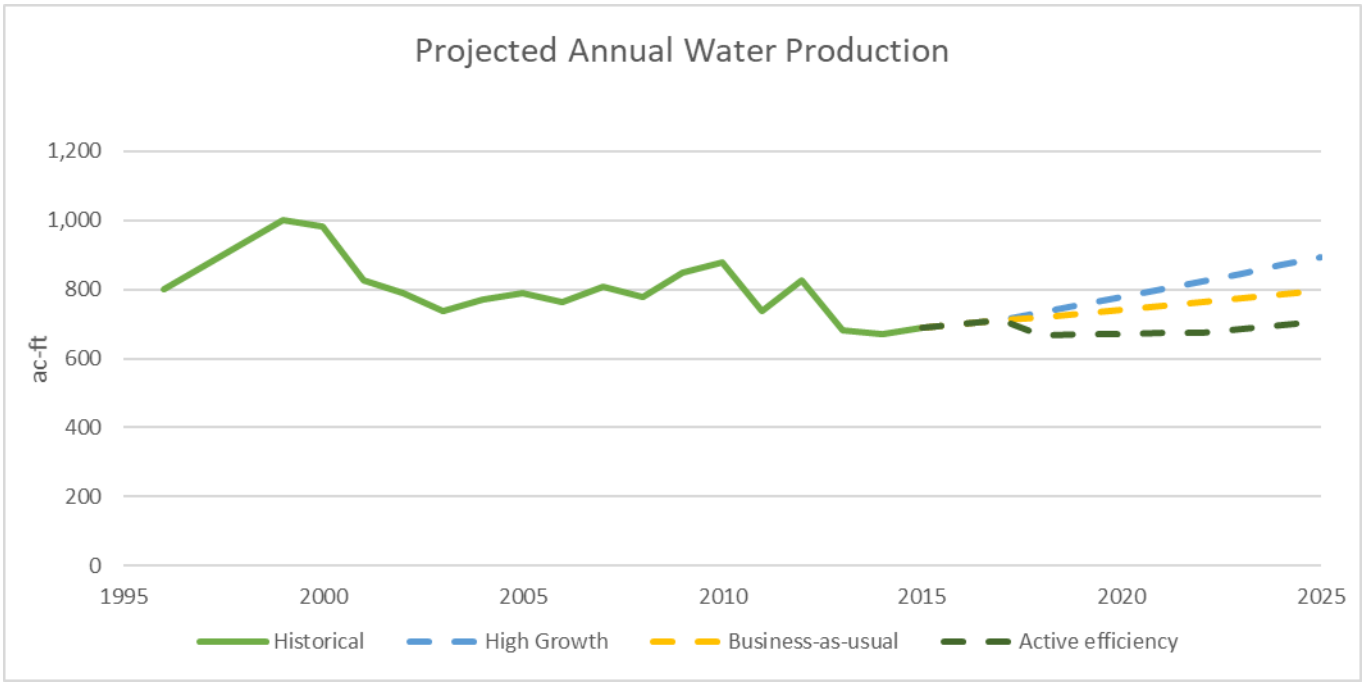

Figure 9: Projected Annual Water Production Volumes (through 2025)

TOWN OF FRISCO WATER EFFICIENCY GOALS

Over the period 2018-2025, the Town aims to implement additional efficiency activities that will:

- Overcome growth in the service population and stabilize demands, with essentially no change in production volumes through 2025.
- Achieve 520 ac-ft in water savings over the period 2018-2025, compared to the business-as-usual forecast.
- Reduce peak demands during the summer associated with outdoor water use.

8 Selection of Water Efficiency Activities

The Town plans to implement additional water conservation measures to supplement current activities and achieve the water efficiency goals presented in **Section 7**. Future activities were identified using multiple factors that included utility priorities, stakeholder input, opportunities for water savings, technical feasibility, and implementation capacity. When feasible, the efficiency activities were quantified in terms of their potential for water savings, customer sectors and end-uses impacted by the measure, and implementation costs. A summary of activities that the Town aims to implement over the next seven years is shown in **Table 4**.

Table 4. Summary of Planned Water Efficiency Activities

Water Efficiency Activities	Sectors Impacted	Implementation Period	Projected Water Savings in 2025
Foundational Activities			
Billing Upgrades	All Customers	2021-Ongoing	Not Quantified
Advanced Metering Infrastructure and Enhanced Water Loss Control	All Customers	2018-Ongoing	41 ac-ft/yr
Conservation-Oriented Rates	All Customers	2018-Ongoing	44 ac-ft/yr
Institutional Collaboration	Utility	2017-Ongoing	Not Quantified
Targeted Technical Assistance and Incentives			
Indoor Water Efficiency	Residential	2018-Ongoing	Not Quantified
Outdoor Water Efficiency	Residential & HOA	2019-Ongoing	1 ac-ft/yr
Ordinances and Regulations			
Land Use Planning	All Customers	2017-Ongoing	Not Quantified
Education Activities			
Education and Outreach	All Customers	2018-Ongoing	Not Quantified
		Total Savings in 2025 (ac-ft/yr)	**86 ac-ft/yr**

8.1 Foundational Activities

8.1.1 Billing Upgrades

The Town intends to partner with a contractor to provide customers with the WaterSmart Report Card. The report card will give customers more detailed information about their water usage, how their usage compares to similar customers, and suggestions for improving their efficiency. The program is expected to be implemented in 2021. Costs associated with this program are expected to be encapsulated in an estimated contracted amount of $4,500 per year. Water savings from this activity were not quantified and are not relied upon to meet the Town's water conservation goals. In addition to potential water savings, the public engagement associated with the report card will be extremely valuable.

8.1.2 Advanced Metering Infrastructure and Enhanced Water Loss Control

The Town currently has AMI meters capable of performing daily reads, but the meters are being read only on a quarterly basis. To realize the full benefit of the AMI system, the Town will upgrade the central radio tower to facilitate daily reads. Switching to daily meter reads is expected to save approximately 7% of total water use (41 ac-ft/yr) through improved leak detection and customer engagement. The program is expected to cost the Town $66,000 each year over the period 2018-2025. These costs include capital expenditures and the additional staff costs associated with data management and increased customer engagement

8.1.3 Conservation-Oriented Rates

As part of the next rate study in 2018, the Town intends to evaluate changes to the pricing structure to better incentivize water conservation. The rate adjustments are estimated to cost $20,000 as an upfront cost with no ongoing costs. Updates to the pricing structure are expected to help the Town conserve 44 ac-ft/yr of water. These water savings estimates assume that customers will reduce consumption by an average of 7.5% per year. The water savings estimate also takes into account that some savings are already being realized through the Town's current pricing structure.

8.1.4 Institutional Collaboration

The water efficiency planning process offered an opportunity for Town staff to align around water supply and water conservation planning. In the future, the Town seeks to continue interdepartmental communications and will continue to participate in a regional water conservation committee convened by High Country Conservation Center.

8.2 Targeted Technical Assistance and Incentives

8.2.1 Indoor Water Efficiency

The Town intends to participate in a regional indoor water efficiency program being developed by a working group and led by High Country Conservation Center. The program will provide residential indoor water audits and will include direct installation of some water saving fixtures (e.g., aerators, showerheads, toilet bricks) during the home visit. Additionally, businesses that participate in the Resource Wise sustainable business program will be provided with water savings recommendations and limited direct installations of high-efficiency water fixtures.

Because the program is only now being designed, the water savings were not quantified and are not relied upon to meet the Town's water savings goals.

8.2.2 Outdoor Water Efficiency

The outdoor water efficiency program will include two related components:

- An outdoor water audit program to evaluate irrigation systems for efficiency improvements.
- An irrigation optimization program to implement efficiency improvements.

The program will not include rebates but customers who complete the optimization program will be eligible for recognition by the Town. These programs are targeted at single-family and multi-family residential customers as well as HOA customers.

To estimate water savings, the Town assumed that 1% of eligible customers will participate each year in the audit program, and that 12% of audit participants will complete the optimization program. Participants are expected to reduce their outdoor water use by 15% at each step of the program. Once fully implemented, the Town expects to conserve 1 ac-ft/yr of water.

The Town aims to have the audit program implemented in 2019, and the optimization program implemented a year later in 2020. The audit program will cost approximately $12,000 per year while the optimization program will cost approximately $7,700 per year to cover staff costs and post-optimization audits for participants. The participant cost is expected to be $250 for residential audits, $1000 for multi-family and HOA audits, and an average of $700 dollars per installation for the optimization program.

The Town will also work with other water providers in Summit County to evaluate whether the outdoor water efficiency programs can be developed as regional programs.

8.3 Ordinances and Regulations

In 2017, as part of the planning process, the Town began participating in a regional land use planning work group to review existing design guidelines and landscaping codes for barriers to water savings. As the working group is only now being convened, the opportunities for water savings have not yet been identified or quantified.

8.4 Educational Activities

Educational efforts are being led regionally by High Country Conservation Center. The top priorities for 2018 that have been identified include:

- Developing or assembling water conservation materials that are targeted to priority sectors in support of implementation efforts under this plan.
- Developing strategies for engaging the visiting and second homeowner population in Summit County.
- Promoting awareness around joint energy-water savings opportunities.
- Identifying key events and outreach channels for education and awareness efforts.

Water savings from the planned educational programs have not been quantified and are not relied upon to meet the Town's water conservation goals.

9 Implementation and Monitoring Plans

9.1 Implementation

The Town's approach to implementing the new water efficiency activities described in **Section 8** includes the following steps:

- Determine the organization responsible for leading the activity.
    - In general, the Town will be responsible for the implementation of the foundational activities (billing upgrades, AMI and enhanced water loss control, and conservation-oriented rates) and any changes to the Town's ordinances and regulations.
    - High Country Conservation Center will lead institutional collaboration, the development of a residential indoor water efficiency program, and education and outreach efforts.
    - The lead organization for the outdoor water efficiency program is yet to be determined.
- When needed, work with other organizations and partners to develop implementation action plans, define funding needs, and exchange information about best practices and lessons learned. The Town has already begun this collaboration in working with the High Country Conservation Center's executive committee during this water efficiency planning process and by participating on several implementation working groups that formed near the end of the planning process.
- Determine funding needs and sources for the activity.
    - For activities to be funded entirely or in part by the Town's operating budget, work within the annual budgeting cycle. This approach will require identifying budget priorities and estimates a year before the activity is to be implemented.
    - For activities to be funded by external sources, look for grant and other funding opportunities. **Appendix B** includes a summary of the implementation resources that were identified during the planning process.

At the end of the water efficiency planning process, four working groups were formed to guide implementation of the regional activities:

- Education and outreach
- Indoor water efficiency
- Integrated water and land use planning
- Outdoor water efficiency

Appendix C includes implementation action plans that were developed for each working group to help transition from planning to implementation. The action plans were included as appendices so that they can evolve as the working groups meet and make progress.

9.2 Plan Review, Monitoring, and Updates

The Water Conservation Act of 2004 (HB04-1365) requires that the water efficiency plan be made publicly available for review and comment for a period of 60 days and that the plan be locally adopted by the Town Council. The Town will comply with these requirements by placing the draft plan on the Town Council's meeting agenda, providing public notice of the plan, allowing time for public review and

comment, and adopting the plan after it is reviewed by the Colorado Water Conservation Board. After the plan has been adopted by resolution by Town Council, **Appendix D** will contain a copy of the resolution.

The Town intends to monitor the success of the water efficiency programs using the metrics presented in **Section 6.1 (Historical Water Demands)**. The Town will use **Appendix A** to track the metrics annually. If the Town finds that any of the water efficiency programs are not effective in achieving water savings, or are not cost effective, the programs may be discontinued.

The Town will update this plan every seven years, as required by The Water Conservation Act of 2004. Plan updates will incorporate the new data accumulated from the annual monitoring process and may include revisions to the Town's water efficiency goals and planned activities, as appropriate.

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APPENDIX A: PLAN DATA

Provided in a separate document.

APPENDIX B: IMPLEMENTATION RESOURCES

Organization / Individual	Implementation Resource	Resource Type	Additional Information
Aaron Clay	Water Law in a Nutshell Workshop	Education and Training	Contact High Country Conservation Center or Middle Park Conservation District
American Water Works Association	Topics area: water conservation programs, water loss control	Technical guidance	Website
American Water Works Association Rocky Mountain Section	Topics: water conservation, tap fees	Training	Website
Colorado Water Conservation Board	Water Conservation Implementation Grants	Grant Funding Source	Website
Colorado Water Conservation Board	Water Resource Conservation Public Education and Outreach Grants	Grant Funding Source	Website
Colorado Water Conservation Board	Water Plan Grants	Grant Funding Source	Website
Colorado WaterWise	Live Like You Love It	Education and outreach materials	Website
Irrigation Association	Topics: landscape water management	Training	Contact Northern Water (2018 training host)
Rural Communities Assistance Program	Topic areas: Water loss control, managerial, financial	Training and technical assistance	Website Contact Jeff Oxenford (720-353-4242)
Sonoran Institute	Land Use and Water Planning Workshop	Education and Training	Website
WaterNow	Project Accelerator Program	Technical and program assistance	Website

APPENDIX C: IMPLEMENTATION ACTION PLANS

EDUCATION AND OUTREACH

Last Updated: January 14, 2018

Next Meeting Scheduled: March 15, 2018

Working Group Role	Name and Organization
Group coordinator *(responsible for scheduling meetings and communications)*	Jessie Burley, High Country Conservation Center
Team members *(responsible for helping with action items)* *Key* *Black = confirmed* *Red = needs confirmation*	Joyce Allgaier, Town of Frisco Abbey Browne, Woodwinds Property Management Robert Buras, Town of Dillon Shellie Duplan, Buffalo Mountain Metro District Jeff Goble, Town of Frisco Greg Hardy, Trout Unlimited Hallie Jaeger, High Country Conservation Center Laura Lynch, Town of Breckenridge Zach Margolis, Town of Silverthorne Katlin Miller, Middle Park Conservation District Mike Nathan, A-Basin Deborah Polich, ? Jen Schenk, High Country Conservation Center Dan Schroder, CSU Extension Karn Stiegelmeier, Board of County Commissioners Troy Wineland, Division of Water Resources

SUMMARY OF 2018 GOALS

- Develop a coordinated education and outreach program for water conservation

STRATEGIES TO ACHIEVE GOALS

Strategy 1: Develop targeted materials by sector

- Identify top priorities for education and outreach
    - Landscaper
    - Indoor
    - Outdoor
    - Commercial
    - Residential
- Inventory existing materials and resources
    - Water utility websites (Denver Water, Town of Breckenridge, etc.)
    - Colorado WaterWise (Live Like You Love It)
    - EPA Water Sense
    - Water audit and related service providers
- Adapt existing materials and develop new materials

- Identify outreach channels
    - Bill enclosures
    - Social media
    - Websites
    - Events
    - Summit Daily
    - Water Warriors program
- Disseminate materials

Strategy 2: Engage the visiting population and second homeowners

- Come up with a message and then keep delivering the message because it's a changing population
- Compile list of HOAs and contact information

Strategy 3: Leverage High Country Conservation Center's Energy Programs

- Anytime talk about water, talk about energy and vice versa

Strategy 4: Aggregate and push out related information and events from other organizations

- Fix-a-leak week

SUMMARY OF ASSIGNED ACTION ITEMS

Action Item	Responsible Team Member	**Due Date**
Create marketing plan strategy		
Connect with organizations that can help with information dissemination		

INDOOR WATER USE EFFICIENCY

Last Updated: January 13, 2018

Working Group Role	Name and Organization
Group coordinator *(responsible for scheduling meetings and communications)*	Laura Lynch, Town of Breckenridge
Team members *(responsible for helping with action items)* *Key* *Black = confirmed* *Red = needs confirmation*	Robert Buras, Town of Dillon Jeff Goble, Town of Frisco Jess Hoover, HC3 Cody Jensen, HC3 Mike Nathan, A-Basin Deborah Polich, ? ? , Summit County Building/Planning Dept

SUMMARY OF 2018 GOALS

- Pilot a residential program
- Develop a commercial outreach channel

STRATEGIES TO ACHIEVE 2018 GOALS

Goal 1: Pilot a residential program that includes educational materials, audits, direct installs, and/or rebates/incentives.

- Leverage HC3's Energy Smart Colorado program for indoor energy efficiency.
    - At a minimum, assess energy program for best practices and lessons learned to inform water program design.
    - Also consider leveraging energy program as an education and outreach channel (e.g., leave materials on water efficiency with residents when conducting an energy assessment).
- Research existing information and programs
    - Evaluate existing residential programs, with an emphasis on comparable mountain communities.
    - For example, Resource Central has a "Slow the Flow" program that includes a residential indoor audit program.
    - Identify rebate structures/incentives.
    - Evaluate types of direct installs needed.
    - Find biggest water savings potential for each rebate measure.
    - Compile effective educational materials.
- Design the pilot program
    - Identify water providers interested in participating in the pilot program.
    - Determine funding needs and sources for pilot program.
- Execute the pilot program.
- Assess performance of the pilot program to inform larger-scale implementation.

Goal 2: Develop a commercial outreach channel

- Research existing information.

- Compile effective educational materials relevant for various commercial sectors.

- Leverage HC3's Resource Wise green business program to connect with businesses and find water savings opportunities.
  - Use the program as an education and outreach channel
    - Leave sector-specific materials on water efficiency with businesses as part of engagement.
    - Hold a Business Lunch n' Learn workshop on water in 2018.
  - Evaluate the potential to expand the program in offering and implementing recommendations for improving water efficiency based on the results from the sustainability and energy assessment.
    - Add information about the energy-water nexus on summary reports
    - Provide water efficiency recommendations to businesses with low water scores
    - Use available funding ($400/business) towards upgrades and projects
    - Direct installs of toilet bricks and pre-spray rinse valves
  - Determine whether water savings from these activities can be modeled

SUMMARY OF ASSIGNED ACTION ITEMS

Action Item	Responsible Team Member	Due Date
Identify fixtures/appliances to target for incentives based on water savings potential	**Mike**	**March 2018**
Research existing residential water efficiency programs	**Laura**	**March 2018**
Flesh out potential to leverage existing HC3 programs, resource needs, etc.	**Jen**	**March 2018**
Evaluate opportunities for leveraging Resource Wise	**Jess and Jessie**	**March 2018**

INTEGRATED WATER AND LAND USE PLANNING

Last Updated: January 14, 2018

Working Group Role	Name and Organization
Group coordinator *(responsible for scheduling meetings and communications)*	Joyce Allgaier, Town of Frisco
Team members *(responsible for helping with action items)* *Key* *Black = confirmed* *Red = needs confirmation*	Graeme Bilenduke, Copper Mountain ski resort Robert Buras, Town of Dillon Mark Cassalia, Denver Water Allison Fulton, Copper Mountain Metro Jeff Goble, Town of Frisco Peter Grosshuesch, Town of Breckenridge Katie Kent, Town of Frisco Susan Lee, Town of Silverthorne Zach Margolis, Town of Silverthorne Mike Nathan, A-Basin Pete Oltman, North Line GIS Ed Pankevicius, Copper Mountain Metro Don Reimer, Summit County Elena Scott, Norris Design Ned West, Town of Dillon Lane Wyatt, NWCCOG

SUMMARY OF 2018 GOALS

- Conserve water through collaboration and actions that support all agencies in our region

STRATEGIES TO ACHIEVE GOALS

Strategy 1: Code Amendments

- Audit codes and additional regulations to identify existing barriers and incentives to water conservation (Joyce and regional planners)
- Amend water standards, codes (require certain irrigation materials and systems) - Jeff
- Look at tap fees and tying to/paying more for landscaping (Mark)
    - See Castle Rock and Aurora programs
    - Schedule an educational workshop
    - Share literature
- Look at stormwater management regulations (bioswales, tree gardens)
- Land use typology
    - Apply budgets to different types of land uses (e.g. – ballfields vs. aesthetic landscape areas) – for example, Denver Water

Strategy 2: Collaboration and Engagement

- Engage all special and metro districts to implement plan
- Set common goals among towns, districts, others to coalesce efforts (even if done at different times)

- Tap informational and regulation resources to raise the bar, give guidance, help share information and information about grants and capacity building (NWCCOG)
- Engage large water users

Strategy 3: Advance water reuse programs, especially for golf courses and snowmaking parks (Lane Wyatt and Torie Jarvis from NWCCOG QQ)

SUMMARY OF ASSIGNED ACTION ITEMS

Action Item	Responsible Team Member	**Due Date**	Action Item
Convene planners to initiate code audits	**Joyce**	**Jan 2018**	
Schedule an educational session on tap fees	**Mark**	**Jan 2018**	**Scheduled for June 2018 through AWWA RMS**

OUTDOOR WATER USE EFFICIENCY

Last Updated: January 14, 2018

Working Group Role	Name and Organization
Group coordinator *(responsible for scheduling meetings and communications)*	Troy Wineland, Colorado Division of Water Resources
Team members *(responsible for helping with action items)* *Key* *Black = confirmed* *Red = needs confirmation*	Abbey Browne, Woodwinds Property Management Robert Buras, Town of Dillon Jeff Goble, Town of Frisco Torie Jarvis, NWCCOG Laura Lynch, Town of Breckenridge Zach Margolis, Town of Silverthorne Mike Nathan, A-Basin Ed Pankevicius, Copper Mountain Metro District Deborah Polich, ? Karn Stiegelmeier, Board of County Commissioners Scott Winter, Colorado Springs Utilities Lane Wyatt, NWCCOG

SUMMARY OF GOALS

- **Overarching:** Reduce outdoor water use while maintaining aesthetics for visitor and resident appeal
- **2018:** Focus on low-cost/no-cost water savings opportunities and customer education and outreach
- **2019-2021:** Design and implement regional programs aimed at outdoor water efficiency, including outdoor water audits, irrigation system optimization, and landscaper certification

STRATEGIES TO ACHIEVE GOALS

Strategy 1: Customer outreach and education

- Identify largest users (for example, HOAs)
    - Work with customers to better schedule their water use
- Work with landscape companies
    - Create a list of water-efficiency minded landscapers
    - Educate additional landscape companies
- Identify educational events, for example one county-wide meeting
    - Annual State of the River
    - NWCCOG QQ meetings
- Educate about joint energy-water savings opportunities
- Develop water budgets using GIS and irrigated lands analysis for customer outreach about the amount of water customers should be using
- Work with City Parks staff on water savings opportunities
- Send out a mailer to contract holders about metering and plantings

Strategy 2: Develop an outdoor water efficiency audit program

- Evaluate existing programs for best practices and lessons learned (for example, Denver Water)
- Identify potential service providers (for example, Resource Central Slow the Flow program)
- Design and implement a pilot program
- Implement a regional program

Strategy 3: Develop an outdoor water efficiency system optimization program

- Evaluate existing programs for best practices and lessons learned
- Identify potential service providers (for example, irrigation companies)
- Design and implement a pilot program
- Implement a regional program

Strategy 4: Develop a landscaper certification program

- Evaluate existing programs for best practices and lessons learned
- Evaluate working with the Irrigation Association
- Design and implement a pilot program
- Implement a regional program

Strategy 5: Evaluate municipal code for updates regarding vegetation requirements

- Coordinate efforts with the land use planning working group

SUMMARY OF ASSIGNED ACTION ITEMS

Action Item	Responsible Team Member	Due Date

APPENDIX D: RESOLUTION TO ADOPT PLAN