PROGRESS REPORT:
CWCWD WATER EFFICIENCY PLAN

for

Central Weld County Water District

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Greeley, CO 80631

prepared by

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Project No. 18-110.05

Progress Report No. **#2 - 75% Progress Report**
Submittal Date **10/15/2018**

Grant Agreement No:
Project Name: **CWCWD Water Efficiency Plan**
Total Project Cost: **$49,210**

Progress Report Summary:

The progress reports will detail the success of previously identified goals and objectives, project challenges, preliminary report findings, and potential need for scope of work and timeline revisions.

Progress Report Contents

The contents of this document will be organized within the framework of the following six steps, which were stated as the responsibilities of NOCO Engineering Co. (NEC) in the development of a Water Efficiency Plan (WEP) for Central Weld County Water District (District):

Step 1: Profile of Existing Water Supply System – Collection and development of supply-side information and historical supply-side water efficiency activities. Consult with the District to clarify and define the District's requirements for the WEP and review available data. Advise and assist the District with providing or obtaining from other special services the necessary data required for the report. The District's Worksheet A will be completed during this step.

Step 2: Profile of Water Demands and Historical Demand Management – Collection and development of demand data and historical demand management activities. Worksheet B will be completed during this step.

Step 3: Integrated Planning and Water Efficiency Benefits and Goals – Identification of how water efficiency will be incorporated into future water supply planning efforts and development of water efficiency benefits and goals. Worksheet C will be completed during this step.

Step 4: Selection of Water Efficiency Activities – Assessment, identification, screening, and evaluation process to select and fully evaluate a portfolio of water efficiency activities for implementation. Worksheet D-1 will be completed during this step.

Step 5: Implementation and Monitoring Plans – Development of an implementation and monitoring plan for the methods selected during step 4. Worksheets J, K, and L will be completed during this step.

Step 6: Adoption of New Policy, Public Review, and Formal Approval – Work associated with this step includes obtaining draft WEP approval from the CWCWD Board. With Board approval, the draft WEP will be submitted to CWCB staff to ensure the plan meets all of the State's criteria for acceptance. With CWCB approval, the draft WEP will begin the public review process. Following the public review process, NEC will incorporate comments into the document and final approval will be solicited from the District Board and CWCB.

A description of progress will be addressed within each step, along with mainstay findings within each action item. Each section will conclude with a list of remaining action items to be completed.

Step 1: Profile of Existing Water Supply Systems
Status: 100% Complete

A comprehensive profile of the District's existing water supply system has been completed, which is comprised of the following information:

- **Overview of existing water supply system:** 100% Complete

  This section includes geographic area served, water and supply sources, key existing facilities

- **Water supply reliability:** 100% Complete

  This section includes water treatment provider's location within areas of both current and future water needs and other regional planning efforts and summary of water supply system reliability (safety factors, drought preparedness, etc.)

- **Supply side limitations and future needs**: 100% Complete

  This section includes Worksheet A and description of how CWCWD intends to address its water supply limitations and future challenges is complete. Worksheet A is provided below.

Table 1: Needs and Limitations (Worksheet A)

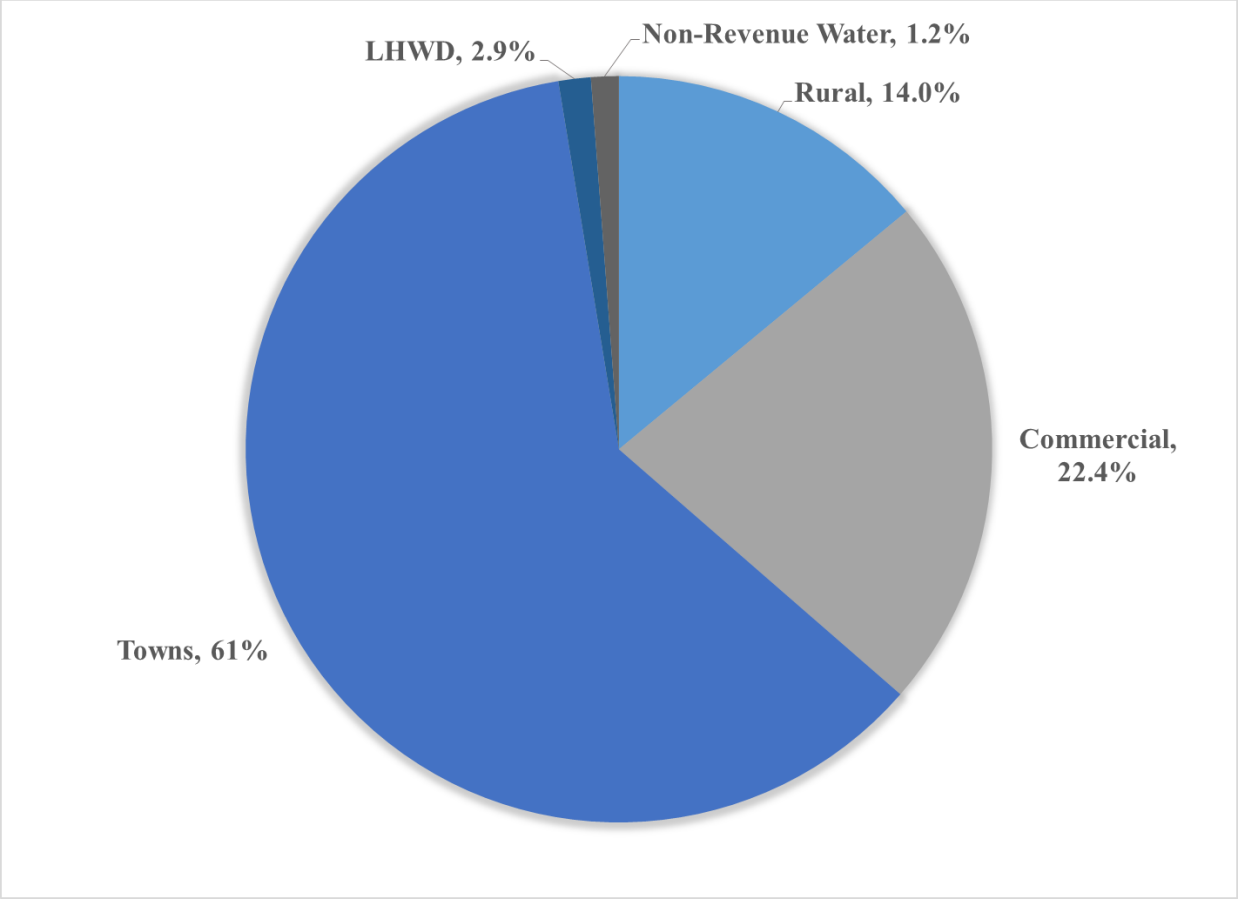
Limitation and/or Future Need	Yes	No	Comments on Limitation or Future Need	How is Limitation or Future Need Being Addressed
System is in a designated critical water supply shortage area	X		The system is in a critical water supply area.	The District will continue to purchase water rights as they become available and contribute towards NISP.
System experiences frequent water supply shortages and/or emergencies		X	The system does not experience supply shortages.	
System has substantial non-revenue water		X	With a newly installed metering system, unaccounted for water is limited to between 0 – 10%.	
Experiencing high rates of population and demand growth	X		Population in the service area is projected to grow	The District is purchasing or trading water rights as they become available.
Planning substantial improvements or additions	X		System improvements are primarily intended to increase the capacity of existing pipelines and supply of surface water sources.	Per the 2012 Master Plan (Farnsworth 2012), there are several capital improvement projects in the planning stages.
Increases to wastewater system capacity anticipated		X	District does not own a wastewater system.	
Need additional drought reserves		X	The system does not experience supply shortages.	
Drinking water quality issues		X	The water delivered by the District meets all State and Federal Safe Drinking Water Act parameters.	Recent changes to the water treatment process has decreased the lead and copper detections and decreased the need to flush the water system.
Aging infrastructure in need of repair	X		Portions of the District's system are over 60 years old.	The District is engaged in replacing 3% of the old mains annually to improve system reliability and decrease water leaks.
Issues with water pressure in portions of distribution system		X	The District has adopted the goal of maintaining a minimum pressure of 35 psi throughout the system during the peak hour demand with a maximum pressure of 250 psi.	

Step 2: Profile of Water Demands and Historical Demand Management
Status: 100% Complete

A complete overview of the historical water demand trends has been completed. The impact of historical water demand management on water use has been assessed as well as an analysis on forecasted future water demands. The following information has been included as part of this section:

- **Description of customer categories and provide information on service area population**: 100% Complete

  This report has identified four main water customer categories: bulk water sales, residential, towns through master meters, and commercial/industrial use (Figure 1).



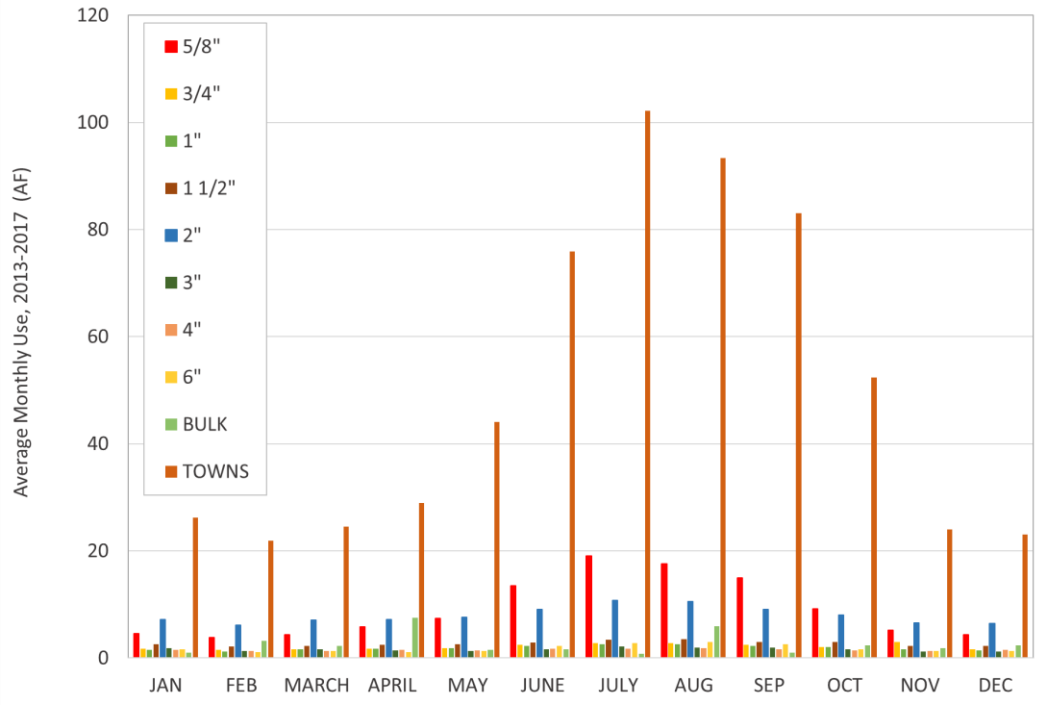
- **Assess historical water demand by customer categories:** 100% Complete

  Historical water demands by customer category were assessed in three ways:
  (1) a bulk volumetric annual averaged annual basis over the last 5 years

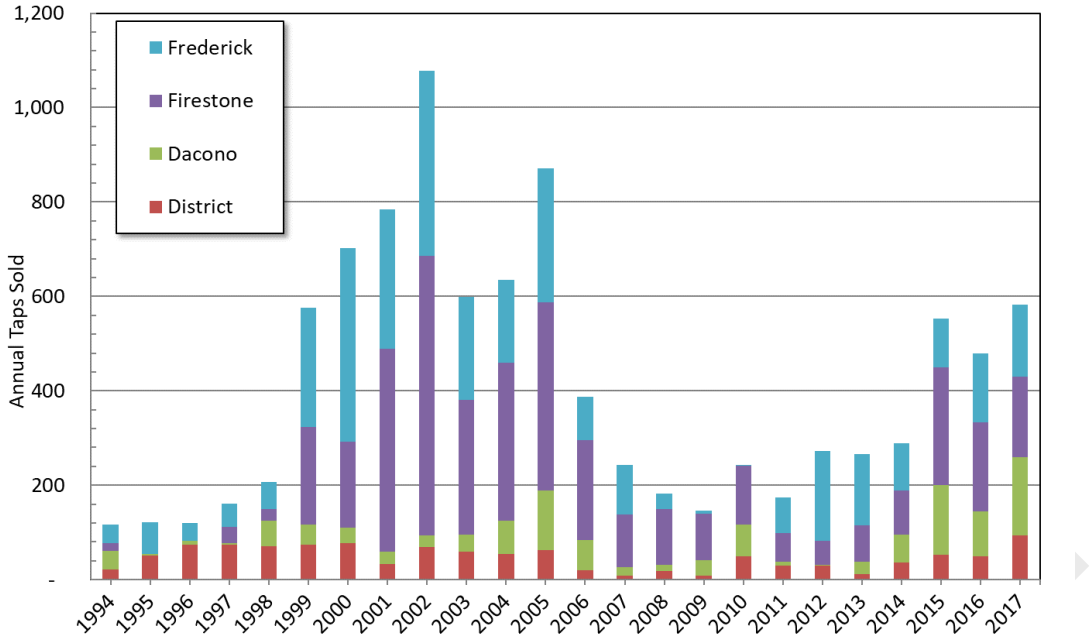
Table 2: Annual treated water deliveries.

Year	Annual Treated Water Deliveries (AF)
2013	9,074
2014	9,548
2015	10,062
2016	10,734
2017	10,567
Average	9,997

(2) monthly average water consumption by tap size



(3) historical tap sales for areas of highest growth.



- **<u>Summarize past and current demand management activities with associated projected savings, and water efficiency goals</u>**: 100% Complete

  Worksheet B was used to assess past and current demand management activities, which is shown below. The savings garnered from the following activities are expected to continue to save the District water in the future.

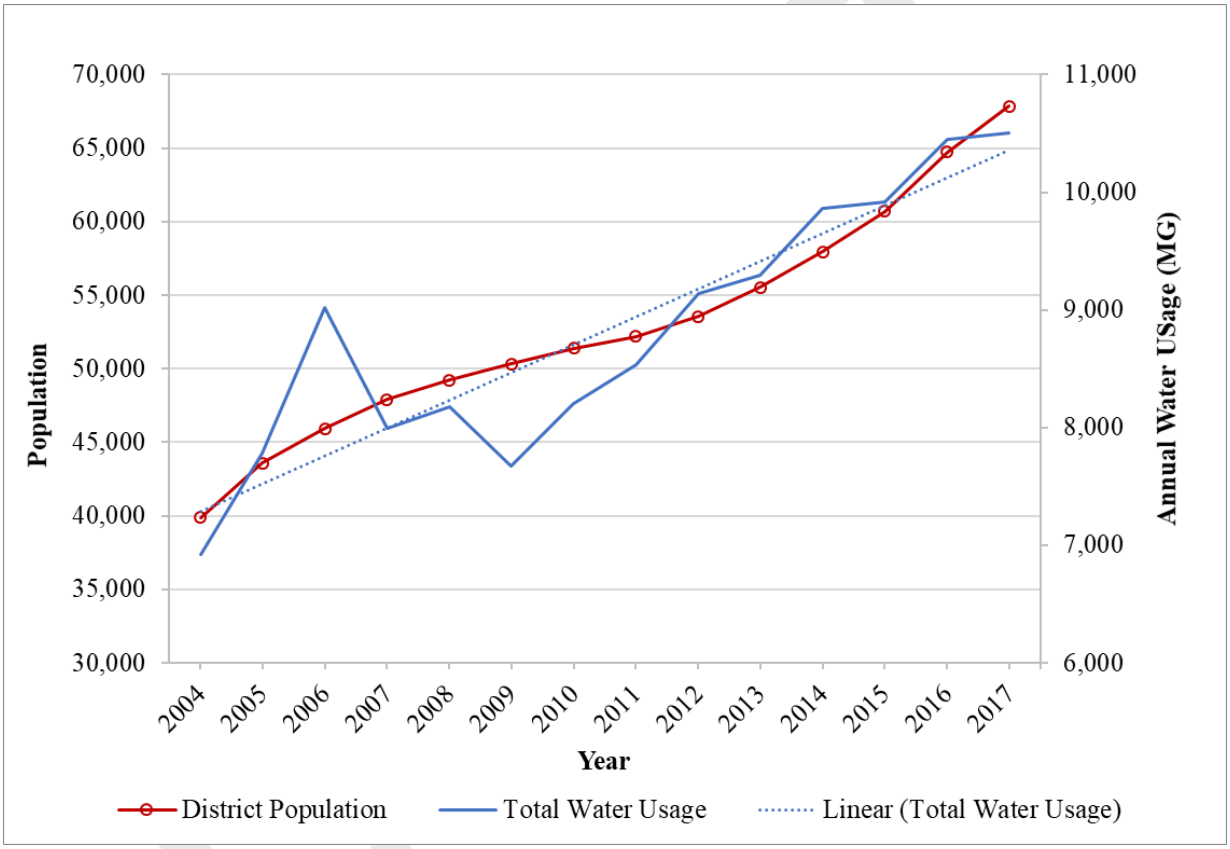
Table 3: Past and current demand management activities and estimated water savings (Workshop B)

Historical and Current Water Efficiency Activities	Period of Implementation	Annual Water Savings for Past Five Years (AF or %)					Total Five-Year Water Savings	Average Annual Savings (AF)
		2013	*2014*	*2015*	*2016*	*2017/18*		
Foundational Activities								
Implement Over-Use Surcharge	**2017 - Present**	NA	0	0	10	478	488	**98**
Offer Budget Tap Connections	**2017 - Present**	NA	NA	NA	NA	5	5	**1**
Leak Detection and Repair	**1995 - Present**	5	5	10	10	10	40	**8**
Maintenance and Improvements of Distribution System	**1995 - Present**	10	10	15	15	15	65	**13**
Addition of ortho-phosphates	**2017 - Present**	NA	NA	NA	32	32	64	**13**
	Total Savings	15	15	25	25	550	662	**133**

Water Savings Estimates Using Demand Data

Although many resources exist that track water usage and water savings, the respective savings earned by each of the previously mentioned activities are very difficult to accurately track and; therefore, were not reported. To assess and estimate savings, demand data was instead used.

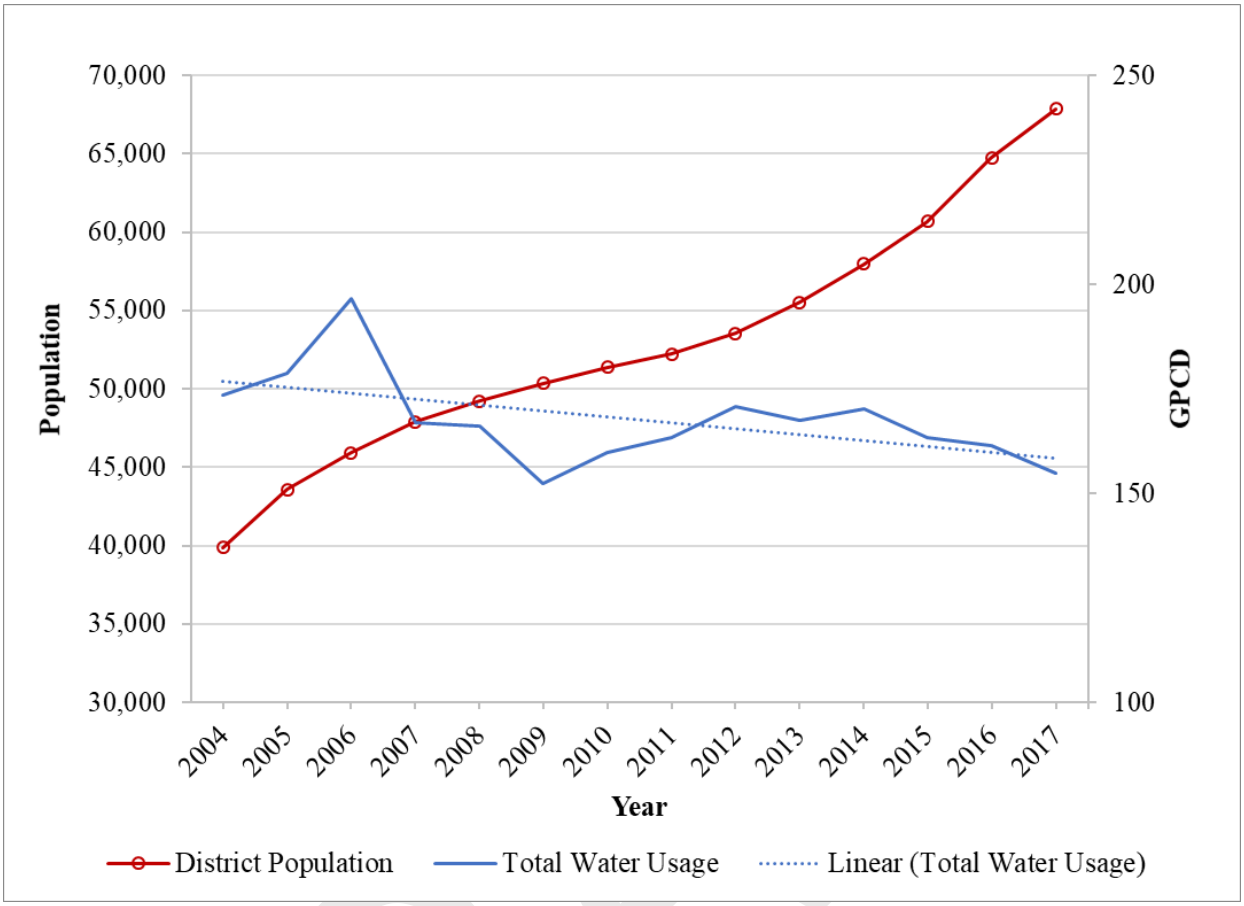
It is important to note that three of the five activities listed in Table 3 went online in 2017, which is beyond the scope of what was possible to reflect from demand data. Related to the remaining two (leak detection/repair and system maintenance), the figure below depicts an overall water efficiency trend.



Total water usage compared to population.

The population of CWCWD showed a very steady increase over the last 15 years. The steadiness of population increase is not reflected proportionally to water use, which varies year to year. The variability of annual water use can also be an artifact of climate profiles that differ from year to year. The above plot shows a period of decreasing water use between 2007 and 2011. Beyond 2011, annual water use remains relatively proportional to population growth.

Water savings becomes evident when looking at the figure below, which shows per capita water usage.



Water usage (GPDC) compared to population.

Between 2004-2007, per capita water use is relatively high. From 2007 to 2017, water use per capita shows a decreasing trend, indicating that, although the District was serving a larger population, people were using less water on average. This decreasing trend in usage may indicate that water efficiency activities that are currently in place are effective.

List Water Efficiency Goals

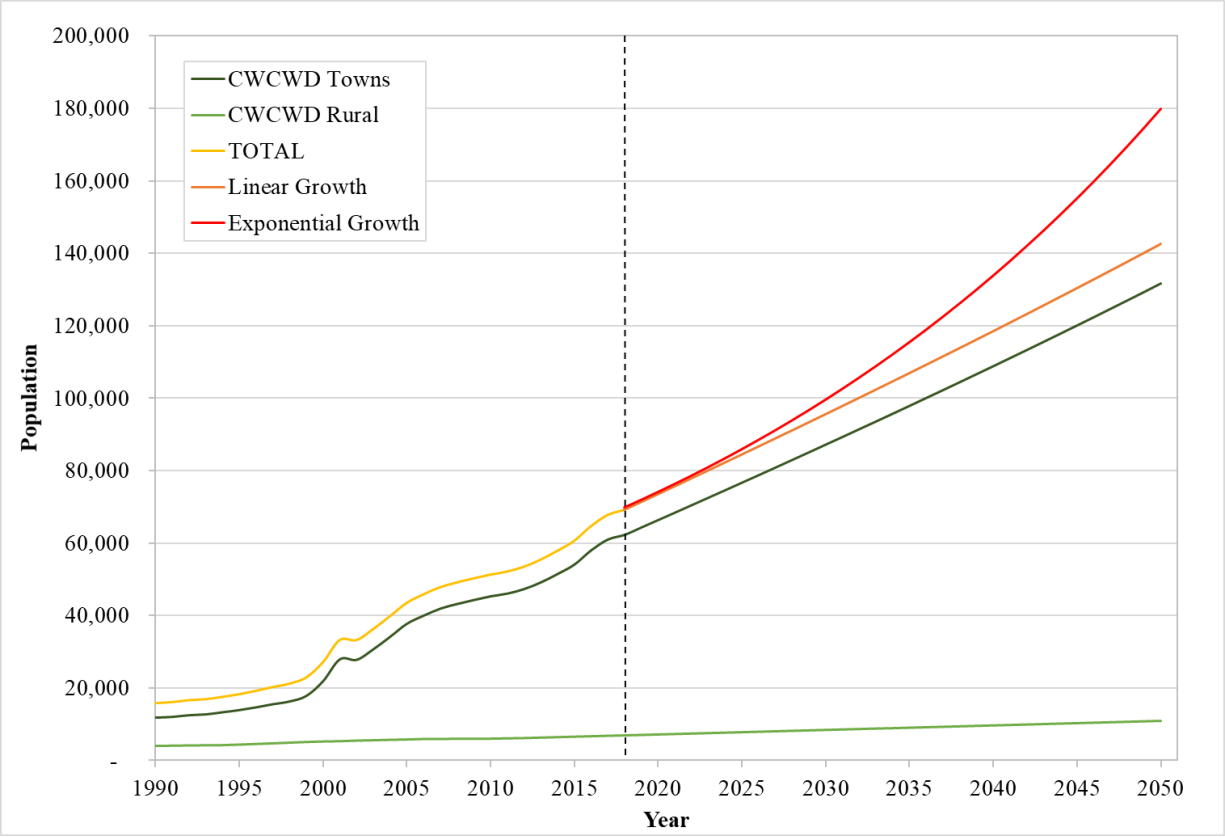
A collaborative effort between the District staff, officials, and consulting engineers was used in the goal development process. Data on the District's water system and current conservation measures were studied to characterize water supply, water demand, and customer use. Discussions were held in which target water users were identified based on the information that has been provided in the preceding chapters. The goals were then established based on those that would have the highest probability of success and public acceptance. The following water conservation goals were created for CWCWD:

- The targeted water savings goal for this Plan will be to reduce the water use for towns and residential by the following over the ten-year planning period:
    - Towns: 10%

    - Rural: 5%
- Reduce system water loss to 5% or less
- To develop a water conservation plan that can be executed within the current CWCWD staffing capacity and with staff approval.
- To employ water efficiency activities that properly reflect and support the community and their District Board representative.

- **<u>Provide demand forecasts assuming no modifications to the currently implemented demand management activities</u>:** 100% Complete

The State of Colorado experienced tremendous population growth during the period of 1990 through 2016. The South Platte River Basin was the fastest growing basin in the State. It is clear from this plot that the majority of population growth will be seen from municipalities. From the CWCWD 2012 Master Plan, this discrepancy is largely due to anticipated growth in the Tri-Town Area/I-24 Corridor. The water usage pattern experienced by the District will reflect changes in customer base, which is projected to grow most dramatically within the municipalities.



Forecasting water demand for CWCWD can be difficult because the District is comprised of multiple governing entities for which decision about future developments, expansions of existing feedlots and dairies, and the installation of new industries are made independently of one another. The following analysis, showing projected peak daily demands in the plot and average daily demands within the table, used varying growth factors to represent different user entities.

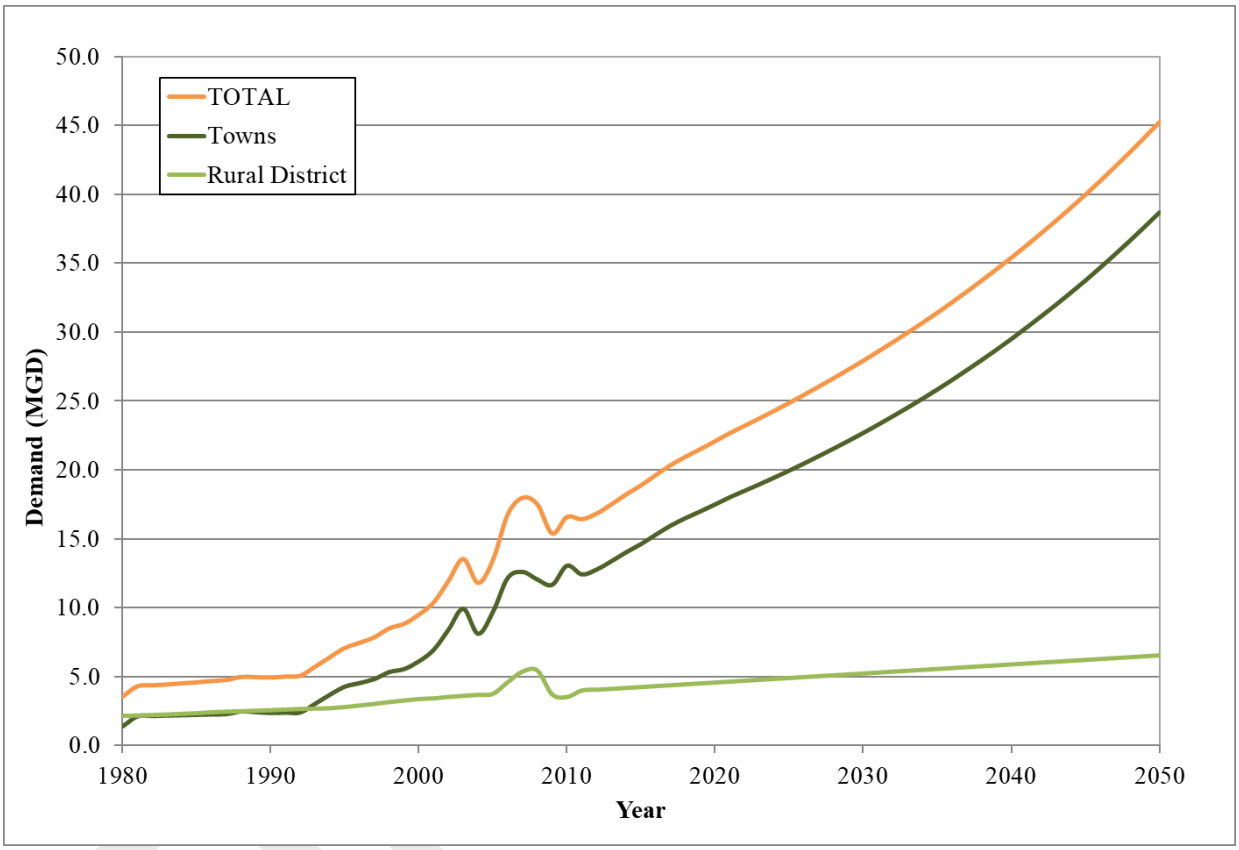


Table 4: Average daily demand projections through the next 10 years.

Year	Population	Tap Equivalents	Unmodified Annual Raw Water Demand (AF)
2017	67,845	17,122	11,981
2018	69,881	17,279	12,092
2019	71,977	17,437	12,202
2020	74,136	17,628	12,336
2021	76,360	17,819	12,469
2022	78,651	18,010	12,603
2023	81,011	18,201	12,737
2024	83,441	18,392	12,870
2025	85,944	18,583	13,004
2026	88,523	18,774	13,138
2027	91,178	18,965	13,271

Step 3: Integrated Planning and Water Efficiency Benefits and Goals
Status: 100% Complete

- **Water efficiency and water supply planning:** 100% Complete

Based on the Statewide Water Supply Initiative (SWSI 2010) forecasts, there will be a 58% gap between water needs and water supplies in the Basin by 2050. Assuming a medium demand scenario and current hydrologic conditions, the South Platte Basin Implementation Plan (SP-BIP; HDR 2015) predicts Weld County will have a water supply gap of 45,500 acre-feet per year (AFY) by 2050. Water efficiency is one method the SWSI report identified for meeting this gap.

CWCWD has acquired sufficient C-BT rights to provide water to its current and future customers through approximately 2030. Additionally, the District has been a participant in NISP; a joint project of 15 utilities administered by the Northern Colorado Water Conservancy District (NCWCD). The project will involve the construction of two reservoirs, pipelines, and pump stations to develop 40,000 AF of new water for the participants. CWCWD's share of that project is 3,500 AF.

Review of the projected demands and the available water supply indicates the District should have adequate supplies from C-BT and NISP to meet projected demands through 2030. Considering the length of time required to develop new supplies, the District should continue its

current program of purchasing additional C-BT shares when they become available, and should also explore alternative supplies, including groundwater supplies in the area.

- **Water efficiency goals:** 100% Complete

  Specific, attainable goals tied to a timeline for implementation with regular review and modifications are key components to a successful conservation plan. Furthermore, the District recognizes the importance of conserving water while minimizing the impact to the customer. Thus, the District has set forth two water conservation goals for the development of this plan. Their goals are based on the existing system's conditions, current and future water demand projections, and anticipated needs for infrastructure improvements:

  - The targeted water savings goal for this Plan will be to reduce the water use for towns and residential by the following over the ten-year planning period:
    - Towns: 10%
    - Rural: 5%
  - Reduce system water loss to 5% or less
  - To develop a water conservation plan that can be executed within the current CWCWD staffing capacity and with staff approval.
  - To employ water efficiency activities that properly reflect and support the community and their District Board representative.

Perform forecasted modified water demands: 100% Complete

A revised demand forecast that includes the impacts of the proposed water efficiency activities is shown in the figure and table below. Under the modified forecast, it is estimated that the total demand for CWCWD in 2027 will be approximately 1,290 AF greater than they currently are. The District will achieve this level of water efficiency by continuing programs that are already in place and reintroduce programs that have been successful in the past. Given the analysis, the District is projected to decrease in demand by continuing current activities as well as introducing those selected in this document. With no major implementations of new projects planned in the next 10 years that will affect water demand, the projected water savings was estimated using the reduction in usage reflected in the per capita water use from 2017 to 2018.

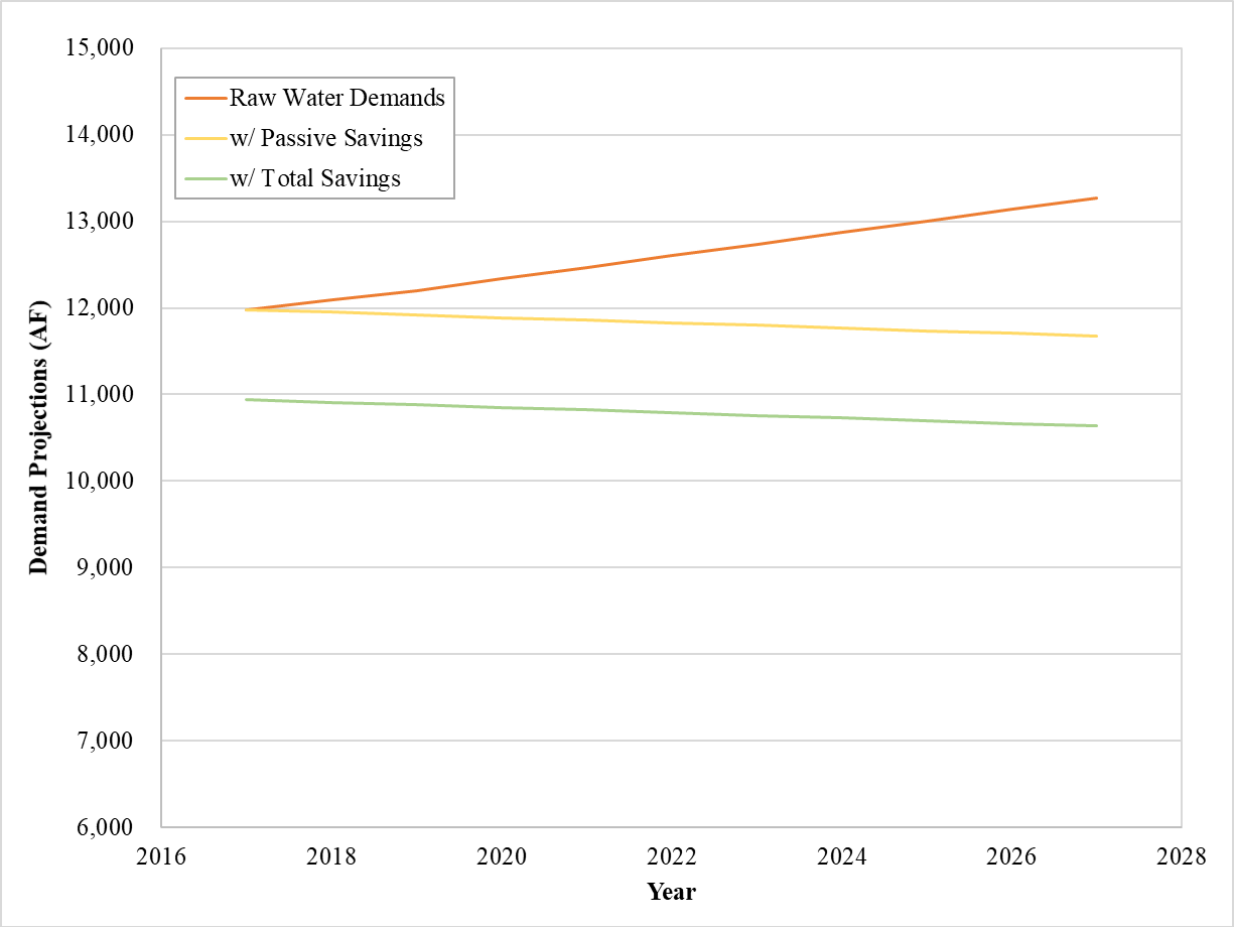

15,000
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
Demand Projections (AF)
2016
2018
2020
2022
2024
2026
2028
Year
Raw Water Demands
w/ Passive Savings
w/ Total Savings

Table Error! No text of specified style in document.**-1: Modified and unmodified demand projections.**

Year	Population	Unmodified Annual Raw Water Demand (AF)	Raw Water Demands Passive Savings (AF)	Raw Water Demand Combination Savings (AF)
2017	111,533	11,981	11,981	10,943
2018	115,848	12,092	11,950	10,912
2019	120,214	12,202	11,920	10,881
2020	124,590	12,336	11,889	10,850
2021	129,179	12,469	11,858	10,820
2022	134,070	12,603	11,827	10,789
2023	139,030	12,737	11,797	10,758
2024	144,171	12,870	11,767	10,728
2025	149,379	13,004	11,736	10,698
2026	154,608	13,138	11,706	10,667
2027	159,824	13,271	11,676	10,637
Savings			**12.0%**	**19.8%**
Increase from 2017		1,290	(306)	(306)
Difference from Unmodified			1,596	2,634

Describe impacts to future water facilities and supply acquisitions: 100% Complete

Water efficiency planning is a cornerstone in the District's decision making when it comes to capital improvement projects, water share acquisition, system maintenance, etc. The benefits garnered from this efficiency planning effort can include the following:

- Forging a conservation-conscious and environmentally friendly culture in the District's water users.
- Suspending the purchase of additional water shares.
- Exposing where saved water can contribute to further growth and development.
- Exposing where saved water can contribute to storage for emergency situations or drought years.

Step 4: Selection of Water Efficiency Activities
Status: 30% Complete

- **Summarize the identification, screening, and evaluation processes used to select the final activities and that demonstrate full evaluation:** 100% Complete

  To comprehensively evaluate and select the final water efficiency activities, CWCWD utilized a four-phase process. These four phases include: 1) assessment; 2) identification; 3) qualitative screening; and 4) evaluation and selection. Water efficiency activities were organized and evaluated within the Statewide Water Supply Initiative (SWSI) Levels Framework. Worksheets D-H from the Municipal Water Efficiency Plan Guidance Document were used to assess the appropriateness and feasibility of water conservation activities.

- **List the final selected water efficiency activities included in new water efficiency plan:** 100% Complete

  The final selected water efficiency activities that will be included in the new water efficiency plan are as follows:

  - *Foundational Activities*
    - Meter testing and replacement/Meter upgrades:
    - Waterline replacement program
    - Targeted Leak Detection and Repair
    - Water Rate Adjustments:
    - Offering Budget Tap Connections
    - Implementing Over-Use Surcharges
    - Distribution system efficiency, including meter testing and replacement, water line replacement, and analysis of non-account water.
    - Master Plans/Water Supply Plans
  - *Targeted Technical Assistance and Incentives*
    - Industrial and commercial efficiency, including water-efficient processes:
    - Technical assistance, including water use audits targeted at large users and large landscapes
  - *Educational Activities*
    - Disseminate itemized bill with usage percentages and water savings tips
    - Designated website updates dedicated to water conservation options and techniques
    - Seasonal (winter/summer) mass mailing campaigns for season-specific water conservation
    - techniques

- *Regulations and/or Ordinances, addressing fixtures and appliances, landscapes, and water waste prohibition -*

The District operates under all applicable American Water Works Association (AWWA) standards, federal, and state laws and regulations and 2006 International Building Code (IBC). Therefore, no additional regulations or ordinances will be implemented.by the District. However; because CWCWD does not possess the jurisdiction to enforce and cite location-specific regulation or ordinance infractions, any changes within this category must be negotiated with and deferred to the Towns. The following water conservation measures are as follows:

- Upon renegotiation with CWCWD Towns, encourage the implementation of regulations for new developments mandating the installation of water conserving irrigation systems including but not limited to: subsurface irrigation, automated timers tailored to landscape orientation, soil moisture sensors, drip irrigation, etc. Tap owners may opt in to pay a monthly surcharge in lieu of abiding by the regulation.
- Upon renegotiation in CWCWD Towns, encourage the implementation of regulations for new developments mandating that 20% of south-facing landscape planning be comprised of low water-use plants, astro-turf or trees and shrubs (not grass). Tap owners may opt in to pay a monthly surcharge in lieu of abiding by the regulation.

Outstanding action items:

- **Calculate combined water savings of selected efficiency activities and compare with that of goals**: 0% Complete
- **Create a monitoring plan that describes the data collection and assessment activities necessary to monitor the effectiveness of the water efficiency plan**: 0% Complete

Step 5: Implementation and Monitoring Plans
Status: 0% Complete

Outstanding action items:

- **Create an implementation plan discussing the actions, timeline, and coordinateion necessary to implement the selected water efficiency activities**: 0% Complete
- **Create a monitoring plan that describes the data collection and assessment activities necessary to monitor the effectiveness of the water efficiency plan**: 0% Complete

Step 6: Adoption of new policy, public review, and formal approval
Status: 0% Complete

Outstanding action items:

- **Summarize the public's role in development of the plan and release draft for public review**: 0% Complete
- **Execute the formal process for plan adoption**: 0% Complete
- **Summarize the processes that will occur to facilitate the update of the plan and the anticipated timing of plan updates**: 0% Complete