City of Cortez
Service Center
110 West Progress Circle
Cortez, CO 81321

May 15, 2019

Mr. Kevin Reidy
Water Conservation Technical Specialist
Colorado Water Conservation Board
Office of Water Conservation & Drought Planning Section
1313 Sherman St., Room 718
Denver, CO 80203

Dear Mr. Reidy:

REFERENCE: ADOPTED 2018 CITY OF CORTEZ WATER CONSERVATION PLAN

Enclosed is the 2018 City of Cortez Water Conservation Plan. Shown below is the information requested by CWCB's *"Guidelines for the Office to Review and Evaluate Water Conservation Plans."*

1. **Include name and contact information.**
   Name: Richard Landreth, Water Treatment Plant Superintendent
   Organization: Public Works Department, City of Cortez
   Address: 110 West Progress Circle, Cortez, CO 81321
   E-mail: rlandreth@cityofcortez.com
   Phone: 970-565-9824
   Fax: 970-565-8356

2. **List organizations and individuals assisting in plan development.**
   Name: Philip F. Johnson, Director of Public Works
   Organization: Public Works Department, City of Cortez
   Address: 110 West Progress Circle, Cortez, CO 81321
   E-mail: pjohnson@cityofcortez.com
   Phone: 970-564-4069
   Fax: 970-565-8356

3. **Quantify retail water delivery.**
   The retail water delivered from the Cortez Water Treatment Plant to the drinking water customers of the City of Cortez, as well as Montezuma County Water District No. 1 and the Ute Mountain Ute Tribe, is shown below.

Year	Retail Water Delivered [acre-feet]	Retail Water Delivered [MG]
2013	2497.11	813.69
2014	2574.53	838.91
2015	2444.86	796.66
2016	2588.51	843.47
2017	2653.00	877.52

   The retail water delivery to residential, commercial, industrial, and other uses in the City of Cortez is shown below. The residential, commercial, industrial, and other uses for the Ute Mountain Ute Tribe are not reflected.

Year	Cortez Water Demand [MG]			
	Residential (Single-Unit & Multi-Unit)	**Commercial**	**Industrial**	**Schools, Churches, Government**
2013	Data Not Available			
2014	Data Not Available			
2015	Data Not Available			
2016	380.7	145.9	0	38.5
2017	393.3	123.8	0	45.9

The City of Cortez water supply source is from McPhee Reservoir on the Dolores River, a surface-water source. The water is treated at the Cortez Water Treatment Plant prior to distribution.

4. Identify population served by retail water delivery.

The estimated population within the Service Area for the City of Cortez drinking water system is shown below.

Year	Estimated Population in Service Area (City of Cortez, Montezuma Water District #1)[a]
2013	8,959
2014	9,010
2015	9,103
2016	9,407
2017	9,470

Note: [a] The Ute Mountain Ute Tribe purchases treated drinking water from the City of Cortez Water Treatment Plant using their own water rights.
The population of the Ute Mountain Ute Tribe served by this water is not known.

5. Provide public review and comment information.

A public hearing was conducted by the Cortez City Council on November 13, 2018, to receive public comment on the City's proposed water conservation plan. Notice of the public hearing was advertised in the local newspaper (The Cortez Journal) on August 31 and September 7, 11, and 21, 2018. Draft copies of the proposed 2018 City of Cortez Water Conservation Plan were available at the Cortez City Hall, 123 Roger Smith Avenue, Cortez; at the City Service Center, 110 West Progress Circle, Cortez; and on the City's website at www.cityofcortez.com.

6. Include signature of individual with the authority to commit resources of the submitting entity.

Philip F. Johnson, in his capacity as the Director of Public Works, has the authority to commit resources for the City of Cortez. His signature is below.

7. Include copy of the entity's water conservation plan.

The proposed 2018 City of Cortez Water Conservation Plan, including appendices, is enclosed.

Thank you for your attention to this matter. We look forward to your response.

Sincerely,

Philip F. Johnson
Director of Public Works

Enclosure

City of Cortez
2018 Water Conservation Plan

Prepared for:

CITY OF CORTEZ
PUBLIC WORKS DEPARTMENT
CORTEZ, COLORADO

Prepared in 2010 by:

BRILLIAM ENGINEERING

Updated October 2017
By Richard Landreth

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PART 1 - INTRODUCTION.

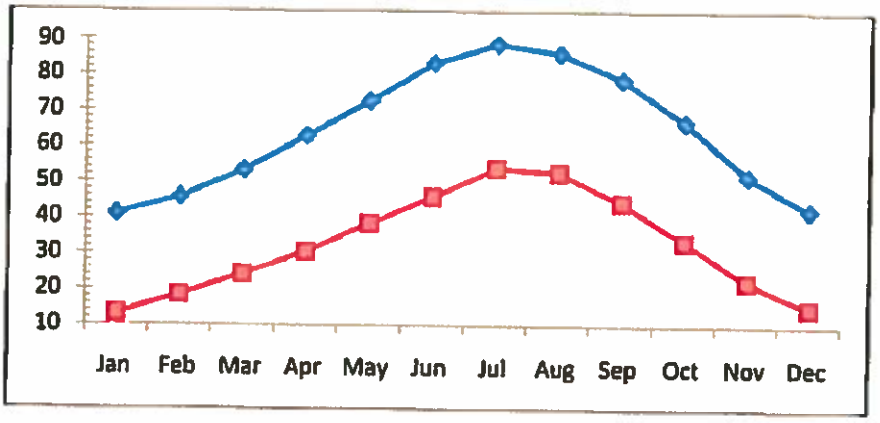
Government, Population, and Land Use.
The City of Cortez is a home-rule municipality that is the seat of Montezuma County, Colorado, within the southwest portion of the state.

Cortez had a population of 9,007 in 2017, and is the most populous city within Montezuma County. The County population is approximately 27,000. Table 1 and Graph 1a, in the Appendix, shows the historic population of the City of Cortez and Montezuma County Water District #1 (MCWD#1) from 1970 to 2009, as well as projected populations to 2040.

Montezuma County is roughly one-third tribal land, one-third federal land (administered by the National Park Service, the United States Forest Service and the Bureau of Land Management), and one-third private or state/county land. The entrance to the Mesa Verde National Park is located nine miles east of Cortez, along State Highway 160. Much of Montezuma County is irrigated cropland, producing alfalfa, wheat, and beans, as well as large numbers of cattle and sheep.

Topography and Climate. Montezuma County is also varied topographically, ranging in elevation from about 6,000 feet to more than 14,000 feet, and from high Colorado Plateau Desert to Alpine Tundra. The La Plata and San Juan Mountains are located to the north and east, within sight of Cortez. Cortez itself is located at an elevation of approximately 6,200 feet. The local climate is characterized by an abundance of sun (approximately 300 days per year), minimal humidity, and an annual average precipitation of only thirteen inches. Significant precipitation often occurs during powerful storms, either strong thunderstorms or snowfall. In summer, average temperatures range from the low fifties to the mid-nineties degrees Fahrenheit. In winter, average temperatures range between the mid- teens and low forties degrees Fahrenheit. The average annual maximum and minimum daily temperatures in Cortez are 64.6°F and 32.9°F, respectively. Chart 1, below, shows the average monthly maximum and minimum daily temperatures in Cortez. Chart 2, below, shows the average monthly precipitation received within Cortez.

CHART 1: AVERAGE MONTHLY MAXIMUM AND MINIMUM DAILY TEMPERATURES (°F) IN CORTEZ, COLORADO.



Source: Western Regional Climate Center (http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?cocort)

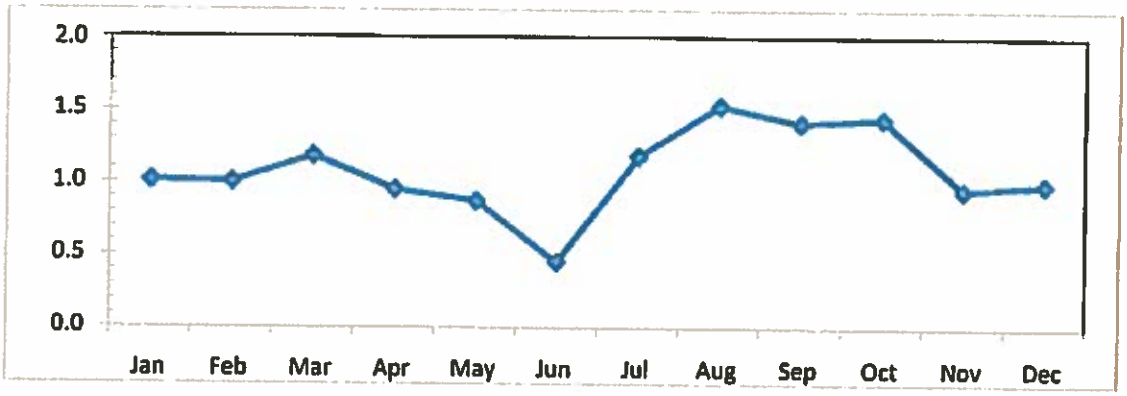


CHART 2: AVERAGE MONTHLY PRECIPITATION (INCHES OF WATER) IN CORTEZ, COLORADO.
Source: Western Regional Climate Center (http://www.wrcc.dri.edu/)

Public Water System.

The City's Department of Public Works operates its own drinking water system that supplies water to residents within the City of Cortez's boundaries, as well as several adjacent areas – the MCWD#1 and the Ute Mountain Ute Tribe. The estimated population supplied by the City of Cortez & MCWD#1 water system is approximately 10,000. The Cortez water system is categorized as a Public Water System (PWS), as defined by the federal Safe Drinking Water Act and the U.S. Environmental Protection Agency. The water provided to the Ute Mountain Ute Tribe is from their annual allocation of municipal & industrial water, and is treated by the City of Cortez. The Ute Mountain Ute Tribe water is outside of the scope of this report, and is only discussed herein to the extent that it affects the operation of the Cortez WTP.

Purpose and Contents of Water Conservation Plan.

This plan constitutes the City of Cortez's strategy for reducing the volume of water withdrawn from its water supply sources, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, and for increasing the reuse of water. The emphasis and overarching goal of this plan is to achieve lasting, long-term improvement in water use efficiency. This plan does this by identifying water conservation measures and programs that have been or will be implemented by the City of Cortez, as well as outlining how these measures and programs will be implemented. The target audiences for the plan include residents, commercial enterprises, governmental institutions, and other users of the Cortez drinking water supply.

Per Capita Water Demand.

Table 1 and Graph 1b in the Appendix show the historic and projected per capita daily water demand for the City of Cortez and MCWD#1. They show that per capita daily water demand fell consistently from approximately 325 gal / person / day (gpcd), leveling at approximately 230 gpcd for a few years then dropping to just above 200 gpcd in 2016. As described later in the plan, the City's short-term goal is for per capita daily water use to remain at this level in the future, with an accompanying long-term commitment to reduce per capita water demand to at or below 180 gpcd.

Plan Resources.

The plan was developed using the additional resources listed in Section 8, particularly the Colorado Water Conservation Board (CWCB) Model Water Conservation Plan. Figure A, below, shows the location of CWCB's Model Water Conservation Plan sections within Cortez's plan. The plan builds upon and updates the City of Cortez's 1996 Water Conservation Plan. Water demand projections were developed utilizing the per capita water demand and population methodology outlined in the American Water Works Association (AWWA) Manual of Water Supply Practices M50, "Water Resources Planning" (2007).

FIGURE A: LOCATION OF CWCB MODEL WATER CONSERVATION PLAN SECTIONS IN CORTEZ'S PLAN.

CWCB Model Water Conservation Plan Section	Location in Cortez's Plan
Step 1 – Profile the Existing Water System	
1.1 – Provide Physical Characteristics of Existing Water Supply System	Part 2, § 2.01
1.2 – Identify All Sources of Water	Part 2, § 2.02
1.3 – Identify System Limitations	Part 2, § 2.03
1.4 – Characterize Water Cost and Pricing	Part 2, § 2.04
1.5 – Review Current Policies and Planning Initiatives	Part, 2, § 2.05
1.6 – Summarize Current Water Conservation Activities	Part 2, § 2.06
Step 2 – Characterize Water Use and Forecast Demand	
2.1 – Characterize Current Water Use	Part 3, § 3.01
2.2 – Select Forecasting Method	Part 3, § 3.02
2.3 – Prepare Demand Forecast	Part 3, § 3.03
Step 3 – Profile Proposed Facilities	
3.1 – Identify and Cost Potential Facility Needs	Part 4
3.2 – Prepare an Incremental Cost Analysis	Part 4
3.3 – Develop Preliminary Capacity and Cost Forecasts	Part 4
Step 4 – Identify Conservation Goals	
4.1 – Develop Water Conservation Goals	Part 5, §§ 5.01-5.03
4.2 – Document the Goal Development Process	Part 5
Step 5 – Identify Conservation Measures and Programs	
5.1 – Identify Conservation Measures and Programs	Part 6, § 6.01
5.2 – Develop and Define Screening Criteria	Part 6, § 6.02
5.3 – Screen Conservation Measures and Programs	Part 6, § 6.02
Step 6 – Evaluate and Select Conservation Measures and Programs	
6.1 – Create Combinations of Measures and Programs	Part 6, §§ 6.03-6.04
6.2 – Estimate Costs and Water Savings of Conservation Options	Part 6, § 6.02
6.3 – Compare Benefits and Costs	Part 6, § 6.02
6.4 – Define Evaluation Criteria	Part 6, § 6.02
6.5 – Select Conservation Measures and Programs	Part 6, §§ 6.03-6.04
Step 7 – Integrate Resources and Modify Forecasts	
7.1 – Revise Demand Forecast(s)	Part 7
7.2 – Identify Project-Specific Savings	Part 7
7.3 – Revise Supply-Capacity Forecast(s)	Part 7
7.4 – Summarize Forecast Modifications and Benefits of Conservation	Part 7
7.5 – Consider Revenue Effects	Part 7
Step 8 – Develop Implementation Plan	
8.1 – Develop Implementation Schedule	Part 8, § 8.02
8.2 – Develop Plan for Public Participation in Implementation	Part 8, § 8.03
8.3 – Develop Plan for Monitoring and Evaluation Process	Part 8, § 8.04
8.4 – Develop Plan for Updating and Revising the Conservation Plan	Part 8, § 8.05
8.5 – Define Plan Adoption / Completed / Approval Date	Part 8, § 8.06
Step 9 – Monitor, Evaluate and Revise Conservation Activities and the Conservation Plan	
9.1 – Implement the Plan	Part 8

PART 2 - EXISTING WATER SYSTEM PROFILE.

2.1 PHYSICAL CHARACTERISTICS OF EXISTING WATER SUPPLY SYSTEM.

The City of Cortez's drinking water system supplies the City's residents and several adjacent areas outside of the City's municipal boundaries, including Montezuma Water District No. 1 and the Ute Mountain Ute Tribe. The drinking water supplied to Cortez, MCWD#1 and the Ute Mountain Ute Tribe is their exclusive source of drinking water.

The water system is operated by the City of Cortez's Department of Public Works. The Public Works Director is Phillip Johnson. The Water Treatment Plant Superintendent is Richard Landreth.

The City's water system consists of raw water drawn from McPhee Reservoir, followed by a small water storage reservoir, water treatment plant, finished water storage tanks, a distribution system, and associated administrative offices. The treatment plant provides a series of treatment processes, including coagulation, flocculation, sedimentation, multimedia granular filtration, submerged membrane microfiltration, and chlorine disinfection. Adjacent to the treatment plant is a raw water storage pond (the "upper" pond) and a small backwash pond (the "lower" ponds). Water flows from the upper raw water storage pond to the treatment plant by gravity. Backwash water from the treatment plant flows by gravity into the lower backwash ponds, and is then returned via pumping to the upper raw water storage pond.

The City's drinking water system was originally constructed in 1960 and has undergone several subsequent upgrades. The treatment system was upgraded in 2007 to include submerged microfiltration treatment, complementing the existing treatment processes. In early 2010, additional upgrades were made to improve the filter backwash system, as described further in Part 4, below. The recent upgrades have improved system performance and reliability, and helped ensure compliance with increasingly stringent public health and environmental regulations.

Finished water is stored in three above-ground storage tanks that pressurize the distribution system and ensure adequate water is available during high demand periods. Each storage tank has a capacity of two million gallons (MG), and all are located near the drinking water treatment plant. Two tanks are located at a higher elevation than the lower tank. The upper two tanks provide water to the Ute Mountain Ute Tribe through a dedicated pipeline and to the lower tank. The lower tank provides water to the City of Cortez and Montezuma Water District No. 1.

2.2 WATER SOURCES.

The drinking water supply for the City is from the Dolores River and McPhee Reservoir, the second largest reservoir within Colorado.

The Dolores River is a tributary of the Colorado River, approximately 250 miles long, and flows through Colorado and Utah. It starts in southwestern Colorado near Dolores Peak and Mount Wilson in the San Miguel Mountains. It flows southwest, past the Town of Dolores, where it turns, flowing north and northwest. It then flows through the Dolores River Canyon, cuts across Paradox Valley before receiving the San Miguel River in Montrose County and crossing into Utah, where it joins the Colorado River in Grand County.

McPhee Reservoir was created via the construction of McPhee Dam on the Dolores River, and is part of the Dolores Project. The Dolores Project is managed by the Dolores Water Conservancy District

(DWCD), and consists of a system of canals, tunnels, and laterals that convey water from McPhee Reservoir to a number of nearby agricultural, residential, commercial, and governmental users. McPhee Reservoir has a maximum storage capacity of 229,000 acre-feet of water.

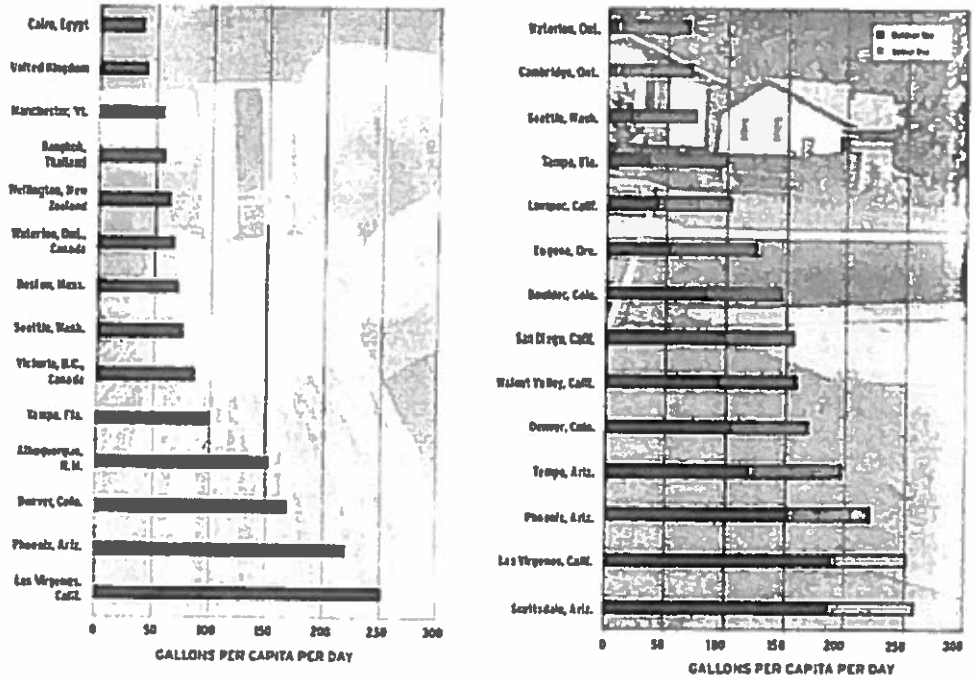
2.3 SYSTEM LIMITATIONS.

The City of Cortez drinking water system has five limitations, described below.

System Limitation #1: Per Capita Water Demand is Relatively High.
As shown in Table 1 and Graph 1b, in the Appendix, the current per capita daily water demand for the City of Cortez & MCWD#1 is just over 200 gallons per person per day (gpcd). This daily water demand reflects a reduction down from the per capita rate of 325 gpcd in 1990. Per capita daily water demand fell consistently between 1990 and 2002, and plateaued at 230 gpcd for a few years before dropping to 200 gpcd.

As shown in Chart 3, below, 200 gpcd is on the higher end of average water demand for a number of cities in the U.S. and elsewhere in the World. In particular, note how the per capita water demand in Albuquerque, NM; Boulder, CO; Denver, CO; and Tempe, AZ are all significantly lower than 200 gpcd. Note how the bulk of the water demand for cities above roughly 125 gpcd is for outdoor water use.

CHART 3: AVERAGE PER CAPITA WATER CONSUMPTION IN SELECT CITIES.



Source: Figures 2.2 & 3.2, Amy Vickers, "Handbook of Water Use and Consumption" (2001).

System Limitation #2: Annual Available Raw Water Limited.
The City's drinking water system's second limitation is the amount of raw water available from McPhee Reservoir and the Dolores River. The City currently has senior direct flow water rights for 3,040 acre-feet per year from the Dolores River. The City also purchases rights to 2,300 acre-feet per year from the McPhee Reservoir. Therefore, the City's total available raw water is 5,340 acre-feet per year or 1,740 million gallons (MG).

Table 1 and Graph 1a, in the Appendix, show the available annual water supply relative to the water demand from the City of Cortez & MCWD#1. (The drinking water consumed by the Ute Mountain Ute Tribe is from their municipal & industrial water rights allocation from the Dolores River, and does not count against the water rights for the City of Cortez & MCWD#1.) Table 1 shows that current annual water demand is approximately one-half of the available water supply. Water demand from the City of Cortez & MCWD#1 is projected to increase until 2040, due to anticipated population growth. However, a significant quantity of available water will remain accessible for unforeseen demand and other contingencies.

System Limitation #3: Drinking Water Used for Supplemental Park Irrigation, Street Sweepers. The second limitation of the City's drinking water system is the use of treated drinking water for irrigation at City Park and the City's street sweepers. These uses are ideal for water reuse, such as from reclaimed treated wastewater or used pool water.

City Park, located in downtown Cortez across Montezuma Avenue from Centennial Park, currently uses drinking water for its irrigation system. City Park is the oldest and smallest of three main parks in Cortez, all of which are managed by the City's Department of Parks and Recreation. The irrigation for the other two parks – Centennial Park and Parque de Vida – is primarily from raw, untreated, irrigation water. Centennial Park includes two shelters, a duck pond, a Disc Golf Course, and two- and-a-half miles of paths for walkers and joggers. Irrigation for Centennial Park is from raw water, supplied by a pressurized irrigation pipeline managed by the Montezuma Valley Irrigation Company (MVIC). Treated water from the City's drinking water supply can supplement the normal irrigation supply at Centennial Park, on an as-needed basis. The third city park – Parque de Vida, located immediately across the street from Centennial Park – receives irrigation water primarily from raw, untreated, irrigation water, not treated drinking water. Parque de Vida includes three multi-purpose fields, a baseball field, softball field, two basketball courts, four tennis courts, a skateboard park, shelters, playground, sand volleyball courts, and a music amphitheater. Combined, Centennial Park and Parque de Vida consume 400,000 gallons of irrigation water per day during the peak summer recreation period, which is roughly from June to August.

Due to the cost of treating drinking water to potability standards and conveying it from the treatment plant, it is preferable to use either raw, untreated water or reclaimed wastewater for both park irrigation and street sweepers. Reused wastewater would need to be properly treated (including adequate disinfection) to protect public health, and the one-time use limitation, detailed later in the plan, would need to be addressed.

The City also has several additional parks –Montezuma Park, Shady Lane Park, Plaza Park, Market Street Pocket Park, and 3rd Street Pocket Park are all small in size and irrigated exclusively by potable water. Denny Lake Park is located on the east side of town, along State Highway 160. The irrigation water for this park also is supplied by the City's potable drinking water supply.

Conquistador Golf Course is a city owned facility and is irrigated by raw untreated water during the irrigation season. However, the golf course has the ability to irrigate the greens and fill ponds as needed during times when raw water is unavailable. This use was unmetered but is now metered.

Finally, the City's outdoor swimming pool – located in City Park – is filled with treated drinking water. The pool has a capacity of approximately 135,000 gallons, and is filled and emptied fully on an annual basis. The unwanted water from the pools is currently discharged into the wastewater system when emptying the pool. This water could be used for street sweeping purposes, or similar uses where potable water is not required, thereby displacing use of treated drinking water for these purposes.

System Limitation #4: Unmonitored Use for Supplemental Park Irrigation, Pool, Street Sweepers
A master water meter measures the quantity of drinking water consumed by Centennial Park's supplemental irrigation system, the City's outdoor swimming pool, and the City's street sweepers. The water use data at the master meter is currently monitored and recorded.

Individualized water meters would be preferable to quantify and help the City conserve water individually from these separate flows. These meters should be monitored routinely and then recorded.

In lieu of individualized water meters, the data from the master meter on the line used by Centennial Park's supplemental irrigation system, the City's outdoor swimming pool, and the City's street sweeper should be monitored routinely and recorded.

System Limitation #5: Hydrant Flushing Program Unmetered.
The third limitation of the City's drinking water system is the lack of metering of the water consumed during the annual fire hydrant flushing program. The purpose of the program is to flush corrosion products and other unwanted debris trapped within the drinking water distribution system. The flushing both ensures the serviceability of each fire hydrant, but also improves drinking water quality.

The City performs two types of flushing: (1) high volume transmission line flushing, and (2) low volume distribution line flushing. During the high volume water main flushing, Public Works personnel flush three incoming transmission lines six times per year for 90 minutes at a flowrate of 3,000 gallons per minute (gpm). The high volume flushing consumes approximately 5 million gallons (MG) per year. During the low volume distribution line flushing, over 100 hydrants are flushed, and another 6 MG per year is consumed. Thus, the City's entire flushing program consumes an average of 11 MG per year.

2.4 WATER COSTS AND PRICING.

The City's current water rate structure was established by City Council Resolution No. WE-2017-1, Series 2017, passed in 2017. Resolution No. WE-2017-1, Series 2017 is included in the Appendix, and was effective January 1, 2018. Highlights of the City's water rate structure are shown in Figure B, below.

FIGURE B: HIGHLIGHTS OF CITY'S WATER RATE STRUCTURE.

User Type	1st 1000 gal (min.)	Each Add'l. 1000 gal
Residential, single-family (3/4" x 5/8" diameter taps)	$21.80 / month	$2.92
Residential, master meter (multi-family residential or occupied mobile home space served by same tap, service line, and/or meter)	$20.60 / month	$2.92
Commercial (3/4" x 5/8" diameter taps)	$21.80 / month[a]	$2.92

Notes:
[a] The minimum monthly rate increases as meter size increases.
See City Council Resolution No. WE-2017-1, Series 2017, in the Appendix, for more detail.

The City also has a "service line and development charge" for each new service line, with rates varying upon the type and size of the connection. The City also imposes service charges for connecting and reconnecting to the water supply.

The City's water rate structure applies to all water service served within its City limits, as well as users outside. Unmetered services are charged a rate based on estimated usage as determined by the City's Director of Finance.

2.5 CURRENT POLICIES AND PLANNING INITIATIVES.

The City has a number of existing policies in place that affect water use under both normal and drought conditions. These are detailed in the conservation measures – Part 5 – of the plan.

Future Drought Mitigation Planning Initiative.

While drought is mentioned indirectly by this Water Conservation Plan, the potential for drought is ever present in southwest Colorado, particularly in light of the 2002 drought and accompanying wild fires. During and following the historic 2002 drought, the City adopted a number of drought mitigation efforts, including public education and regulatory measures. These measures are addressed further later in the plan.

Starting in 2019, the City will develop a separate Drought Mitigation Plan to supplement and support its overall water supply management program, as well as the City's Comprehensive Plan.

The purpose of a Drought Mitigation Plan is to describe a strategy or combination of strategies for temporary supply management and demand management response(s) to temporary and potentially recurring water supply shortages and other water supply emergencies. Drought response measures in this context typically include mandatory restrictions on certain water uses, water allocation, or the temporary use of an alternative water supply. The underlying idea of drought mitigation planning is several fold: (a) while often unpreventable, short-term water shortages and other water supply emergencies can be anticipated; (b) the potential risks and impacts of drought can be considered and evaluated in advance of the actual event; (c) response measures can be determined with implementation procedures defined, in advance, to avoid, minimize, or mitigate the risks and impacts of drought related shortages; and (d) for water providers, the basic goal of drought mitigation planning is to ensure an uninterrupted supply of water in an amount sufficient to satisfy essential human needs, while also minimizing adverse impacts on quality of life, the economy, and the environment.

The City's future Drought Mitigation Plan will, at a minimum, include the following elements:

- Drought Task Force. The drought task force will combine various organizational entities and stakeholders that may influence preparation and implementation of a Plan into a communicating unit for purposes of preparing and implementing the Plan;

- Drought Vulnerability Assessment of the Water Supply System. The vulnerability assessment will consider seniority of water rights, reliability of infrastructure, availability of alternative supplies, and flexibility of water demand to identify key resource needs, and to support development of relevant policy, emergency response, and public education and awareness needs.

- Drought Mitigation Policies. Existing drought mitigation policies will be assessed and revised as necessary, with additional policies created if needed. These policies may include, but are not limited to, establishing drought response principals, objectives and priorities; authorities for declaring drought; triggers for drought-related actions; ordinances for drought measures; lines of internal and external communications protocols and content; and means for monitoring for drought and/or water supply scarcity.

- List of Emergency Response Needs. This list will include, but is not limited to, declarations of drought, emergency water supply programs and methods, managing new taps, and identifying funding partners and sources for assistance.

- Drought Preparedness Public Education / Awareness Program. Can tie into City's ongoing water conservation public education / awareness program.

The City's future Drought Mitigation Plan will be related to, but separate from, the City's Water Conservation Plan. That said, both will be integrated within the City's overall water supply management program.

2.6 CURRENT WATER CONSERVATION ACTIVITIES.

The City's existing Water Conservation Plan was most recently revised in 2010. It outlined eleven "water conservation approaches" that the City considered in order to reduce per capita water consumption. This plan builds upon and expands the 1996 plan. It includes more detail as to how the City will maintain its success at maintaining per capita water consumption since 2002.

PART 3 - WATER USE AND DEMAND.

3.1 CURRENT WATER USE.

Table 1 in the Appendix shows the annual water demand for the City of Cortez & MCWD#1 between 1990 and 2040. The data from 1990 to 2016 is historic, while the years out to 2040 are projected.

The City of Cortez & MCWD#1 used 665 and 683 MG in 2016 and 2017, respectively. The Ute Mountain Ute Tribe used 178 and 195 MG in 2016 and 2017, respectively. Thus, the total water used in both service areas was 843 and 878 MG in 2016 and 2017, respectively, well below the available annual water supply of 1,740 MG (5,340 acre-feet).

Table 2 breaks down by user type the water demand by the City of Cortez & MCWD#1 in 2016 and 2017. User types for the City of Cortez include the following categories:

- Residential (single unit);
- Residential (multi-unit);
- Commercial;
- Schools;
- Churches; and
- Government (City & Parks).

Table 3 and Graph 3, in the Appendix, show the number and percentage of taps by user type, and the average water demand per tap.

Tables 4-8 and Graphs 4-8 show the seasonal variation in water demand for the City of Cortez & MCWD#1 and Ute Mountain Ute Tribe, on an individual, collective, and average basis. It shows that water demand peaks during July and is low during December through February. This demand pattern is consistent with significant water use for outdoor, warm weather uses such as landscaping irrigation, vehicle washing, recreation (e.g., outdoor pools, kiddie sprinklers, slip-and-slides, etc.).

Table 9, and Graphs 9a, 9b, 10a, and 10b show the seasonal variation in water production and per capita water production between 2000 and 2017. This data, similar to Tables 4-8 and Graphs 4-8, shows significant seasonal variation in water consumption, with the highest rates in mid- summer and the lowest in mid-winter. This demand pattern is consistent with significant water consumption for outdoor use, particularly landscaping irrigation.

3.2 DEMAND FORECASTING METHOD.

The demand forecasting method used was the per capita and population methodology outlined in the AWWA's Manual of Water Supply Practices M50 ("Water Resources Planning"). Historic populations from 1970 to 2016 were tabulated, and a linear trendline was extrapolated to project population growth out to 2040. This projection uses an annualized growth rate that begins around 1.1% for 2010 through 2015 and declines to 0.7% for 2016 through 2040. This gradual decline in annualized growth rate is consistent with a maturing community approaching its carrying capacity (approximately 16,000 persons for the City of Cortez).

3.3 DEMAND FORECAST.

Table 1, in the Appendix, shows historic and projected population, per capita water use, and annual water demand for the City of Cortez & MCWD#1 between 1990 and 2040. Graphs 1a, 1b, and 1c also depict this data over time.

Demand forecasting was done by estimating population growth and changes in per capita daily water demand between 2016 and 2040. Based on historic population growth trends, it is estimated that the population within the City of Cortez grows on an annualized basis of approximately 0.7% per year.

Specifically, the demand forecasts followed the per capita methodology outlined in the AWWA's Manual of Water Supply Practices M50, titled "Water Resources Planning" (2nd Ed.), dated 2007. Historic populations were graphed from 1970 to 2016, and a linear trendline extrapolated growth out to 2040. This projection uses an annualized growth rate that begins around 1.1% for 2010-2015 and gradually declines to 0.7% for 2016-2040. This gradual decline in annualized growth rate is consistent with a maturing community that is gradually reaching its carrying capacity (16,000 persons).

PART 4 - PROPOSED FACILITY IMPROVEMENTS.

The City recently performed a series of improvements to its drinking water treatment system. These improvements consisted of the following:

- Removal and replacement of existing granular multi-media filter media (i.e., sand and gravel);
- Replacement of unserviceable filter componentry;
- Installation of additional piping, valves, fittings, and associated hardware in order to improve treatment system operation; and
- Upgrade of electrical and instrumentation & controls equipment, updating of operating software, and replacement of level control equipment.

The improvements were funded by State Revolving Fund (SRF) low-interest loans, administered by the Colorado Water Resources and Power Development Authority (CWRPDA). The improvements improved system performance, but did not add additional treatment capacity to the system. Thus, an incremental cost analysis is not appropriate at this time.

The existing drinking water system has the capacity to treat the available annual water supply of 1,740 MG from the McPhee Reservoir. The drinking water system – including the treatment plant, storage tanks, and distribution system – has a rated capacity of 9.0 MGD peak flow. The rated capacity is based on 9.0 MGD of pre-treatment capacity and 11 MGD of filtration capacity.

The plant has sufficient operational flexibility and physical robustness to satisfy demand peaks that occur during mid-Summer, as well as operating efficiently during periods of low demand that occur in mid-Winter. During periods of peak demand, the treatment train runs more often and for a longer cycle than under normal flow conditions. Similarly, during periods of low demand, the treatment train cycles less often and for shorter periods of time. In addition, not all of the treatment units (in particular, the submerged membrane microfiltration units, which are oriented in parallel so they are operationally independent) need be operated during low demand periods.

The capacity of the drinking water system shall remain the same over the 30-year planning horizon of this plan. No additions or retirements beyond the scope of the current engineering project are expected.

PART 5 - WATER CONSERVATION GOALS

The City of Cortez has four water conservation goals, described in §§ 5.1 to 5.4, below. Thesegoals were originally developed as part of the City's 1996 Water Conservation Plan and updated in 2010. They have been updated and expanded by the City of Cortez, Department of Public Works.

5.1 GOAL #1: IN SHORT-TERM MAINTAIN PER CAPITA WATER DEMAND AT CURRENT REDUCED LEVELS; OVER LONG-TERM, REDUCE PER CAPITA WATER DEMAND TO 200 GPCD. This goal has essentially been reached, the new goal is to reduce per capita water demand to 180 gpcd.

As shown in Table 1 and Graph 1b, in the Appendix, the current per capita daily water demand for the City of Cortez & MCWD#1 is just above 200 gpcd. This daily water demand reflects a reduction down from the per capita rate of 325 gpcd in 1990. Per capita daily water demand fell consistently between 1990 and 2002, and plateaued at 230 gpcd for a few years then has dropped to just above 200 gpcd since that time. The City's short-term goal (i.e., over the next 1-2 years) is to maintain its per capita water demand for users supplied by its water system supply area at current reduced levels, and for per capita water demand not to increase. Over the long-term (namely, over the 7-year implementation period of the plan), the City's goal is to reduce per capita water demand to 180 gpcd. Reducing per capita water demand to 180 gpcd will bring the City's water conservation success in line with that seen elsewhere in the region, and will be the foundation for additional reductions in per capita water demand in subsequent years.

Reducing per capita water demand from the current 200 gpcd to 180 gpcd will require aggressive implementation of the water-saving measures / programs contained in this Water Conservation Plan. Future annual updates and comprehensive revision of the plan, detailed in § 8.5 of this plan, will quantitatively determine the City's achievement of this long-term commitment. If the City is not achieving measurable success in reducing the per capita water consumption from 200 gpcd over the medium-term (i.e., over a 3-5 year period), the annual updates will identify the need to more aggressively implement the water saving measures / programs. This would also include the need for additional financial resources to increase the available rebates, distribute free self-audit kits, offer a greater cost-share on professional commercial water audits, etc.

Additional reductions beyond the 180 gpcd goal will likely require very long-term efforts (i.e., over 7+ years) and significantly more financial resources than those tentatively outlined in this plan. This will require effectively a distinct cultural change amongst the City's residents with respect to water consumption and conservation, which will require a sustained and diligent water conservation program by the City as well as wide-spread recognition by City residents of the importance of water conservation.

Towards the end of the report, Figure L provides a quantitative estimate of water savings if per capita water demand falls from 200 to 180 gpcd. Future annual review and comprehensive revisions of the plan will carefully look at whether the city has met this goal, and will revise accordingly depending on the City's success. Again, the City's goal is to reduce per capita water consumption to 180 gpcd during the 7-year implementation period of this plan, and the City will strengthen its water-saving measures/ programs as necessary to achieve this goal.

5.2 **GOAL #2: FULL METERING / MONITORING. This goal has been reached for the most part, but remains a goal until completed.**

The City seeks to achieve full metering and monitoring of all users within the Cortez water system. Any existing facilities that are currently unmetered or become unmetered shall have meters installed to monitor water usage. At present, the only unmetered use of drinking water are the City's hydrant flushing program and several park connections to the potable water system. Drinking water is used for supplemental irrigation at Centennial Park, to fill the City's outdoor swimming pool, and to fill the tanks of the City's street sweepers. A single line with a master meter provides water to these three uses. The City will monitor and record this data.

The City's goal is to achieve 100% metering and monitoring of all water users within the City- operated distribution system.

5.3 **GOAL #3: IMPROVE QUANTIFICATION OF WATER LOSS, ATTAIN WATER LOSS OF <10%.**

A water system's water loss factor is the ratio of unaccounted water to the total amount of water distributed. Within the municipal drinking water industry, a water system that achieves a water loss factor of 10% or less is considered to be adequately minimizing water loss.

The City has an ongoing aggressive water leak detection and repair program, which has significantly reduced water loss within the City-operated distribution system. This includes replacing old water mains and repairing service lines with detectable water leaks.

The City DPW maintains an ongoing water accounting, comparing water produced at the water treatment plant versus water measured at the numerous users within the distribution system. The City's current water loss accounting estimates that there is less than 10% loss within the distribution system. Table 8 and Graph 8 show annual water production, as distinguished from water use, for the City of Cortez & MCWD#1, Ute Mountain Ute Tribe, and both together between 2000 and 2017. Note that the annual water production for City of Cortez & MCWD#1 of 665 and 683 MG in 2016 and 2017, respectively, differ from the water demand of 565 and 563 MG. The discrepancy is due to unaccounted for users, water loss, and errors in water meters, and accounts for about 15% of total water produced. Note that there is significant uncertainty with this estimated water loss percentage, due to factors including the lack of recent acoustic leak detection, potential for inaccurate measurement at water meters and unmetered uses, and lack of a detailed water budget or water loss study. Inherent with the goal of reducing water loss below 10% is to improve quantification of the water loss via a detailed water budget.

The City also committed to maintain a water loss ratio of less than 10% of water produced. Future annual updates of the Water Conservation Plan will seek to quantitatively verify this estimated water loss ratio and seek to keep it below 5%.

5.4 GOAL #4: INVESTIGATE ADVANCED METERING INFRASTRUCTURE.

Advanced Metering Infrastructure is a fixed base system that would allow us and our customers to monitor our water usage in real time. The system consists of three components. First, an automatic meter reading system needs to be installed. We have completed this component. Second, there is a communication network. This network includes transmitters and receivers communicating to central point, a computer or network. The third component is a management system, software program.

5.5 GOAL #5: COMPLETE A DROUGHT CONTINGENCY PLAN.

This Plan will be developed and used as a guide for water conservation during times of water shortage. A complete description is found in section 2.5 of this plan.

5.6 GOAL #6: ADD A PLANNING COMPONENT TO THIS PLAN.

This goal will soon become a required part of a Water Conservation Plan and so will be completed at the time that guidance documents are released.

PART 6 - WATER-SAVING MEASURES / PROGRAMS.

In the 1996 Water Conservation Plan, the City identified eleven potential "water conservation approaches" to reduce water demand. This plan organizes the water-saving measures / programs into nine groupings, in order to be consistent with CWCB guidance and water conservation planning requirements pursuant to state statutes.

6.1 WATER-SAVING MEASURES / PROGRAMS CONSIDERED.

A wide variety of water-saving measures / programs were considered during the development of this plan. The water-saving measures / programs considered included, but were not limited to, the following:

- Water-efficient fixtures & appliances (e.g., low-flow toilets & urinals, aerating showerheads & faucets, front-loading washing machines);
- Landscape efficiency (e.g., Xeriscaping, drip irrigation systems);
- Industrial and commercial efficiency (e.g., closed-loop cooling systems);
- Water reuse systems (e.g., reclaimed water for landscaping irrigation); and
- Distribution system efficiency (e.g., leak detection and repair).

[1] http://waterefficiency.net/

6.2 SCREENING AND EVALUATION OF WATER-SAVING MEASURES / PROGRAMS.

Water-saving measures / programs were selected for this plan based on four criteria:

(1) Estimated breakdown of water consumption by use;
(2) Presence within the 2010 Water Conservation Plan;
(3) Feasibility of implementing conservation measures;
(4) Non-duplication with ongoing water conservation measures.

If a water-saving measure / program was included within the 2010 plan and it is still applicable to the current drinking water system, then it was carried over into this plan. Additional conservation measures were added, if they were feasible (i.e., could be implemented given the context of Cortez's drinking water system) and not duplicative with any ongoing conservation measures.

Note that the City currently lacks sufficient data to perform a proper cost-benefit analysis of the ongoing and planned water-saving measures / programs.

6.3 SELECTED WATER-SAVING MEASURES / PROGRAMS.

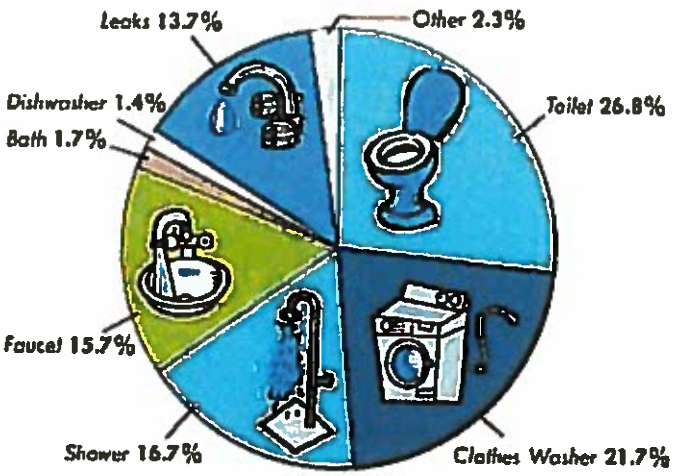
The City's water conservation program consists of nine water-saving measures and programs, as described below.

A. WATER-SAVING MEASURE / PROGRAM #1: WATER-EFFICIENT FIXTURES & APPLIANCES.

As shown in Chart 4, below, on average within the U.S., the majority of water use within residential dwellings is for toilet flushing and clothes washing. (Data on indoor water use for the City of Cortez is unavailable, but the City may develop estimates, based on voluntary and representative sampling, of indoor water use by its customers in the future.)

Therefore, beginning in 2020, the City will adopt an indoor water-efficient toilet and washing machine replacement rebate program. Under this rebate program, customers who purchase and install water-efficient toilets and washing machines will get a rebate applied toward their future water bills.

CHART 4: ESTIMATED BREAKDOWN OF INDOOR HOUSEHOLD WATER USE.



Source: AWWA Research Foundation (2001)

The specific rebate quantities and eligibility criteria for the water-efficient toilet and washing machine replacement rebate program will be developed in the future. What follows is a tentative discussion of the likely rebate quantities and eligibility criteria.

Most likely the toilets rebate will be for users with toilets currently using more than the federally-mandated 1.6 gallons per flush (gpf). As described in Section 2.1 (titled "Toilets") of Amy Vickers' "Handbook of Water Use and Conservation" (2001), 5.0+ gpf toilets were used prior to 1980 and 3.5, 4.1, and 4.5 gpf toilets were installed during 1980-1994 range. 4.5 gpf was used to estimate water saved per toilet replaced. The City's toilet rebate program will target the highest demand water toilets for replacement via two ways. First, the City will focus educational efforts on the toilet rebate program in parts of the City with the oldest housing stock. For example, the City may begin the toilet rebate program in the areas of oldest housing stock, before expanding eligibility to the entire city. Second, if the number of rebate applications will exhaust the funds available to support the rebate program, applications for replacement of the toilets with greatest use or the oldest, least efficient toilets will be prioritized over newer, more efficient toilets or those with relatively less use. This prioritization will maximize the water savings per rebate dollar. In the event that rebate funds are exhausted, additional resources will be allocated for subsequent years to meet the overall demand for rebate funds.

The rebates will likely require that the new toilet achieve at least 1.28 gpf, not merely the 1.6 gpm currently required for new construction or home renovation. 1.28 gpf toilets will likely involve use of dual flush, powerflush, or flapperless technologies, which offer higher performance than more conventional low-volume gravity-tank toilets. Thus each toilet replaced is estimated to save 3.22 gallons per flush.

The washing machine rebate is currently expected to be $100 for all WaterSense-certified (a US Environmental Protection Agency water conservation program[3]) front-loading washing machines using 27 gallons per load or less. As described in Section 2.2 (titled "Clothes Washers") of Amy Vickers' "Handbook of Water Use and Conservation" (2001), 51 gallons per load washing machines were used prior to 1980, and 27, 39 or 43 gallon per load have been used to the present day. 43 gallons per load was used to estimate water saved per washing machine replaced. The City's washing machine rebate program will target the highest demand washing machines for replacement. In addition, rebate recipients will likely be offered free faucet aerators to improve the water efficiency of their faucets (kitchen, bathroom, etc.). The plan does not include estimates of water savings from distribution of water efficient faucets, but future plan updates / revision may take these water savings into account. The City will also include expanding the rebate program to include high efficiency showerheads as funding becomes available.

The toilet and washing machine replacement rebates are anticipated to be offered on a first-come, first-serve basis. No money will be distributed for toilets and washing machines installed prior to the beginning of the program. If the rebate money is exhausted in a particular year, applicants will be automatically rolled into the following year. The City will likely allocate additional funds if rebate funds are quickly exhausted. Similarly, if unused rebate money is available at the end of a year, it will either be carried over into the following year or used for other water conservation programs. The City is currently planning on budgeting a total of $5,000 per year for the indoor water-efficient toilet and washing machine replacement rebate program. Figures C-1 and C-2, below, show the preliminary projected toilet and washing machine rebate rates, participation, and estimated water savings. Figure C-3, also below, summarizes the estimated water savings for these two rebate programs. The City will evaluate the effectiveness of its rebate program during the annual Water Conservation Plan review, beginning in 2021.

[3] http://www.epa.gov/WaterSense/

FIGURE C-1. PRELIMINARY PROJECTED TOILET REPLACEMENT REBATES AND ESTIMATED WATER SAVINGS.

Year	2019	2020	2021	2022	2023	2024
Water-Efficient Toilet Replacement Rebate Program						
Toilet Rebates Issued Per Year	40	40	40	40	40	40
Cumulative No. of Toilet Rebates Issued	40	80	120	160	200	240
Rebate Per Toilet Replaced	$25	$25	$25	$25	$25	$25
Total Toilet Rebates Issued Per Year	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Estimated Persons per Household[1]	2.64	2.64	2.64	2.64	2.64	2.64
Estimated Flushes per Person per Day[1]	5.1	5.1	5.1	5.1	5.1	5.1
Reduction in Water Use per Flush (gal) [from 4.5 to 1.28 gallons / flush]	3.32	3.32	3.32	3.32	3.32	3.32
Water Savings per Toilet Replaced (gpd)	44.7	44.7	44.7	44.7	44.7	44.7
Estimated Daily Water Savings (gpd)	1,788	3,576	5,354	7,152	8,940	10,728
Estimated Annual Water Savings (MG)	0.7	1.3	2.0	2.6	3.3	3.9

Notes:

[1]Source: Table 2.2, Amy Vickers' "Handbook of Water Use and Conservation" (2001)

FIGURE C-2. PRELIMINARY PROJECTED WASHING MACHINE REPLACEMENT REBATES AND EST. WATER SAVINGS.

Year	2019	2020	2021	2022	2023	2024
Water-Efficient Washing Machine Replacement Rebate Program						
Washing Machine Rebates Issued Per Year	10	10	10	10	10	10
Cumulative Number of Washing Machine Rebates Issues	10	20	30	40	50	60
Rebate Per Washing Machine Replaced	$100	$100	$100	$100	$100	$100
Total Washing Machine Rebates Per Year	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Estimated Persons per Household[1]	2.64	2.64	2.64	2.64	2.64	2.64
Estimated Loads per Person per Day[1]	0.37	0.37	0.37	0.37	0.37	0.37
Reduction in Water Use per Load (gal) [from 43 to 27 gallons / load]	16	16	16	16	16	16
Water Savings per Washing Machine Replaced (gpd)	15.6	15.6	15.6	15.6	15.6	15.6
Estimated Daily Water Savings (gpd)	156	312	468	624	780	936
Estimated Annual Water Savings (MG)	0.06	0.11	0.17	0.22	0.28	0.34

Notes:

[1]Source: Table 2.17, Amy Vickers' "Handbook of Water Use and Conservation" (2001)

FIGURE C-3. SUMMARY OF ESTIMATED WATER SAVINGS FOR WATER-EFFICIENT FIXTURES & APPLIANCES.

Year	2019	2020	2021	2022	2023	2024
Water-Efficient Toilet Replacement Rebate Program (MG)	0.7	1.3	2.0	2.6	3.3	3.9
Water-Efficient Washing Machine Replacement Rebate Program (MG)	0.06	0.11	0.17	0.22	0.28	0.34
Total Estimated Water Savings for Water-Efficient Fixtures & Appliances (MG)	0.8	1.4	2.2	2.8	3.6	4.2

In addition, note that the City has adopted, within Sections 6 and 21 of its City Code, several international building codes, including the International Plumbing Code (IPC). The IPC mandates the use of water-efficient plumbing fixtures on all new construction and building remodeling. These requirements are enforced by City's building inspectors during routine building construction and occupancy inspections.

In addition, the City educates the public generally, and plumbers and other building construction personnel specifically, on water efficient fixtures by distributing written literature, via the City's website, and in routine interaction as to ongoing and future construction projects.

B. WATER-SAVING MEASURE / PROGRAM #2: WATERWISE LANDSCAPING PROGRAM (I.E., WATERWISE LANDSCAPES, DROUGHT-RESISTANT VEGETATION, EFFICIENT IRRIGATION, REMOVAL OF HIGH WATER DEMAND PLANTS).

Waterwise landscaping utilizes native and other climate-appropriate, low water-use plants and other landscaping features that require a minimum of additional watering beyond natural precipitation. Waterwise landscaping features can also include gravel beds, decorative rocks, and stone walkways. (Waterwise landscaping is also known as "Xeriscaping" – a combination of "xeros" (Greek for "dry") and landscape. This term has generally fallen out of favor by water conservation professionals, however, because of public confusion over its meaning.)

No later than 2019, the City will implement a waterwise landscaping program. The core of this program is to more aggressively promote and encourage citizen involvement with the waterwise plant demonstration plots. The program will also involve distribution of a revised and finalized waterwise landscaping brochure, which will both help promote the waterwise plant demonstration plots as well as encourage residents to install waterwise landscaping at their properties.

The City has tentatively budgeted $1,000 for 2019 to fund the waterwise landscaping program, and will allocate more money in subsequent years as required. The waterwise landscaping program will be a joint effort of the Department of Public Works and Parks & Recreation Department, given that DPW has expertise in terms of the water system while Parks & Recreation has experience in organizing programming and dealing with the public, particularly students and volunteers.

Several years ago, City personnel planted two waterwise plant demonstration plots: the first at the City Service Center within the Cortez Industrial Park (110 Progress Circle on the northwest side of town), the other as part of building landscaping of the Police Station near Centennial Park near downtown Cortez. In the Appendix is a schematic of the waterwise landscape demonstration garden planted at the City Service Center, as well as a species list. Both locations are relatively high traffic areas, particularly the downtown plot. Since their installation, however, the City has not sufficiently promoted the waterwise plant demonstration plots. As part of the waterwise landscaping program, the City will aggressively promote the waterwise landscaping demonstration plots and encourage greater utilization by the community. The City will also follow the waterwise landscaping program in future landscaping projects such as the 7th Street median landscaping

The City's waterwise landscaping program is anticipated to consist of six main elements:

- Element #1: Revise and distribute the waterwise landscaping brochure;
- Element #2: Rededication of waterwise landscaping demonstration plots and the addition of several new ones;
- Element #3: Volunteer programming at waterwise landscaping demonstration plots;
- Element #4: Educational programming at waterwise landscaping demonstration plots;
- Element #5: Evaluate future waterwise landscaping audit programs; and
- Element #6: Evaluate future waterwise landscaping rebate programs.

What follows is a detailed description of these six main elements of the City's new waterwise landscaping program.

First, the City will revise and distribute its waterwise landscaping brochure. The draft waterwise brochure included in the Appendix will be the basis for updating the brochure in the future. The draft brochure was originally developed to help promote the waterwise plant demonstration plots, and contains a detailed description of the plant species originally planted in the plots. The revised and finalized brochure will include more detailed guidance on the grass selection and use the term "waterwise" in lieu of "Xeriscape". This brochure will serve two purposes: 1) help promote the waterwise landscaping demonstration plots, and 2) serve as a guide to City residents to show how waterwise plants can be decorative yet require very little watering once established. The waterwise landscaping brochure will reference to Municipal Code Section 27-6(b)(3), which explicitly recommends that residents use water-saving grasses such as fescues, wheatgrasses, and Blue Grama, in-lieu of water-wasting grasses such as Kentucky Bluegrass. (The Municipal Code can be accessed online[4] via the City's website. New ordinances, as they are passed by the City Council, are also posted online.) The City will distribute the waterwise landscaping brochure both online (via the City's website), and in hard copy (at City offices, at distribution boxes at the waterwise landscaping demonstration plots, and at City-sponsored waterwise landscaping programming).

Second, once the waterwise landscaping brochure is revised, finalized, and printed, the City will rededicate the waterwise landscaping demonstration plots in a formal public ceremony. The ceremony will be widely publicized in advance by the local media (particularly the *Cortez Journal*,[5] the local newspaper), and maximum citizen participation will be encouraged. The timing is yet to be determined, but will likely occur on or about Earth Day 2019. It is anticipated that the ceremony will be attended by the Mayor, members of the City Council, select City staff, landscaping enthusiasts, school children, and other interested citizens. Prior to the rededication, the City will post clearly observable signage at the demonstration plots so residents can find them. In addition to the signage at the plots themselves, the City DPW will post road signs denoting "Waterwise Landscaping Demonstration Plots" to direct drivers to the location of the plots. Distribution boxes for the waterwise landscaping brochures will be installed at each of the plots, with City personnel responsible for routine replacement of the brochures as they are depleted. The City will seek to get the waterwise demonstration gardens published by online listing of xeriscape demonstration gardens maintained by CWCB[6] as well as Colorado Waterwise.[7]

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[4] http://www.cityofcortez.com

[5] http://www.cortezjournal.com/

[6] http://cwcb.state.co.us/public-information/education-outreach/Pages/LocalXeriscapeDemonstrationGardens.aspx

[7] http://www.coloradowaterwise.org

Third, the City Parks & Recreation Department will coordinate volunteer programming at the waterwise landscaping demonstration plots. This volunteer effort will be particularly important in order to improve the plots prior to finalization of the waterwise landscaping brochure, as neglect has likely resulted in the loss of certain waterwise landscaping plants as well as the introduction of unwanted non-waterwise weed species. Groups that will be targeted as part of this volunteer effort will include: school horticulture groups, scout troops, 4-H participants, landscaping clubs, retirement homes, and persons needing to perform community service hours. Young people, in particular, will be encouraged to perform "service learning" projects utilizing the waterwise landscaping demonstration plots. These projects can include, but are not limited to, including routine maintenance (e.g., weed removal, fall / spring cleanup), one-time upgrades (e.g., plot expansion, plant transplants, and construction of amenities such as benches, mulch walkways, etc.), as well as county fair exhibits. The City's Parks & Recreation Department will investigate obtaining and distributing "Waterwise Landscaping" patches for distribution to scouts who perform a minimum number of volunteer hours at the plots. The City will also recognize volunteers who perform significant work at the demonstration plots, with the "Waterwise Landscaping Hero" designation. Such volunteers will receive a "Certificate of Recognition" signed by the Mayor, and their names will be added to a plaque located at an appropriate place in a public location.

Fourth, the City Parks and Recreation Department will coordinate with the Montezuma County Extension office[8] to leverage the waterwise landscaping demonstration plots within their ongoing educational programming, such as the Master Gardener Program and the Native Plant Master Program. In addition, the Parks and Recreation Department will utilize the waterwise landscaping demonstration plots during annual Earth Day activities, that occur on or about April 22 each year. Educational programs on waterwise landscaping will also occur during the Earth Day activities, as well as volunteer opportunities for annual spring clean-up. The Parks and Recreation Department will organize and perform other educational programs at other times of the year, but the Earth Day- related activities at the landscaping demonstration plot will be the keystone event eachyear.
The City's waterwise landscaping educational programs will address the following topics:

- Evaluation of water consumption by existing landscaping;
- Waterwise plant species;
- Planning and design of waterwise landscaping;
- Water-efficient irrigation system and practices;
- Locations where turf grass makes sense;
- Soil improvements / mulching; and
- Maintenance of waterwise landscaping.

These efforts will supplement the City's waterwise landscaping brochure with literature distributed by the Colorado State University Extension office.[9]

Fifth, no later than 2019, as part of the annual update of the plan, the City will evaluate whether to institute an outdoor landscaping audit program. Under an outdoor landscaping audit program, residents would be offered free on-site audits of their landscaping by a xeriscape specialist (possibly a City staff member with extensive training and experience in efficient outdoor irrigation techniques and xeriscaping / waterwise landscaping). Participating residents would be offered a written report providing specific recommendations on optimizing outdoor irrigation, as well as potential xeriscape improvements. Note that a future outdoor irrigation audit program will require dedicated funding, and likely extensive staff training and time. Therefore, it is premature to implement an outdoor irrigation audit program in the immediate future (i.e., next 1-2 years).

[8] http://www.co.montezuma.co.us
[9] http://www.ext.colostate.edu/pubs/pubs.html#water

Sixth and finally, no later than 2020, as part of the annual update of the plan, the City will evaluate whether to institute a waterwise landscaping / xeriscaping rebate program. Under such a rebate program, residents who remove their existing water-inefficient landscaping (e.g., Kentucky bluegrass) with waterwise landscaping / xeriscaping (e.g., the water-saving grasses recommended by the Municipal Code) will receive a rebate on their water bill. Performance of an outdoor irrigation audit will be one of the prerequisites to receiving a waterwise landscaping rebate. Note that a future waterwise landscaping / xeriscaping rebate program will require dedicated funding, extensive public education, a verification component, and extensive staff training and time. Therefore, it is premature to implement a waterwise landscaping rebate program at this time. This program may be implemented at a future date, particularly if the educational elements and outdoor irrigation audit program of the waterwise landscaping program are determined to have achieved limited success at achieving reductions in outdoor water demand.

In terms of quantifying water savings from the waterwise landscaping program, it is very difficult at this point to estimate the water savings from removal of existing water-efficient landscaping and replacement with waterwise landscaping. The reduction in exterior watering will vary on a number of factors, including: property size, soil type, plant species removed and added, annual rainfall, seasonal temperature averages, topography, and sun exposure, amongst other factors. However, Figure D, below, is an effort to estimate the water savings for the City's waterwise landscaping program. It is estimated that, beginning in 2019, ten households will be inspired and motivated by the waterwise landscaping program to remove their existing water-wasting turf grass and install waterwise landscaping. (This estimate of participation is conservative given that Cortez is a community of roughly 9000 residents. Assuming 2.64 persons per household, 60 households constitutes 211 people switching from traditional landscaping to xeriscaping. This represents 2.5% of residents, a fairly conservative estimate.) It also is estimated that each household cuts its water consumption in half via the installation of the waterwise landscaping.

FIGURE D. ESTIMATED WATER SAVINGS DUE TO WATERWISE LANDSCAPING PROGRAM.

Year	2019	2020	2021	2022	2023	2024
Households Install Waterwise Landscaping	10	10	10	10	10	10
Cumulative Number of Households	10	20	30	40	50	60
Estimated Persons per Household[1]	2.64	2.64	2.64	2.64	2.64	2.64
Existing Exterior Water Usage (gpcd)[2]	29	29	29	29	29	29
Existing Exterior Water Usage (gal / household / day)	77	77	77	77	77	77
Days During Annual Watering Period (mid-May to mid-October)	150	150	150	150	150	150
Existing Exterior Water Usage (gal / household / year)[3]	11,550	11,550	11,550	11,550	11,550	11,550
Reduction in Exterior Water Usage	50%	50%	50%	50%	50%	50%
Reduction in Exterior Water Usage (gal / household / year)	5,775	5,775	5,775	5,775	5,775	5,775
Cumulative Water Savings (MG)	0.06	0.12	0.17	0.23	0.29	0.35

Notes:

[1]Source, footnote in Table 2.2, Amy Vickers, "Handbook of Water Use and Conservation" (2001).

[2]Source: p. 141, Amy Vickers, "Handbook of Water Use and Conservation" (2001).

[3]Estimate is consistent with the annual estimate of 10,000 gallons of supplemental irrigation per year, with hotter, drier parts of the country using greater amounts, as cited by Vickers (above).

Note that each annual review of the Water Conservation Plan will attempt to gauge the success of the waterwise landscaping program, and reevaluate the water savings estimates previously provided. If it is found that insufficient success has been achieved through the educational programs outlined in waterwise program elements one through four, described above, then elements five and six – the outdoor irrigation audit program and the waterwise landscaping rebate program – will be implemented.

C. WATER-SAVING MEASURE / PROGRAM #3: WATER-EFFICIENT INDUSTRIAL & COMMERCIAL PROCESSES.

The City, no later than 2020, will implement a commercial water audit program. This program will consist of two parts: (1) an educational component consisting of the distribution of a free commercial water conservation self-audit kit, upon written request by commercial water users, and (2) the cost-share of professional water audit.

First, the City's Department of Public Works (DPW) will post educational information on the City's website with guidance for commercial entities (e.g., restaurants, hotels, supermarkets) on how to conserve water. Instructions will include detailed directions on how to perform a water conservation self-audit, within a packaged commercial water conservation self-audit "kit" distributed free to commercial water customers in good standing (i.e., no outstanding water bills), upon written request. These self-audit kits will address both indoor and outdoor water use, and will be applied as appropriate given each customer's unique water usage profile. (For example, a car wash would focus more on the outdoor water use component, while a restaurant with extensive dish-washing would focus more on the indoor water use component.)

Second, the City will cost-share with eligible businesses who request a water audit performed by a trained and experienced water conservation professional. Again, the professional water use audits would address both indoor and outdoor water use, tailored as necessary to the customer's unique water use profile. Likely, in order to be eligible for the cost-share, businesses must be a water customer in good standing (i.e., no outstanding water bills), have performed a water conservation self-audit, submitted a written report of their self-audit to the City, implemented some water conservation measures, and request in writing a cost share. Interested commercial entities will submit a short application to the City DPW for review and approval, before proceeding with the professional water conservation audit. During the audit, the professional water auditor will travel to the commercial enterprise's facility or facilities, perform the audit, and provide written recommendations of ways to reduce water use and an estimate of how it would save money over time. Prior to rolling out the commercial water audit program, the City DPW will determine more specifics about application procedure, eligibility, reimbursement protocol, qualifications required for the auditors and the like. Tentatively, it is anticipated that the cost share would be performed on a 50%/50% basis. The City currently anticipates budgeting at least $2,000 per year, on an ongoing annual basis beginning in 2020, for this water-saving measure / program. If more commercial businesses apply for the professional audit cost-share program than the available funds allow, then either the amount of available funding will be increased or the City will select which businesses offer the greatest water conservation benefits.

In terms of quantifying water savings from the commercial water audit program, it is very difficult to estimate the water savings. The reduction in water consumption will vary on a number of factors, including: business type (e.g., restaurant, bar, hotel, grocery store, administrative office), size of business, number of employees, number of customers, hours of operation, seasonality of business, efficiency of existing water using processes. That said, Figure E, below, is an effort to estimate the

water savings for the City's commercial water audit program. It is estimated that, beginning in 2020, five commercial businesses will perform water self-audits, based on the City's guidance. The levels of water savings shown in Figure E, below, are consistent with AWWA's Manual of Water Supply Practice M36, "Water Audit and Loss Control Programs" (2009) as well as "Water Loss Control (2nd Ed.)" (2009) by Julian Thornton et al.

FIGURE E. ESTIMATED WATER SAVINGS DUE TO THE CITY'S COMMERCIAL WATER AUDIT PROGRAM.

Year	2020	2021	2022	2023	2024	2025
Commercial Water Audit Program						
Commercial Businesses Performing Water Self-Audit (Via Free "Kit")	0	0	5	5	5	5
Cumulative No. of Commercial Bizs Performing Water Self-Audit	0	0	5	10	15	20
Estimated Daily Water Savings per Commercial Business (gpd / biz)	100	100	100	100	100	100
Annual Water Savings per Business in Yr Self-Audit Performed (gal / yr)	0	0	182,500	182,500	182,500	182,500
Est. Water Savings in Year Self-Audit Performed (MG)	0	0	0.18	0.18	0.18	0.18
Commercial Businesses Receiving Professional Water Audits	0	0	1	2	3	4
Cumulative No. of Commercial Bizs Receiving Professional Water Audits	0	0	1	3	6	10
Estimated Daily Water Savings per Commercial Business (gpd / biz)	250	250	250	250	250	250
Est. Water Savings per Biz in Year Prof Water Audit Performed (gal / yr)	0	0	91,250	182,500	273,750	365,000
Est. Water Savings in Year ProfWater Audit Performed (MG)	0	0	0.09	0.18	0.27	0.37
Estimated Water Savings from Commercial Water Audits Program (MG)	0	0	0.26	0.37	0.45	0.55

Note that the City lacks significant industrial or institutional presence within Cortez. If significant industrial or institutional activities are located within the City, future updates or revisions of the plan will need to take their water demands into account.

D. WATER-SAVING MEASURE / PROGRAM #4: WATER REUSE SYSTEMS.

Raw water drawn from McPhee Reservoir is held in a raw water storage pond (the "upper" pond), prior to flowing into the City's water treatment plant. Backwash water -- produced when the filters within the treatment plant are backwashed -- flows into a backwash pond (the "lower" pond). Water within the lower pond is then pumped back into the upper pond, where suspended particulate matter settles out and the recycled water eventually flows back into the treatment plant. 45,000 gallons of backwash water is typically used per media filter backwash.

Filter operation at the Cortez WTP can generally be organized into three periods: a peak use period (June through August), a moderate peak use period (May and September), and an off-peak use period (October through April). Prior to the filter improvements, typically filters needed to be backwashed

every 24-hour period of operation. Typically four filters were operated during the peak use period, two filters during the moderate use period, and one filter during the off-peak use period. Therefore, on average, four filters were backwashed daily during the peak use period, two filters backwashed daily during the moderate use period, and one filter backwashed daily during the off-peak use period. Due to the recent filter improvements, the filters will need to be backwashed only every 48-hours of operation. Therefore, backwash frequencies are expected to fall to two, one, and one-half backwashes per day during the peak, moderate, and off-peak use periods, respectively.

The water treatment plant operators estimate that roughly one-third of the recycled backwash water is lost due to evaporation or groundwater infiltration, with two-thirds returned to the upper pond.

Figure F, below, contains estimates of the volumes of water recycled back to the upper pond, and the reduction of water lost in the lower pond due to evaporation / infiltration. The reduction of water lost in the lower pond due to evaporation / infiltration represents the water savings due to longer filter runs / reduced backwash frequency. Note that since the filter improvements have dramatically reduced the amount of backwash water going to the lower pond, the volume of water recycled from the lower pond to the upper pond has actually fallen from 21.1 MG/year to 10.5 MG/year.

FIGURE F. ESTIMATED WATER SAVINGS FROM BACKWASH WATER REDUCTION / RECYCLING.

Year	2018	2019	2020	2021	2022	2023
Water Recycled Back to Upper Pond (MG)	10.5	10.5	10.5	10.5	10.5	10.5
Reduction in Volume Lost in Lower Pond Due to Evaporation / Infiltration (MG)	5.26	5.26	5.26	5.26	5.26	5.26
Estimated Water Savings from Backwash Water Reduction / Recycling (MG)	15.8	15.8	15.8	15.8	15.8	15.8

Detailed calculations of these water savings estimates are provided in the Appendix. Note that given the uncertainties in the anticipated changes in backwash frequency, the above estimates of water savings do not account for anticipated changes in water production between 2018 and 2023. Future annual updates will seek to better quantify the water savings due to the longer filter runs / reduction in backwash frequency.

While the City is free to recycle backwash water at its treatment plant, the City is contractually limited in its ability to pursue reuse of "reclaimed" treated wastewater effluent. The City's drinking water supply, provided by the Dolores Water Conservancy District (DWCD)[11], is subject to a contractual clause that reserves post-use water as belonging to the U.S. Bureau of Reclamation. In other words, like many Western Slope communities, the City's water is subject to a one-time use limitation, and water reuse projects would currently violate this requirement. Therefore, for the anticipated 7-year duration of this plan, post-use water reuse is not a feasible option.

That said, over the very long-term (greater than 7-years), the City is interested in pursuing water reuse on a limited basis for irrigation of recreational fields requiring irrigation (e.g., baseball diamonds), vehicle washing at the City's vehicle yard, and other uses where non-potable water is acceptable. The City would need to negotiate with DWCD to modify the water reuse prohibition, as well as coordinate with other interested stakeholders (e.g., U.S. Bureau of Reclamation) prior to utilizing water reuse. Moreover, wastewater within the City currently receives primary and secondary treatment by the Cortez Sanitation District prior to discharge into a nearby surface water source. Water reuse would require extensive additions to the existing wastewater treatment system to meet current environmental and public health regulatory requirements, in addition to a new and separate reclaimed water

distribution system. The Cortez Sanitation District is a separate governmental entity from the City of Cortez, and any future potential post-use water reuse would need to obtain their agreement and participation. In summary, any future potential water reuse is currently only at a conceptual level, and it is uncertain over what timeframe the City might proceed.

E. WATER-SAVING MEASURE / PROGRAM #5: DISTRIBUTION SYSTEM LEAK IDENTIFICATION AND REPAIR.

The City has an ongoing drinking water distribution system leak prevention, detection, and repair program. In their day-to-day activities running the water system (i.e., operating the water treatment plant, water storage tanks, and the water distribution system), DPW staff continuously evaluate the distribution system, looking for leaks and excessively corroded pipe, as well as faulty hydrants, valves, and other appurtenances. They also carefully observe water quality and pressure conditions both at the water treatment plant and at multiple locations within the distribution system.

The City's distribution system leak prevention, detection and repair program is broader than simply waiting to go out and fix catastrophic water main breaks. For example, as part of the City's fire hydrant maintenance and unidirectional distribution system flushing program, if DPW staff see or suspect a line or appurtenance is leaking (based on noise, cavitation, pressure disruptions, water color, water odor, external or internal pipe corrosion, or observable or measurable water leakage), DPW staff will investigate and make the appropriate repairs. If water system customers complain of water quality or pressure problems in a certain part of the distribution system, DPW staff will investigate and make the appropriate repairs.

When distribution system leaks are suspected, they are investigated immediately. If leaks are detected, they are repaired immediately by DPW staff. These repairs usually consist of either repair or replacement of faulty pipe or appurtenances. Alternatively, if upon investigation a leak cannot be identified, DPW staff will perform more careful inspections within that area of the distribution system looking for areas of concern. For example, if an area of the distribution system is suspected of having several small leaks, DPW staff will make note of the concern and investigate further, looking for the specific leaks, faulty valves or hydrants, or other problems (e.g., pipe obstructions, buckled pipe, extensive pipe corrosion, illegal water connections, etc.).

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[11] http://www.doloreswater.com

Records of the distribution system leak identification and repair program are maintained by City DPW personnel and are available for review at the City Service Center. In particular, the DPW maintains and updates a detailed GIS database and AutoCAD drawings of the drinking water distribution system, showing the location, size, and material of each water line and appurtenance. Within these systems, DPW personnel annotate their subjective condition assessment of each line, as part of their routine distribution system maintenance activities. DPW personnel maintain written record drawings (as-builts) depicting when different sections of line were originally built or subsequently repaired. Records also include logs of appurtenance maintenance (e.g., valve opening closing, hydrant flushing, etc.). These records are used to identify water lines most needing replacement in the City's Capital Improvements Program (CIP). (Note that the City's water treatment plan has a sophisticated Supervisory Control and Data Acquisition (SCADA) system that its operators use to efficiently operate the drinking water treatment plant. The SCADA system is used exclusively to control the water treatment plant – particularly the treatment process – but is not used to manage the distribution system, such as the day-to-day operations & maintenance.)

Complementing the City's routine leak detection program, the City in the past has hired external consultants to acoustically evaluate (using sonic leak detection systems) water mains and other portions of the distribution system for otherwise undetectable leaks. Generally speaking, this work is performed as funding becomes available, and was most recently performed in the 2010s by a specialty contractor. In the past, City DPW personnel selected areas within the distribution system most needing leak detection evaluation, based on the age and condition of the lines, suspicion or previous presence of leaks, flowrate of water through the line, and time since the line was most recently evaluated. No later than 2020, the City will budget and allocate funds for a comprehensive acoustic leak detection survey. Given that comprehensive acoustic leak detection has not been done in more than 8-years, the comprehensive acoustic leak detection survey will include as much of the entire distribution system as possible.

Note that some areas of the distribution system (e.g., under waterway crossings, through challenging terrain or dense vegetation) may be inaccessible to leak detection survey crews, or the depth of the water lines may make acoustic leak detection ineffective. The goal of the comprehensive acoustic leak detection survey will be to survey as much of the distribution system as is safe and practicable to do so.

Following the comprehensive acoustic leak detection survey, more targeted acoustic leak detection efforts will be performed as necessary, utilizing the comprehensive survey as a baseline. Preliminary estimated cost for the comprehensive acoustic leak detection survey is $50,000. Repairs required of leaky pipes and appurtenances (e.g., valves) identified during the survey are not included in this cost.

It is very difficult to estimate water savings from leak detection in advance, particularly when leak detection has not been performed in some time. The quantity of leaks can depend upon the pressures within the distribution system, variations in water flowrates, extent of corrosion in the water pipeline, extent to which leaks have been repaired upon detection, and other maintenance-related factors. Given these uncertainties, no estimates of water savings due to the 2020 acoustic leak detection have been developed. The future acoustic leak detection, as well as the future water audit / water loss control study, will seek to quantify the current level of water loss so that estimates of water savings from acoustic leak detection can be incorporated into future water conservation plans.

FIGURE G. ESTIMATED WATER SAVINGS DUE TO ACOUSTIC LEAK DETECTION AND REPAIR PROGRAM.

Year	2020	2021	2022	2023	2024	2025
Commercial Water Audit Program						
Estimated Water Savings Due to Leak Detection*	0	0	0	0	0	0

*NOTE: Not estimated due to uncertainties with current water loss and potential benefits of new acoustic leak detection program. Future revisions of water conservation plan will quantify savings from acoustic leak detection and repair program.

As part of implementation of this water conservation plan, the City will continue to refine and improve its water accounting system. In particular, the City will seek to ensure that all water users are metered and all meters are properly calibrated and the data recorded.

F. WATER-SAVING MEASURE / PROGRAM #6: PUBLIC EDUCATION, CUSTOMER WATER USE AUDITS, WATER-SAVING DEMONSTRATIONS.

The City actively seeks to educate its residents and improve public awareness of water conservation through literature distribution, educational programs, and responding to resident's questions and comments. For example, public education literature on water conservation is available for free both at the City's offices and at its website.[12] This literature covers the City's water wasting prohibition and land watering restrictions, drought mitigation steps, and general water saving tips for both indoor and outdoor water uses. Examples of this public education literature are included in the Appendix. Annually, the City distributes to each residence connected to the water supply a Consumer Confidence Report (CCR). The CCR provides information on the water source and water quality, as well as information on how to use water wisely and avoid wasting water. Further, the City submits to the local newspaper short informational clips about water conservation. The Appendix contains an example of informational releases on drought mitigation submitted to the *Cortez Journal* in 2018, as well as articles published within the *Cortez Journal* in 2011 through 2017. The City also works with local schools to educate children on water conservation and organizes occasional public tours of the City's drinking water system's facilities. Finally, as they come in, City staff addresses any resident's questions or comments on water conservation, drought mitigation, and the drinking water supply in general.

It is very difficult to estimate water savings due to public education. Water savings depend upon how many residents are reached by the educational program, how many and to what extent those who receive the public education reduce their water demand, whether the changes in water demand are permanent or temporary. As such, a 1% reduction in annual water demand was used as a "best guess" to estimate water savings, shown in Figure H, below. The City will revisit this estimate during future annual updates and comprehensive revisions of the Water Conservation Plan, and seek to more accurately quantify the water savings from educational efforts.

FIGURE H. EST. WATER SAVINGS DUE TO PUBLIC EDUCATION, CUSTOMER AUDITS, WATER-SAVING DEMOS.

Year	2018	2019	2020	2021	2022	2023
Commercial Water Audit Program						
Forecast Annual Water Demand (MG)	788	797	806	814	823	832
Reduction in Water Demand Due to Public Education, Audits, Demos (%)	1%	1%	1%	1%	1%	1%
Estimated Water Savings (MG)	7.9	8.0	8.1	8.1	8.2	8.3

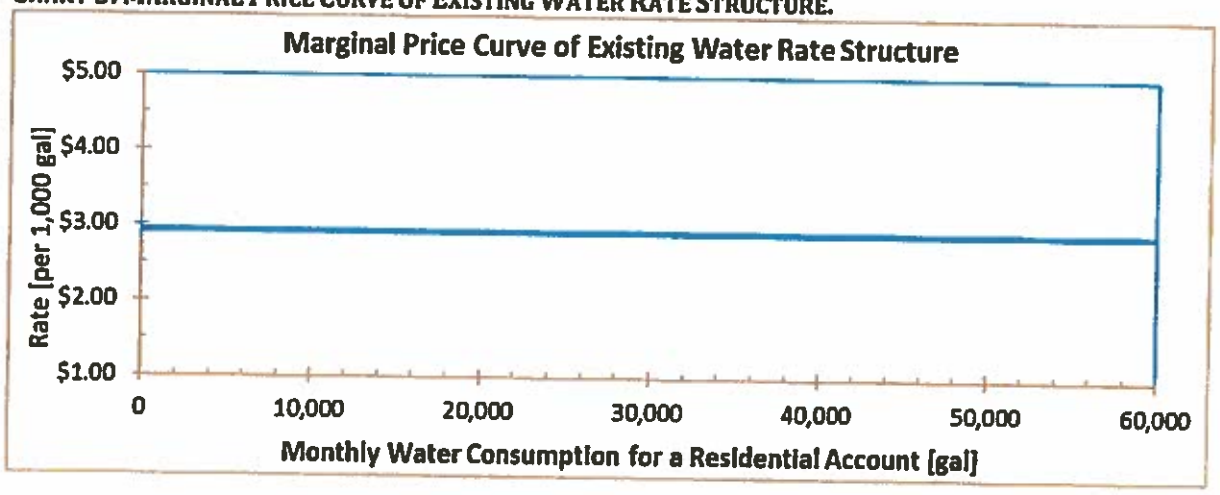
[12] http://www.cityofcortez.com

In future updates / revision of the plan, more detailed estimates of the water savings due to public education will be formulated. The City will, at some point during the plan's implementation, conduct a water conservation survey in which questions include whether people try to conserve water, in what ways do they try to conserve water, what steps the City could take to encourage water conservation, how much they might cut back on water use if water rates were adjusted, etc. The survey could be conducted both online and in hard copy (perhaps distributed as a stuffer within the routine utility bill). The survey likely would be performed over a 30 or 60-day period, after advertising it online, in the newspaper, and within a preceding utility bill. The results of the survey will help the City gauge the effectiveness of its water conservation program, as well as estimate water savings due to its various elements program, particularly public education, customer water-use audits, and water-saving demonstrations.

G. WATER-SAVING MEASURE / PROGRAM #7: WATER RATE STUDY / CONSERVATION PRICING.

The City currently uses a uniform water rate structure. Namely, the City currently charges a base rate for the first 1,000 gallons of monthly usage, with a set rate per each additional 1,000 gallons used. Chart 5, below, shows the flat marginal rate for each additional 1,000 gallons used.

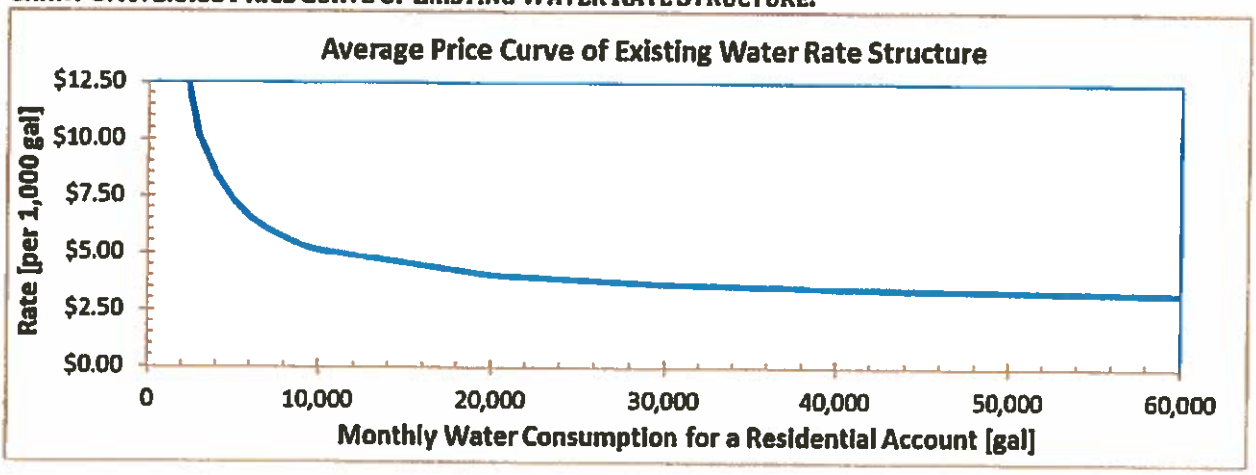
CHART 5: MARGINAL PRICE CURVE OF EXISTING WATER RATE STRUCTURE.



Uniform water rate structures do not provide a particularly strong price signal to encourage conservation, in contrast to conservation-oriented pricing structures such as increasing block rate or seasonal water rate structures. Chart 6, below, shows how the average price of Cortez's existing water rate structure decreases as water use increase. Generally, the positive slope or steepness of the average price curve indicates how effective the water rate structure in sending a conservation price signal. (Ref. Western Resource Associates, "Front Range Water Meter: Water Conservation Ratings and Recommendations for 13 Colorado Communities," November 2007[13]) Thus, the negative slope of Cortez's average price curve reflects its lack of a strong conservation price signal.

[13] http://www.westernresourceadvocates.org/media/watermeter/index.php

CHART 6: AVERAGE PRICE CURVE OF EXISTING WATER RATE STRUCTURE.



Accordingly, the City will consider adjusting its water rate structure to encourage additional conservation by high water users, an approach known as "conservation-oriented rate structures." A potential conservation-oriented rate structure could consist of increasing block rates, whereby the marginal water rate (e.g., dollars charged per 1,000 gallons of additional usage) increases as a customer's monthly water use increases. (The opposite of an increasing block rate structure is a decreasing block rate structure, in which unit price decreases as consumption volume increases. Decreasing block rate structures discourage water conservation, and will not be adopted by the City.) Another conservation-oriented rate structure is seasonal rates, in which a higher rate is charged during the summer to discourage inefficient outdoor water use (e.g., excessive watersprinkling).

While the City has adjusted water rates as needed over time, a comprehensive water rate study has not been done for the City for approximately 30-years. As such, the City will hire a qualified consultant to perform a water rate study no later than 2019. The City has tentatively budgeted $4 0,000 for this study. The purpose of the study is to guide a potential future conservation pricing rate structure. It is anticipated that a potential future conservation pricing rate structure would be implemented in 2020.

The Appendix contains a preliminary scope of work for the water rate study. The City's DPW will modify this scope of work as necessary, prior to submitting a request for proposals. Any water rate study will be performed in accordance with standard water industry guidance, such as AWWA Manual of Water Supply Practices M1, "Principles of Water Rates, Fees, and Charges" (2000), and "Water and Wastewater Finance and Pricing: A Comprehensive Guide (3rd Ed.)" by George Raftelis (2005)

Conservation-oriented rate structures that send a strong "price signal" to customers have been shown to provide utilities with stable and sufficient revenue and reduce water use roughly 10 – 30%, based on the experience several Western utilities. (Ref. Western Resources Associates, Structuring Water Rates to Promote Conservation[14]). Accordingly a water savings rate that adjusts upwards from 0% to 10%, over a 4-year period to allow customers to adjust their behavior in response to the conservation pricing structure, has been used to estimate water savings from the potential future conservation-oriented rate structure.

[14] http://www.westernresourceadvocates.org

Figure I, below, is an estimate of the water savings due to a potential future conservation pricing structure.

FIGURE I. ESTIMATED WATER SAVINGS DUE TO POTENTIAL FUTURE CONSERVATION-ORIENTED RATE STRUCTURE.

Year	2018	2019	2020	2021	2022	2023
Forecast Annual Water Demand (MG)	788	797	806	814	823	832
Est. Reduction in Water Demand from Conservation-Oriented Rate Structure	0%	0%	2.5%	5%	7.5%	10%
Estimated Water Savings (MG)	0	0	20.2	40.7	61.9	83.2

H. WATER-SAVING MEASURE / PROGRAM #8: REGULATORY MEASURES.

The City has adopted a series of regulatory measures to promote water conservation.

Specifically, City's Municipal Code, Chapter 27, regulates its water system and provides the City with several measures to promote water conservation. Excerpts of Chapter 27 are in the Appendix.

First, Section 27-6 prohibits daytime watering between 10am and 5pm from May 15 to September 15. Those caught violating the daytime watering prohibition shall be given a warning upon the first offense, and have the water shutoff upon second offense. After payment of a re-connect fee, the offending resident's water will be turned back on. Section 27-6 also establishes a "new lawn permit" for any new lawn that needs to be watered every day and during the restricted time of 10am to 5pm. The permit shall be issued upon payment of a fee, and is valid for twenty-one days of watering for newly-seeded lawns and fifteen days of watering for sod.

Second, Section 27-19 prohibits water wasting, including through hydrants and faucets, or the constant running of water through toilets or pipes to prevent their freezing.

Third, Section 27-44 mandates that residents keep all fixtures and pipes located on their property in good working order. The City has the power to shut off a resident's water if they fail to make needed repairs after receiving notice.

The City's regulatory measures are enforced via a joint effort of the City's DPW personnel and the City Police Department. If City DPW personnel recognize a code violation – e.g., violation of lawn watering restrictions in time of drought – they will refer the issue to Police, who will issue the formal citation. In addition, City Police have the authority to issue citations without referral from DPW personnel.

Finally, note that the City – as a home-rule municipality – has the authority as part of its inherent governmental police powers to impose additional measures to protect public health, safety and welfare of its residents. Such emergency restrictions might be put in force during time of a prolonged, severe drought such that water level within McPhee Reservoir falls significantly, or if the water system were to become contaminated and water could only be used for non-potable purposes such as laundry and bath.

Like with educational efforts, it is very difficult to estimate the water savings due to regulatory measures. Water savings from regulatory measures depend upon a variety of factors, many of which are intangible and difficult to access. These include how aggressive current regulatory measures are enforced, the strength of fines or penalties assessed for non-compliance, the willingness of a community's residents to pay fines and continue violating the regulations, and general public

perception of regulation breakers (i.e., is pressure amongst community residents to comply with the regulatory measures). As such, a 1% reduction in water savings was used as a "best guess" to estimate water savings, as shown in Figure J, below. The City will revisit this estimate during future annual updates and comprehensive revisions of the Water Conservation Plan, and seek to more accurately quantify the water savings from regulatory measures.

FIGURE J. ESTIMATED WATER SAVINGS DUE TO REGULATORY MEASURES.

Year	2018	2019	2020	2021	2022	2023
Forecast Annual Water Demand (MG)	667	671	642	646	617	621
Est. Water Savings from Regulatory Measures	1%	1%	1%	1%	1%	1%
Estimated Water Savings (MG)	6.7	6.7	6.4	6.5	6.2	6.2

I. **WATER-SAVING MEASURE / PROGRAM #9: Rainwater Harvesting.**

In 2016, rainwater harvesting became legal in Colorado. The new law allows a homeowner to collect up to 110 gallons of rainwater in barrels for outside use. The law requires that barrels must be equipped with a sealable lid. Single family households and multi-family households with four or fewer units may harvest rainwater. It would be difficult to quantify the amount of treated water saved so nothing is added to the estimate in Figure K.

PART 7 - QUANTITATIVE ESTIMATES OF WATER SAVINGS.

Figure K, below, shows the quantitative estimates of water savings by each of the nine water-saving measure / program. Each of these quantitative estimates was outlined earlier within the plan, and will be revised as needed during future annual updates and comprehensive revision of the plan.

FIGURE K. QUANTITATIVE ESTIMATES OF WATER SAVINGS BY WATER-SAVING MEASURE / PROGRAM.

Year	2018	2019	2020	2021	2022	2023
#1: Water-Efficient Fixtures & Appliances	0.8	1.4	2.2	2.8	3.6	4.2
#2: Waterwise Landscapes, Drought-Resistant Vegetation, Efficient Irrigation, Removal of High Water Demand Plants	0.06	0.12	0.17	0.23	0.29	0.35
#3: Water-Efficient Industrial & Commercial Processes	0	0	0.26	0.37	0.45	0.55
#4: Water Reuse Systems (Backwash Water Reduction / Recycling)	15.8	15.8	15.8	15.8	15.8	15.8
#5: Distribution System Leak Identification & Repair	0	0	0	0	0	0
#6: Public Education, Customer Water Use Audits, Water-Saving Demonstrations	7.9	8.0	8.1	8.1	8.2	8.3
#7: Water Rate Study / Conservation Pricing	0	0	20.2	40.7	61.9	83.2
#8: Regulatory Measures	0	8.0	8.1	8.1	8.2	8.3
#9: Rainwater Harvesting						
Est. Total Water Savings from Selected Water-Savings Measures / Programs (MG)	0	33.3	54.7	76.2	98.3	120.7
Estimated Total Water Savings from Selected Water-Savings Measures / Programs (acre-feet)	0	102.2	167.8	233.8	301.6	370.4

As shown in Table 1 and Graph 1b, in the Appendix, per capita water use has fallen between 1990 and 2002 from 325gpd then flat-lined at 230 gpcd for a few years then dropped to just above 200 gpcd, since approximately 2015. The demand forecasts within the Appendix utilize 200 to 180 gpcd as the per capita daily water demand to determine total annual water demand.

Goal #1 for this plan is to maintain per capita water demand at the current reduced levels of 200 gpcd in the short-term (1-2 years), while decreasing per capita water demand over the long-term (5-7 years) to 180 gpcd. Figure L, below, shows an estimate of the water savings if the 180 gpcd goal is met by the end of the 7-year duration of this plan, as compared to water use if the per capita water use remained at the current 200 gpcd level.

Also shown in Figure L are the estimated total water savings from the previously selected water- savings measures / programs. This side-by-side comparison shows that the estimated water savings of the selected water-saving measures / programs are sufficient to meet the 200 gpcd water conservation goal.

In other words, the estimated water savings from selected water-saving measures / programs are significantly greater than water savings required to achieve water conservation goal.

FIGURE L. ESTIMATED WATER SAVINGS IF CONSERVATION GOAL MET.

Year	2017	2018	2019	2020	2021	2022
Forecasted Population	9,007	9,142	9,279	9,595	9,699	9,802
Current Per Capita Water Use (gpcd)	206	200	200	200	200	200
Per Capita Water Use Goal (gpcd)	200	200	195	190	185	180
Water Savings (if Goal Achieved) (MG)	0	0	20.8	42.0	63.7	85.9
Water Savings (if Goal Achieved) (acre-feet)	0	0	63.8	129.0	195.6	263.5
Estimated Total Water Savings from Water- Savings Measures / Programs	0	32.4	33.3	54.7	76.2	98.3
Estimated Total Water Savings from Water- Savings Measures / Programs	0	99.4	102.2	167.8	233.8	301.6
Estimated Per Capita Water Use from Water- Savings Measures / Programs	0	200	195	190	185	180

Since this plan's short-term goal is for per capita water use to remain at 200 gpcd, no revenue effects are anticipated, so increased water rates or surcharges will not be needed, at least in the short-term, due to declines in per capita water demand. Additionally, water conservation is not expected to reduce the need for future capital expenditures. If the long-term commitment – reducing per capita water use below 200 gpcd – does begin to impact the City's water revenues, then annual reviews of the Water Conservation Plan will need to consider revenue effects.

PART 8 - IMPLEMENTATION PLAN.

8.1 ROLE OF CONSERVATION PLAN IN CORTEZ'S WATER SUPPLY PLANNING.

The City of Cortez believes that water conservation planning must and will play an integral role in its water supply planning. The City aims to integrate its water conservation program with its water supply planning effort. Given that water supply and demand are interconnected, simultaneous and coordinated water conservation and water supply planning efforts will help ensure these do not remain isolated from one another.

The City recognizes that its water supply from McPhee Reservoir is not unlimited, particularly in the event of a drought or other emergency water shortage. As previously discussed, McPhee Reservoir is managed by the Dolores Water Conservancy District (DWCD), a governmental entity separate and distinct from the City of Cortez. Given that the City does not have unilateral dominion and control over its raw water source, the City will continue to work collaboratively with the DWCD to ensure that McPhee Reservoir is properly managed to provide an adequate supply of water for currentand future needs.

In addition, the City will aggressively implement this Water Conservation Plan to ensure that water will be available in the future for the City's water customers, whether in times of water abundance or drought. In particular, the City has committed significant resources, not only to operate, maintain, and recently upgrade its drinking water treatment plant, but to also develop, obtain CWCB approval, and implement this Water Conservation Plan. The Water Conservation Plan is a dramatic improvement from the 1996 plan, and has been significantly strengthened in response to numerous CWCB comments. Section 8.03, below, describes the City's implementation schedule for the plan. Over the plan's 7-year duration, the City will implement the various water-saving measures and programs that the City has committed itself to.

It is important to note that the City DPW's Water Division, which operates and maintains the drinking water system, is responsible for the City's water supply. Accordingly, the Water Division was the proponent for development of this Water Conservation Plan, and is the lead for its implementation.

There is no other entity within the City that has greater expertise in water supply management or better understands the importance of water supply planning. Other City Departments will also be involved with the plan's implementation, such as the water-wise landscape demonstration gardens, water conservation education and ordinance enforcement, as previously discussed. In addition, the City leadership is informed of and fully supports the water conservation program articulated by this plan. The Mayor and City Council reviewed the draft Water Conservation Plan, conducted a public hearing on the plan, directed staff to develop an ordinance to implement the plan, and subsequently unanimously passed that ordinance.

8.2 IMPLEMENTATION SCHEDULE.

Figure M, below, shows the implementation schedule for the Water Conservation Plan. The implementation schedule includes the "no later than" date that each individual water-saving measure / program will be implemented. Also included is an anticipated budget allocation for each water- saving measure / program.

FIGURE M: IMPLEMENTATION SCHEDULE.

Water Saving Measure / Program	mentation Date	cipated Budget Allocation
#1: Water-Efficient Fixtures & Appliances	No later than 2020	TBD / year
#2: Waterwise Landscaping Program – City Projects	2019	$30,000
#3: Water-Efficient Industrial & Commercial Processes	No later than 2020	TBD / year
#4: Water Reuse Systems	Ongoing	Not Applicable
#5: Distribution System Leak Identification & Repair	2019	$50,000
#6: Public Education, Customer Water Use Audits, Water-Saving Demonstrations	Ongoing	TBD / year
#7: Water Rate Study / Conservation Pricing	2019	$40,000 (one time)
#8: Regulatory Measures	Ongoing	Currently incurred
#9: Rainwater Harvesting	No later than 2020	TBD / year

8.3 PUBLIC PARTICIPATION.

Public participation in this Water Conservation Plan is integral to the accomplishment of its goals. The City has taken the following actions to promote participation by the public with the Water Conservation Plan:

- Post the Water Conservation Plan on City's website.

The City posted the draft plan on August 29, 2018, on the City's website.[15] A copy of the internet notice is in the Appendix.

- Distribute copies of Water Conservation Plan at City's offices.

Since August 14, 2018, the City DPW has made available copies of the draft plan at the City Service Center and at City Hall. At the June 12, 2018, City Council workshop, hard copies of the draft Water Conservation Plan were distributed to Council members.

- Seek public written comment during a 60-day public comment period on the draft Water Conservation Plan.

The public comment period on the draft plan ran from August 31 to October 28, 2018, during which written comments were solicited.

Included in the Appendix is a 3-page interoffice memorandum from Rich Landreth to the City Manager and City Council summarizing the Water Conservation Plan and recommending a schedule for formal approval of the draft plan. During the Council workshops on June 12; August 14; and August 28, 2018, Director of Public Works Phil Johnson and Water Plant Superintendent Richard Landreth made presentations to the Council on the water conservation planning process and the draft plan (minutes from those workshops are included in the Appendix). .

The Appendix contains the agenda for the August 28, 2018, meeting, with item 7.b. directing staff to advertise the Draft Water Conservation Plan for the required 60-day comment period; this item was unanimously approved by Council. Minutes from the August 28, 2018, regular City Council meeting are also included in the Appendix.. A public notice was put in the newspaper and on the City's website, giving the public an opportunity to provide for oral and/or written public comment on the draft plan.

Also included in the Appendix is the agenda and minutes for the October 23, 2018, Council meeting, with item 7.a. being first reading of Ordinance No. 1257, Series 2018, adopting by reference the 2018 Water Conservation Plan for the City of Cortez.

The agenda for the November 13, 2018, Council meeting is in the Appendix, with item 5.a. being the public hearing and second reading of Ordinance No. 1257, Series 2018. City Council unanimously approved the motion to adopt the 2018 Water Conservation Plan.

- Designate a point-of-contact for public comment including phone number.

The public notice designated Richard Landreth, Water Treatment Plant Superintendent as the draft plan's point-of-contact.

- Issue a responsiveness summary to all comments received during the public comment period.

Only one comment was received from the public on the draft Water Conservation Plan, from Brett M. Schmidt. His comment and the City's response were presented to Council at the public hearing on November 13, 2018, and are included in the Appendix.

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[15] http://www.cityofcortez.com

- Revise the draft Water Conservation Plan, as necessary, based on public comments received.
  The draft plan has been revised several times, both based on comments provided by the CWCB as well as feedback from the City Council during the August 14, 2018, meeting.

- Continue education and public awareness campaign.
  Upon plan finalization, City staff will implement the public education elements of the plan.

8.4 MONITORING AND EVALUATION.

The City's Department of Public Works (DPW) will be responsible for monitoring and evaluating performance of the Water Conservation Plan, including scrutinizing the costs and water savings of the selected conservation options. Mr. Richard Landreth, Water Treatment Plant Superintendent, DPW, will lead these efforts. The City Council, as advised by DPW staff, will need to ensure thatadequate funding is provided to fulfill the goals and implement the water-saving measures / programsoutlined in the plan.

8.5 Annual Updates and Comprehensive Revision of Water Conservation Plan.

The City's DPW will perform an annual review of the Water Conservation Plan, and modify the plan in accordance with needs identified during the annual review. DPW will coordinate with other City offices, in particular the Planning and Building Department, the Parks and Recreation Department, and the City Manager's Department, as appropriate during the annual reviews.

Richard Landreth, Water Treatment Plant Superintendent, is designated as the current point-of-contact for the Water Conservation Plan. Richard is currently expected to lead the annual review process, but this may change depending on personnel changes and other requirements amongst City staff. For example, if the City at some point were to hire a water conservation coordinator, it is likely that person would lead the annual reviews of the Water Conservation Plan.

The end result of each annual review will be, at a minimum, a memorandum to the City Manager and City Council outlining the implementation of the water saving measures / programs within the Water Conservation Plan, budget requirements to finance future year's water conservation program efforts, and recommendations on additional steps to further the City's water conservation goals.

The City will perform a comprehensive revision of the plan if identified as directed by the annual reviews, but absolutely no later than 2024. Colorado state law requires that CWCB-approved Water Conservation Plans be revised on a maximum 7-year rotating cycle. The comprehensive revision will be guided by the annual reviews performed each year beginning in 2019, and will involve another 60- day (minimum) public review and comment period. The comprehensive revision will involve a complete reevaluation of the Water Conservation Plan, and the development of a revised plan.
The comprehensive Water Conservation Plan revision will be led by City staff but also involve a newly established "City of Cortez Water Conservation Planning Workgroup." The workgroup will likely consist of at least 3 sitting members of the City Council, members of City staff, and may also include several interested members from the local community. The purpose of the workgroup is to ensure that the new Water Conservation Plan adequately reflects the residents' wishes and desires, to ensure that the democratic representatives are integrally involved with the new plan (as opposed to simply approving the plan after it has already been developed without their active participation), and to involve City staffers who will be involved on a day-to-day basis in the implementation of the plan.

8.6 Plan Approval.

As previously discussed, the City Council held a 60-day public comment period from August 31 through October 28, 2018, on the draft Water Conservation Plan, as well as a public hearing during the City Council meeting on November 13, 2018. At that time, the City Council unanimously approved Ordinance No. 1257, Series 2018. The Appendix contains the relevant public notices, meeting agendas, and approved ordinances.

8.7 Solicitation of Additional Funds.

The City's Grants and Special Projects Division, with the City Manager's Department, will seek additional funds in order to support implementation of the plan.

PART 9 - REFERENCES / ADDITIONAL RESOURCES.

Government:

- Colorado State University Extension – http://www.ext.colostate.edu
  + Paper "Water Conservation In and Around the House" – http://www.ext.colostate.edu/pubs/consumer/09952.html

- Colorado Water Conservation Board (CWCB) – http://cwcb.state.co.us/
  + CWCB Water Conservation Plan Development Guidance Document – http://cwcb.state.co.us/Apps/hb1365/index.htm

  Dolores Water Conservancy District (DWCD) – http://www.doloreswater.com/

- U.S. Environmental Protection Agency (USEPA) – http://www.epa.gov
  + WaterSense Program – http://www.epa.gov/watersense
  + Water Use It Wisely – http://wateruseitwisely.com

- Water Information Program (for Dolores and San Juan Watersheds) -http://www.waterinfo.org/

Not For Profit Organizations:

- Alliance for Water Efficiency (AWE) – http://www.allianceforwaterefficiency.org

- American Water Works Association (AWWA) – http://www.awwa.org

- Colorado Water Wise - http://coloradowaterwise.org/

- Western Resource Advocates –
  + Water Conservation Tips – http://www.westernresourceadvocates.org
  + Water Rate Structures –http://www.westernresourceadvocates.org

Publications:

- AWWA, Manual of Water Supply Practices M1, "Principles of Water Rates, Fees, and Charges" (2000) - http://awwa.org/

- AWWA, Manual of Water Supply Practices M36, "Water Audits and Loss Control Programs" (2009) -

- AWWA, Manual of Water Supply Practices M50, "Water Resource Planning" (2007) -

- AWWA, Manual of Water Supply Practices M52, "Water Conservation Programs - A Planning Manual" (2006) -

- AWWA, Standard G200, "Distribution Systems Operation and Management" -

- Ellefson, Connie Lockhart and David Winger, "Xeriscape Colorado: The Complete Guide" (2004)

- Knopf, Jim; "WaterWise Landscaping with Trees, Shrubs, and Vines: A Xeriscape Guide forthe Rocky Mountain Region, California, and Desert Southwest" (2005)

- Letterman, Raymond D. (Ed.); "Water Quality and Treatment: A Handbook of Community Water Supplies (5th Ed.)" (1999)

- Mays, Larry W. (Editor); "Water Distribution Systems Handbook" (2000)
- Raftelis, George A.; "Water and Wastewater Finance and Pricing: A Comprehensive Guide (3rd Ed.)" (2005)
- Seneviratne, Mohan; "A Practical Approach to Water Conservation for Commercial and Industrial Facilities" (2007)
- Thornton, Julian et al.; "Water Loss Control (2nd Ed.)" (2008)
- Vickers, Amy; "Water Use and Conservation" (2001) – http://www.waterplowpress.com/
- U.S. Environmental Protection Agency, "Water Conservation Plan Guidelines," Document No. EPA-832-D-98-001 (1998) - http://www.epa.gov/

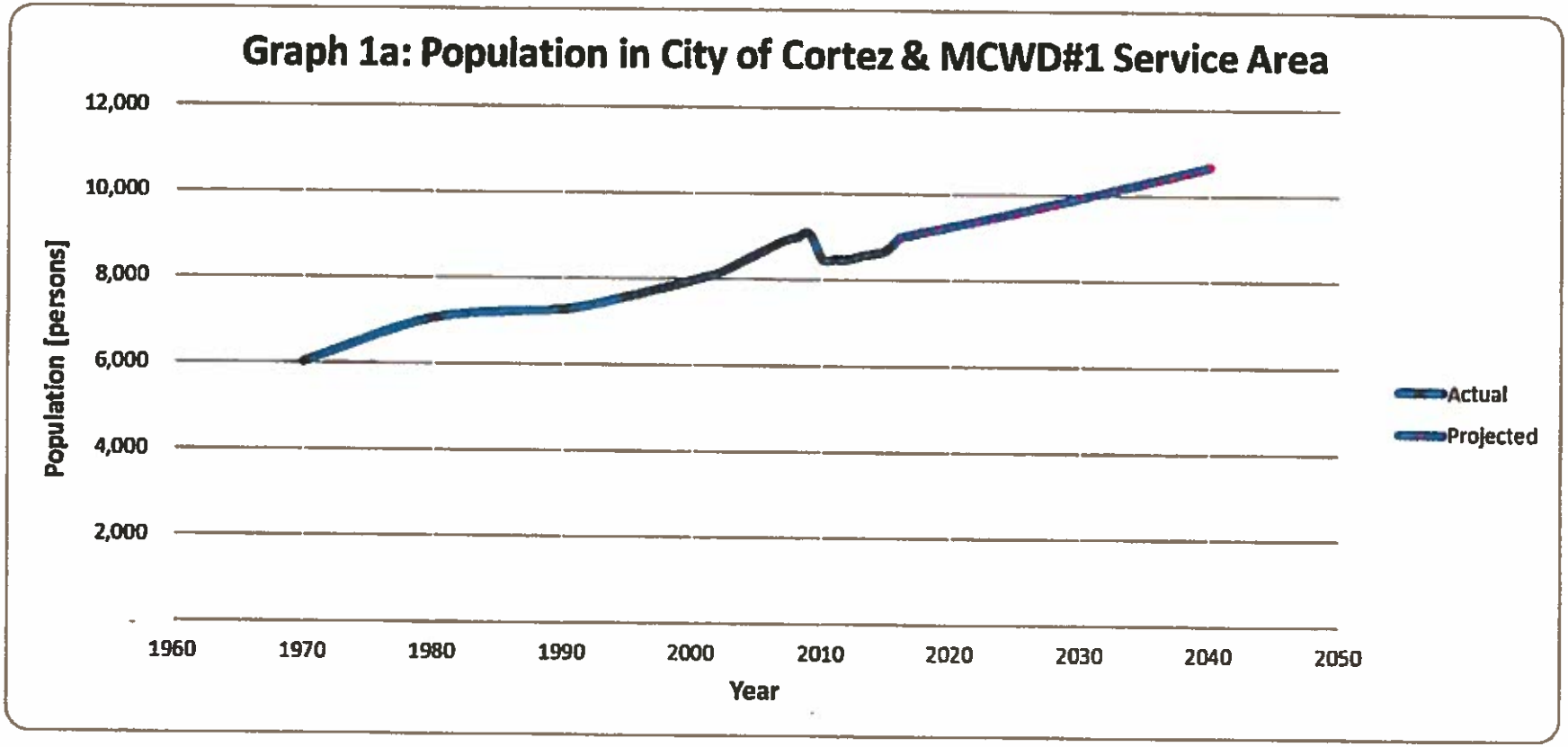
City of Cortez
2018 Water Conservation Plan

Appendix

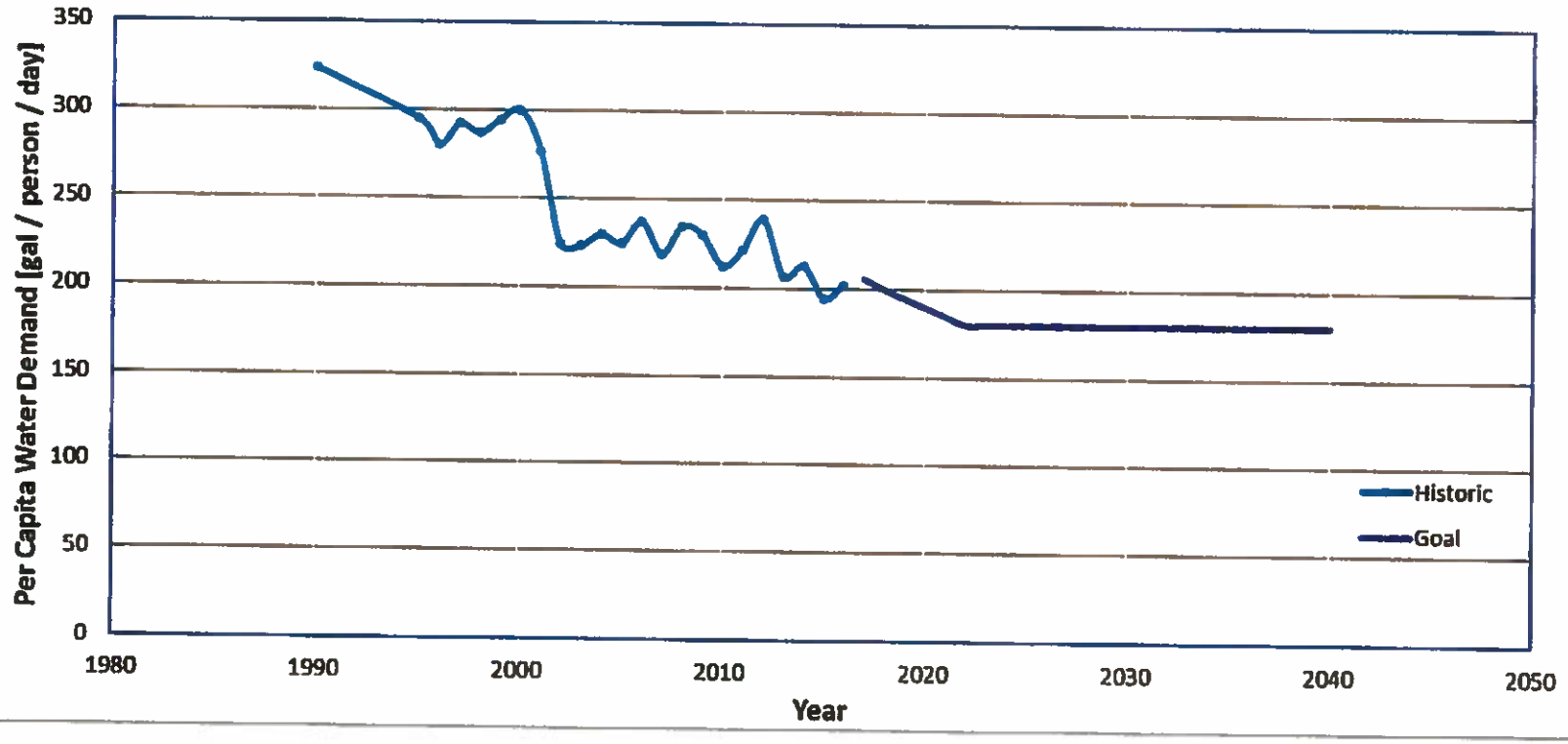
Tables and Graphs

Table 1: City of Cortez & MCWD #1: Population, Annual Water Demand/ Supply, Per Capita Demand

	Population (In Service Area)		Annual Water Demand [MG]			Available Annual Water Supply (Water Rights) [MG]	Per Capita Water Demand		
Year	Historic	Projected	Historic	Projected - Current Per Capita Water Use	Projected - Meet Water Conservation Goal		Historic	Projected - Current Per Capita Water Use	Projected - Meet Water Conservation Goal
1970	6,032					1,740			
1980	7,062					1,740			
1990	7,284		660			1,740	324		
1995	7,587		617			1,740	295		
1998	7,663		783			1,740	280		
1997	7,740		825			1,740	292		
1998	7,817		818			1,740	287		
1999	7,895		849			1,740	295		
2000	7,977		874			1,740	300		
2001	8,057		813			1,740	276		
2002	8,137		666			1,740	224		
2003	8,290		676			1,740	223		
2004	8,442		709			1,740	230		
2005	8,595		708			1,740	225		
2006	8,747		757			1,740	237		
2007	8,900		712			1,740	219		
2008	8,989		770			1,740	235		
2009	9,078		762			1,740	230	208	
2010	8,484		658			1,740	212	206	
2011	8,478		667			1,740	222	206	
2012	8,478		740			1,740	239	206	
2013	8,559		646			1,740	207	206	
2014	8,610		669			1,740	213	206	
2015	8,703		618			1,740	195	206	
2016	9,007	9,007	665		0	1,740	202	206	
2017	9,070	9,070			662	1,740	206	206	206
2018		9,133			667	1,740		206	200
2019		9,197			655	1,740		206	195
2020		9,262			642	1,740		206	190
2021		9,327			630	1,740		206	185
2022		9,392			617	1,740		206	180
2023		9,458			621	1,740		206	180
2024		9,524			626	1,740		206	180
2025		9,591			630	1,740		206	180
2026		9,658			635	1,740		206	180
2027		9,725			639	1,740		206	180
2028		9,793			643	1,740		206	180
2029		9,862			648	1,740		206	180
2030		9,931			652	1,740		206	180
2031		10,000			657	1,740		206	180
2032		10,070			662	1,740		206	180
2033		10,141			666	1,740		206	180
2034		10,212			671	1,740		206	180
2035		10,283			676	1,740		206	180
2036		10,355			680	1,740		206	180
2037		10,428			685	1,740		206	180
2038		10,501			690	1,740		206	180
2039		10,574			695	1,740		206	180
2040		10,648			700	1,740		206	180


Graph 1a: Population in City of Cortez & MCWD#1 Service Area
12,000
10,000
8,000
6,000
4,000
2,000
-
Population [persons]
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
Year
Actual
Projected

Graph 1b: Per Capita Water Demand in City of Cortez & MCWD#1 Service Area



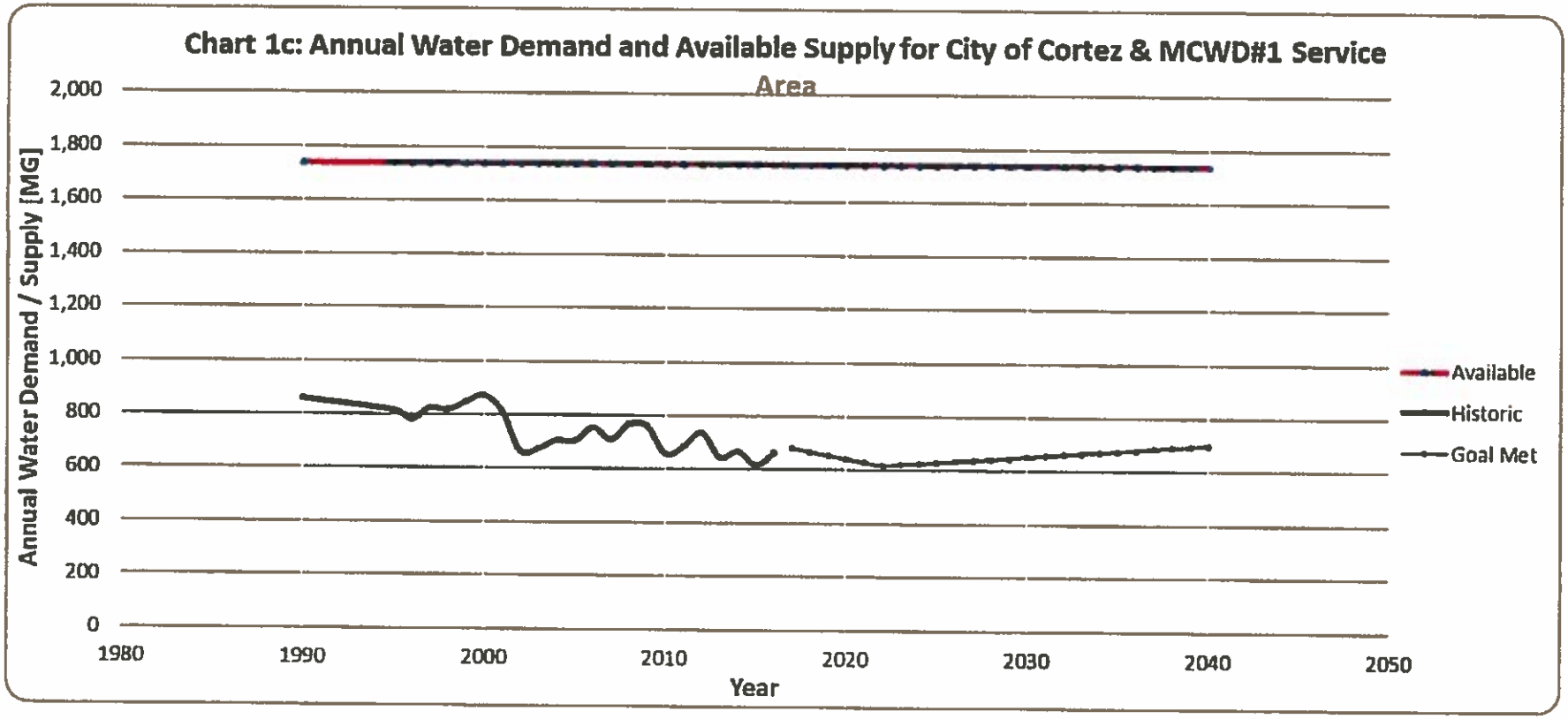


Chart 1c: Annual Water Demand and Available Supply for City of Cortez & MCWD#1 Service Area
Annual Water Demand / Supply [MG]
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
1980
1990
2000
2010
2020
2030
2040
2050
Year
Available
Historic
Goal Met

Table 2: Water Demand by User, Metered and Estimated Unmetered (2016 & 2017)

Metered Water User Type[1]	Water Demand [MG] 2016	2017	Change (2016 to 2017) Absolute [MG]	Percentage [%]
City of Cortez				
Residential (Single Unit)	327.8	319.6	-8.2	-2.5%
Residential (Multi-Unit)	52.9	73.7	20.7	39.1%
Commercial	145.9	123.8	-22.1	-15.1%
Schools	21.4	31.1	9.8	45.7%
Churches	6.2	7.2	1.0	15.6%
Government	10.9	7.6	-3.4	-30.9%
Total City of Cortez	565.1	562.9	-2.2	-0.4%
Montezuma County Water District No. 1	45.1	50.8	5.7	12.6%
TOTAL METERED WATER DEMAND	520.0	512.1	-7.9	-1.5%
Unmetered / Unmonitored Water Users (Estimated Water Use)				
Unmonitored Master Meter: Centennial Park Supplemental Irrigation, Swimming Pool, Street Sweepers[2]	1.0	1.0	0.0	0.0%
Unmetered: Hydrant Flushing Program	11.0	11.0	0.0	0.0%
TOTAL ESTIMATED UNMETERED WATER DEMAND	12.0	12.0	0.0	0.0%

Notes:

[1]Water demand by Ute Mountain Ute Tribe is accounted for separately

[2]Metered via a single master meter, but water use data used is not currently monitored

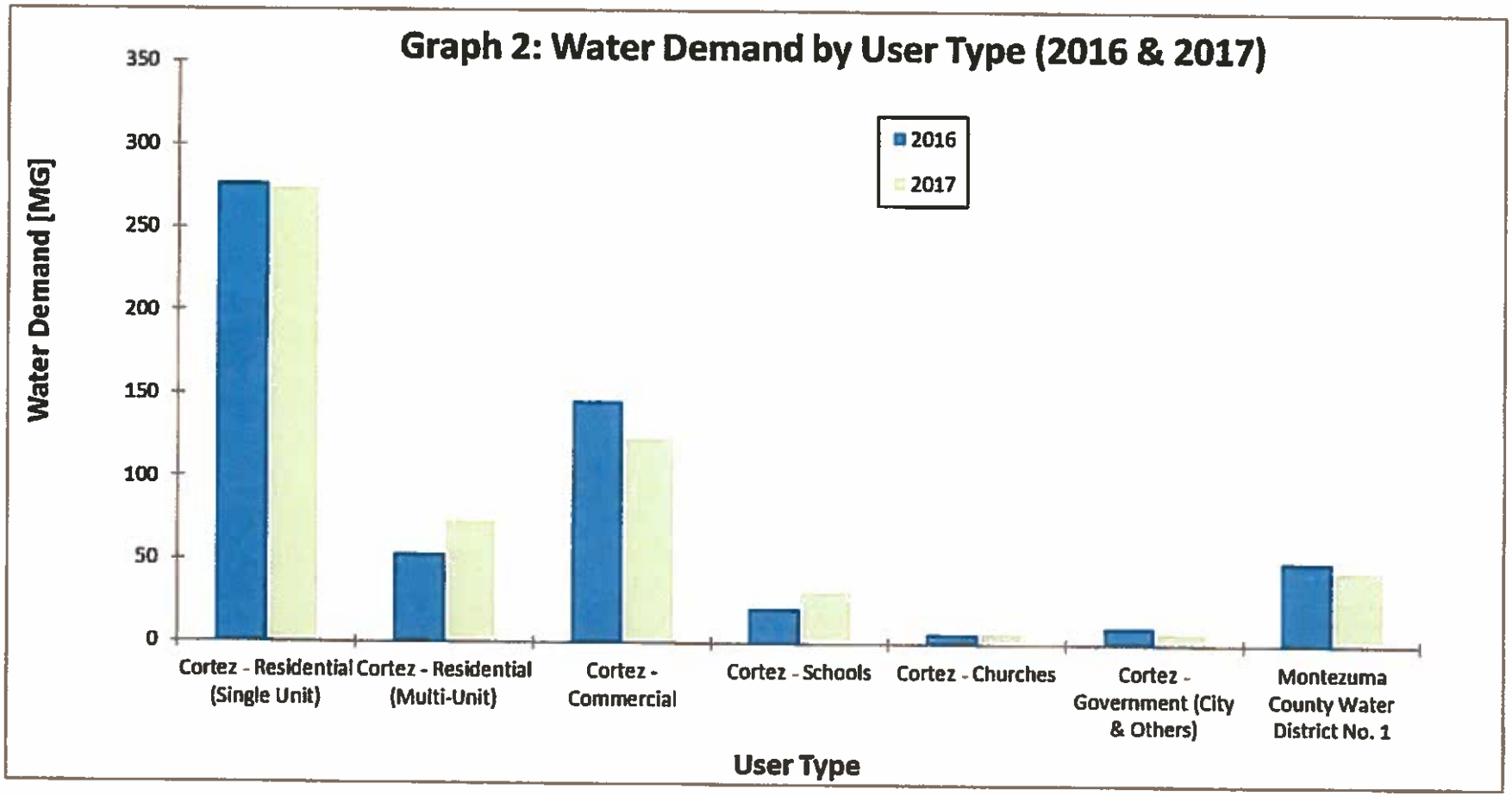

Graph 2: Water Demand by User Type (2016 & 2017)
Water Demand [MG]
350
300
250
200
150
100
50
0
2016
2017
Cortez - Residential (Single Unit)
Cortez - Residential (Multi-Unit)
Cortez - Commercial
Cortez - Schools
Cortez - Churches
Cortez - Government (City & Others)
Montezuma County Water District No. 1
User Type

Table 3: Number & Percent of Taps, Water Demand, Average Water Demand by User Type in City of Cortez (2016 & 2017)

Metered Water User Type	Number of Taps	Percent of Taps	Water Demand [MG]		Average Water Demand Per Tap [MG]	
			2016	2017	2016	2017
City of Cortez						
Residential (Single Unit)	2,879	80.8%	327.8	319.6	0.11	0.11
Residential (Multi-Unit)	179	5.0%	52.9	73.7	0.30	0.41
Commercial	425	11.9%	145.9	123.8	0.34	0.29
Schools	26	0.7%	21.4	31.1	0.82	1.20
Churches	29	0.8%	6.2	7.2	0.21	0.25
Government (City & Parks)	24	0.7%	10.9	7.6	0.46	0.31
TOTAL	3,562	100.0%	565.1	562.9		

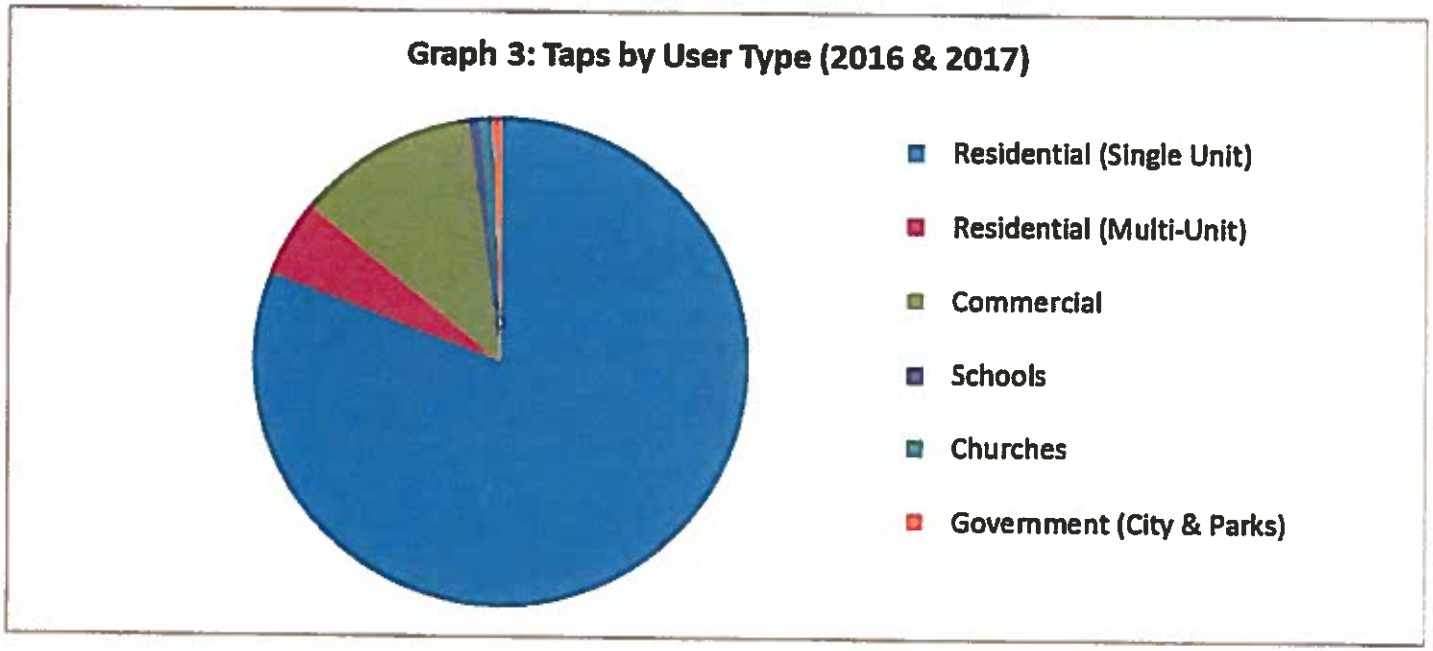


Table 4: Monthly Water Produced at Cortez WTP (2008 - 2017)

Units: [MG]	Year										
Month	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Monthly Average
January	58.9	49.0	44.2	54.5	37.4	47.2	37.8	38.5	41.1	41.0	45.0
February	60.1	39.2	36.8	48.3	34.7	38.5	34.6	33.8	37.1	37.6	40.0
March	57.2	46.1	42.8	50.9	38.3	40.8	39.6	42.9	40.8	42.6	44.2
April	62.4	55.2	52.9	63.7	61.1	51.2	44.9	53.9	47.3	54.9	54.7
May	106.8	110.6	93.0	95.9	118.6	92.1	90.7	62.8	81.6	86.7	93.9
June	135.4	116.1	129.5	136.2	142.0	122.8	120.6	102.7	128.8	132.1	126.6
July	135.9	150.1	120.0	141.7	133.4	124.9	135.0	111.3	127.0	130.4	131.0
August	137.8	141.3	91.8	128.1	126.0	100.8	107.4	109.0	100.3	114.8	115.7
September	112.7	109.6	105.9	96.3	99.5	68.9	91.0	97.7	91.0	99.8	97.2
October	69.2	62.4	65.9	60.7	63.8	52.8	61.0	66.2	65.7	55.5	62.3
November	41.9	39.1	39.6	36.6	38.8	36.4	37.6	37.6	42.6	41.2	39.1
December	39.9	40.5	48.2	39.0	40.4	37.5	38.9	40.3	40.5	40.9	40.6
Annual Total	1,018.2	959.2	870.6	951.9	934.0	813.7	838.9	796.7	843.5	877.5	

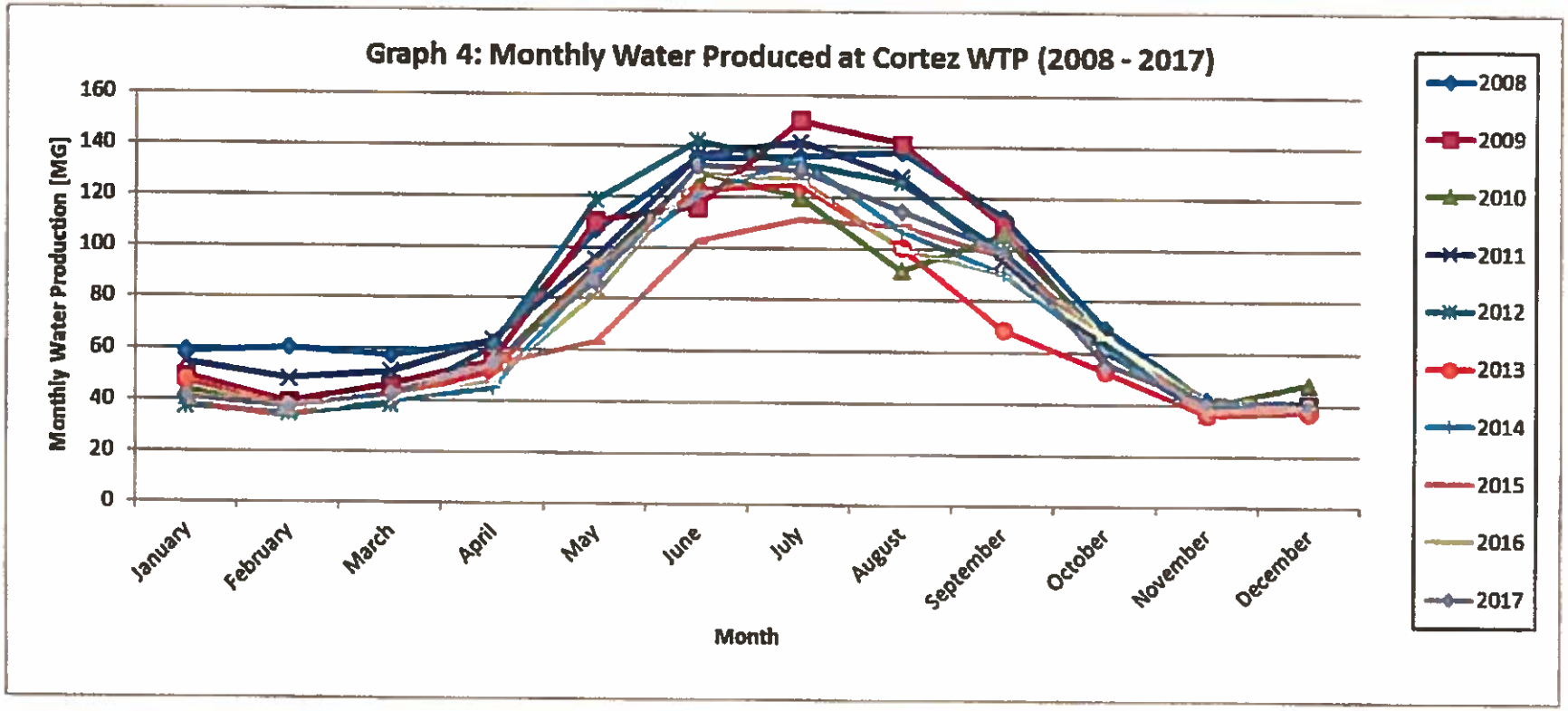


Table 5: Monthly Water Produced for City of Cortez & Montezuma County Water District #1 (2008 - 2017)

Units: [MG]

Month	Year										Monthly Average
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
January	37.1	37.4	29.1	28.9	29.7	36.2	29.3	29.1	31.3	30.5	31.8
February	45.7	28.8	24.5	26.4	26.2	27.4	27.6	25.0	28.0	27.7	28.7
March	42.0	32.7	29.0	28.6	29.1	30.3	31.5	32.5	30.5	31.2	31.7
April	45.7	42.6	38.4	40.7	48.6	40.2	34.6	39.5	36.5	42.8	41.0
May	86.2	90.8	76.9	68.9	97.8	75.1	75.0	48.2	66.0	71.0	75.6
June	103.0	95.4	107.2	103.2	116.4	99.7	97.8	81.1	101.4	104.9	101.0
July	111.8	122.2	95.0	112.0	106.6	100.0	108.8	89.6	103.0	101.4	105.0
August	114.5	114.4	72.7	101.7	99.1	82.0	87.0	86.0	80.0	91.0	92.8
September	94.8	89.1	83.3	76.6	77.4	55.5	71.3	78.3	74.0	79.3	78.0
October	52.7	47.9	48.0	44.0	50.1	42.1	48.1	51.8	52.8	41.8	47.9
November	33.0	29.9	26.5	27.3	29.2	28.2	28.5	27.5	31.6	30.7	29.2
December	28.5	29.4	26.8	28.7	29.4	29.1	30.0	29.2	30.0	30.2	29.1
Annual Total	795.0	760.6	657.3	687.0	739.6	645.9	669.3	617.8	665.1	682.6	

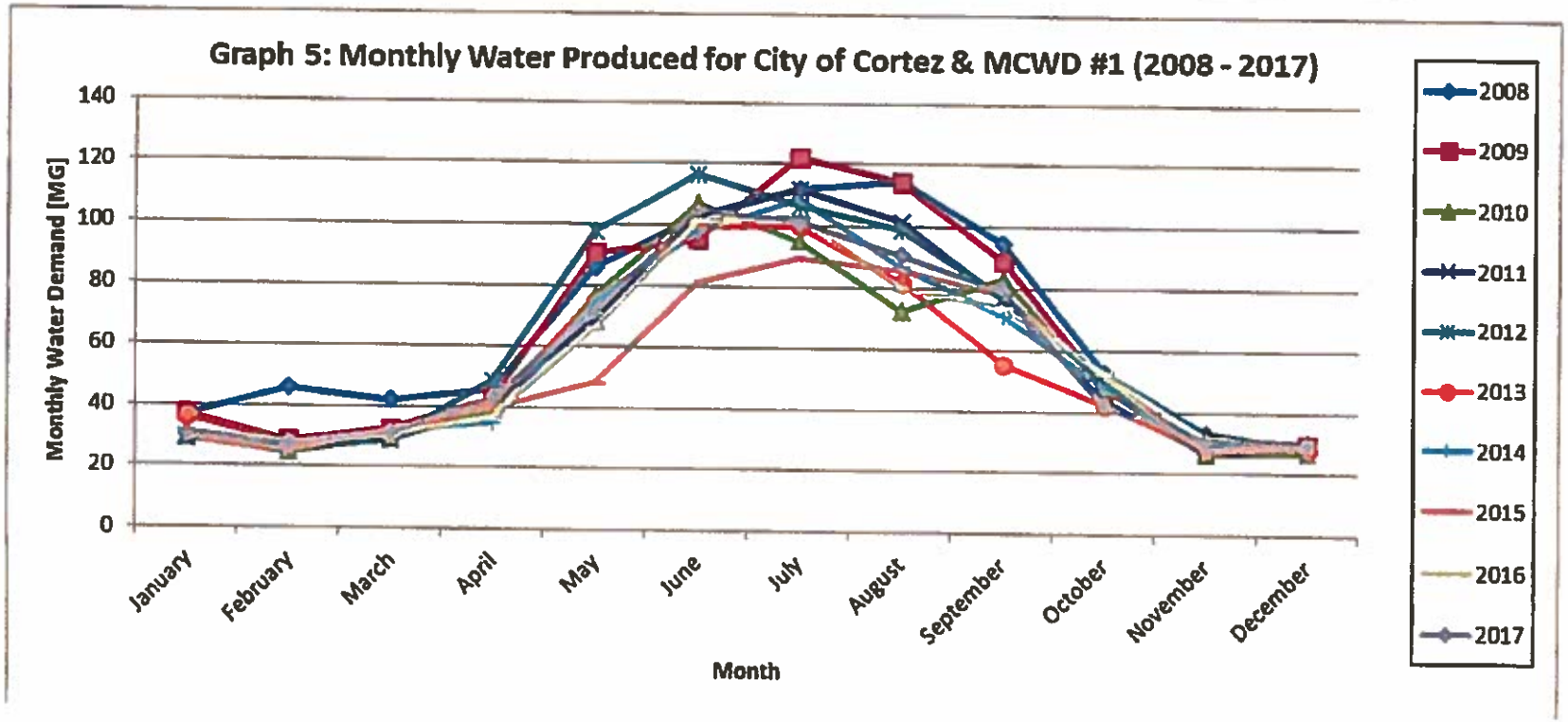


Table 6: Monthly Water Produced for Ute Mountain Ute Mountain Tribe (2008 - 2017)

Units: MG

Month	Year										Monthly Average
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
January	21.8	11.6	15.1	25.6	7.8	11.0	8.5	9.4	9.8	10.5	13.1
February	14.3	10.4	12.3	21.9	8.4	11.0	7.0	8.8	9.0	9.9	11.3
March	15.2	13.4	13.7	22.3	9.2	10.5	8.1	10.4	10.3	11.4	12.5
April	16.8	12.5	14.5	22.9	12.5	11.0	10.3	14.4	10.9	12.1	13.8
May	20.7	19.8	16.1	27.0	20.8	17.0	15.6	14.6	15.6	15.7	18.3
June	32.4	20.7	22.3	33.0	25.6	23.2	22.8	21.6	27.3	27.2	25.6
July	24.1	27.9	25.0	29.7	26.7	24.8	26.2	21.8	24.0	29.0	25.9
August	23.3	26.9	19.1	26.4	26.9	18.8	20.3	23.0	20.3	23.9	22.9
September	17.9	20.6	22.6	19.7	22.1	13.4	19.6	19.4	16.9	20.5	19.3
October	16.5	14.4	17.9	16.7	13.6	10.7	13.0	14.4	12.9	13.7	14.4
November	8.9	9.2	13.2	9.4	9.7	8.2	9.1	10.1	11.0	10.4	9.9
December	11.4	11.1	21.3	10.3	11.0	8.3	8.9	11.1	10.4	10.7	11.5
Annual Total	223.3	198.5	213.3	264.9	194.4	167.8	169.6	178.9	178.4	195.0	

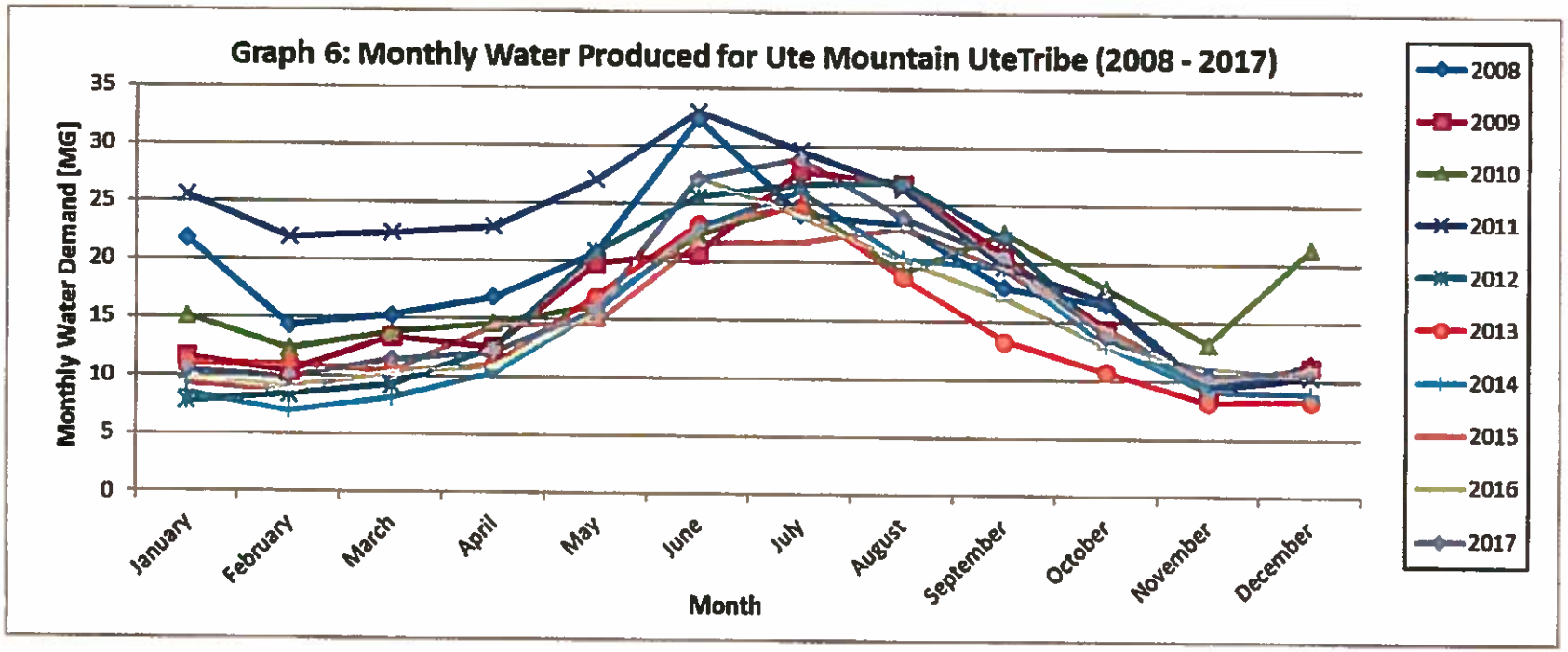


Table 7: Monthly Water Production by User (2008 - 2017)

Units: MG

Month	Total Water Produced	City of Cortez & MWD #1	Ute Mountain Ute Tribe
January	45.0	31.8	13.1
February	40.0	28.7	11.3
March	44.2	31.7	12.5
April	54.7	41.0	13.8
May	93.9	75.6	18.3
June	126.6	101.0	25.6
July	131.0	105.0	25.9
August	115.7	92.8	22.9
September	97.2	78.0	19.3
October	62.3	47.9	14.4
November	39.1	29.2	9.9
December	40.6	29.1	11.5

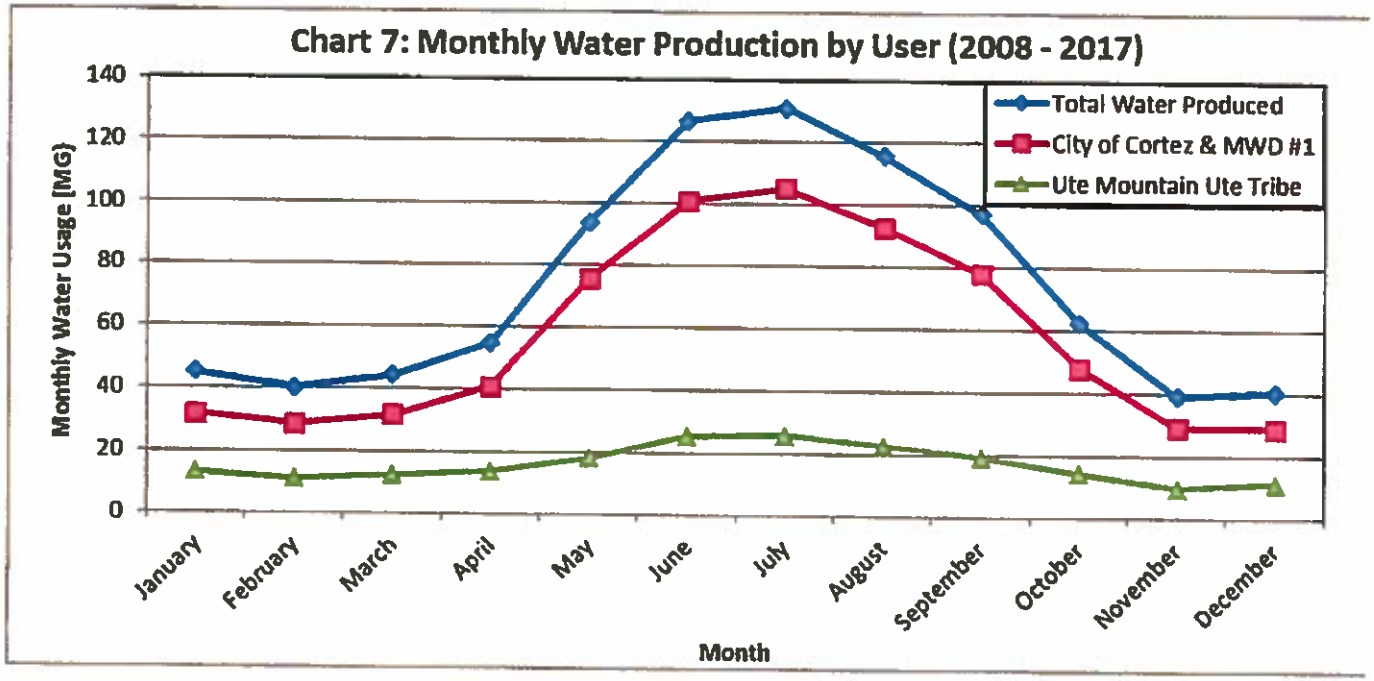


Table 8: Annual Water Production by User (2008 - 2017)

Units: MG

User	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Water Produced	1,018.2	959.2	870.6	951.9	934.0	813.7	838.9	796.7	843.5	877.5
City of Cortez & MWD #1	795.0	760.6	657.3	687.0	739.6	645.9	669.3	617.8	665.1	682.6
Ute Mountain Ute Tribe	223.3	198.5	213.3	264.9	194.4	167.8	169.6	178.9	178.4	195.0

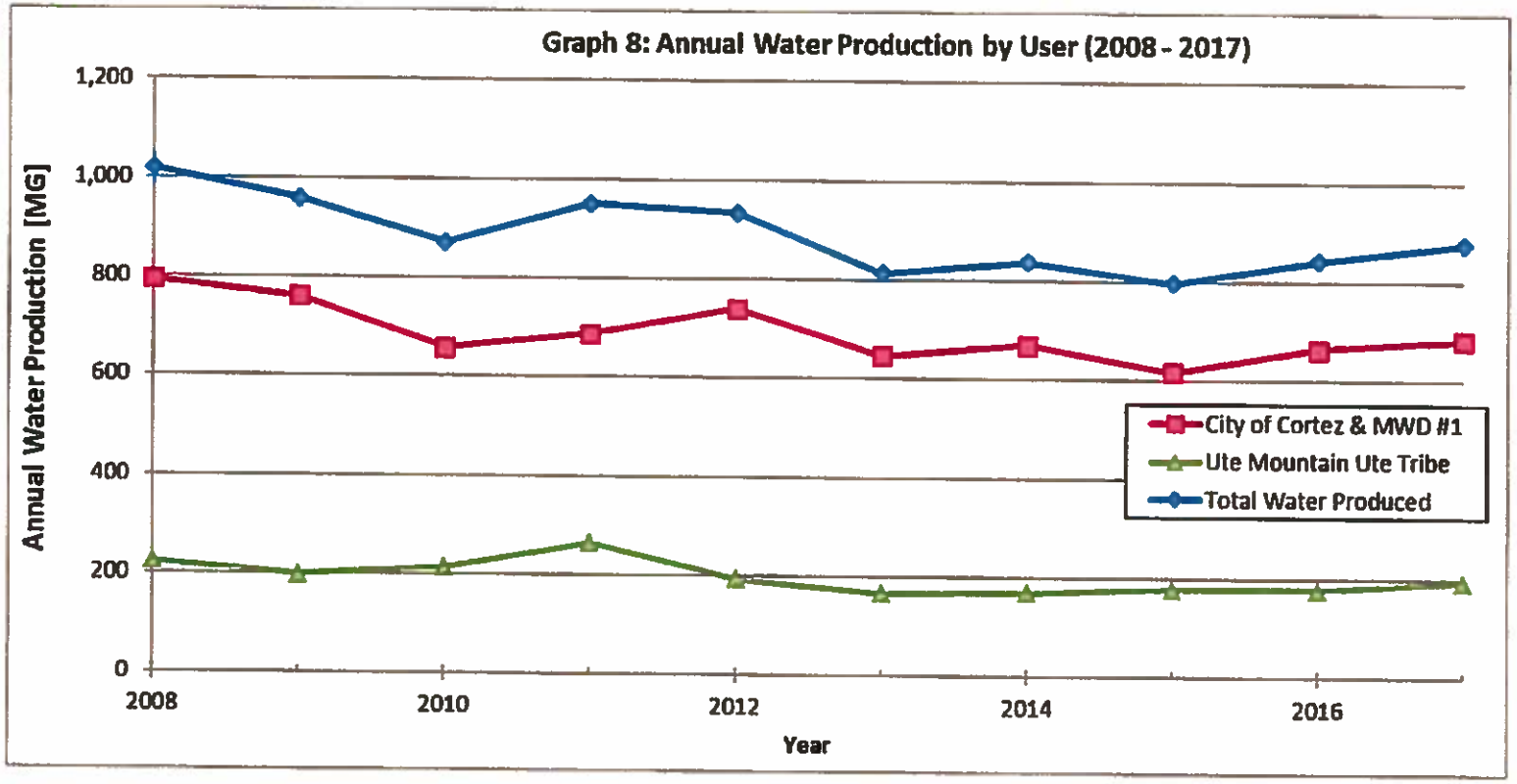
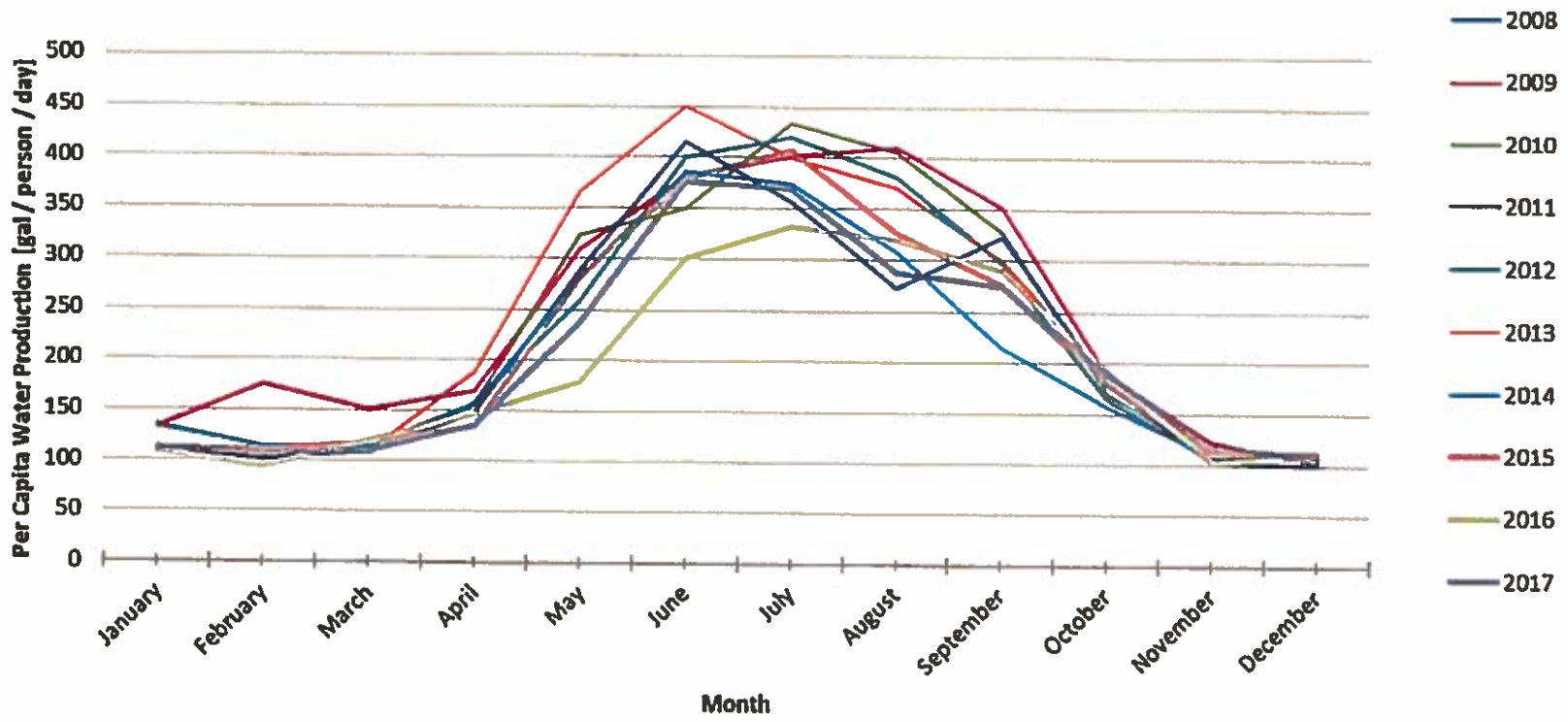


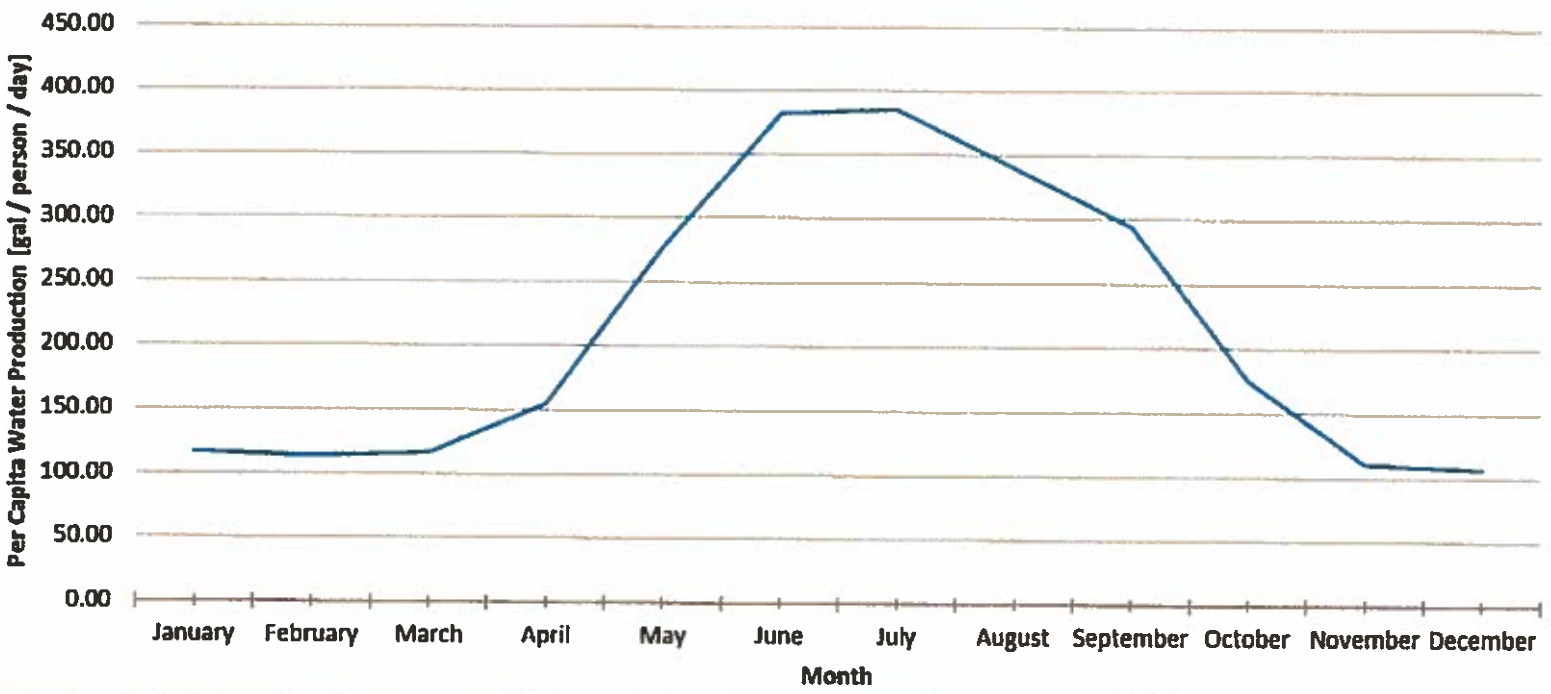
Table 9: Monthly Per Capita Daily Water Production for City of Cortez & Montezuma County Water District #1 (2008 - 2017)

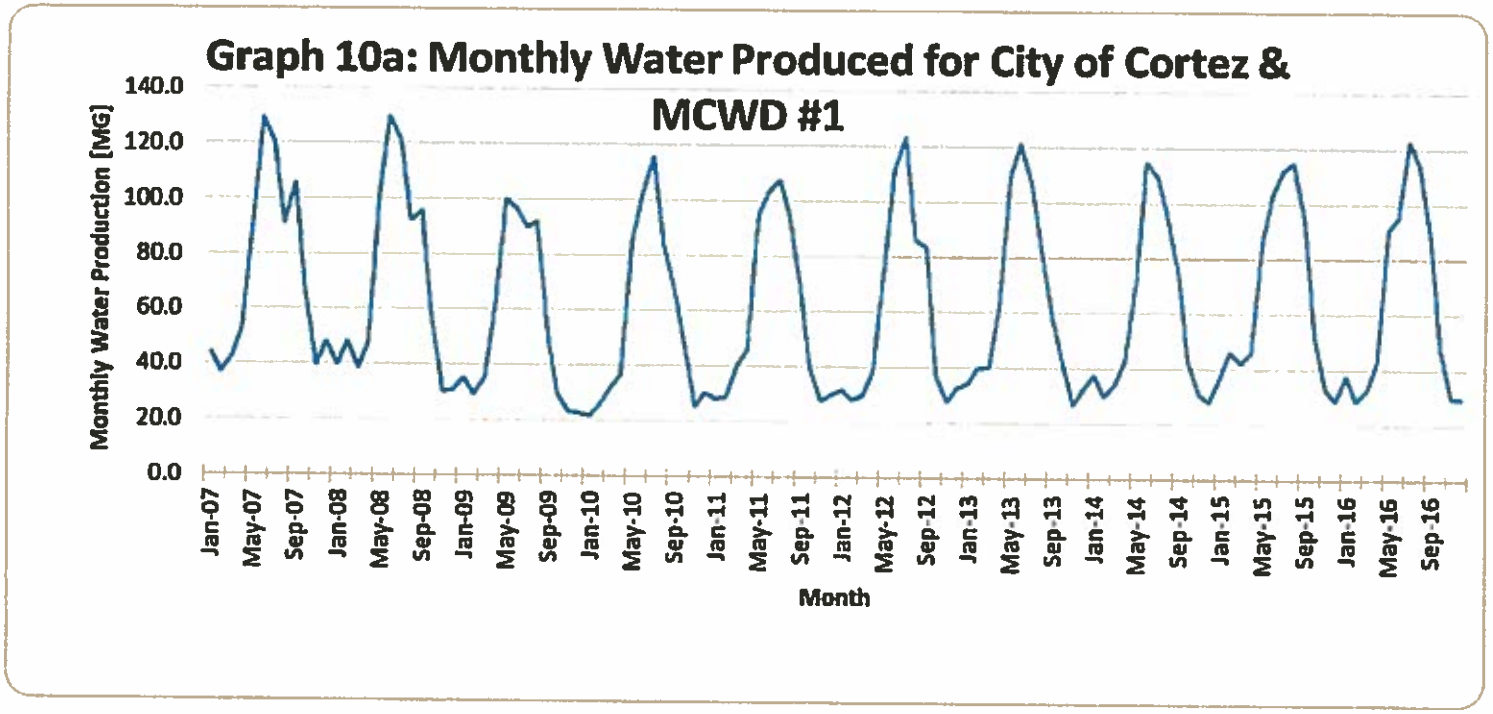
Month	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Monthly Average
January	133.0	132.8	108.93	108.26	111.09	135.53	109.62	107.98	112.23	108.49	116.79
February	175.3	113.1	101.62	109.38	105.09	113.82	110.36	92.64	107.61	108.96	113.80
March	150.7	116.2	108.78	107.25	109.13	113.51	117.96	120.28	109.42	111.00	116.42
April	169.3	156.6	148.55	157.74	188.15	155.62	133.86	146.41	135.29	157.32	154.88
May	309.2	322.7	287.98	258.15	366.47	281.42	281.10	178.80	236.76	252.58	277.51
June	381.8	350.2	415.18	399.58	450.60	385.81	378.45	300.73	376.25	385.65	382.42
July	401.4	434.3	356.08	419.46	399.42	374.81	407.60	331.97	369.82	360.79	385.56
August	411.0	406.4	272.25	381.16	371.21	307.27	326.12	318.67	287.16	323.49	340.47
September	351.6	327.1	322.49	296.52	299.65	214.91	276.10	290.11	274.53	291.33	294.43
October	189.2	170.3	179.66	164.76	187.88	157.73	180.04	192.11	189.45	148.53	175.96
November	122.3	109.6	102.49	105.53	112.88	109.18	110.25	101.91	117.15	112.99	110.43
December	102.3	104.4	100.46	107.50	109.99	109.14	112.31	108.15	107.87	107.56	106.97

Graph 9a: Monthly Per Capita Daily Water Production for City of Cortez & MCWD #1 (2008 - 2017)



Graph 9b: Ave. Monthly Per Capita Daily Water Production for City of Cortez & MCWD #1 (2008 - 2017)




Graph 10a: Monthly Water Produced for City of Cortez & MCWD #1
Monthly Water Production [MG]
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-07
May-07
Sep-07
Jan-08
May-08
Sep-08
Jan-09
May-09
Sep-09
Jan-10
May-10
Sep-10
Jan-11
May-11
Sep-11
Jan-12
May-12
Sep-12
Jan-13
May-13
Sep-13
Jan-14
May-14
Sep-14
Jan-15
May-15
Sep-15
Jan-16
May-16
Sep-16
Month

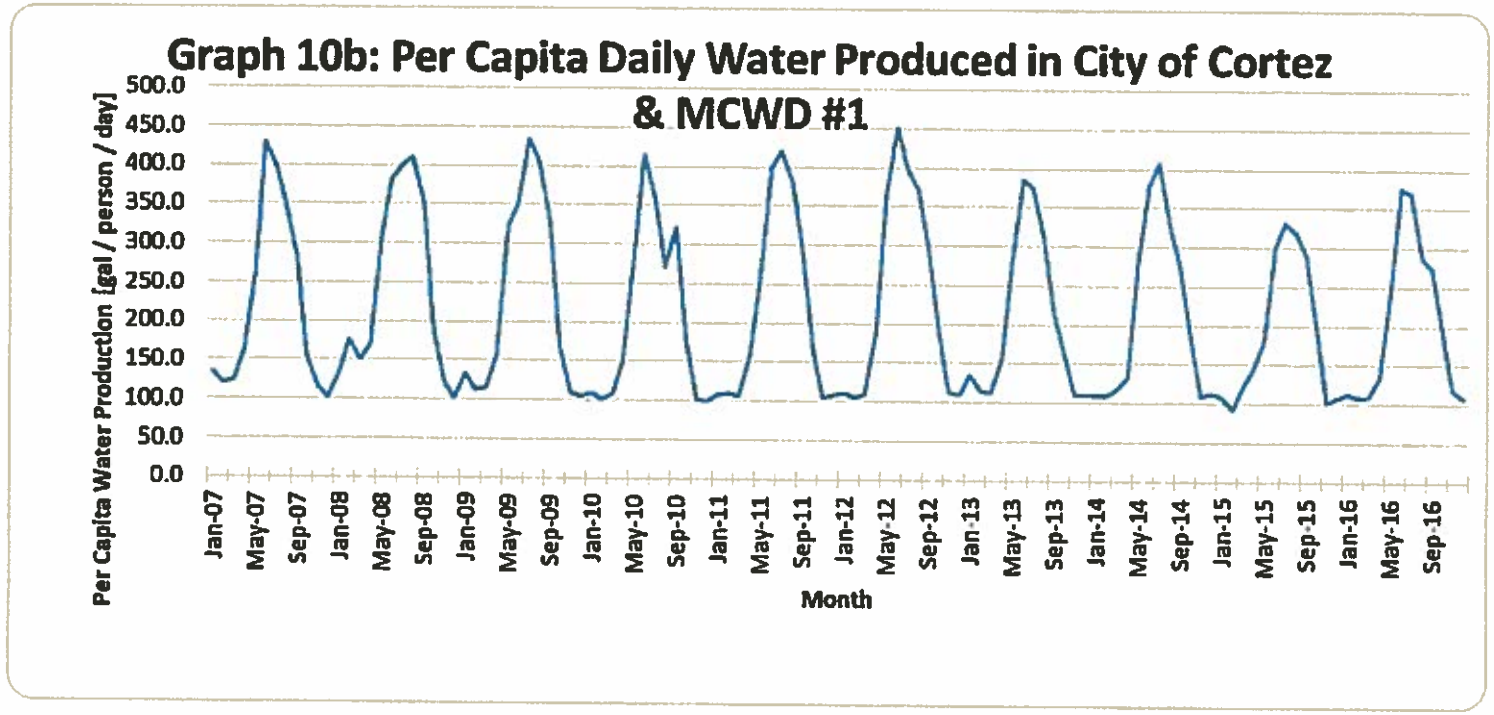
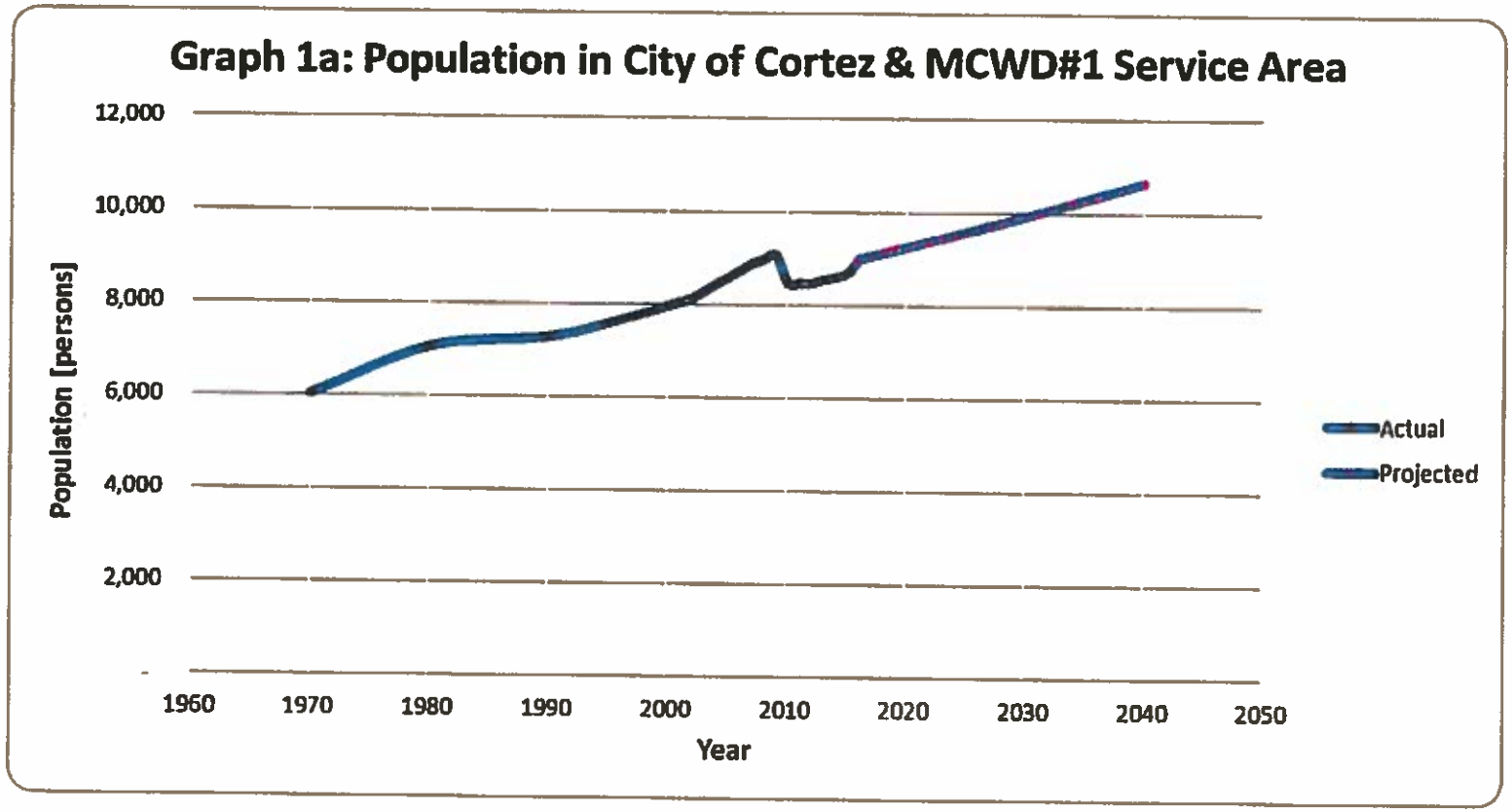
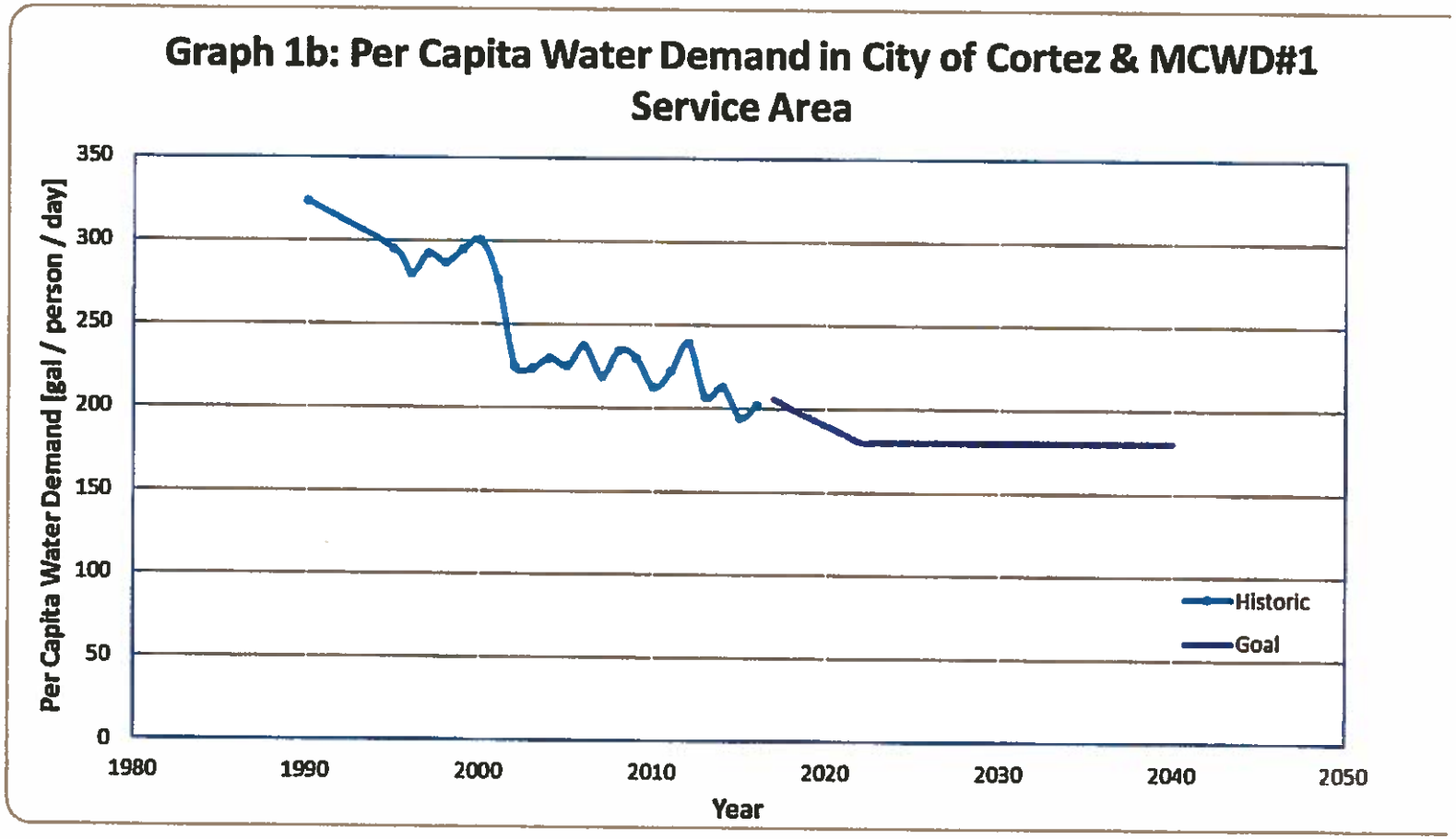

Graph 10b: Per Capita Daily Water Produced in City of Cortez & MCWD #1
Per Capita Water Production [gal / person / day]
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Jan-07
May-07
Sep-07
Jan-08
May-08
Sep-08
Jan-09
May-09
Sep-09
Jan-10
May-10
Sep-10
Jan-11
May-11
Sep-11
Jan-12
May-12
Sep-12
Jan-13
May-13
Sep-13
Jan-14
May-14
Sep-14
Jan-15
May-15
Sep-15
Jan-16
May-16
Sep-16
Month

Table 10: Estimates of Water Savings from Longer Filter Runs / Reduced Filter Backwash Frequency

Inputted value
Carried over value
Calculated value

Pre-Filter Improvements		Post-Filter Improvements	
Peak Use Period: June - August		**Peak Use Period: May - September**	
Backwash Volume (gal / backwash)	47,500	Backwash Volume (gal / backwash)	47,500
Period Length (days / period)	92	Period Length (days / period)	92
Filter Backwash Frequency (backwashes / day)	4	Time Between Backwashes (days/backwash)	2
Number of Filter Backwashes During Period (backwashes / period)	368	Number of Filter Backwashes During Period (backwashes / period)	184
Volume of Backwash Water to Lower Pond (gal / period)	17,480,000	Volume of Backwash Water to Lower Pond (gal / period)	8,740,000
Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333	Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333
Fraction of Water Recycled Back to Upper Pond (-)	0.667	Fraction of Water Recycled Back to Upper Pond (-)	0.667
Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	5,826,608	Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	2,913,304
Volume of Water Recycled Back to Upper Pond (gal / period)	11,653,392	Volume of Water Recycled Back to Upper Pond (gal / period)	5,826,696
Moderate Use Period: May, September		**Moderate Use Period: May, September**	
Backwash Volume (gal / backwash)	47,500	Backwash Volume (gal / backwash)	47,500
Period Length (days / period)	61	Period Length (days / period)	61
Filter Backwash Frequency (backwashes / day)	2	Filter Backwash Frequency (backwashes / day)	1
Number of Filter Backwashes During Period (backwashes / period)	122	Number of Filter Backwashes During Period (backwashes / period)	61
Volume of Backwash Water to Lower Pond (gal / period)	5,795,000	Volume of Backwash Water to Lower Pond (gal / period)	2,897,500
Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333	Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333
Fraction of Water Recycled Back to Upper Pond (-)	0.667	Fraction of Water Recycled Back to Upper Pond (-)	0.667
Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	1,931,647	Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	965,824
Volume of Water Recycled Back to Upper Pond (gal / period)	3,863,353	Volume of Water Recycled Back to Upper Pond (gal / period)	1,931,676
Off-Peak Use Period: October - April		**Off-Peak Use Period: October - April**	
Backwash Volume (gal / backwash)	47,500	Backwash Volume (gal / backwash)	47,500
Period Length (days / period)	212	Period Length (days / period)	212
Filter Backwash Frequency (backwashes / day)	1	Filter Backwash Frequency (backwashes / day)	0.33
Number of Filter Backwashes During Period (backwashes / period)	212	Number of Filter Backwashes During Period (backwashes / period)	69.96
Volume of Backwash Water to Lower Pond (gal / period)	10,070,000	Volume of Backwash Water to Lower Pond (gal / period)	3,323,100
Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333	Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333
Fraction of Water Recycled Back to Upper Pond (-)	0.667	Fraction of Water Recycled Back to Upper Pond (-)	0.667
Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	3,356,633	Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	1,107,689
Volume of Water Recycled Back to Upper Pond (gal / period)	6,713,367	Volume of Water Recycled Back to Upper Pond (gal / period)	2,215,411
TOTAL VOLUME OF BACKWASH WATER TO LOWER POND (gal / year)	33,345,000	TOTAL VOLUME OF BACKWASH WATER TO LOWER POND (gal / year)	14,960,600
TOTAL VOLUME RECYCLED BACK TO UPPER POND (gal / year)	22,230,111	TOTAL VOLUME RECYCLED BACK TO UPPER POND (gal / year)	9,973,783
TOTAL VOLUME LOST DUE TO EVAPORATION / INFILTRATION (gal / year)	11,114,889	TOTAL VOLUME LOST DUE TO EVAPORATION / INFILTRATION (gal / year)	4,986,817
REDUCTION IN VOLUME LOST DUE TO EVAPORATION / INFILTRATION (gal / year)	6,128,072	TOTAL WATER SAVINGS DUE TO REDUCED EVAPORATION / INFILTRATION & BACKWASH WATER RECYCLING (gal / year)	16,101,855
REDUCTION IN VOLUME LOST DUE TO EVAPORATION / INFILTRATION (MG / year)	6.13	TOTAL WATER SAVINGS DUE TO REDUCED EVAPORATION / INFILTRATION & BACKWASH WATER RECYCLING (MG / year)	16.1





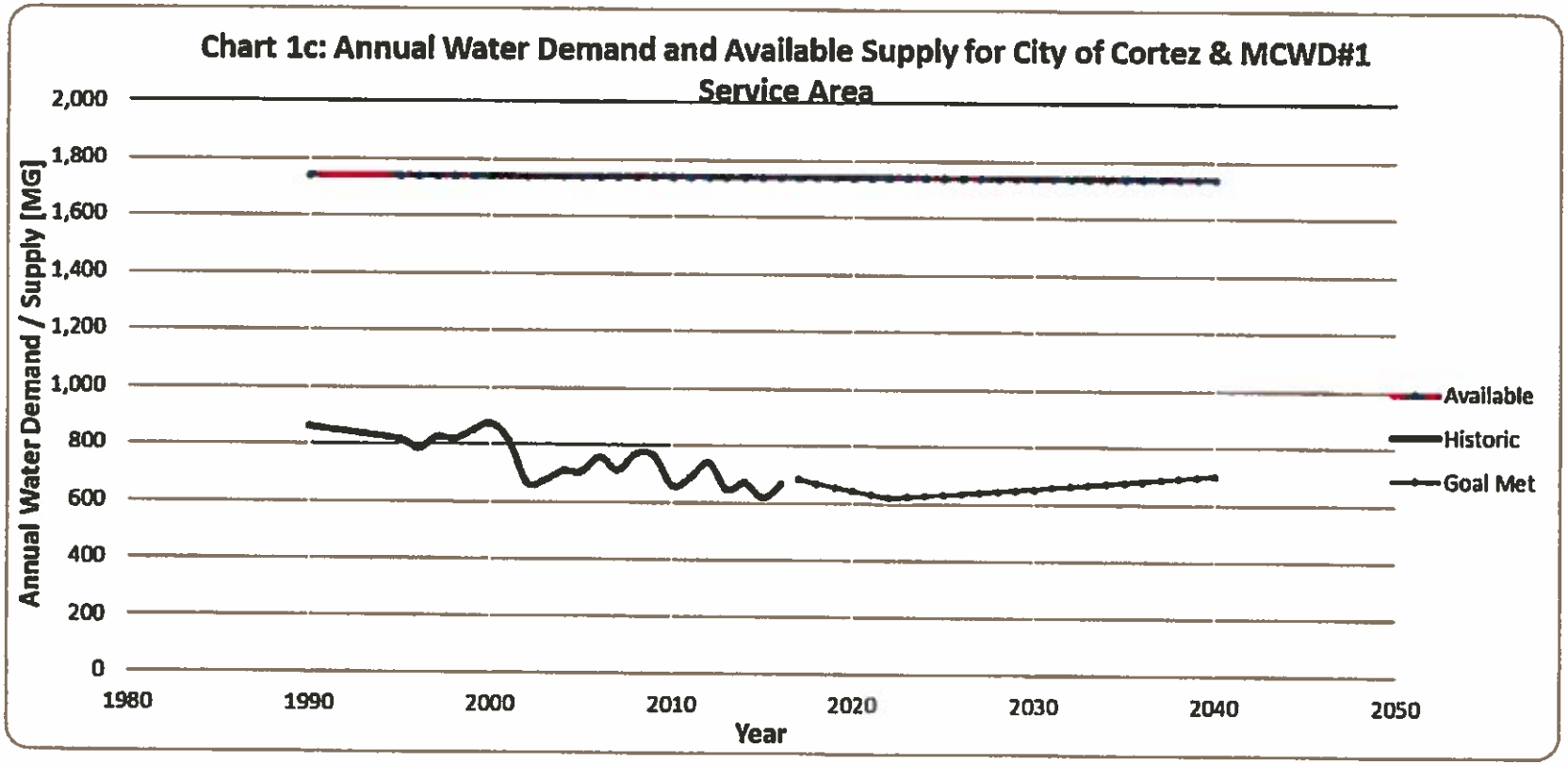


Table 2: Water Demand by User, Metered and Estimated Unmetered (2016 & 2017)

Metered Water User Type[1]	Water Demand [MG] 2016	2017	Change (2016 to 2017) Absolute [MG]	Percentage [%]
City of Cortez				
Residential (Single Unit)	327.8	319.6	-8.2	-2.5%
Residential (Multi-Unit)	52.9	73.7	20.7	39.1%
Commercial	145.9	123.8	-22.1	-15.1%
Schools	21.4	31.1	9.8	45.7%
Churches	6.2	7.2	1.0	15.6%
Government	10.9	7.6	-3.4	-30.9%
Total City of Cortez	565.1	562.9	-2.2	-0.4%
Montezuma County Water District No. 1	45.1	50.8	5.7	12.6%
TOTAL METERED WATER DEMAND	520.0	512.1	-7.9	-1.5%
Unmetered / Unmonitored Water Users (Estimated Water Use)				
Unmonitored Master Meter: Centennial Park Supplemental Irrigation, Swimming Pool, Street Sweepers[2]	1.0	1.0	0.0	0.0%
Unmetered: Hydrant Flushing Program	11.0	11.0	0.0	0.0%
TOTAL ESTIMATED UNMETERED WATER DEMAND	12.0	12.0	0.0	0.0%

Notes:

[1]Water demand by Ute Mountain Ute Tribe is accounted for separately

[2]Metered via a single master meter, but water use data used is not currently monitored

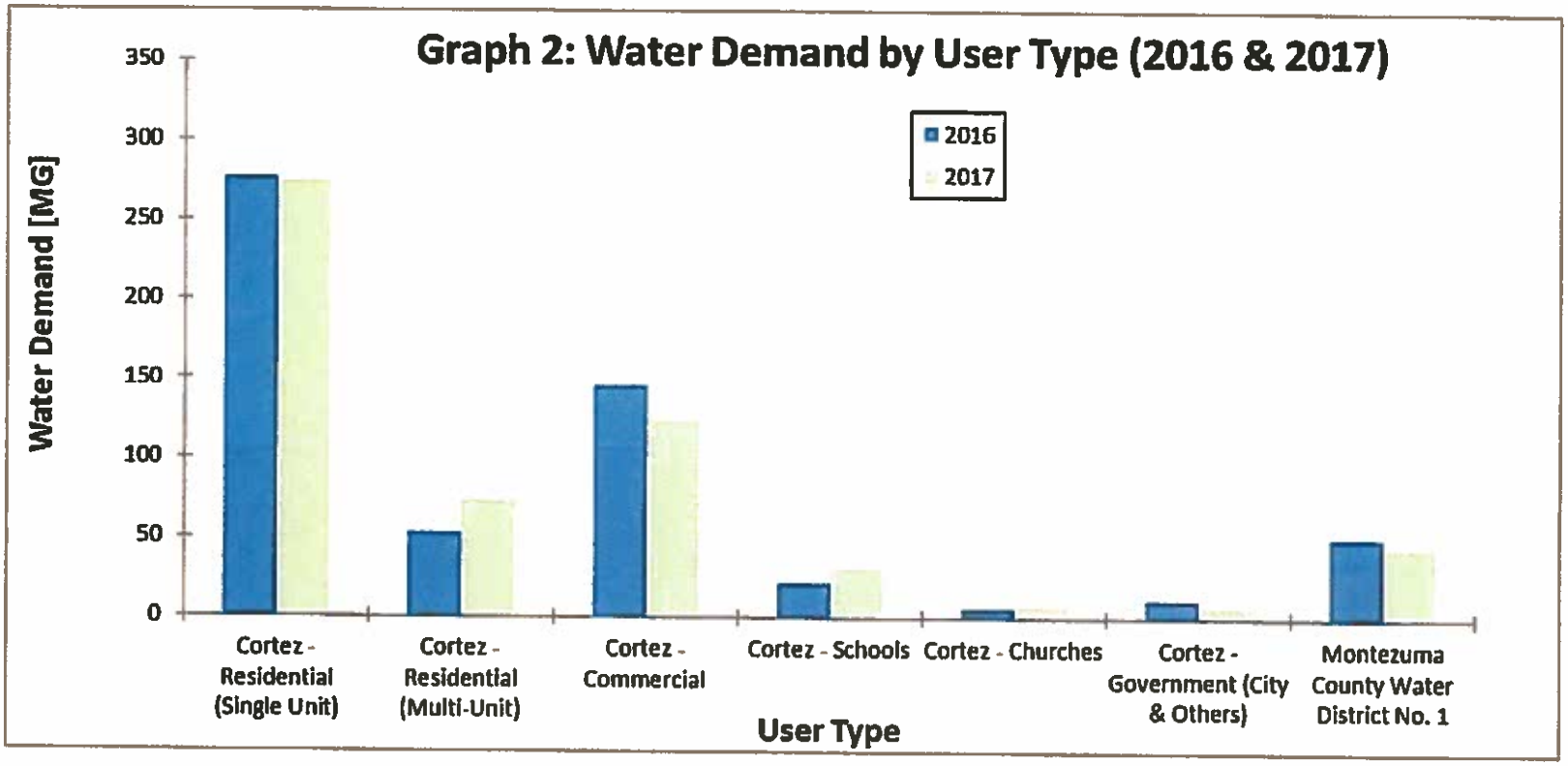

Graph 2: Water Demand by User Type (2016 & 2017)
Water Demand [MG]
350
300
250
200
150
100
50
0
2016
2017
Cortez - Residential (Single Unit)
Cortez - Residential (Multi-Unit)
Cortez - Commercial
Cortez - Schools
Cortez - Churches
Cortez - Government (City & Others)
Montezuma County Water District No. 1
User Type

Table 3: Number & Percent of Taps, Water Demand, Average Water Demand by User Type in City of Cortez (2016 & 2017)

Metered Water User Type	Number of Taps	Percent of Taps	Water Demand [MG] 2016	Water Demand [MG] 2017	Average Water Demand Per Tap [MG] 2016	Average Water Demand Per Tap [MG] 2017
City of Cortez						
Residential (Single Unit)	2,879	80.8%	327.8	319.6	0.11	0.11
Residential (Multi-Unit)	179	5.0%	52.9	73.7	0.30	0.41
Commercial	425	11.9%	145.9	123.8	0.34	0.29
Schools	26	0.7%	21.4	31.1	0.82	1.20
Churches	29	0.8%	6.2	7.2	0.21	0.25
Government (City & Parks)	24	0.7%	10.9	7.6	0.46	0.31
TOTAL	3,562	100.0%	565.1	562.9		

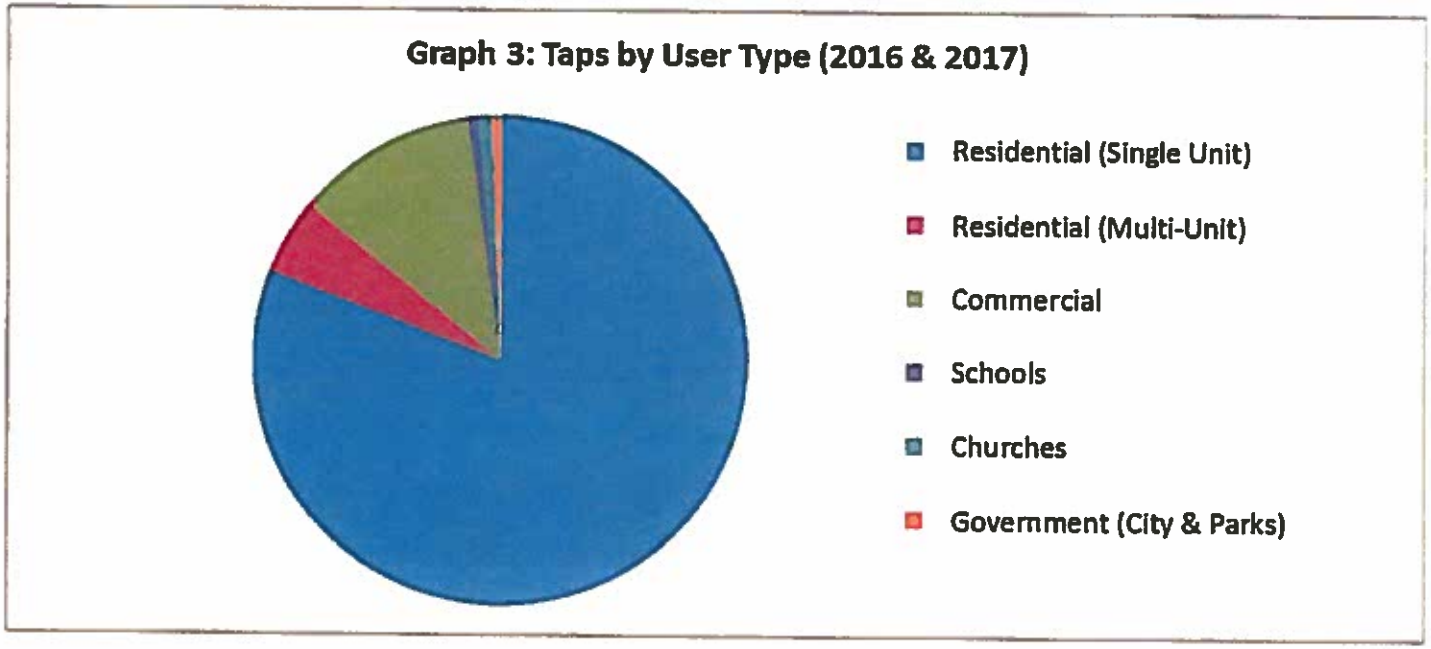


Table 4: Monthly Water Produced at Cortez WTP (2008 - 2017)

Units: [MG]	Year										
Month	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Monthly Average
January	58.9	49.0	44.2	54.5	37.4	47.2	37.8	38.5	41.1	41.0	45.0
February	60.1	39.2	36.8	48.3	34.7	38.5	34.6	33.8	37.1	37.6	40.0
March	57.2	46.1	42.8	50.9	38.3	40.8	39.6	42.9	40.8	42.6	44.2
April	62.4	55.2	52.9	63.7	61.1	51.2	44.9	53.9	47.3	54.9	54.7
May	106.8	110.6	93.0	95.9	118.6	92.1	90.7	62.8	81.6	86.7	93.9
June	135.4	116.1	129.5	136.2	142.0	122.8	120.6	102.7	128.8	132.1	126.6
July	135.9	150.1	120.0	141.7	133.4	124.9	135.0	111.3	127.0	130.4	131.0
August	137.8	141.3	91.8	128.1	126.0	100.8	107.4	109.0	100.3	114.8	115.7
September	112.7	109.6	105.9	96.3	99.5	68.9	91.0	97.7	91.0	99.8	97.2
October	69.2	62.4	65.9	60.7	63.8	52.8	61.0	66.2	65.7	55.5	62.3
November	41.9	39.1	39.6	36.6	38.8	36.4	37.6	37.6	42.6	41.2	39.1
December	39.9	40.5	48.2	39.0	40.4	37.5	38.9	40.3	40.5	40.9	40.6
Annual Total	1,018.2	959.2	870.6	951.9	934.0	813.7	838.9	796.7	843.5	877.5	

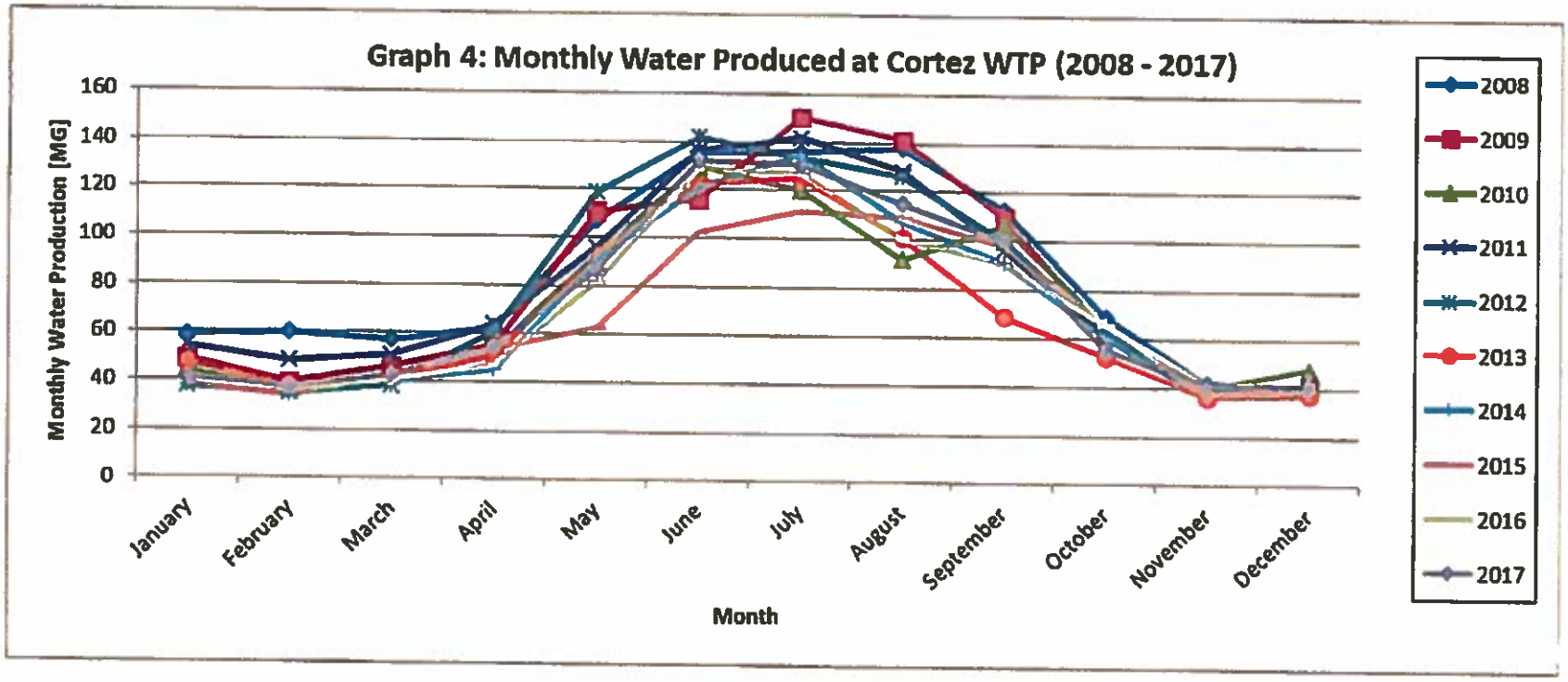


Table 5: Monthly Water Produced for City of Cortez & Montezuma County Water District #1 (2008 - 2017)

Units: [MG]

Month	Year										Monthly Average
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
January	37.1	37.4	29.1	28.9	29.7	36.2	29.3	29.1	31.3	30.5	31.8
February	45.7	28.8	24.5	26.4	26.2	27.4	27.6	25.0	28.0	27.7	28.7
March	42.0	32.7	29.0	28.6	29.1	30.3	31.5	32.5	30.5	31.2	31.7
April	45.7	42.6	38.4	40.7	48.6	40.2	34.6	39.5	36.5	42.8	41.0
May	86.2	90.8	76.9	68.9	97.8	75.1	75.0	48.2	66.0	71.0	75.6
June	103.0	95.4	107.2	103.2	116.4	99.7	97.8	81.1	101.4	104.9	101.0
July	111.8	122.2	95.0	112.0	106.6	100.0	108.8	89.6	103.0	101.4	105.0
August	114.5	114.4	72.7	101.7	99.1	82.0	87.0	86.0	80.0	91.0	92.8
September	94.8	89.1	83.3	76.6	77.4	55.5	71.3	78.3	74.0	79.3	78.0
October	52.7	47.9	48.0	44.0	50.1	42.1	48.1	51.8	52.8	41.8	47.9
November	33.0	29.9	26.5	27.3	29.2	28.2	28.5	27.5	31.6	30.7	29.2
December	28.5	29.4	26.8	28.7	29.4	29.1	30.0	29.2	30.0	30.2	29.1
Annual Total	795.0	760.6	657.3	687.0	739.6	645.9	669.3	617.8	665.1	682.6	

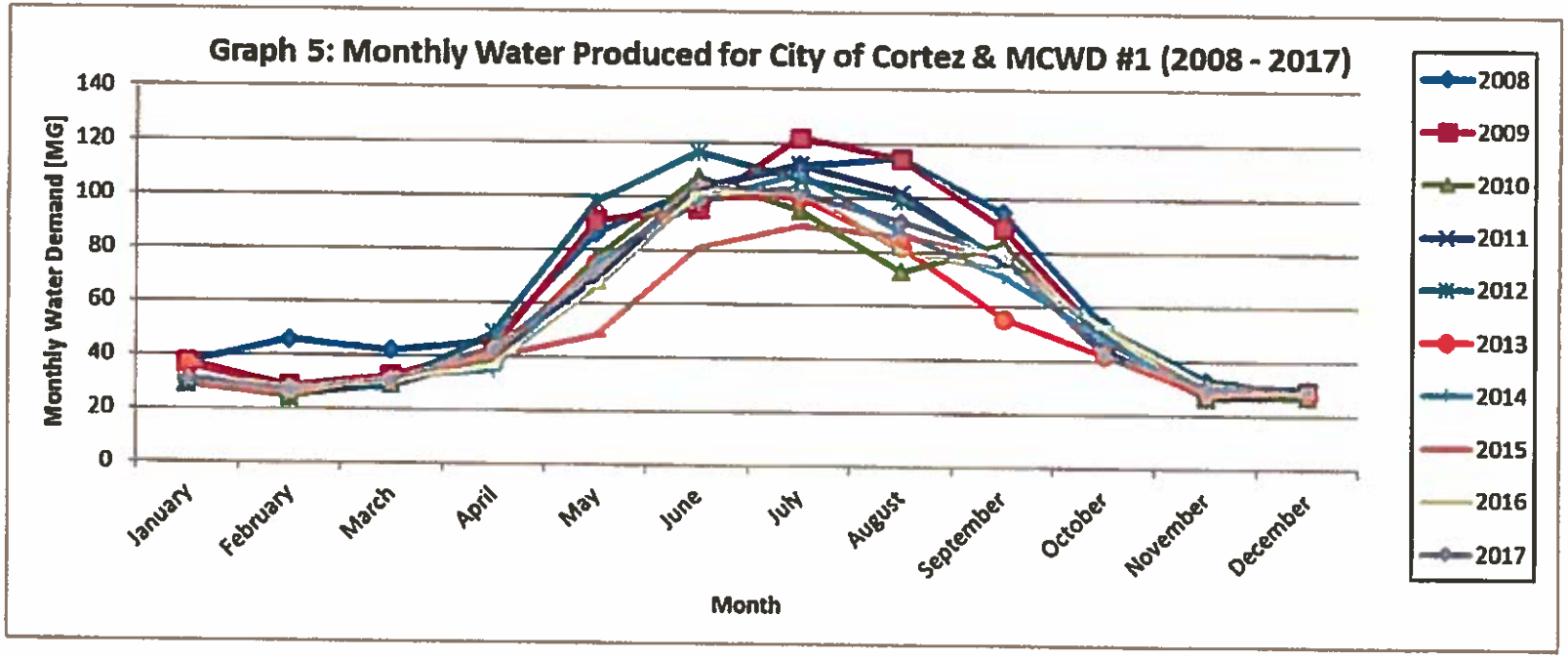


Table 6: Monthly Water Produced for Ute Mountain Ute Mountain Tribe (2008 - 2017)

Units: MG	Year										
Month	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Monthly Average
January	21.8	11.6	15.1	25.6	7.8	11.0	8.5	9.4	9.8	10.5	13.1
February	14.3	10.4	12.3	21.9	8.4	11.0	7.0	8.8	9.0	9.9	11.3
March	15.2	13.4	13.7	22.3	9.2	10.5	8.1	10.4	10.3	11.4	12.5
April	16.8	12.5	14.5	22.9	12.5	11.0	10.3	14.4	10.9	12.1	13.8
May	20.7	19.8	16.1	27.0	20.8	17.0	15.6	14.6	15.6	15.7	18.3
June	32.4	20.7	22.3	33.0	25.6	23.2	22.8	21.6	27.3	27.2	25.6
July	24.1	27.9	25.0	29.7	26.7	24.8	26.2	21.8	24.0	29.0	25.9
August	23.3	26.9	19.1	26.4	26.9	18.8	20.3	23.0	20.3	23.9	22.9
September	17.9	20.6	22.6	19.7	22.1	13.4	19.6	19.4	16.9	20.5	19.3
October	16.5	14.4	17.9	16.7	13.6	10.7	13.0	14.4	12.9	13.7	14.4
November	8.9	9.2	13.2	9.4	9.7	8.2	9.1	10.1	11.0	10.4	9.9
December	11.4	11.1	21.3	10.3	11.0	8.3	8.9	11.1	10.4	10.7	11.5
Annual Total	223.3	198.5	213.3	264.9	194.4	167.8	169.6	178.9	178.4	195.0	

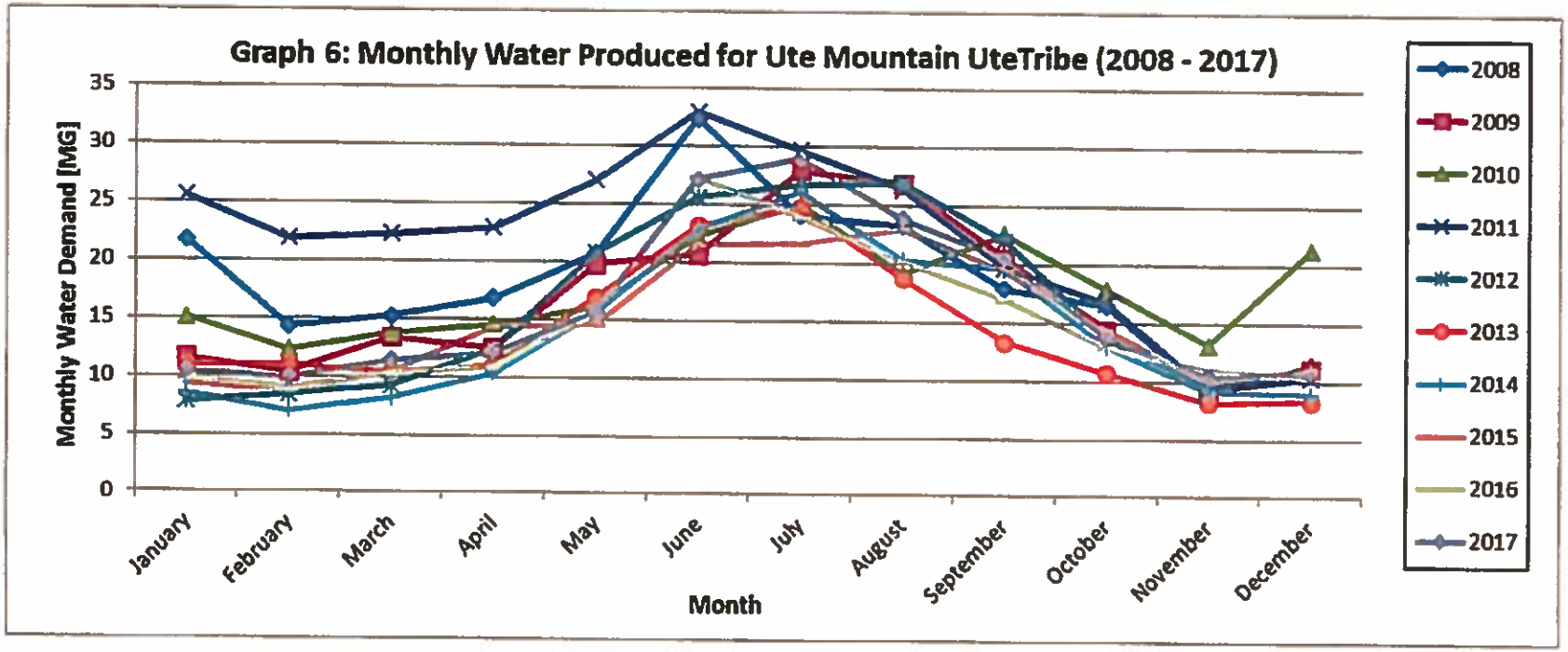


Table 7: Monthly Water Production by User (2008 - 2017)

Units: MG

Month	Total Water Produced	City of Cortez & MWD #1	Ute Mountain Ute Tribe
January	45.0	31.8	13.1
February	40.0	28.7	11.3
March	44.2	31.7	12.5
April	54.7	41.0	13.8
May	93.9	75.6	18.3
June	126.6	101.0	25.6
July	131.0	105.0	25.9
August	115.7	92.8	22.9
September	97.2	78.0	19.3
October	62.3	47.9	14.4
November	39.1	29.2	9.9
December	40.6	29.1	11.5

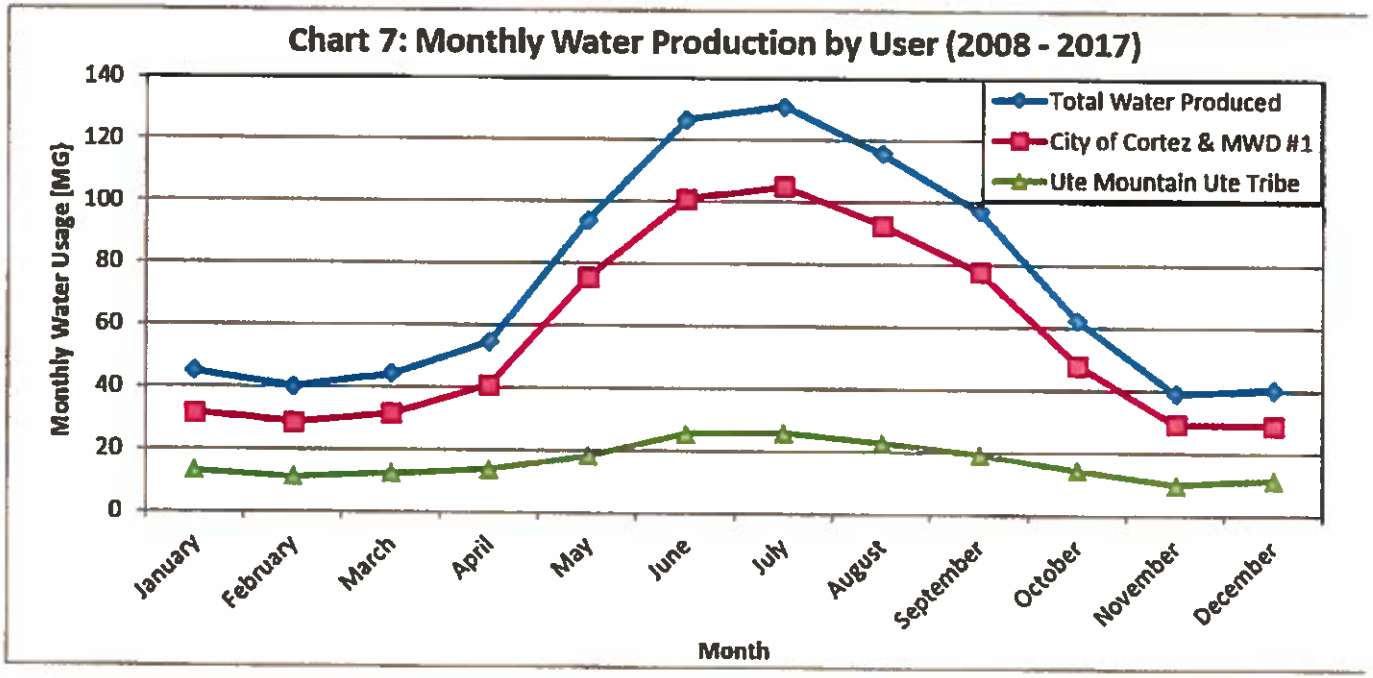


Table 8: Annual Water Production by User (2008 - 2017)

Units: MG

User	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Water Produced	1,018.2	959.2	870.6	951.9	934.0	813.7	838.9	796.7	843.5	877.5
City of Cortez & MWD #1	795.0	760.6	657.3	687.0	739.6	645.9	669.3	617.8	665.1	682.6
Ute Mountain Ute Tribe	223.3	198.5	213.3	264.9	194.4	167.8	169.6	178.9	178.4	195.0

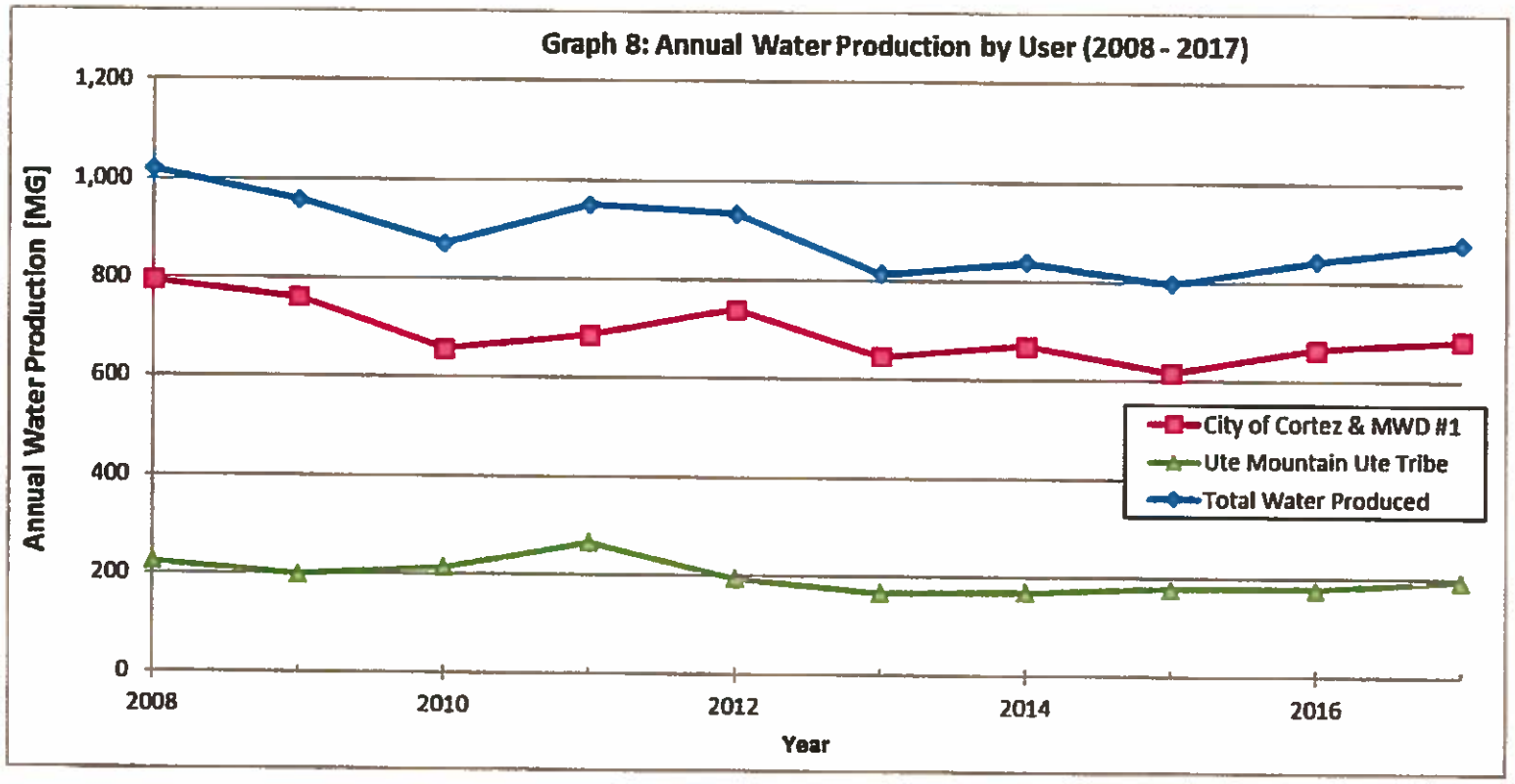
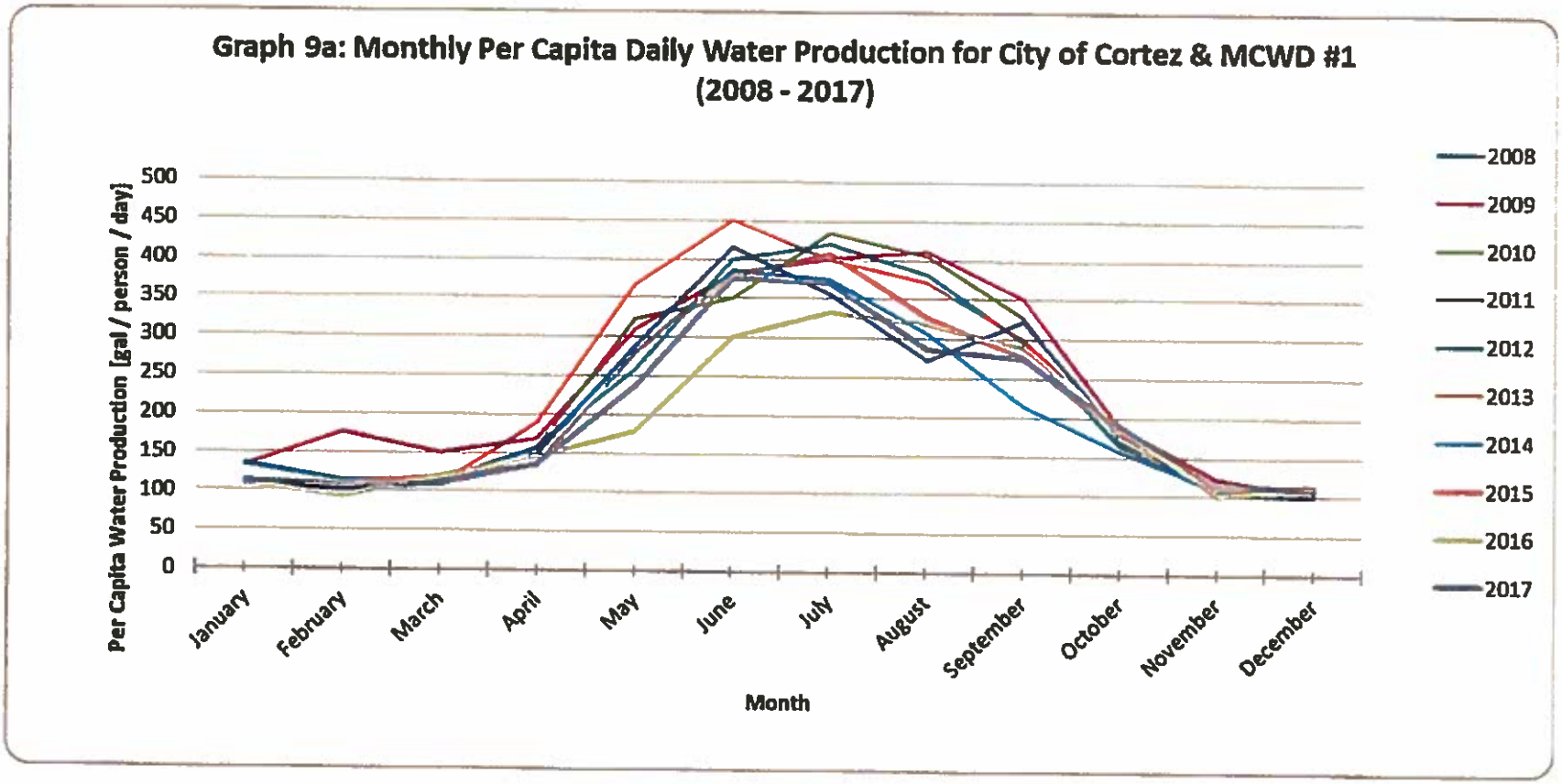
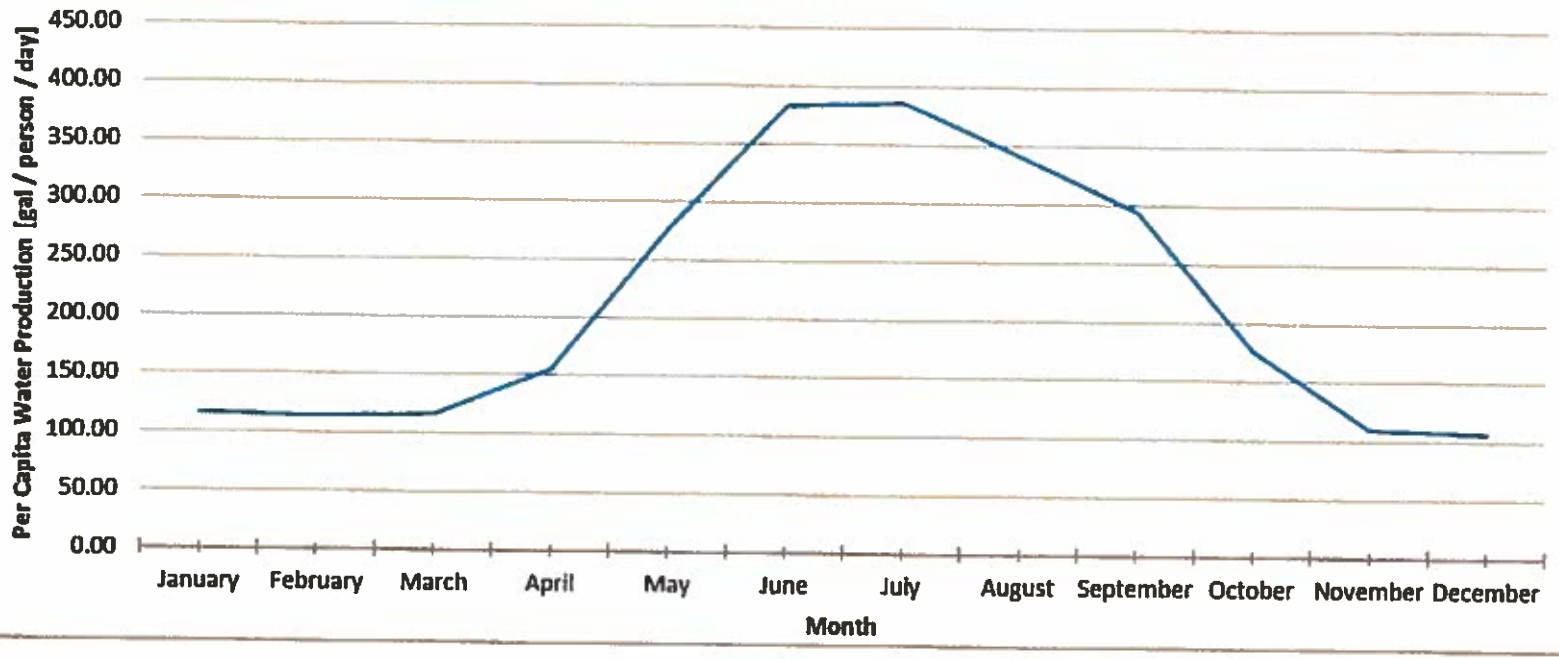


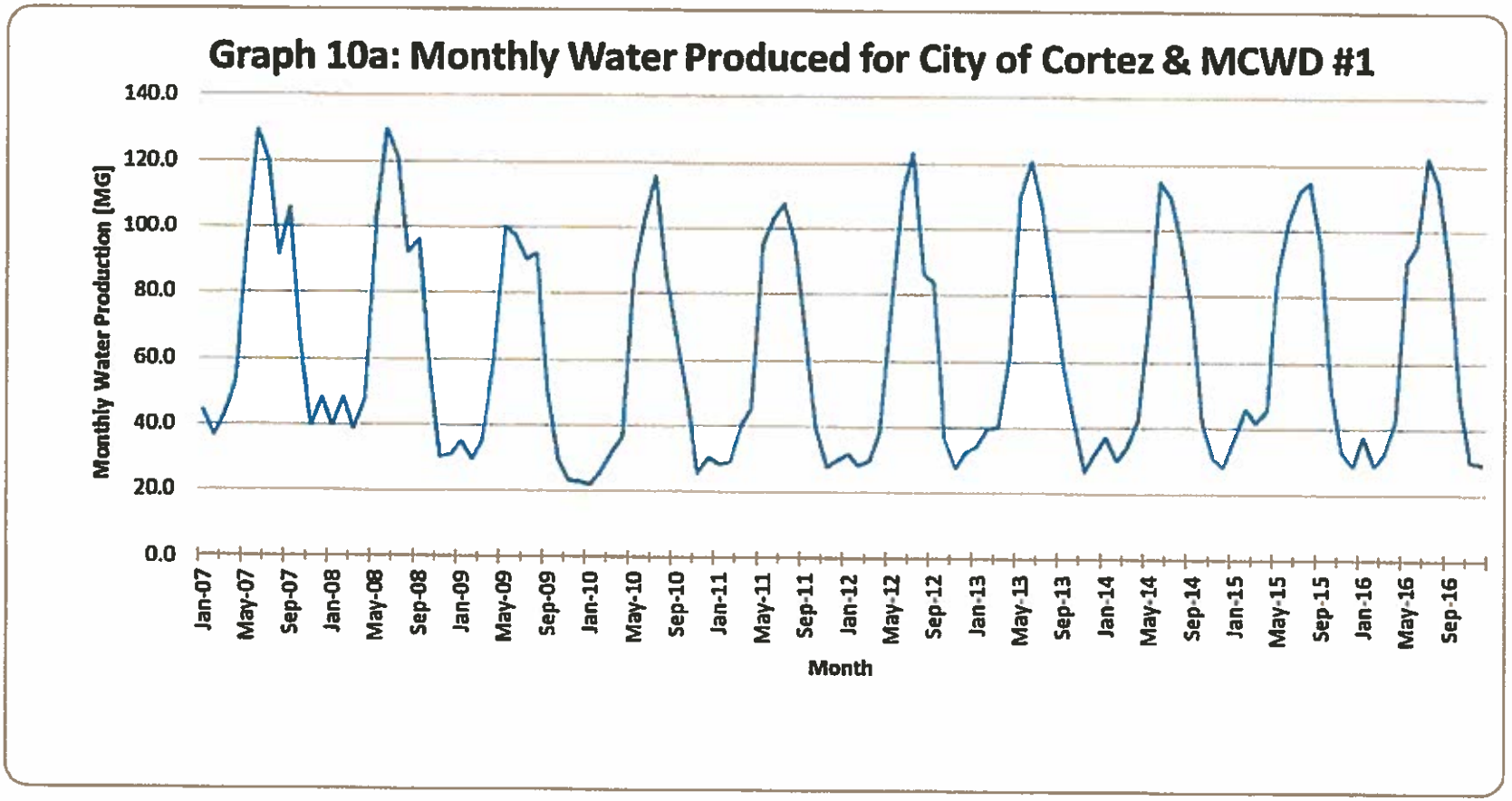
Table 9: Monthly Per Capita Daily Water Production for City of Cortez & Montezuma County Water District #1 (2008 - 2017)

Month	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Monthly Average
January	133.0	132.8	108.93	108.26	111.09	135.53	109.62	107.98	112.23	108.49	116.79
February	175.3	113.1	101.62	109.38	105.09	113.82	110.36	92.64	107.61	108.96	113.80
March	150.7	116.2	108.78	107.25	109.13	113.51	117.96	120.28	109.42	111.00	116.42
April	169.3	156.6	148.55	157.74	188.15	155.62	133.86	146.41	135.29	157.32	154.88
May	309.2	322.7	287.98	258.15	366.47	281.42	281.10	178.80	236.76	252.58	277.51
June	381.8	350.2	415.18	399.58	450.60	385.81	378.45	300.73	376.25	385.65	382.42
July	401.4	434.3	356.08	419.46	399.42	374.81	407.60	331.97	369.82	360.79	385.56
August	411.0	406.4	272.25	381.16	371.21	307.27	326.12	318.67	287.16	323.49	340.47
September	351.6	327.1	322.49	296.52	299.65	214.91	276.10	290.11	274.53	291.33	294.43
October	189.2	170.3	179.66	164.76	187.88	157.73	180.04	192.11	189.45	148.53	175.96
November	122.3	109.6	102.49	105.53	112.88	109.18	110.25	101.91	117.15	112.99	110.43
December	102.3	104.4	100.46	107.50	109.99	109.14	112.31	108.15	107.87	107.56	106.97


Graph 9a: Monthly Per Capita Daily Water Production for City of Cortez & MCWD #1 (2008 - 2017)
Per Capita Water Production [gal / person / day]
500
450
400
350
300
250
200
150
100
50
0
January
February
March
April
May
June
July
August
September
October
November
December
Month
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017

Graph 9b: Ave. Monthly Per Capita Daily Water Production for City of Cortez & MCWD #1 (2008 - 2017)




Graph 10a: Monthly Water Produced for City of Cortez & MCWD #1
Monthly Water Production [MG]
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Jan-07
May-07
Sep-07
Jan-08
May-08
Sep-08
Jan-09
May-09
Sep-09
Jan-10
May-10
Sep-10
Jan-11
May-11
Sep-11
Jan-12
May-12
Sep-12
Jan-13
May-13
Sep-13
Jan-14
May-14
Sep-14
Jan-15
May-15
Sep-15
Jan-16
May-16
Sep-16
Month

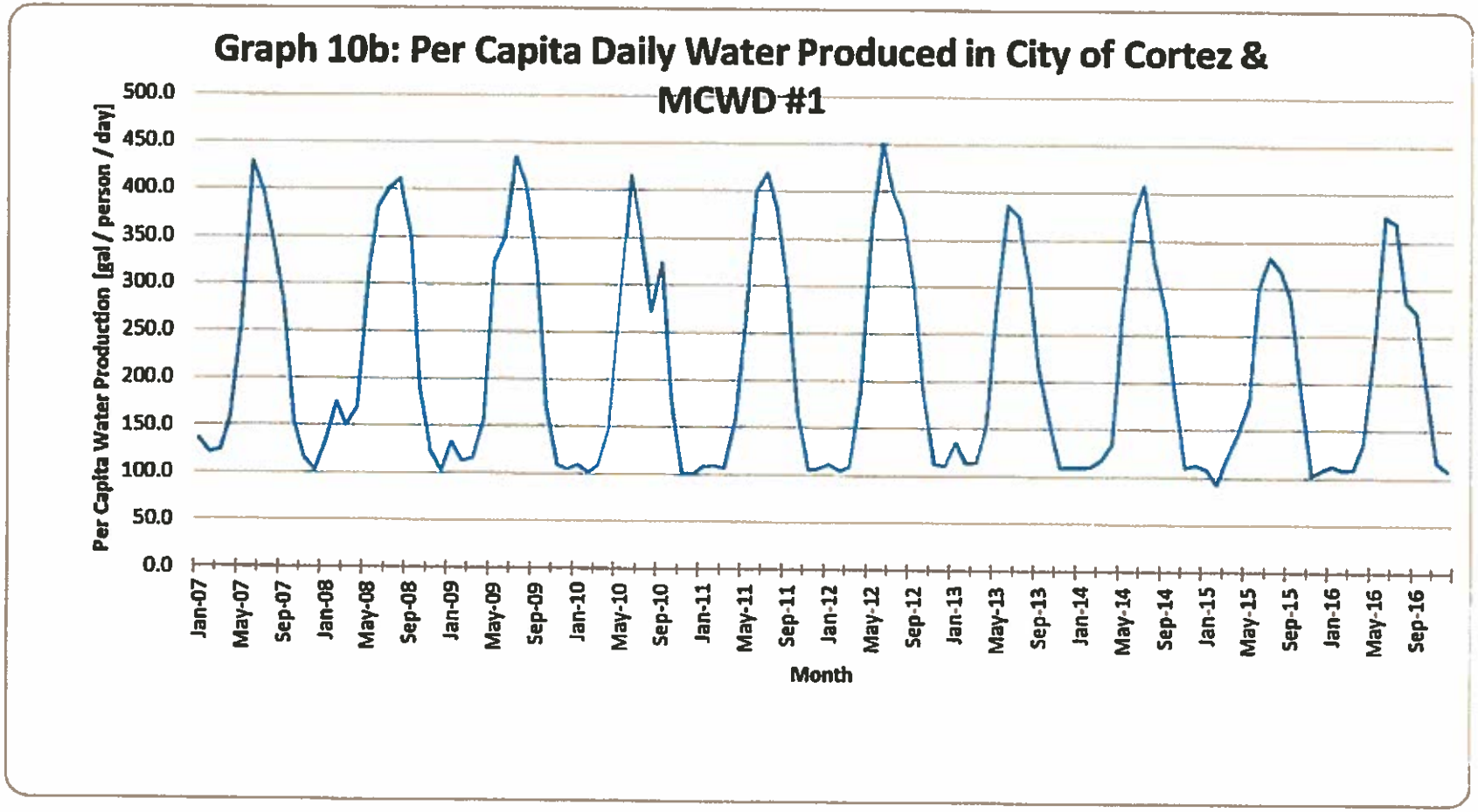

Graph 10b: Per Capita Daily Water Produced in City of Cortez & MCWD #1
Per Capita Water Production [gal / person / day]
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Jan-07
May-07
Sep-07
Jan-08
May-08
Sep-08
Jan-09
May-09
Sep-09
Jan-10
May-10
Sep-10
Jan-11
May-11
Sep-11
Jan-12
May-12
Sep-12
Jan-13
May-13
Sep-13
Jan-14
May-14
Sep-14
Jan-15
May-15
Sep-15
Jan-16
May-16
Sep-16
Month

Table 10: Estimates of Water Savings from Longer Filter Runs / Reduced Filter Backwash Frequency

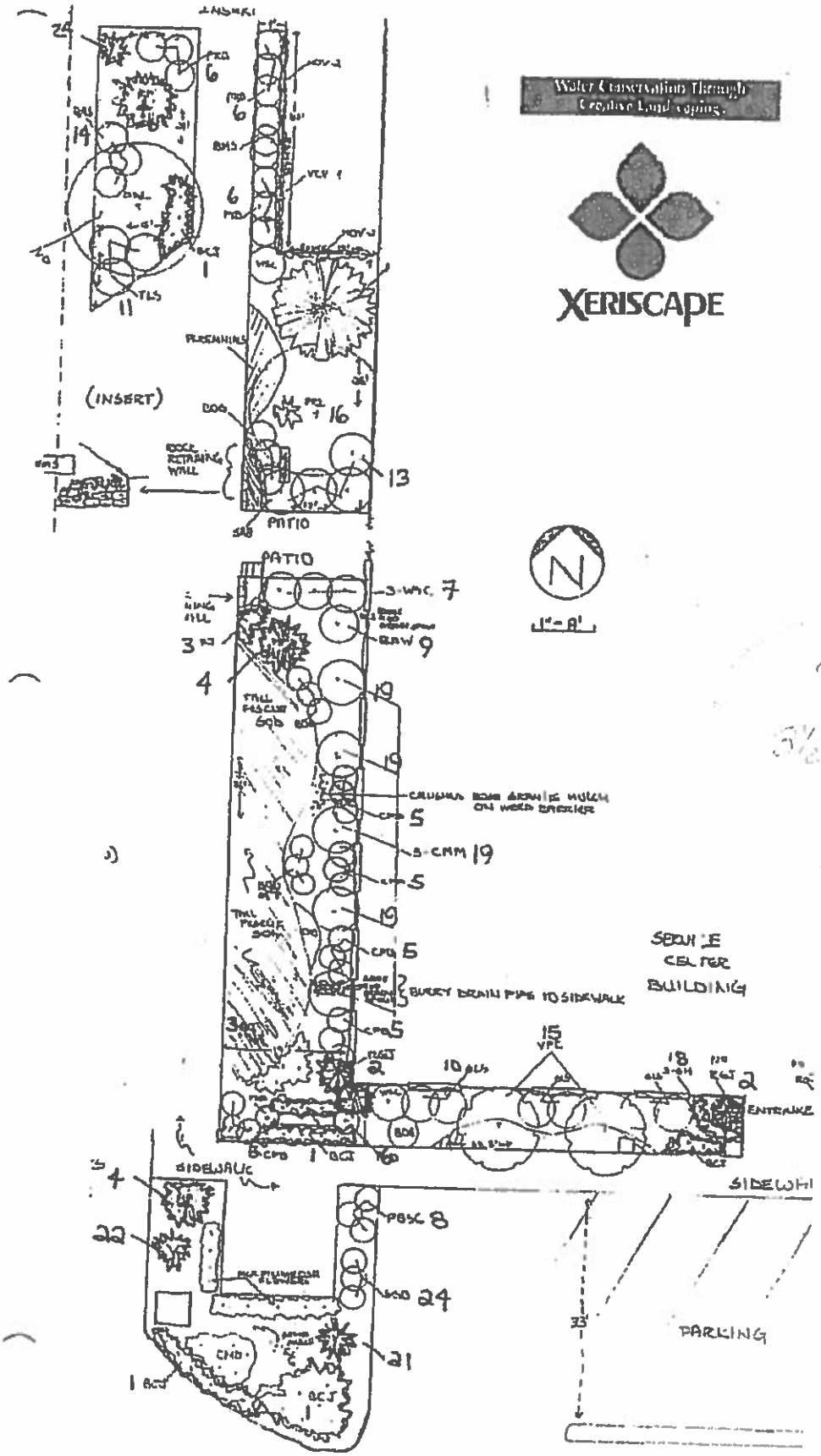
Inputted value
Carried over value
Calculated value

Pre-Filter Improvements		Post-Filter Improvements	
Peak Use Period: June - August		**Peak Use Period: May - September**	
Backwash Volume (gal / backwash)	47,500	Backwash Volume (gal / backwash)	47,500
Period Length (days / period)	92	Period Length (days / period)	92
Filter Backwash Frequency (backwashes / day)	4	Time Between Backwashes (days/backwash)	2
Number of Filter Backwashes During Period (backwashes / period)	368	Number of Filter Backwashes During Period (backwashes / period)	184
Volume of Backwash Water to Lower Pond (gal / period)	17,480,000	Volume of Backwash Water to Lower Pond (gal / period)	8,740,000
Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333	Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333
Fraction of Water Recycled Back to Upper Pond (-)	0.667	Fraction of Water Recycled Back to Upper Pond (-)	0.667
Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	5,826,608	Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	2,913,304
Volume of Water Recycled Back to Upper Pond (gal / period)	11,653,392	Volume of Water Recycled Back to Upper Pond (gal / period)	5,826,696
Moderate Use Period: May, September		**Moderate Use Period: May, September**	
Backwash Volume (gal / backwash)	47,500	Backwash Volume (gal / backwash)	47,500
Period Length (days / period)	61	Period Length (days / period)	61
Filter Backwash Frequency (backwashes / day)	2	Filter Backwash Frequency (backwashes / day)	1
Number of Filter Backwashes During Period (backwashes / period)	122	Number of Filter Backwashes During Period (backwashes / period)	61
Volume of Backwash Water to Lower Pond (gal / period)	5,795,000	Volume of Backwash Water to Lower Pond (gal / period)	2,897,500
Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333	Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333
Fraction of Water Recycled Back to Upper Pond (-)	0.667	Fraction of Water Recycled Back to Upper Pond (-)	0.667
Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	1,931,647	Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	965,824
Volume of Water Recycled Back to Upper Pond (gal / period)	3,863,353	Volume of Water Recycled Back to Upper Pond (gal / period)	1,931,676
Off-Peak Use Period: October - April		**Off Peak Use Period: October - April**	
Backwash Volume (gal / backwash)	47,500	Backwash Volume (gal / backwash)	47,500
Period Length (days / period)	212	Period Length (days / period)	212
Filter Backwash Frequency (backwashes / day)	1	Filter Backwash Frequency (backwashes / day)	0.33
Number of Filter Backwashes During Period (backwashes / period)	212	Number of Filter Backwashes During Period (backwashes / period)	69.96
Volume of Backwash Water to Lower Pond (gal / period)	10,070,000	Volume of Backwash Water to Lower Pond (gal / period)	3,323,100
Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333	Fraction of Water Lost in Lower Pond Due to Evaporation / Infiltration (-)	0.333
Fraction of Water Recycled Back to Upper Pond (-)	0.667	Fraction of Water Recycled Back to Upper Pond (-)	0.667
Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	3,356,633	Volume of Water Lost Due to Evaporation / Infiltration (gal / period)	1,107,689
Volume of Water Recycled Back to Upper Pond (gal / period)	6,713,367	Volume of Water Recycled Back to Upper Pond (gal / period)	2,215,411
TOTAL VOLUME OF BACKWASH WATER TO LOWER POND (gal / year)	33,345,000	TOTAL VOLUME OF BACKWASH WATER TO LOWER POND (gal / year)	14,960,600
TOTAL VOLUME RECYCLED BACK TO UPPER POND (gal / year)	22,230,111	TOTAL VOLUME RECYCLED BACK TO UPPER POND (gal / year)	9,973,783
TOTAL VOLUME LOST DUE TO EVAPORATION / INFILTRATION (gal / year)	11,114,889	TOTAL VOLUME LOST DUE TO EVAPORATION / INFILTRATION (gal / year)	4,986,817
REDUCTION IN VOLUME LOST DUE TO EVAPORATION / INFILTRATION (gal / year)	6,128,072	TOTAL WATER SAVINGS DUE TO REDUCED EVAPORATION / INFILTRATION & BACKWASH WATER RECYCLING (gal / year)	16,101,855
REDUCTION IN VOLUME LOST DUE TO EVAPORATION / INFILTRATION (MG / year)	6.13	TOTAL WATER SAVINGS DUE TO REDUCED EVAPORATION / INFILTRATION & BACKWASH WATER RECYCLING (MG / year)	16.1

City of Cortez
2018 Water Conservation Plan

Appendix

Waterwise Landscaping
Demonstration Garden Information
and
Draft Brochure



Reduced 5½ x 14 to 8½ x 11

Brochure Page 1

City of Cortez Service Center Xeriscape Beds

Symbol	Plant Name	Xeriscape
Evergreens		
1	Blue Chip Juniper	X
2	Robusta Green Upright Juniper	X
3	Buffalo Juniper	X
4	Mugho Pine Shrub	X
Shrubs		
5	Crimson Pygmy Barberry	X
6	Potentilla 'Katherine Dykes'	X
7	Western Sandcherry	XX
8	Pawnee Buttes Sandcherry	XX
9	Blue Arctic Willow	
10	Gro-lo Sumac	X
11	Three Leaf Sumac	XXX
12	Littleleaf Sumac	XX
13	Silver Buffaloberry	X
14	Blue Mist Spiree	XX
Trees		
15	Velvet Pillar Upright Crabapple	
16	Purple Robe Locust	XX
17	Austrian Pine	X
Broadleaf Evergreens		
18	Compact Oregon Grape Holly	X
19	Curleaf Mt. Mahogany	X
20	Littleleaf Mt Mahogany	X
21	Yucca Banana	XXX
22	Yucca Narrowleaf	XXX
23	Yucca Red Flowering	X
24	Spanish Broom	XX
Perennials		
25	Blue Catmint Compact	X
26	Mexican Primrose	X
27	Blue Oat Grass	XX
28	Parkers Yarrow	XXX
29	Penstemon varieties	X
30	Sedum Autumn Joy	XX

X=Dry
XX=Very Dry
XXX=Extra Dry

Water Wise

(reduced 8½ x 14 to 8½ x 11)

Brochure Page 2

CITY OF CORTEZ
SERVICE CENTER
110 W. PROGRESS CIRCLE
CORTEZ, CO 81321

SITE LANDSCAPE PLAN AND PLANT MATERIAL FOR A DROUGHT TOLERANT LANDSCAPE.

Page 1

XERISCAPE™

PROMOTING WATER CONSERVATION THROUGH CREATIVE LANDSCAPING

Fundamentals of Xeriscape...

Planning & Design

Many people create their own designs with excellent results. Landscape professionals can also serve as helpful resources. They can provide advice, critique or develop your plan for you. Planning is one of the most important steps to a successful Xeriscape because it allows you to install your landscape in phases, which minimizes initial expenses.

Turf Alternatives

Locate turf where it provides functional benefits and separate it from other plantings so that it can be watered more efficiently. Consider alternatives to turf, such as patios, decks, mulches, and native or low water-use plantings that add to your property value, while they beautify your landscape.

Mulches

Mulched planting beds are an ideal replacement for turf areas. Mulches cover the soil and minimize evaporation, reduce weed growth and slow erosion. Organic mulches typically include bark chips, wood grindings and pole peelings. Non-organic mulches include rock and various gravel products.

Zoning of Plants

Plantings, including turf areas, should be divided into separate water use areas according to their function and location in the landscape. Take advantage of microclimates or existing water in the landscape and locate plants according to their specific water and cultural needs. Try to consolidate high water-use plants to the most accessible and easily maintainable portion of the landscape. Then, utilize the many beautiful low water-use plants available in zones designated for them. Use your plantings to create "rooms" or use areas in the landscape, and be sure to allow space for mature plant size.

Soil Improvements

Rocky mountain soils are improved with the addition of organic matter. This allows for better absorption of water and improved water holding capacity of the soil. Soils that have organic matter also provide beneficial nutrients to plants, as well as air for deep root growth. Improve the soil prior to planting and installation of automatic irrigation systems.

PLANT LIST

Very Low Water Zone

Trees

Bur Oak
Quercus macrocarpa
70-80'

Pinyon Pine
Pinus edulis
15-50'

Russian Olive
Elaeagnus angustifolia
15-40', gray leaves

Shrubs

Curlleaf Mountain Mahogany
Cercocarpus ledifolius
5-10'

Mexican Cliffrose
Cowania mexicana
6-10', yellow flowers

New Mexican Privet
Forestiera neomexicana
5-8'

Rubber Rabbitbrush
Chrysothamnus nauseosus
2-4', yellow flowers

Russian Sage
Perovskia atriplicifolia
3-5', purple flowers

Sand Cherry
Prunus besseyi
4-6'

Saskatoon Serviceberry
Amelanchier alnifolia
7-15', blue berries

Shrubby Sage
Artemisia spp.
2-5', gray leaves

Three Leaf Sumac
Rhus trilobata
3-5', red fall color

Ground Covers

Creeping Juniper
Juniperus horizontalis
6-12"

Creeping Red Penstemon
Penstemon pinifolius
6-12", red flowers

Fringed Sage
Artemisia frigida
8-20", gray leaves

Hardy Ice Plant
Delosperma nubigenum
3", yellow flowers

Pussytoes
Antennaria rosea
3", white/pink flowers

Sedum Spp.
Sedum spp.
3-15", multicolor flowers

Snow-in-Summer
Cerastium tomentosum
6-10", white flowers

Sulfur Flower
Eriogonum umbellatum
6-8", yellow flowers

Woolly Thyme
Thymus pseudolanuginosus
2", pink flowers

Perennials

Blanket Flower
Gaillardia aristata
18-30", yellow/red flowers

Blue Flax
Linum perenne
15-18", blue flowers

Gayfeather
Liatris punctata
18-24", purple flowers

Prairie Coneflower
Ratibida columnaris
15-18", yellow/orange flowers

Rocky Mountain Penstemon
Penstemon strictus
18-24", blue flowers

Silvertuft Cinquefoil
Potentilla hippiana
6-10", yellow flowers

Annuals

Annual Baby's Breath
Gypsophilla elegans
18-20", white flowers

Page 2

Annual Coreopsis
Calliopsis tinctoria
18-18" orange/red flowers

California Poppy
Eschscholtzia californica
6-8", yellow/orange flowers

<untain Bachelor Button
ntaurea cyanus
15", blue flowers

dice
tonium sinuata
28", blue/yellow flowers

TURF AREA
BUFFALO GRASS
BLUEGRAMA

PLANT LIST

Low Water Zone

Trees

Bigtooth Maple
Acer grandidentatum
18-25', red fall color

Golden Rain Tree
Koelreuteria paniculata
30-40', yellow flowers

Green Ash
Fraxinus pennsylvanica
55-75'

Kentucky Coffee Tree
Gymnocladus dioicus
60-75'; pods

Ponderosa Pine
Pinus ponderosa
25-50'

Rocky Mountain Juniper
Juniperus scopulorum
30-40'

Rocky Mountain Maple
Acer glabrum
12-18', red fall color

Russian Hawthorne
Crataegus ambigua
12-20', red fruit

Western Catalpa
Catalpa speciosa
45-70', white flowers

Western Hackberry
Celtis occidentalis
40-60'

Shrubs

American Plum
Prunus americana
4-6', white flowers

Bluemist Spirea
Caryopteris clandonensis
30"-3', blue flowers

Golden Currant
Ribes aureum
3-4', yellow flowers

Littleleaf Mockorange
Philadelphus microphyllus
5-6', white flowers

Mugho Pine
Pinus mugo mughus
3-10'

Shrub Rose
Rosa rugosa
12"-3', pink flowers

Spreading Cotoneaster
Cotoneaster divaricata
18-24", red fruit

Ground Covers

Creeping Baby's Breath
Gypsophila repens
2-4", white flowers

Creeping Grape Holly
Mahonia repens
12-18", yellow flowers

Creeping Potentilla
Potentilla verna-nana
2", yellow flowers

Euphorbia
Euphorbia myrsinites
10-18", yellow leaves

Himalayan Border Jewel
Polygonum affine
8-12", white/pink flowers

Sweet Woodruff
Galium odorata
6-12", white flowers

Perennials

Asters, New York
Aster novae-belgii
12-28", purple/white flowers

Basket-of-Gold
Alyssum saxatile
6-12", yellow flowers

Carpathian Harebell
Campanula carpatica
4-6", blue/white flowers

Cottage Pinks
Dianthus plumaris
3-5", pink flowers

Daylilies
Hemerocallis spp.
12-24", multicolor

Evergreen Candytuft
Iberis sempervirens
5-12", white flowers

Evening Primrose
Oenothera spp.
6-30", yellow/white flowers

Iceland Poppy
Papaver nudicale
6-10", multicolor

Perennial Statice
Limonium latifolium
15", white/purple flowers

Annuals

Moss Rose
Portulaca grandiflora
6", multicolor

Siberian Wallflower
Cheiranthus allionii
8-10", yellow/orange

Strawflower
Helichrysum bracteatum
12-36", multicolor

TURF AREA
BUFFALO GRA
BLUE GRAMA
WHEATGRASS
SHEEP FESCU

Water Zones are suitable for Xeriscapes. This is a partial list of additional species with similar characteristics may also be appropriate. (Contact your nursery for further information.)

Use plants listed under Moderate Water Zone only in naturally moist areas or areas receiving frequent irrigation.

Moderate Water Zone

Trees

Colorado Blue Spruce
Picea pungens
60-75'

Quaking Aspen
Populus tremuloides
30-50', yellow fall color

Shrubs

Cranberry Viburnum
Viburnum trilobum
4-6', red fall color

Dwarf Arctic Willow
Salix purpurea nana
4-6'

Kalmia St. Johnswort
Hypericum var. *kalmianum*
2-3', yellow flowers

Winged Euonymus
Euonymus alata
10-15', red fall color

Ground Covers

Bishop's Weed
Aegopodium podagraria
10-15", variegated leaves

Bugleweed
Ajuga reptans
4-6", purple flowers

Periwinkle
Vinca minor
4-6", blue/purple flowers

Perennials

Native Blue Columbine
Aquilegia caerulea
18-24", blue/white flowers

Shasta Daisy
Chrysanthemum maximum
2-3', white flowers

Annuals

Four O'Clock
Mirabilis jalapa
24-30", magenta flowers

Globe Amaranth
Gomphrena globosa
30"-4', red flowers

Turf Selections

Turf Areas

Blue Grama
Buffalo Grass
Kentucky Bluegrass
Tall Fescue
Creeping Red Fescue

Ornamental Grasses

Blue Avena
Blue Fescue
Miscanthus Grass

Borders

Blue Grama
Wheatgrass

BLUE GRASS ALTERNATIVES:

THERE ARE MANY OTHER GRASSES THAT ARE SUITABLE FOR TURF AREAS THAT REQUIRE MUCH LESS WATER. GRASSES ARE EITHER COOL SEASON, (THEY LIKE COOL WEATHER AND ARE GREEN MOST OF THE YEAR) OR WARM SEASON. (THESE LIKE IT HOT AND ARE DORMANT MOST OF THE WINTER AND COOLER MONTHS.

COOL SEASON GRASS:...
- BLUE GRASS
- TALL FESCUE
- SHEEP FESCUE
- WHEATGRASSES

WARM SEASON.....
- BUFFALOGRASS
- BLUE GRAMA GRASS

BARK CHIPS OR SHREADED WOOD PRODUCTS MAKE A GREAT GROUNDS COVER CRUSHED GRANITE, LAVA ROCK AND RIVER COBBLES ARE ALL GREAT LAWN SUBSTITUTES. MANY COLORS AND SIZE AGGREGATES ARE AVAILABLE USE A WEED BARRIER FABRIC UNDER ALL BARK CHIP OR GRAVEL GROUNDS COVERS

IRRIGATION:

WATERING IS NEEDED TO GET EVEN DROUGHT TOLERANT PLANTS ESTABLISHED. THE FIRST GROWING SEASON AND WINTERS ARE MOST CRUCIAL TO ESTABLISHING MANY PLANTS. WHETHER A DRIP SYSTEM, SPRINKLER SYSTEM OR A HOSE AND BUCKET ARE YOUR CHOICE OF WATERING PLEASE ALLOW 2-3 YEARS FOR MOST PLANTS TO BECOME FULLY DROUGHT TOLERANT.

XERISCAPE LANDSCAPING WILL HELP YOU CONSERVE WATER

These seven simple steps will produce a beautiful water saving landscape.

- Good Design
- Soil Improvement
- Reduced Turf Area
- Larger Mulch Areas
- Use Low Water Demand Plants
- Zoned Irrigation Systems
- Good Maintenance

GRASSES ARE AVAILABLE MAINLY FROM SEED. SOME VARIETIES SUCH AS BLUE GRASS, TALL FESCUE AND BUFFALOGRASS ARE AVAILABLE AS SOD OR PLUGS.

WATER REQUIREMENTS

BLUE GRASS	1" / WEEK 40"/YEAR
TALL FESCUE	18-30" / YEAR
SHEEP FESCUE	ENOUGH TO KEEP GREEN
WHEATGRASSES	ENOUGH TO KEEP GREEN
BUFFALO GRASS	10-15" / YEAR
BLUE GRAMA	10-15" / YEAR

MANY DROUGHT TOLERANT GRASSES CAN GO DORMANT IN SUMMER DROUGHTS AND GREEN UP WHEN RAINS OR IRRIGATION IS APPLIED. IT IS BEST TO KEEP GRASSES THAT ARE ESTABLISHED WATERED ENOUGH SO AS THEY STILL APPEAR GREEN. THIS MIGHT ONLY BE ONCE A WEEK ON MOST GRASSES.

City of Cortez
2018 Water Conservation Plan

Appendix

Public Education Literature

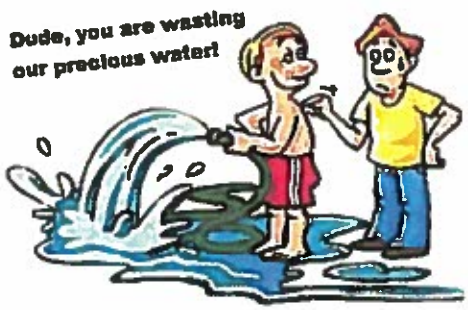
AREA DROUGHT IMPACTS
THE CORTEZ WATER SUPPLY

Southwest Colorado is experiencing extreme drought conditions this year; our snow pack is at record lows, similar to 1990 and 2002. Water supplies for homes and businesses are available this summer for City residents, but all water users will need to practice conservation of our water supplies. Water users are urged to practice beneficial water use as emphasized below and be extra careful not to waste water.

The City adopted a revised **Water Conservation Plan** in 2010 as a guide in the continuing effort to use water resources in the most efficient means possible. The Plan can be accessed on the City's website at: *http://www.cityofcortez.com/government/public_works/water*. The Plan contains information on the current level of water use in the City, with comparisons of historical usage, and the proposed programs the City will be providing to lower the per capita (per person) usage. In 2017, the City's per capita average use was 204 gallons per day. The City's goal is to reach a per capita usage of 180 gallons per day by 2020. With everyone practicing water conservation and participating in good water use practices, this goal can easily be achieved.

THE FOLLOWING CONSERVATION INFORMATION EXPLAINS THE BASICS OF HOW TO USE WATER WISELY.

The phrase **"Use Water Wisely"** is the focal point of water conservation and the City of Cortez continues to promote water conservation as an important part of daily water usage. City water supplies are adequate, but residents should only water outside uses what they need while complying with the **"NO WATERING BETWEEN 10:00 A.M. AND 5:00 P.M."** restriction. The ***"no watering during the hottest part of the day"*** restriction is a permanent ordinance and will be enforced.



The City passed **Ordinance No. 1013, Series 2004, which permanently banned irrigation watering between the hours of 10:00 a.m. and 5:00 p.m. and is enforced from May 15th through September 15th every year.** On the first violation, the water user will receive a warning. On the second violation, the user's water will be turned off and it will require a **$40.00** turn-on fee to have the water turned back on. The best, and easiest, water conservation measure is to just not waste water.

Recommended Watering Schedule – It is recommended that residents implement a ***two times a week watering schedule.*** Residents can choose the days that best work for their lawns and garden. Those residents with automatic sprinklers for their lawns should be able to program their controllers to meet these recommendations.

NO WATERING IS ALLOWED BETWEEN 10 AM AND 5 PM FROM MAY 15 - SEPTEMBER 15 EACH YEAR.
Since most water evaporates during the heat of the day, this helps to conserve our water supply.

In-Home Water Conservation – There are many water conservation practices you can perform in the home that will save water. Some of these include: taking quicker showers, not letting the water run while shaving or brushing your teeth, and only running full loads of clothes or dishes.

Violations – The City enforces Sec. 27-19 of the Cortez City Code: ***"Wasting Water Prohibited"*** concerning unattended hoses/watering systems or excessive waste due to poor watering practices. Residents violating the ordinance will be notified by the City with a courtesy warning; however, successive violations will receive a citation subject to fines. Should the City declare a water conservation emergency, restrictions will be specifically stated and notices delivered to residents as to the extent of necessary water conservation.

Best Lawn Watering Practices – Lawns should be watered in the early morning between 3:00 a.m. and 7:00 a.m. or late evening between 7:00 p.m. and 11:00 p.m. Wetting the soil 4 to 6 inches deep, with several days between watering, develops deep, solid roots. Lawns with deep root growth are more resistant to drought. Residents should try to use a plan of watering their lawn twice a week for approximately 20 minutes per station.

LAWN WATERING CONSERVATION – BASIC LAWN WATERING CONSERVATION RULES:

- Water in early morning and late evening hours. **Do not water in the heat of the day between 10:00 a.m. and 5:00 p.m. This is against City Ordinances and fines will be imposed for violations.**
- Water lawns and landscaping only - not streets, sidewalks, or driveways.
- Avoid watering during windy weather - this wastes water due to increased evaporation and actually blows the water away from the area intended to be watered.
- Keep your grass height at 2½ to 3 inches - taller grass holds water better. Leave grass clippings on the lawn to form a temporary layer of mulch to conserve moisture.
- Mow often enough to cut only 25% of the length – this prevents excessive shock that causes grass to turn yellow.
- Monitor your lawn to water only when needed - typically when grass blades begin to look dull and bluish-gray.

No Wasted Water – Do not allow hoses to run unattended; fix plumbing leaks immediately; fix leaking toilets; and report water main leaks in the street to the Public Works Department by calling 970.565.7320.

Xeriscaping – When planning new areas for landscaping, consider flowers and plants that require less amounts of water to survive. In addition, residents can look into less water-intensive grass types such as fescues, blue grama, wheat grass, and buffalo grass, which all use less water than bluegrass. The landscaping at the City Service Center in the Industrial Park is an example of Xeriscaping with a fescue grass plot, gravel beddings, and low-water usage plants.

New Lawn Permit Available – Anyone who plans to start a new lawn this year and wants to water between 10:00 a.m. and 5:00 p.m. must get a **"New Lawn/Exemption from Watering Restrictions Permit"** from the Public Works Department in the City Service Center. The permit will allow daily watering between 10:00 a.m. and 5:00 p.m. for up to 21 days to start the grass growing. There is a $25 charge for this permit and it should be displayed prominently in the front yard. **If you do not need to water during the restricted watering period, a new lawn permit is not necessary.** There are many grass variety alternatives available that use less water, with each variety having different characteristics to consider. Check out the books and information on Xeriscaping at the Cortez Public Library for more information on which variety would be the best choice for your lawn.

Contact the Public Works Department in the City Service Center, 110 West Progress Circle, Cortez, CO 81321, or call 970.565.7320 for more information.

AN AVERAGE PERSON CAN GO NEARLY TWO MONTHS WITHOUT EATING. **BUT LESS THAN A WEEK WITHOUT WATER COULD KILL YOU.**

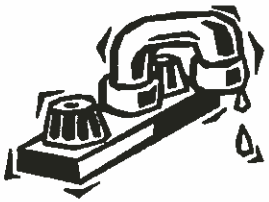
YET, AS IMPORTANT AS WATER IS, MOST OF US KNOW LITTLE ABOUT IT. TAKE THIS TEST AND SEE HOW MUCH YOU KNOW ABOUT WATER.

1. What percentage of the world is covered by water?

2. What percentage of the world's water is readily available for humans to use?

3. How much water is contained in the human body?

4. Which contains more water as a percentage of body weight, a woman's body or a man's body?



5. Why do male and female bodies tend to have different amounts of water?

6. How much water does the human body lose in a typical day?

7. Why is water especially good for people on a diet?

8. What is the largest use of water outdoors?

9. What is the largest use of water indoors?

10. Public water systems produce billions of gallons of drinking water every day, more than 180 gallons per person. What percentage of that is consumed by people?

SEE ANSWERS ON BACK

WATER TIPS

There is as much water in the world today as there was thousands of years ago. Actually, it's the same water. The water from your faucet could contain molecules that dinosaurs drank. Perhaps Columbus sailed across it.

For the price of a single 12-ounce can of soda - about 50 cents - many communities deliver up to 1,000 gallons of fresh, clean drinking water to homes 24 hours a day. If drinking water and soda pop were equally costly, your water bill would skyrocket more than 10,000%!!!

If everyone in the United States flushed the toilet just one less time per day, we could save a lakeful of water about a mile long, a mile wide, and four feet deep every day.

Little leaks add up in a hurry. A faucet drip or invisible toilet leak that totals only two tablespoons a minute comes to 15 gallons a day. That's 105 gallons a week and 5,460 wasted gallons of water a year.

Is it possible your toilet has a secret leak? You can test it by putting ten drops of food coloring in the tank. Don't flush for 15 minutes. If the colored water shows up in the bowl, the tank is leaking.

Seventy-five percent of a tree is water.

Plant drought-resistant trees and plants. Many beautiful trees and plants thrive with far less watering than other species.

Use your automatic dishwasher and automatic washing machine only for full loads.

Some people thoughtlessly flush away tissues and other bits of trash in the toilet. Using a wastebasket, instead, will save all those gallons of water that otherwise go wastefully down the drain.

Information taken from:
Catalog No. 70077 ©1991 AWWA
Catalog No. 70071 © 1991 AWWA

ANSWERS:

1. Some 80% of the world is covered by water or ice. Only about 20% is dry land.

2. 97% of the world's water is salty or otherwise undrinkable. Another 2% is locked in ice caps and glaciers. That leaves just 1% for all of humanity's needs - all its agricultural, manufacturing, community, and personal household needs.

3. If you're an adult, your body contains about 40 quarts (10 gallons) of water.

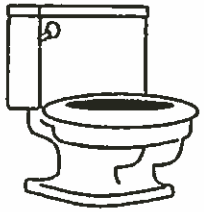
4. A man's body is 60-65% water. A woman's body is 50-60% water. The human brain is about 75% water.

5. Muscle tissue contains a large amount of water. Fat tissues contain virtually no water. Men tend to have more muscle as a percentage of body weight while women have more fat.

6. You lose 2-1/2 to 3 quarts of water per day through normal elimination, sweating and breathing. If you exercise or live in a humid climate, you may lose another quart.

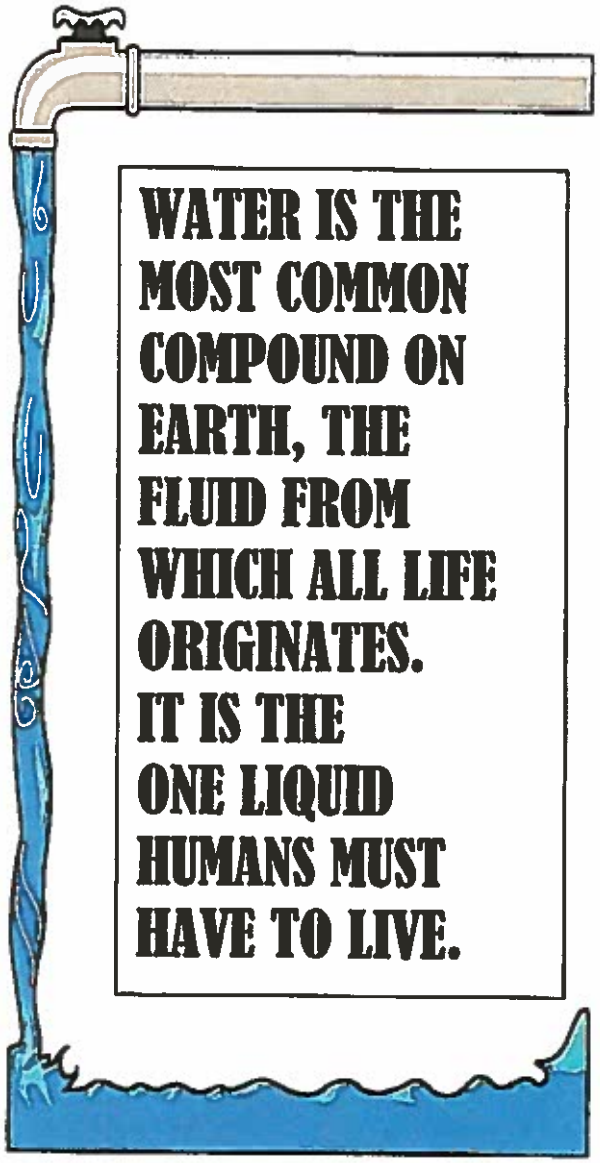
7. It has zero calories and zero sugar, but a good drink of water can reduce hunger. Water also helps your body metabolize stored fats, helps maintain proper muscle tone, and helps rid the body of wastes.

8. Lawn sprinkling uses the most water outdoors.



9. Inside, toilets use the most water, with an average of 27 gallons per person per day. Laundry averages 17 gallons per person per day and showers 14 gallons.

10. Typically, less than 1% of the treated drinking water produced by utilities is actually consumed by people. Most goes for lawns, showers and tubs, toilets, etc.



CITY OF CORTEZ
Service Center
110 West Progress Circle
Cortez, CO 81321
Phone: 970-565-7320

City of Cortez
2018 Water Conservation Plan

Appendix

Regulatory Measures

Sec. 27-6. - Imposition of emergency or conservation restrictions.

(a) Daytime watering restrictions.

(1) Watering of yards will not be allowed between the hours of 10.00 A.M. and 5:00 P.M.

(2) These watering restrictions will be enforced between May fifteenth and September fifteenth of each year.

(3) Anyone violating the ordinance codified in this chapter, will be given a warning notice upon observation of the first offense.

(4) Upon a second observed offense, the person who is violating the ordinance codified in this chapter shall have his/her water shut off.

(5) After water service has been shut off, there shall be a re-connect fee set by the current fee resolution, to restore service to the offending home or business.

(b) Lawn watering permits.

(1) Any person installing a new lawn that needs to be watered every day and during the restricted time of 10:00 A.M. to 5:00 P.M. needs to obtain a "new lawn permit" from the public works department.

(2) The permit will be valid for twenty-one days of watering for newly-seeded lawns and fifteen days of watering for sod.

(3) The city strongly recommends using alternative grass types such as fescues, wheatgrasses, and Blue Grama in-lieu of Kentucky Bluegrass.

(4) The "new lawn permit" fee will be set according to the current fee resolution. The permit shall be displayed in a prominent, visible area in the front lawn. Watering violations will be enforced for new lawns that do not have a permit.

(Ord. No. 427, art. 2, § 5; Ord. No. 1013.)

Sec. 27-13. - Prohibited uses enumerated.

The following uses of water shall be considered as unlawful and punishable:

(a) Hoses with overflow or nozzle greater than 5/8 of an inch in diameter.

(b) Open hoses.

(c) Watering after hours or during water use restrictions.

(d) The use of booster pumps upon the user's premises.

(e) Unattended hoses. It shall be deemed unlawful for any householder or user of water to permit water to run through hoses when such householder is away from such premises, and it shall be the duty of each user to turn all water hoses off at the time such user leaves the premises; provided, that no other responsible person is left in charge.

(f) The use of any type of any inflow and outflow air conditioner. Such type is defined as

that type which does not have a recirculating pump or device mounted on such cooler and which permits the water to run from such cooler onto the ground or back into the city sewage system.

(g) Cooling water for refrigeration units.

(Code 1968, § 7-8-1.)

Sec. 27-19. - Wasting water prohibited.

No person shall:

(a) Waste the water at any hydrant or faucet or permit the water to be wasted through such source.

(b) Leave or permit the water to be left running through such to prevent freezing or for any other purpose except under the direction of the superintendent.

(c) Make use of any form of water closet which necessitates the constant running of water.

(d) In any manner waste or permit the waste of water from any pipe, fixtures or appliances under his control.

(Code 1968, § 7-8-7.)

ORDINANCE NO. 1013
SERIES 2004

AN ORDINANCE ESTABLISHING WATER USE RESTRICTIONS DUE TO SEVERE DROUGHT CONDITIONS

WHEREAS, the City of Cortez and the surrounding community is currently undergoing severe drought such as to create an emergency for the City and its citizens, and

WHEREAS, the City Council has the authority under Chapter 27, Section 6, of the Cortez City Code to impose emergency or conservation water use restrictions; and

WHEREAS, the City has the right to disconnect the service of anyone who violates the restrictions; and

WHEREAS, the City has the right to establish, by ordinance, re-connect fees after water has been shut off.

NOW THEREFORE, be it ordained by the City Council of the City of Cortez, Colorado, that Chapter 27, Section 6, Imposition of emergency or conservation restrictions, shall read:

I. DAYTIME WATERING RESTRICTIONS

A. Watering of yards will not be allowed between the hours of 10:00 a.m. and 5:00 p.m.
B. These watering restrictions will be enforced between May 15th and September 15th of each year.
C. Anyone violating Ordinance No. 1013, Series 2004, will be given a warning notice upon observation of the first offense.
D. Upon a second observed offense, the person who is violating this Ordinance shall have his/her water shut off.
E. After water service has been shut off, there shall be a re-connect fee set by the current fee resolution, to restore service to the offending home or business.

II. LAWN WATERING PERMITS

A. Any person installing a new lawn that needs to be watered every day and during the restricted time of 10:00 a.m. to 5:00 p.m. needs to obtain a "New Lawn Permit" from the Public Works Department.
B. The permit will be valid for twenty-one (21) days of watering for newly-seeded lawns and fifteen (15) days of watering for sod.

C. The City strongly recommends using alternative grass types such as fescues, wheatgrasses, and Blue Grama in-lieu of Kentucky Bluegrass.
D. The "New Lawn Permit" fee will be set according to the current fee resolution. The permit shall be displayed in a prominent, visible area in the front lawn. Watering violations will be enforced for new lawns that do not have a permit.

PUBLIC HEARING. This ordinance shall be considered for second and final reading on the 27th day of April, 2004, at the hour of 7:30 p.m. in the City Council Chambers in City Hall, Cortez, Colorado, at which time and place all persons may appear and be heard concerning the same.

PASSED, ADOPTED AND APPROVED ON FIRST READING THIS 13TH DAY OF APRIL, 2004.

CITY OF CORTEZ

CHERYL BAKER, MAYOR

ATTEST:

LINDA L. SMITH, CITY CLERK

PASSED, ADOPTED AND APPROVED ON SECOND AND FINAL READING THIS 27th DAY OF APRIL, 2004.

CITY OF CORTEZ

Mayor

ATTEST:

LINDA L. SMITH, CITY CLERK

APPROVED AS TO FORM:

JAMES HATTER, City Attorney

City of Cortez
2018 Water Conservation Plan

Appendix

Local Newspaper Articles

Cortez council discusses plans for water conservation

Public works director plans to revise strategies

By Stephanie Alderton (https://the-journal.com/lms/loading.html#retfwetu=aHR0cHMIM0EvL3RoZS1qb3VybmFsLmNvbS8%3D&lbothsahtrtd=aHR0cHMIM0EvL3RoZS1qb3VybmFsLmNvbS9zdGFmZi8zMjIyLXN
Journal Staff Writer

Friday, Feb. 16, 2018 3:27 PM Updated: Thursday, Feb. 22, 2018 10:15 PM

Cortez Public Works Director Phil Johnson used a Tuesday workshop to outline his plans to update the city's water conservation strategies.

The city gets its water supply primarily from the Dolores River and the McPhee Reservoir, both of which are affected by the snowpack in the Dolores River Basin. Although the snow pack is only at 48 percent of normal, according to Natural Resources Conservation Service data on Thursday, Johnson said he doesn't anticipate any water shortages this year. But in order to prepare for possible future drought conditions, he said the city must revise its 2010 water conservation plan.

So far, this winter has had the lowest total snow accumulation in Montezuma County since 1990, Johnson said. That's in stark contrast to last year, when the Dolores River Basin snow pack was much higher than normal. Johnson said he believes the excess water from last year will help carry the town through this year's drier conditions.

"We're not in any danger here," he said. "This drought that we're going into now really won't substantially impact us until the following snow season."

But he said if the city's water sources don't accumulate enough excess water by the end of 2018, a dry 2019 could cause problems for Cortez residents. With that in mind, he urged council members to start thinking about the water conservation plan, which was adopted in 2010 and is scheduled for an update this year.

Eight years ago, the city set four water conservation goals: reduce per capita water demand to 200 gallons per day, implement full monitoring of water usage, maintain less than 5 percent water loss and institute an automatic meter reading system. Johnson said city staff haven't been able to prevent quite as much water loss as they planned, but he said the other goals have largely been met.

In 2018 the city will work on setting new goals for the water plan. Johnson said it will be a lengthy process that will require multiple workshops and a 60-day public comment period. Cortez water superintendent Rich Landreth said he plans to start the revision process after the municipal elections in April.

After the regular workshop, the council held an executive session to discuss legal issues related to town water rights.

Other action

Also during Tuesday's workshop, the council members introduced three new employees: code enforcement officer Keith Cramer, golf course superintendent Tom Kramlich and senior parks worker Don Cantrall. Library director Eric Ikenouye spoke about his plan to promote a part-time library employee to a full-time position as part of a minor staff reorganization, and City Manager Shane Hale gave a brief update on the city's long-range advance plan. The council members also discussed lowering the price of an office building in the Industrial Park they've been trying to sell for some time. Most were in favor of lowering the list price to $225,000, more than $60,000 less than its original price.

COMMUNITY CALENDAR (HTTPS://THE-JOURNAL.COM/LMS/LOADING.HTML#ROTFTWETU=AHROCHMLMOEVL3ROZS1QB3VYBMFSLMNVBS8ZL3DGIBOTHSAHTRTD=AHROCHMLMOEVL3ROZ)

CLICK HERE (HTTPS://WWW.SPINGO.COM/SUBMIT/?PARTNERID=674) TO ADD YOUR EVENT

Area Events

Monday, December 17

9:00 am

Noel Night with Lawrence Baca - Exhibition
Sorrel Sky Gallery

(/calendar#/event/6962052)

6:00 pm

Mancos Schools Holiday Concert and Art Stroll
Mancos Performance Center

(/calendar#/event/7546299)

Tuesday, December 18

9:00 am

Noel Night with Lawrence Baca - Exhibition
Sorrel Sky Gallery

(/calendar#/event/6962047)

7:00 pm

Making a Difference Speaker Series: Stay Human Durango!
Fort Lewis College Community Concert Hall

(/calendar#/event/7501105)

Cortez council discusses updating water conservation plan

Public Works to present water efficiency plan by fall

By Stephanie Alderton (https://the-journal.com/ims/loading.html#rotftwetu=aHR0cHM6Evl.3RoZS1qb3VybmFsLmNvbS8%3D&ibothsahtrid=aHR0cHM6Evl.3RoZS1qb3VybmFsLmNvbS9zdGFmZI8xMjlyLXN
Journal Staff Writer

Monday, June 18, 2018 8:02 AM Updated: Monday, June 18, 2018 7:24 PM

In a workshop on Tuesday, the Cortez City Council discussed plans to improve the town's water efficiency during drought.

Public Works Director Phil Johnson and Water Plant Supervisor Rich Landreth presented a preliminary update to the Cortez water conservation plan, last updated in 2010. One of the plan's main short-term goals will be to reduce the city's water usage to less than 200 gallons per person per day. Johnson said such conservation efforts will become more and more necessary for Cortez as drought conditions become "the new normal."

According to Johnson and Landreth's preliminary update, water usage in Cortez has decreased in the past few decades. The daily water demand in 1990 was 325 gallons per capita, but it has since dropped to just over 200 gallons per capita. The new plan aims to drop that number to 180 gallons per day within the next seven years.

Although that goal would require some major water-saving measures, Landreth said he doesn't believe it's unreasonable.

"I think (these goals) will be easily attainable without a lot of heartache," he said.

Part of the process of updating the conservation plan will be adding more short- and long-term goals, he said.

The draft plan outlines several possible water-saving measures to help the city reach those goals. One is a rebate program designed to give Cortez residents an incentive to trade in their toilets, washing machines and other appliances for more water-efficient ones. Other recommendations include a water-efficient landscaping program for city property, a commercial water audit program, more aggressive leak prevention for the city water systems, a public education campaign and more.

The council members voiced approval of several items in the plan, particularly the rebate program and the water-efficient landscaping, which has already been implemented on a few city properties such as the Service Center.

Landreth urged council members to send him questions or suggestions for the new water plan. He and Johnson plan to bring their next draft to a later workshop, and eventually host public information meetings on it before bringing the final version

before the council for a vote. Johnson estimated the final update will be ready in October.

Johnson said water conservation and drought contingencies need to be a high priority for the city.

"We're facing the new normal now," he said. "The word 'drought' is being touted as a thing that shouldn't be used anymore, because people will see it as a temporary condition. We're now in the 19th year of this latest drought, and we're just getting drier and hotter."

He said the final version of the plan needs to take years of continued drought, as well as possible population increases, into account.

Other action

During the workshop, the council members also:

- Heard a presentation from the Common Ground Cortez Community Gardens group on the progress of the Recreation Center garden.
- Discussed setting a time limit on public comment during regular meetings.

The City Council members tentatively agreed on limiting public comments to four minutes per person.

- Discussed the next steps in the fiber to the home project.

Mayor Karen Sheek recommended spending about $25,000 on additional engineering and public surveys to determine the cost-benefit ratio of installing fiber throughout Cortez. The rest of the council tentatively agreed.

- Scheduled a special executive session for 7:15 a.m. June 18 to discuss contract negotiations for the new city manager.

The council plans to make a hiring decision at its next public meeting, on June 26.

Planning to conserve our most precious resource

Thursday, Oct. 11, 2018 5:03 PM

Anyone residing in Southwest Colorado knows what a precious commodity water is, and worry over drought is a constant in our collective consciousness. The lack of rain this summer has been of special concern given our mild winter, and even with the recent rains the situation is not good.

The United States Drought Monitor shows our area is experiencing D4, exceptional drought conditions, and last Friday's front page story in The Journal announced "Southwest Colorado headed for the second lowest water year in history" — in history! This really comes as no surprise to any of us who have tracked the water level at McPhee Reservoir or visited our neighbor to the east and seen the state of the Animas River. The drought is regional, affecting not only Montezuma County but other communities in the area as well.

Recently, the city of Cortez hosted researchers from Western Water Assessment, based at the University of Colorado Boulder campus, who presented a "Vulnerability, Consequences, and Adaptation Planning Scenarios (VCAPS) workshop. The program is a university-community partnership designed to help municipalities identify weather hazards and the impact of those hazards on the community, with the goal of developing strategic short- and long-term plans to mitigate the effects of long-term drought and changing weather conditions. A report on the findings of the Cortez workshop will be forwarded to the city by January and will be available for public review.

I was one of ten participants in the two half-day workshops, and I can tell you it was a sobering experience. Changing weather patterns are resulting in higher temperatures with longer fire seasons. Reduced snowpack last winter and minimal rain this spring and summer have left reservoirs that once stored water that could be tapped during drier years at dangerously low levels.

McPhee Reservoir is almost 62 feet below full elevation; Lake Powell almost 108 feet below. Lake Mead is at a critical low of 1078.41 feet which is over 141 feet below full elevation. When the lake reaches 1075 feet, lower basin states will be required to reduce withdrawals, and at 1050 feet hydro power production will be stopped. It will take years to replenish these reservoirs, and yet our need for the water they store is neverending, so . . . what to do?

While city water rights are sufficient to continue to meet community needs, it's important to understand that the water supply doesn't stop at the city limits. Everyone who gets their water from McPhee — folks who reside in our city and surrounding towns, farmers and ranchers, Towaoc residents — will be impacted as

water becomes less plentiful. Consequently, every citizen in the city, the county, indeed the region, will need to reevaluate water use and become more conscious of this most valuable resource.

The time for a comprehensive approach to water conservation is now, and the city has taken steps to begin the process. On August 28, the City Council approved a Water Conservation Plan which is available for citizen review and input on the city website, cityofcortez.com. The plan is presented in nine parts which include an existing water system profile, current water use and demand, water saving measures and programs, proposed facility improvements and an implementation plan highlighting the role of conservation in planning for the city's water supply.

The 18th century British physician Thomas Fuller said, "We never know the worth of water till the well is dry." The well isn't dry yet, but "conservation" has become our new "Word of the Day."

The goal of the city is to continue to provide safe, high-quality drinking water at a reasonable price while emphasizing ways to conserve. In the coming months we'll be sharing information on rebate programs to make it easier to invest in water saving devices, water conservation workshops, landscaping workshops to teach home and business owners how to maintain curb appeal while saving water, demonstration xeriscaping plots, and updates on ways the city is practicing what we're preaching.

I'm inviting everyone to come together to work on this issue and participate in the solution. Together we can become more responsible consumers of this priceless resource and wisely use what we have.

Karen Sheek is the mayor of Cortez, a position elected by council members. She was reelected to city council in 2016 and elected mayor for a third term in 2018. Reach her at ksheek@cityofcortez.com

Cortez to adopt water conservation plan in November

City aims for reduction in per capita water use

By Sean Dolan (https://the-journal.com/lms/loading.html?redthwatu=aHR0cHMlM0EvL3RoZS1qb3VybmFsLmNvb$8%3D&bothzahtrid=aHR0cHMlM0EvL3RoZS1qb3VybmFsLmNvb59zdGFmZi83NDM5U)
Journal Staff Writer
Tuesday, Oct. 30, 2018 4:51 PM

Water consumption in Cortez has decreased 38.5 percent since 1990, but for Public Works Director Phil Johnson, that's still too high.

A consumer uses about 200 gallons of water each day, down from 325 gallons in 1990, but an update to the city's water conservation plan, last revised in 2010, aims to cut per capita water use to 180 gallons a day. The Cortez City Council will conduct a public hearing and take a final vote to adopt the water conservation plan at its regular meeting on Nov. 13 at 7:30 p.m.

Johnson said he would like to reach that 180-gallon goal in a couple of years — and then continue the downward trend.

"I would say that we need to get much lower than 180, especially given our current situation with our changing environment, the reduced snowpack levels, etc.," Johnson said.

He said he is concerned with the long-term impacts 50 to 100 years from now. As Cortez, like much of the arid Southwest, is married to snowpack, there won't be many opportunities to suddenly add water to the system.

"The reason I want to save water is so people can adjust and adapt their lifestyle to using less water ... because when our water supply is not what it is now — it's less — our quality of life will not be impacted as greatly because we're able to live within our means," Johnson said.

Reducing water use isn't easy. Johnson said Cortez will have to provide help and education to get there.

The draft plan details conservation goals and water-saving mensures. In addition to a reduction in per person per day water use, the plan calls for full metering of all users in the Cortez system, a reduction in water loss and completion of a drought contingency plan.

Water-saving measures include a rebate program for water-efficient appliances like low-flow toilets and front-loading washing machines as well as encouragement of landscape efficiency, industrial efficiency and water reuse systems.

Johnson said reducing outdoor water use would provide the most benefits. He said the Public Works Department is training its employees to offer residents a water auditing service.

"A lot of people just overwater," Johnson said. "They think the grass needs a lot more water than it really does, and so we want to provide an audit where we can go out there and measure and talk to them."

In the experience of Vic Vanik, owner of Four Seasons Greenhouse and Nursery, persuading people to reduce outdoor water consumption is much easier during a drought than it is during a good water year.

"It's kind of a shame, but people don't really think there's a problem with drought until the drought is here," Vanik said.

He said he's seen an uptick over the past few months in customers looking for drought-tolerant plants. But those plants need a year to become established, so planting drought-tolerant plants during a drought is too late.

"If we continue the drought next year, there will be a lot interest, no doubt about it," Vanik said. "If we have a wet winter, people forget all about the fact that we're in a drought area."

To discourage wasteful outdoor water use, Johnson said Cortez since 2004 has imposed a restriction on watering during the heat of the day, between 10 a.m. and 6 p.m., from May 15 to Sept. 15. But the city's water rate structure does not necessarily encourage conservation, he said.

Cortez operates on a uniform water rate structure. The city charges a base rate for the first 1,000 gallons of monthly usage and a flat marginal rate for each additional 1,000 gallons used. The draft plan states Cortez will consider moving to a "conservation-oriented rate structure" that would encourage conservation among high water users.

Johnson said that could entail hiring a consultant to conduct a rate study in the coming year. He said a conservation-oriented rate structure would start with an affordable core service, maybe around 4,000 or 5,000 gallons per month, and then increase from there.

"Then if they want to use more than that for irrigation, that's a choice," Johnson said. "Obviously it would be something, I think, we're probably going to be looking at an increasing block rate so the more you use the more you pay."

If the Cortez City Council adopts the plan in November, Johnson said the public works department will make it a living, breathing document that will set the pace for local conservation practices.

Like Johnson, Vanik said education is the critical component in reducing water use. He said there are definitely people in Cortez who understand that they live in a desert, but people who come to the area often need a history lesson. Sometimes they don't understand the immutable relationship between snowpack and water supply.

"What happens if we don't have a wet winter? What are we going to do with McPhee (Reservoir) next year?" Vanik said. "It's going to be really bad if we don't have a good winter this winter."

sdolan@the-journal.com

City of Cortez
2018 Water Conservation Plan

Appendix

Preliminary Scope of Work for Future Water Rate Study

CITY OF CORTEZ
FUTURE WATER RATE STUDY
PRELIMINARY SCOPE OF WORK

A. **STUDY OBJECTIVES:**

1. Provide a comparison of current water system costs (operations, capital improvements, bonded debt) against appropriate industry benchmarks.
2. Recommend baseline rate structures required to fund the water system and consider annual inflationary, indexed adjustments to rates needed to maintain the water utility, as well as encourage water conservation by high water use customers.

B. **STUDY REQUIREMENTS:**

The study is to be performed in conformance with the following policy directions:

1. The recommended rate structure shall be based on cost of service and shall be sufficient to meet the revenue requirements of the water utility funds.
2. The study shall recommend rate structures that consider and make provisions for the following factors:
    a. Current and future cost of providing water service in accordance with established and anticipated standards and regulations.
    b. Projected demands.
    c. Age and condition of systems including repair and replacement cycle.
    d. Funding requirements for all current long-term liabilities and debt obligations (bond and loans).
3. The recommended rate structures shall provide direct identification of revenues appropriated to major funded activities and infrastructure.
4. The recommended rate structures shall be consistent with industry practice for utility rate making in Colorado.
5. The benefits of any proposed modifications shall be weighed against the financial impacts on ratepayers.
6. Justifications for any special classes of customers under the recommended rate structure shall be demonstrated.
7. The recommended rate structure shall result in no decrease in stability of the revenue stream, as compared to the current structure. An analysis will be completed to determine if funding is available for increased water conservation efforts. Consideration will also be given to funding past and future depreciation (i.e., replacement of facilities).
8. The recommended rate structure shall be easy to administer and understand.
9. The City of Cortez's existing billing system should be able to handle any proposed rate structure.
10. The recommended rate structure shall be planned for five years from 2020 through 2024.
11. The recommended rate structure shall be consistent with and reflect the city's policy direction as reflected in the City's most recent Comprehensive Plan and Water System Plan as of November 13, 2018.

12. The recommended rate structure will encourage water conservation by providing a sufficient pricing signal to high water use customers to encourage water conservation.

C. STUDY ELEMENTS:

In making its rate structure recommendations, the final report shall explicitly include the following elements and analysis:

1. Current Rate Structure: Assess the current rate structure's performance as a baseline for comparing recommended changes.
2. Equity: Assess the equity of recommended water rates for all types of property ownership to include multi-family units.
3. Sensitivity Analysis: Assess the ability of the revenue stream generated by the recommended rate structures to continue to fully fund water system costs. Assessment is to include a sensitivity analysis where the long-term revenue generated under each alternative shall be illustrated when confronted with the impacts of growth.
4. Other Service Charges: Assess existing customer service fee structure and identify other potential areas for service and system charges and recommend changes.
5. Annual operating fund balance targets.
6. Annual target contingency fund balances and level of liquidity.
7. Budgeting Horizon and Cycle: Assess appropriate budgeting horizon and cycle needed to support recommended rate structures.
8. Comprehensive Summary of Recommended Rate Structure(s): Assess performance of each recommended rate structure and provide recommendation on preferred rate structure. In recommending a rate structure the requirements of the Colorado law must be achieved.
9. Supporting Data: Provide data supporting conclusions and observations made for each of the areas above and site within study.
10. Utility Bond Rating: Identity utility bond rating enhancement opportunities.
11. Conservation Signal: Assess the strength of the pricing signal, of both the existing and recommended price structure, to encourage customers, particularly high water use customers, to conserve water.

D. SERVICES TO BE PROVIDED BY CONSULTANT:

1. Conduct a review of the existing water rates and status of the utility funds. Develop a general familiarity with the City of Cortez's billing system.
2. Meet or confer with staff as needed. Meet with a special committee during one late afternoon to obtain comments. Attend two meetings one late afternoon and one during the evening with the City Council to present the interim status of the study and obtain their input.
3. Conduct analyses as required to address the scope of work.
4. Preliminary Report:
    a. Prepare a preliminary study report and tentative rate structure.
    b. Submit 15 copies.
    c. Present preliminary report and tentative rate structure to staff and/or committee for comments.

d. Present preliminary report and tentative rate structures to the City Council.

5. Final Report:
   a. Incorporate changes pursuant to comments received at the first presentation.
   b. Submit 15 copies, plus one reproducible copy.
   c. Provide a disk with report in MS Word format, with spreadsheets in Excel format including a rate model with all assumptions.
   d. Present the final report and recommended rate structure to the City Council and members of the public at a regular Council meeting.
   6. Supply a time schedule for developing the preliminary and final reports. The final report shall be delivered to the City by <date>.

E. SERVICES TO BE PROVIDED BY THE CITY DEPARTMENT OF PUBLIC WORKS:
The services to be provided by the City Department of Public Works include, but are not necessarily limited to the following:

1. Furnish all reasonably available records and information, including financial reports, budgets, and consumption data.
2. Provide staff and engineering support and assistance as required and agreed to in advance of study.

2018 CITY OF CORTEZ WATER CONSERVATION PLAN APPENDIX ADDENDA

- Memo to Council from Rich Landreth for June 12, 2018, Council Workshop: *Update of the 2010 Water Conservation Plan*
- Minutes: Cortez City Council Regular Workshop, June 12, 2018
- Memo to Council from Rich Landreth for August 14, 2018, Workshop: *Water Conservation Plan Goals, Water Saving Measures, and Implementation Schedule*
- Minutes: Cortez City Council Regular Workshop, August 14, 2018
- Agenda and Minutes: Cortez City Council Regular Meeting, August 28, 2018
- Minutes: Cortez City Council Regular Workshop, August 28, 2018
- Public Notice of Water Conservation Plan Public Comment Period
- Agenda & Minutes: Cortez City Council Regular Meeting, October 23, 2018
- Agenda & Minutes: Cortez City Council Regular Meeting, November 13, 2018
- Comments from Brett M. Schmidt, P.E. on City of Cortez's Draft 2018 Water Conservation Plan, and Comment Responses from City
- Resolution No. WE-2017-1, Series 2017: *Establishing the Water Rate Charges and the Water Development Charges for the City of Cortez Water Enterprise*
- City of Cortez Ordinance No. 1257, Series 2018: *Adopting by Reference the 2018 Water Conservation Plan for the City of Cortez, Colorado*

PW-18-68

City of Cortez
City Council Correspondence

June 12, 2018

MEMO TO: Honorable Mayor and Members of the Cortez City Council

FROM: Rich Landreth, Water Treatment Plant Superintendent

SUBJECT: UPDATE OF THE 2010 WATER CONSERVATION PLAN

BACKGROUND

The City's Water Conservation Plan was first adopted in 1996. In 2009, the City hired Brilliam Engineering to update the Plan to meet the new guidelines established by the Colorado Water Conservation Board (CWCB). This updated Plan was adopted by the City Council; then submitted to and approved by CWCB in 2010. The CWCB guidelines require an update every seven years. The Public Works Department began updating the existing Plan in 2017 for adoption by Council in 2018.

DISCUSSION

Sections 1 through 4 of the Water Conservation Plan, as well as the Appendix, have been updated with the best available information. Beginning in Section 5, most of the goals have been reached or are in progress; new goals will need to be established. In Section 6, the water savings measures need to be addressed; many of them have not been implemented. Our task will be to review the measures and decide whether to keep them, change them, or delete them. Finally, an implementation plan will need to be developed.

When all of the steps are completed, the Plan will be need to be formally approved and adopted by the City Council and submitted to the CWCB for their approval. Each year during its seven-year term, the Plan will be evaluated and updated. One final note, the CWCB is developing guidelines for adding a planning component to a water conservation plan. Section 5.5 has been added as a placeholder for this section.

ACTION

After tonight's review and discussion of the draft plan, another work session should be scheduled to finalize our goals, water saving measures, and implementation plan. Once that has been accomplished, a final "draft" plan will be ready to present to Council.

Since the updated Plan must be adopted by Ordinance, we will follow up by presenting the Ordinance and final "draft" Plan for first reading before City Council. We will then advertise for the mandated 60-day time frame for public comment and notice of public hearing. Second reading and public hearing of the Ordinance will then be held before City Council for adoption of the updated Water Conservation Plan.

CORTEZ CITY COUNCIL
REGULAR WORKSHOP
TUESDAY, JUNE 12, 2018

1. The workshop began at 5:40 p.m., with dinner served. Attendance at the workshop included Mayor Karen Sheek, Mayor Pro-tem Orly Lucero, Sue Betts, Mike Lavey, and Gary Noyes. Councilmembers Ty Keel and Jill Carlson were absent. Staff members present were Management Intern Peyton Heitzman, Director of Public Works Phil Johnson, Water Treatment Plant Superintendent Rich Landreth, Director of Parks and Recreation Dean Palmquist, Chief of Police Roy Lane, and City Clerk Linda Smith. There were seven people in the audience. Pictures of the Recreation Center Community Garden were shared with Council.

2. Council continued discussion from the last Council worksession on limiting the time citizens speak. Mayor Sheek pointed out that all citizens should be treated the same when they speak at a Council meeting. Council agreed that a reasonable time limit should be set to allow everyone the opportunity to address Council. Discussion was held on the amount of time and how the process would be administered. Council agreed to keep the time limit the same for both public hearings and citizen participation time and that the person should be allowed to speak twice. It was agreed that citizens would be allowed to speak no more than two times and the time limit would be limited to four minutes each time. Also, the time limit requirement would be excluded if there are follow-up questions with Council.

3. Public Works Director Johnson stated that discussion was held previously with Council on the need to revise the 2010 Conservation Plan; however, it was determined that the plan would be updated after the new Councilmembers began. Water Treatment Plant Superintendent Landreth reviewed the chapters of the Conservation Plan and noted that the process would take several months to complete. He spoke about the data/appendix/graphs and stated that the new plan would be refreshed each year after adoption. He spoke about educating the public on water conservation and the need to accurately meter the water that is used by residents, businesses, and the parks. It was noted that a public comment period of 60 days would be included in the process before a public hearing is held with City Council. Water Treatment Plant Superintendent Landreth stated that the Colorado Water Conservation Board (CWCB) would have final approval of the plan. Discussion was held on providing demonstration gardens which could explain the different xeriscape options. He spoke about rebate programs that may be offered in the future. He asked Council to forward any questions they may have on the plan. Director of Public Works Johnson spoke about integrating Land Use Code requirements for water usage for future subdivisions into the plan as well. He also spoke about two pilot programs being offered by Western Water Assessment with the University of Colorado Boulder. He stated that he is checking out the program to see if the City could participate.

4. Mayor Sheek spoke about the next steps for the Fiber – Feasibility Study. She stated that during the recently completed feasibility and business case study presented by Finley

City of Cortez
City Council Correspondence

August 14, 2018

MEMO TO: Honorable Mayor and Members of the Cortez City Council

FROM: Rich Landreth, Water Treatment Plant Superintendent

SUBJECT: WATER CONSERVATION PLAN GOALS, WATER SAVING MEASURES, AND IMPLEMENTATION SCHEDULE

BACKGROUND

During the Council work session on June 12, 2018, discussion was held on updating the 2010 Water Conservation Plan. One item discussed was the need to finalize Water Conservation Goals in Part 5 and Water Savings Measures in Part 6.3 of the Plan. We also need to set an Implementation Schedule, Part 8.2.

DISCUSSION

Attached is an outline of Parts 5 and 6.3, along with suggestions for new goals and water-saving measures. Also included is a table for the implementation schedule. Once items are selected for inclusion in the Plan, a final draft will be completed and presented to Council at a public hearing. After the presentation, there will be a 60-day public comment period.

Once the comment period has ended and all questions and comments addressed, the Plan will need to be approved by ordinance. Upon approval by Council of the ordinance adopting the Plan, a copy will be submitted to the Colorado Water Conservation Board for their approval.

The Public Works Department will be responsible for monitoring the Plan progress and completing an annual evaluation and review. Results of this annual evaluation and review will be presented to the City Council.

ACTION

Select goals, water savings measures, and an implementation schedule so that a final draft can be presented to the public in the near future.

WATER CONSERVATION PLAN GOALS, WATER SAVING MEASURES, AND IMPLEMENTATION SCHEDULE

PART 5 - WATER CONSERVATION GOALS

5.1 GOAL #1: IN SHORT-TERM - MAINTAIN PER CAPITA WATER DEMAND AT CURRENT REDUCED LEVELS. OVER LONG-TERM - REDUCE PER CAPITA WATER DEMAND TO 200 GPCD. This goal has essentially been reached; our new goal is to reduce per capita water demand to 180 gpcd.

5.2 GOAL #2: FULL METERING / MONITORING. This goal has been reached for the most part; recommend leaving this as a goal until the entire system is metered.

5.3 GOAL #3: IMPROVE QUANTIFICATION OF WATER LOSS, MAINTAIN WATER LOSS OF <5%. Our current apparent unaccountable water equals about 15%. This should be lower as we complete meter installations and begin reporting known water losses (leaks, hydrant flushing, and unbilled usage).

5.4 GOAL #4: INSTITUTE AUTOMATIC METERING READING SYSTEM. This project was completed in 2016; recommend changing this to: "Investigate Advanced Metering Infrastructure System (AMI)". This is a central fixed-base system that would allow real-time usage information for the City and our customers.

ADDITIONAL SUGGESTED GOALS:

5.5 Goal #5: Complete a Drought Contingency Plan

5.6 Goal #6: Add a Planning component to the Plan

PART 6.3 – SELECTED WATER SAVINGS MEASURES / PROGRAMS

A. WATER-SAVING MEASURE / PROGRAM #1: WATER-EFFICIENT FIXTURES & APPLIANCES – Rebate program.

B. WATER-SAVING MEASURE / PROGRAM #2: WATERWISE LANDSCAPING PROGRAM – To include incentives.

C. WATER-SAVING MEASURE / PROGRAM #3: WATER-EFFICIENT INDUSTRIAL & COMMERCIAL PROCESSES.

D. WATER-SAVING MEASURE / PROGRAM #4: WATER REUSE SYSTEMS.

E. WATER-SAVING MEASURE / PROGRAM #5: DISTRIBUTION SYSTEM LEAK IDENTIFICATION AND REPAIR.

F. WATER-SAVING MEASURE / PROGRAM #6: PUBLIC EDUCATION, CUSTOMER USE AUDITS, WATER SAVINGS DEMONSTRATIONS – Development of demonstration gardens.

G. WATER-SAVING MEASURE / PROGRAM #7: WATER RATE STUDY / CONSERVATION PRICING – Tiered rate structure.

H. WATER-SAVING MEASURE / PROGRAM #8: REGULATORY MEASURES – Watering restrictions; Limits on the amount of turf for new construction; Dual plumbing systems.

I. WATER-SAVING MEASURE / PROGRAM #9: INCENTIVES, REBATES TO ENCOURAGE CONSERVATION – This is the same as Program #1, recommend removal.

ADDITIONAL WATER SAVING MEASURES TO CONSIDER:

Rainwater Harvesting

IMPLEMENTATION SCHEDULE:

Water Saving Measure / Program	Implementation Date	Anticipated Budget Allocation
#1: Water-Efficient Fixtures & Appliances	No later than 2020	? / year
#2: Waterwise Landscaping Program	No later than 2019	? (one time)
#3: Water-Efficient Industrial & Commercial Processes	No later than 2020	? / year
#4: Water Reuse Systems	Ongoing	Not Applicable
#5: Distribution System Leak Identification & Repair	Ongoing / Contractor	$50,000
#6: Public Education, Customer Water Use Audits, Water-Saving Demonstrations	Ongoing	? / year
#7: Water Rate Study / Conservation Pricing	No later than 2019	$40,000 (one time)
#8: Regulatory Measures	Ongoing	Currently incurred
#9: Incentives, Rebates to Encourage Conservation	No later than 2020	See #1 (above)

CORTEZ CITY COUNCIL
REGULAR WORKSHOP
TUESDAY, AUGUST 14, 2018

1. The workshop began at 5:15 p.m., with Council's picture retaken. Dinner was served at 5:30 p.m. Attendance at the workshop included Mayor Karen Sheek, Mayor Pro-tem Orly Lucero, Sue Betts, Jill Carlson, Ty Keel, Mike Lavey, and Gary Noyes. Staff members present were Management Intern Peyton Heitzman, Risk Manager/Executive Assistant Dawn Lightenburger, Director of General Services Rick Smith, Director of Public Works Phil Johnson, Water Treatment Plant Superintendent Rich Landreth, Director of Planning and Building Sam Proffer, Director of Parks and Recreation Dean Palmquist, City Attorney Mike Green, City Manager John Dougherty, and City Clerk Linda Smith. There were three people in the audience.

2. Discussion was held on the 2019 Community Support Grant Process. Risk Manager/Executive Assistant Lightenburger stated that the grants would be posted on-line on September 1, 2018 and due back by September 28, 2018. She stated that Council will review the requests at the October 23, 2018, Council worksession. Council asked that the 'Accountability' portion of the grant application be bolded so it is clear what is required for the grant to be considered.

3. The questions for the broadband survey were reviewed for finalization. Doug Dawson, from CCG Consulting, stated that he would like to divide question 16 into two questions and one typo was pointed out (like to live). Discussion was held on various questions that were included on the survey and several Councilmembers asked that the survey be sent out in the water bills as well as completed as a random phone survey. It was suggested that 'internet access' be used instead of the word 'broadband' (question 5 and 6) and if possible a definition describing what internet access would consist of. It was suggested that Question 10 be reworded so it is clear on who is providing the service. Discussion was held on the time line to complete the surveys. Mr. Dawson noted that the random phone survey would be calling cell phones.

4. An update was give by Water Treatment Plant Superintendent Landreth and Public Works Director Johnson on the Water Conservation Plan goals, water saving measures, and implementation schedule. Discussion was held on the plan which is being implemented to save water now and in the future. Discussion was held on cost saving incentives/rebate programs that could be offered to customers and it was noted that the automated meter system has been completely installed and is fully functional. Water Treatment Plant Superintendent Landreth stated that the plan outlines the need to complete a leak detection survey of the City water system as it has been some time since a survey was last completed. It was noted that the City has 84 miles of water pipeline and Director of Public Work Johnson stated that the City could apply for a grant to help pay for the survey. Discussion was held on public education of the Water Conservation Plan and new programs that would be available to the community. Discussion will continue at the next worksession to finalize the plan, budgetary numbers, and prepare the plan for a public hearing with City Council.

PLEASE VIEW THE LIVE STREAMED CITY COUNCIL MEETINGS ON THE CITY'S WEBSITE: http://www.cityofcortez.com/497/City-Council-Live-Stream

CORTEZ CITY COUNCIL
REGULAR MEETING
TUESDAY, AUGUST 28, 2018
7:30 p.m.

1. CALL TO ORDER - PLEDGE OF ALLEGIANCE

2. CONSENT AGENDA

The listing under "Consent Agenda" is a group of items to be acted on with a single motion and vote. This agenda is designed to expedite the handling of limited routine matters by City Council. The mayor will ask if a citizen or Council member wishes to have any specific item removed from the Consent Agenda for discussion. Either the public or a Council member may request that an item be removed from the Consent Agenda at that time, prior to Council's vote.

a. Approval of the Worksession and Regular Meeting Minutes of August 14, 2018.

b. Approval of the Expenditure Vouchers of August 28, 2018

c. Approval of a Renewal 3.2% Beer Off Premises Liquor License for Good 2 Go/South Broadway

Council will consider approving a renewal 3.2% Beer Off Premises Liquor License for Good 2 Go Stores LLC, DBA Good 2 Go, located at 717 South Broadway, Cortez.

d. Approval of a Renewal 3.2% Beer Off Premises Liquor License for Good 2 Go/Main Street

Council will consider approving a renewal 3.2% Beer Off Premises Liquor License for Good 2 Go Stores, LLC, DBA Good 2 Go, located at 302 West Main Street, Cortez.

e. Approval of a Renewal Tavern Liquor License for Destination Grill

Council will consider approving a renewal Tavern Liquor License for Cortez Conference Center LLC, DBA Destination Grill, located at 2121 East Main Street, Cortez.

3. PRESENTATIONS

a. 2018 Community Project of the Year Award from Mountain Connect

Jeff Gavlinski of Mountain Connect will be presenting an award to Rick Smith and the City of Cortez for the 2018 Community Project of the Year.

4. CITIZEN PARTICIPATION
(Comments may be limited to four (4) minutes per person, please comment on items not listed as a public hearing. Council may or may not respond to comments.)

5. PUBLIC HEARINGS

a. Resolution No. 17, Series 2018 (Associate Planner Neva Connolly)

Council will consider approving Resolution No. 17, Series 2018, with five conditions, approving a conditional use permit to establish a church at 2220 East Main Street, in the Commercial.Highway (C) zoning district, as submitted by property owner Thomas Maley.

6. UNFINISHED BUSINESS – None.

7. NEW BUSINESS

a. Resolution No. 18, Series 2018 (Associate Planner Neva Connolly)

Council will consider approving Resolution No. 18, Series 2018, with three conditions approving the Amended Plat of Unit 2617 of Tract A-2 Fairway Estates, as submitted by owner Joan Luhman.

b. Advertisement of the Draft 2018 Water Conservation Plan
(Director of Public Works Phil Johnson)

Council will consider directing staff to advertise the Draft 2018 Water Conservation Plan for the required sixty (60) day comment period. (The Draft 2018 Water Conservation Plan is included with the August 28, 2018, Workshop Packet)

c. Appointment to the Parks, Recreation, and Forestry Advisory Board
(Director of Parks and Recreation Dean Palmquist)

Council will consider appointing Sawyer Dietrich as a student representative on the Parks, Recreation, and Forestry Advisory Board.

d. Bid for Production of the Historic Preservation Podcast
(Management Intern Peyton Heitzman)

Council will consider approving the bid from KSJD for the production of a Historic Preservation podcast in the amount of $7,500.

b. Advertisement of the Draft 2018 Water Conservation Plan. Director of Public Works Johnson stated that Council and staff have completed their discussion on the draft 2018 Water Conservation Plan and, in accordance with State requirements, the final draft is required to be advertised for a sixty (60) day comment period. He stated that once the comment period has ended and all questions and comments addressed, the plan will need to be approved by ordinance and then submitted to the Colorado Water Conservation Board for their approval. He noted that a copy of the plan is available at City Hall, the City Service Center, and the City's website for residents to review and make comments. He noted that the comment period will run from August 31, 2018 to October 31, 2018. He stated that public comments will be included as part of the plan.

Councilmember Noyes moved that Council direct staff to advertise the Draft 2018 Water conservation Plan for the required sixty (60) day comment period. Councilmember Carlson seconded the motion, and the vote was as follows:

Betts	Carlson	Keel	Lavey	Lucero	Noyes	Sheek
Yes	Yes	Yes	Yes	Yes	Yes	Yes

c. Appointment to the Parks, Recreation, and Forestry Advisory Board. Director of Parks and Recreation Palmquist stated that a letter was received from Sawyer Dietrich to serve as a youth representative on the Parks, Recreation, and Forestry Advisory Board. He stated that the Parks, Recreation, and Forestry Advisory Board discussed Mr. Dietrich serving on the board and have given their unanimous support for his appointment for a one-year term. Councilmember Lavey stated that Mr. Dietrich would be present at the Council meeting; however, he is working at Moose and More.

Councilmember Betts moved that Council approve the appointment of Sawyer Dietrich as a student representative on the Parks, Recreation, and Forestry Advisory Board. Councilmember Lavey seconded the motion, and the vote was as follows:

Betts	Carlson	Keel	Lavey	Lucero	Noyes	Sheek
Yes	Yes	Yes	Yes	Yes	Yes	Yes

d. Bid for Production of the Historic Preservation Podcast. Management Intern Heitzman stated that in March 2018, Council approved the Historic Preservation Board's request to apply for a grant from History Colorado for the purpose of developing a podcast that shares the unique history of Montezuma Avenue. She stated that the grant of $7,708 was awarded and bids were sent out for creation of the podcast. She stated that five bids were received and the Historic Preservation Board believes the services offered by KSJD (at a bid amount of $7,500) will be the best fit for the project. She stated that the KSJD has pledged to host the podcast through their website as well as set up a link to the podcast from the City's website which will allow the podcast to be available in multiple locations, and avoid the City paying an additional $1,000 fee that would be required by the City's website to format the podcast. She stated that table tents would also be produced which will advertise the podcast. In answer to a question from Councilmember Keel, Linda Towle, Vice-Chairperson of the Historic Preservation Board, stated that the podcast for Montezuma Avenue would be a separate podcast from the several other podcasts that have been created over the past

CORTEZ CITY COUNCIL
REGULAR WORKSHOP
TUESDAY, AUGUST 28, 2018

1. The workshop began at 6:15 p.m., with snacks being served. Attendance at the workshop included Mayor Karen Sheek, Mayor Pro-tem Orly Lucero, Sue Betts, Jill Carlson, Ty Keel, Mike Lavey, and Gary Noyes. Staff members present were Management Intern Peyton Heitzman, Director of General Services Rick Smith, Director of Public Works Phil Johnson, Director of Planning and Building Sam Proffer, Chief of Police Roy Lane, City Planner Tracie Hughes, Associate Planner Neva Connolly, City Attorney Mike Green, City Manager John Dougherty, and City Clerk Linda Smith. There were no citizens in the audience. Mayor Sheek spoke about upcoming Meet the Candidate forums that will be held over the next six weeks.

2. Director of Public Works Johnson continued review on the Water Conservation Plan from the last Council worksession. He stated that the plan is ready for acceptance and to move forward for the public comment period. He reviewed a few changes that were made to the plan from the last discussion. He stated that upon approval by Council following the 60-day comment period, the plan would be submitted to the Colorado Water Conservation Board for their approval. He spoke about grants that could be obtained from the Colorado Water Conservation Board and Department of Local Affairs once the plan is adopted. He stated that the City would like to apply for a grant to complete a leak survey of the City lines. Discussion was held on the conservation of water and the advantages of xeriscaping. Director of Public Works Johnson stated that copies of the plan would be available at City Hall, the Service Center, and on-line for citizens to review and make comments.

3. City Planner Hughes reviewed the draft Three-Mile Plan and Master Streets Plan for the City. She gave background on the plan noting that the City has been working with Kendig Keast Collaborative on drafting the Three-Mile Plan under the revision of the Land Use Code contract. She stated that the Planning and Zoning Commission and Montezuma County's Planning Commission have both reviewed the Three-Mile Plan which is considered an advisory document. She spoke about the process for annexing into the City as allowed by State law. She stated that the Planning staff has been working with the City Engineer and Public Works Department to update the Master Street Plan which was last updated in 1999. She stated that the City reviews County developments to be sure it matches up with the Master Streets Plan prior to approval of a plat. Discussion was held on an Intergovernmental Agreement that could be completed with the County that would help with guidance on development around the City boundaries.

4. Chief of Police Lane gave Council an update on the marijuana raid that was conducted today. Councilmember Carlson spoke about a resident who reached out to her and suggested that tribal elements be incorporated in the new southside community park.

The workshop was adjourned at 7:20 p.m.

PW-18-100
August 31, 2018

City of Cortez
Service Center
110 West Progress Circle
Cortez, CO 81321

PUBLIC NOTICE OF WATER CONSERVATION PLAN
CITY OF CORTEZ
PUBLIC COMMENT PERIOD: AUGUST 31 – OCTOBER 28, 2018
PUBLIC HEARING: CITY COUNCIL MEETING, NOVEMBER 13, 2018

Notice is hereby given that the City of Cortez is updating its Water Conservation Plan, pursuant to State Law. The City is seeking public comment over the next sixty (60) days, and will conduct a Public Hearing on the Plan during the City Council Meeting on Tuesday, November 13, 2018. The City Council Meeting will be called to order at 7:30 p.m. in the Council Chambers at City Hall, 123 Roger Smith Avenue, Cortez.

Comments on the 2018 Water Conservation Plan will be received during the time designated in the meeting's agenda. Anyone wishing to comment on the Plan should be present at the November 13, 2018, Council meeting.

The City's Water Conservation Plan is designed to promote the efficient consumption of all water usage by residents, businesses, and local governments to more beneficially use our water resources, and insure a future adequate water supply.

The 2018 Water Conservation Plan is available for review by the public at City Hall and at the City Service Center, 110 West Progress Circle, Cortez, during regular business hours. The Plan is also available on the City's website at www.cityofcortez.com. The designated point of contact for public comment is Richard Landreth, Water Treatment Plant Superintendent, 970.565.7320.

Written comments on the Plan should be submitted to the City Clerk's Office at City Hall no later than 5:00 p.m. on Thursday, November 1, 2018. Comments can also be emailed by that deadline to: ConservationPlan.2018@cityofcortez.com.

ADVERTISED: August 31, 2018
September 7, 2018
September 11, 2018
September 21, 2018

The Journal
#8 West Main
Cortez, CO 81321

08/29/18

Mailing Address: P.O. Drawer A, Durango, CO 81302

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Account:	105480	Date:	08/29/18
Client:	Debbie Speer	Ad Date:	08/31/18
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		Ad ID:	292001
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Address:	123 ROGER SMITH AVE	Sales Person:	C10
	Cortez, CO 81321	Words:	277
		Lines:	75
		Agate Lines:	109
Telephone:	(970) 565-3402	Depth:	7.819
Description:	292001 PUBLIC NOTICE OF WATER CONSER	Inserts:	8
		Blind Box:	

Other Charges:	$2.00	Gross:	$94.25
Discount:	$0.00		
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We Appreciate Your Business!
-Thank You Debbie Speer!-

292001
PUBLIC NOTICE OF WATER CONSERVATION PLAN

CITY OF CORTEZ

PUBLIC COMMENT PERIOD: AUGUST 31 – OCTOBER 28, 2018

PUBLIC HEARING: CITY COUNCIL MEETING, NOVEMBER 13, 2018

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Written comments on the Plan should be submitted to the City Clerk's Office at City Hall no later than 5:00 p.m. on Thursday, November 1, 2018. Comments can also be emailed by that deadline to: ConservationPlan.2018@cityofcortez.com.

Published in The Journal August 31 and September 7, 11 and 21, 2018.

PLEASE VIEW THE LIVE STREAMED CITY COUNCIL MEETINGS ON THE CITY'S WEBSITE:

CORTEZ CITY COUNCIL
REGULAR MEETING
TUESDAY, OCTOBER 23, 2018
7:30 p.m.

1. CALL TO ORDER - PLEDGE OF ALLEGIANCE

2. CONSENT AGENDA

The listing under "Consent Agenda" is a group of items to be acted on with a single motion and vote. This agenda is designed to expedite the handling of limited routine matters by City Council. The mayor will ask if a citizen or Council member wishes to have any specific item removed from the Consent Agenda for discussion. Either the public or a Council member may request that an item be removed from the Consent Agenda at that time, prior to Council's vote.

a. Approval of the Worksession and Regular Meeting Minutes of October 9 2018.

b. Approval of the Expenditure Vouchers of October 23, 2018

c. Approval of a Special Event Permit for United Way of Southwest Colorado

Council will consider approving a Special Event Permit for United Way of Southwest Colorado to host a 'Meet and Greet' event on November 7, 2018, from 3:30 p.m. to 8:00 p.m., at the Pink Building (addressed as 30 North Beech Street).

3. PRESENTATIONS – None.

4. CITIZEN PARTICIPATION
(Comments may be limited to four (4) minutes per person, please comment on items not listed as a public hearing. Council may or may not respond to comments.)

5. PUBLIC HEARINGS

a. Resolution No. 22, Series 2018 (Associate Planner Neva Connolly)

Council will consider approving Resolution No. 22, Series 2018, approving a Conditional Use Permit to establish a temporary emergency shelter at the Grace Fellowship Evangelical Free Church, located at 24 North Chestnut, in the Central Business Zone (CBD), as submitted by Laurie Knutson (Agent for the Bridge Emergency Shelter) and Jon R. Kelly (Agent for Grace Fellowship Church).

6. UNFINISHED BUSINESS – None.

7. NEW BUSINESS

   a. Ordinance No. 1257, Series 2018 (Director of Public Works Phil Johnson)

   Council will consider on first reading, Ordinance No. 1257, Series 2018, adopting by reference the 2018 Water Conservation Plan for the City of Cortez, Colorado, promoting the efficient consumption of all water usage by residents, business, and local governments to more beneficially use water resources and insure a future adequate water supply, and set for public hearing on November 13, 2018.

   b. Resolution No. 23, Series 2018 (Management Intern Peyton Heitzman)

   Council will consider approving Resolution No. 23, Series 2018, approving a GOCO (Great Outdoors Colorado) Grant for the new south side park.

8. DRAFT RESOLUTION/ORDINANCES – None.

9. OTHER ITEMS OF BUSINESS – None.

10. ADDITIONAL CITIZEN PARTICIPATION

11. CITY ATTORNEY'S REPORT – None.

12. CITY MANAGER'S REPORT – None

13. CITY COUNCIL COMMITTEE REPORTS

   a. Mayor's Report on Workshop

14. ADJOURNMENT

Individuals with disabilities needing auxiliary aid(s) may request assistance by contacting City Hall: address – 123 Roger Smith Avenue, Cortez; phone – 970-565-3402; fax – 970-565-8172; e-mail – lsmith@cityofcortez.com. We would appreciate if you would contact us at least 48 hours in advance of the scheduled event so arrangements can be made to locate requested auxiliary aid(s).

Councilmember Betts moved that Council approve Resolution No. 22, Series 2018, approving a Conditional Use Permit to establish a temporary emergency shelter at the Grace Fellowship Evangelical Free Church, located at 24 North Chestnut, in the Central Business Zone (CBD), as submitted by Laurie Knutson (Agent for the Bridge Emergency Shelter) and Jon R. Kelly (Agent for Grace Fellowship Church) with six conditions: a) all requirements of utility providers, City departments and affected Districts must be satisfied, as outlined in adopted City Codes and other regulatory documents, specifically in reference to Building Code and Fire Code requirements. City Engineering requirements, if any, must be met; b) any exterior lighting shall be contained on the property, as per Land Use Code Section 5.07 – Performance Standards; c) the appropriate construction drawings for the project, signed, and stamped by a Colorado-licensed architect or engineer, if needed, must be approved by the Building Official and City Engineer and a building permit obtained prior to any construction on site; d) showers must be installed in the facility before shelter occupancy is allowed; e) the maximum occupancy for shelter guests is 33 persons; and f) the Conditional Use Permit will be terminated on May 1, 2019. Councilmember Carlson seconded the motion, and the vote was as follows:

Betts	Carlson	Keel	Lavey	Lucero	Noyes	Sheek
Yes	Yes	Yes	Yes	Yes	Yes	absent

6. UNFINISHED BUSINESS – None.

7. NEW BUSINESS

a. Ordinance No. 1257, Series 2018. Director of Public Works Johnson stated that Ordinance No. 1257, Series 2018, adopts by reference the 2018 Water Conservation Plan for the City of Cortez, Colorado, promoting the efficient consumption of all water usage by residents, business, and local governments to more beneficially use water resources and insure a future adequate water supply. He stated that Council has reviewed the plan during several worksessions and the public comment period will be concluded on November 1, 2018. He stated that so far one comment has been received that will be included in the plan. He stated that staff recommends approval of Ordinance No. 1257, Series 2018, on first reading and that the final reading and a public hearing be set for November 13, 2018.

Councilmember Keel moved that Council approve Ordinance No. 1257, Series 2018, on first reading and set for public hearing on November 13, 2018. Councilmember Carlson seconded the motion, and the vote was as follows:

Betts	Carlson	Keel	Lavey	Lucero	Noyes	Sheek
Yes	Yes	Yes	Yes	Yes	Yes	absent

b. Resolution No. 23, Series 2018. Management Intern Heitzman stated that Resolution No. 23, Series 2018, supports the grant application for a local Parks and Outdoor Recreation Grant from the State Board of the Great Outdoors Colorado Trust Fund for the completion of the Cortez Neighborhood Park (Phase One). She stated that the GOCO grant is for $350,000 to help fund the eleven acre development of the neighborhood park that will be located at the property of the old high school. She stated that the application is due November 1, 2018, and grants will be awarded in

PLEASE VIEW THE LIVE STREAMED CITY COUNCIL MEETINGS ON THE CITY'S WEBSITE: http://www.cityofcortez.com/497/City-Council-Live-Stream

CORTEZ CITY COUNCIL
REGULAR MEETING
TUESDAY, NOVEMBER 13, 2018
7:30 p.m.

1. CALL TO ORDER - PLEDGE OF ALLEGIANCE

2. CONSENT AGENDA

The listing under "Consent Agenda" is a group of items to be acted on with a single motion and vote. This agenda is designed to expedite the handling of limited routine matters by City Council. The mayor will ask if a citizen or Council member wishes to have any specific item removed from the Consent Agenda for discussion. Either the public or a Council member may request that an item be removed from the Consent Agenda at that time, prior to Council's vote.

a. Approval of the Worksession and Regular Meeting Minutes of October 23, 2018, and Special Worksession of October 25, 2018

b. Approval of the Expenditure Vouchers of November 13, 2018

c. Approval of a Renewal Hotel and Restaurant Liquor License for Loungin' Lizard

Council will consider approving a renewal Hotel and Restaurant Liquor License for Loungin' Lizard Inc., DBA Loungin' Lizard, located at 2-4 West Main Street, Cortez.

3. PRESENTATIONS – None.

4. CITIZEN PARTICIPATION
(Comments may be limited to four (4) minutes per person, please comment on items not listed as a public hearing. Council may or may not respond to comments.)

5. PUBLIC HEARINGS

a. Ordinance No. 1257, Series 2018 (Director of Public Works Phil Johnson)

Council will consider approving on final reading, Ordinance No. 1257, Series 2018, adopting by reference the 2018 Water Conservation Plan for the City of Cortez, Colorado, promoting the efficient consumption of all water usage by residents, business, and local governments to more beneficially use water resources and insure a future adequate water supply.

b. Resolution No. 24, Series 2018 (Associate Planner Neva Connolly)

Council will consider approving Resolution No. 24, Series 2018, approving the Old High School Minor Subdivision, as submitted by Lori Haukeness, representative for owner Montezuma County School District RE-1, with four conditions, and authorizing the Mayor to sign the plat.

c. Resolution No. 25, Series 2018 (Associate Planner Neva Connolly)

Council will consider approving Resolution No. 25, Series 2018, approving the Lot 11A and Lot 11B Minor Subdivision of the Cortez Industrial Park, as submitted by James Hunter, manager of F&F Holdings, LLC (owner), with two conditions, and authorizing the Mayor to sign the plat.

6. UNFINISHED BUSINESS – None.

7. NEW BUSINESS

a. Resolution No. 26, Series 2018 (Associate Planner Neva Connolly)

Council will consider approving Resolution No. 26, Series 2018, approving an Amended Plat of Lot 1 of the Amended Plat Tucker Subdivision, as submitted by owner Mark Rodgers, with four conditions.

b. Cancel Council Meeting on December 25, 2018 (City Clerk Linda Smith)

Council will consider canceling the Council meeting scheduled for December 25, 2018, due to the holidays.

c. Ordinance No. 1258, Series 2018 (Associate Planner Neva Connolly)

Council will consider approving on first reading, Ordinance No. 1258, Series 2018, approving four separate structures located within the "Original Townsite of Cortez" and "Coffins Addition" to be included in the City of Cortez Register of Historic Structures, Sites, and Districts, specifically the structures at 21 East Main Street, 111-113 East Main Street, 237 West Main Street, and 202 West North Street, and set for public hearing on November 27, 2018.

8. DRAFT RESOLUTION/ORDINANCES – None.

9. OTHER ITEMS OF BUSINESS – None.

10. ADDITIONAL CITIZEN PARTICIPATION

11. CITY ATTORNEY'S REPORT – None.

CITY COUNCIL
REGULAR MEETING
TUESDAY, NOVEMBER 13, 2018

1. The meeting was called to order at 7:30 p.m., and was opened with the Pledge of Allegiance. Councilmembers present were Mayor Karen Sheek, Mayor Pro-tem Orly Lucero, Sue Betts, Jill Carlson, Ty Keel, Mike Lavey, and Gary Noyes. Staff members present were Chief of Police Roy Lane, Director of Public Works Phil Johnson, Associate Planner Neva Connolly, Director of Planning and Building Sam Proffer, City Attorney Mike Green, and City Clerk Linda Smith, and City Manager John Dougherty. There were six people present in the audience. Mayor Sheek stated that condolences are sent to the people in California as they deal with the multiple fires and loss of life. She commended the people that are helping to bring supplies in and the brave front line of firefighters.

2. The Consent Agenda items acted upon by Council were as follows:

   a. Approval of the Worksession and Regular Meeting Minutes of October 23, 2018.

   b. Approval of the payment of the Expenditure Vouchers of November 13, 2018.

   c. Approval of a Renewal Hotel and Restaurant Liquor License for Loungin' Lizard Inc., DBA Loungin' Lizard, located at 2-4 West Main Street, Cortez.

   Mayor Pro-tem Lucero moved that Council approve the Consent Agenda with the additional expenditure list totaling $98,704.91. Councilmember Keel seconded the motion, and the vote was as follows:

Betts	Carlson	Keel	Lavey	Lucero	Noyes	Sheek
Yes	Yes	Yes	Yes	Yes	Yes	Yes

3. PRESENTATIONS – None.

4. CITIZEN PARTICIPATION

   a. Notice to Council Regarding Accident. Glen Brace, 10560 CR 23, Cortez, presented Council with a copy of a letter that has been sent to the City regarding a ticket that was issued to him in 2017. He stated that he wanted Council to be aware of the letter and that there are 90 days for everyone to respond.

5. PUBLIC HEARINGS

   a. Ordinance No. 1257, Series 2018. Director of Public Works Johnson stated that Ordinance No. 1257, Series 2018, adopts by reference the 2018 Water Conservation Plan for the City of Cortez, promoting efficient consumption of all water usage by residents, business, and local governments to more beneficially use water resources and insure a future adequate water supply. He stated that the

plan contains information on the physical characteristics of the City's existing water system and inventory of resources. He stated that the plan describes water supplies, water pricing, water use, and future forecasts, and purposes to implement water-saving programs with larger expenses in different years to minimize the impact to the City. He stated that advertisement was placed in the local newspaper on the adoption of the new plan and a 60-day period (August 31 to October 28, 2018) was set for receiving questions and comments on the ordinance. He stated that one comment was received which was added to the plan. Mayor Sheek opened the public hearing; however, no one spoke, and the hearing was closed.

Councilmember Noyes moved that Council approve Ordinance No. 1257, Series 2018, adopting by reference the 2018 Water Conservation Plan for the City of Cortez, promoting efficient consumption of all water usage by residents, business, and local governments to more beneficially use water resources and insure a future adequate water supply. Mayor Pro-tem Lucero seconded the motion, and the vote was as follows:

Betts	Carlson	Keel	Lavey	Lucero	Noyes	Sheek
Yes	Yes	Yes	Yes	Yes	Yes	Yes

b. Resolution No. 24, Series 2018. Associate Planner Connolly stated that Resolution No. 24, Series 2018, approves the Old High School Minor Subdivision. She stated that the City received an application from Lori Haukeness, representative for the property owner Montezuma Cortez RE-1 School District, to create a two-lot minor subdivision of the property formerly known as the "old high school." She stated that the property is bounded by Oak Street on the west, 7th Street on the south, and South Chestnut Street on the east. She stated that the property is approximately 14.1 acres and the intent is to divide the property into Lot 1 with 10.8 acres and Lot 2 with 3.3 acres. She stated that the City intends to purchase the property and to develop Lot 1 with a future neighborhood park and Lot 2 would be sold to the Montezuma Housing Authority for development of housing. She stated that there is an easement on the plat for the future development of Elm Street. She stated that the subdivision has meet all the requirements of Land Use Code Section 6.11, Minor Subdivisions. She reviewed the comments from utility supplies and affected special districts and stated that staff recommends approval through Resolution No. 24, Series 2018, with three conditions. Mayor Sheek opened the public hearing; however, no one spoke and the hearing was closed.

Mayor Pro-tem Lucero moved that Council authorize the Mayor to sign the plat and approve Resolution No. 24, Series 2018, approving the Old High School Minor Subdivision, as submitted by Lori Haukeness, representative for owner Montezuma County School District RE-1, with the following three conditions: a) all requirements of utility providers, City departments, and affected districts must be satisfied, as outlined in adopted City Codes and other regulatory documents; b) the final plat must show the 15-foot drainage easement on the northern portion of Lot 2; and c) in accordance with Land Use Code Section 6.11(e)(2)(a), the minor subdivision plat must be recorded within six (6) months of City Council approval, or the approving actions shall be deemed void. Councilmember Lavey seconded the motion, and the vote was as follows:

Betts	Carlson	Keel	Lavey	Lucero	Noyes	Sheek
Yes	Yes	Yes	Yes	Yes	Yes	Yes

SUBJECT: COMMENTS ON CITY OF CORTEZ'S DRAFT 2018 WATER CONSERVATION PLAN

Mr. Landreth:

Thank you for the opportunity to provide comment on the City of Cortez's draft 2018 Water Conservation Plan. I was the principal author of the 2010 plan while employed with Briliam Engineering in Pagosa Springs, Colorado. The 2010 plan was developed in collaboration with the City's Water Treatment Plant Superintendent, reviewed and approved by the Colorado Water Conservation Board, and approved unanimously by the Cortez City Council.

I commend the City of Cortez for its continued efforts to promote water conservation by the community. The future prosperity and well-being of the entire Four Corners region will be largely affected by stewardship of its water resources, particularly as water becomes scarcer due to population growth and climate change.

The draft 2018 plan appears to be a very modest refresh of the 2010 plan, with data updated for recent years where available, but proposes no new goals and no new water-saving measures/programs.

CITY COMMENT: There are actually several new or revised goals:

- First, reducing the gpcd from 200 gpcd to 180 gpcd.
- Second, investigating a move from AMR (a completed goal) to AMI.
- The development of a Drought Contingency Plan has also been added as a goal.
- The rest of the goals were not completed, so were left in.

I respectfully offer the following three suggestions to improve the city's water conservation efforts:

- **Describe Funding for Water Conservation Efforts:** The water-saving measures/programs that the city has selected (and described in paragraph 6.3) require significant financial resources to implement. Yet, the draft plan lacks any description of the funds that have been spent or will be budgeted to implement these measures/programs. **The plan should explicitly describe the funds that have been invested in water conservation measures by the City of Cortez during the preceding years, as well as what the city has or will budget for water conservation in the next several years.**

- CITY COMMENT: The potential funding for projects is enumerated in Part 8, Figure M.

- **Need Increased Public Participation:** A major issue with the 2010 Water Conservation Plan was a lack of meaningful public participation. Involvement of the citizens of the City of Cortez in the community's water conservation efforts is critically important to its success. Many of the water-saving measures/programs selected by the city require citizen involvement, such as installing water-efficient fixtures/appliances, waterwise landscaping, and rainwater harvesting. **To help increase public participation in the community's water conservation efforts, the finalization and implementation of the plan be overseen by the City's Planning and Zoning Commission, supported by the City's Department of Public Works.** The Planning and Zoning Commission is well positioned to help educate the City's residents about the water conservation plan, as well as conducting the annual reviews of the city's water conservation efforts, as described in paragraph 8.5.

- **CITY COMMENT: Cortez City Council would be the venue to help educate the City's residents about the Plan - the City's Planning and Zoning Commission is strictly an advisory board to Council. The City Public Works Department advertised the comment period for the 2018 Water Conservation Plan in the local newspaper and on the City's website for the required sixty (60) days.**

- **Designate Water Conservation Coordinator.** About 10 years ago, the Pagosa Springs Area Water & Sanitation District (PAWSD) hired a full-time water conservation coordinator to help implement its water conservation plan.1 The Water Conservation Coordinator's efforts were essential in helping achieve PAWSD's water conservation goals. The City of Cortez would similarly benefit from a dedicated staff member to help implement the water conservation plan. **So, the City of Cortez should designate one of its employees to serve as a Water Conservation Coordinator to help implement the water conservation plan**. The Water Conservation Coordinator would preferably be a full-time position working jointly with the both the planning & building and public works departments. The Water Conservation Coordinator should not be the WTP Superintendent who needs to remain focused on safe operation & maintenance of the city's water system.

- **CITY COMMENT: The City's Department of Public Works is presently working on revising a job description to include a part-time Water Conservation Coordinator.**

If you have any questions concerning these comments or would like to discuss further, please feel free to contact me at brettmschmidt@gmail.com or 608-515-4101.

Respectfully submitted,

Brett M. Schmidt

Brett M. Schmidt, P.E.

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[1] "Water Conservation Assessment for Southwest Colorado," by Four Corners Office for Resource Efficiency, August 26, 2011, available at http://fourcore.org/Portals/0/Documents/REAP/Products/WaterAssessment.pdf

CITY OF CORTEZ, COLORADO
WATER ENTERPRISE

RESOLUTION NO: WE-2017-1, SERIES 2017

A RESOLUTION ESTABLISHING THE WATER RATE CHARGES AND THE WATER DEVELOPMENT CHARGES FOR THE CITY OF CORTEZ WATER ENTERPRISE AND SUPERSEDING COUNCIL RESOLUTION NO. WE-2016-1, SERIES 2016

WHEREAS, the present revenues of the City of Cortez Water Enterprise have been found to be insufficient to meet the requirements of operations, maintenance, and bond debt service; and

WHEREAS, the deficiency in revenues has been brought about by cost increases in chemicals, equipment parts, supplies, and all general maintenance requirements; and

WHEREAS, the City of Cortez Water Enterprise has determined that the water rates are to be established to meet the Enterprise's operating costs and depreciation costs.

NOW, THEREFORE, BE IT RESOLVED BY THE CORTEZ CITY COUNCIL, ACTING AS THE GOVERNING BODY OF THE CITY OF CORTEZ WATER ENTERPRISE:

Effective with the January 1, 2018, billing, the City of Cortez Water Enterprise shall initiate the following schedule of water rate charges and water tap fees and all previous schedules or resolutions in conflict with this resolution are hereby repealed.

I. METERED WATER RATES

A minimum fee – as shown below - will be charged for the first 1,000 gallons of water usage for all residential and non-residential units. Except: a master meter fee – as shown below - will be charged for each dwelling unit or occupied mobile home space when those units are served by the same tap, service line, and/or meter. In addition to the minimum fee, $2.92 for each additional 1,000 gallons of water usage shall also be charged. The rates herein shall apply to all water service provided outside the City limits. Unmetered services will be charged a rate based on estimated usage as determined by the Director of Finance.

A. RESIDENTIAL

Base Rate	Minimum Monthly Rate
Single-family (3/4" x 5/8")	$21.80
Master Meter (Multi-family/MH Park)	$20.60
Plus Usage over 1,000 gallons	$2.92 per thousand gallons

B. COMMERCIAL

Base Rate	Minimum Monthly Rate
3/4" x 5/8" Meter	$21.80
1" Meter	$33.80

1-1/2" Meter	$48.85
2" Meter	$66.30
3" + Meter	$96.00
Plus Usage	$ 2.92 per thousand gallons

C. COMMERCIAL WATER DOCK - $8.25 for 500 gallons

D. SERVICE LINE AND DEVELOPMENT CHARGES

1. Single-family, commercial, irrigation-only, and mobile homes with individual services, and other uses not listed in items 2 – 4 below.

Size of Tap	Inside City
3/4"	$ 5,301.00
1"	$ 8,856.00
1-1/2"	$17,712.00
2"	$28,346.00
Over 2"	Negotiated

2. In the case of multi-unit dwellings or mobile home spaces being served by the same tap, service line, and/or meter, the development fee will be calculated as follows:

No. of Units	Development Fee/Unit
Each Unit	$5,301.00

3. For sizes larger than 2" that include provisions for fire protection by sprinkler systems or hydrants, the fee shall be based on that portion of the size applied for that is not applicable to fire protection, plus the cost of providing the tap, the sum thereof constituting the tap fee.

4. There shall be added to the schedule of development charges herein a fifty percent (50%) additional charge for all water service connections outside the City limits.

E. SERVICE CHARGE FEES

1. Water Service Fee – The water service fee for connecting water service to new customers and/or existing customers shall be $25.00.

2. Reconnect Fee – If the water service is turned off due to non-payment of a bill owed, a reconnect fee of $40.00 will be charged. The past amount due must be paid before the water service can be turned back on. The reconnect fee of $40.00 will be added to the next billing. Any special payment provisions must be approved by the Director of Finance.

3. Dangerous Animals – If the Animal Control Officer has to be called to the site because dogs are keeping City Personnel from turning water off at a residence, a fee of $25.00 will be charged, in addition to the Reconnect Fee.

4. New Lawn Installation - Exemption from Watering Restrictions – $25.00.

F. CROSS CONNECTION PROGRAM FEES

Cross Connection Assembly Inspection $40.00
RE-INSPECTION FEE $40.00
Non-Compliance Testing of Backflow Assemblies.....$100.00

II. DEFINITIONS

1. Dwelling Unit – a single unit providing complete, independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking, and sanitation.

2. Mobile Home Space – an area designed for use by a wheel-mounted dwelling unit, which space is provided with a connection to the water system of the City for use by the dwelling unit.

3. Residential Customer Unit – the occupant and/or owner of a single-family dwelling unit (detached or attached such as condominium or townhouse) or mobile home space, wherein title to land or the right to occupy in the case of a condominium, is conveyed. In the case of two or more multiple-family dwelling units, such as duplexes, triplexes, apartments, or mobile home spaces rented or leased, each shall be a residential customer.

4. Irrigation Only System – A metered service line to be used solely for irrigation of landscaping and lawns and does not flow to the sanitation system. It will be charged as an additional service when active.

5. Non-Residential Unit - all other types and classes of units.

INTRODUCED, READ, AND PASSED AS A RESOLUTION THIS 12TH DAY OF DECEMBER 2017, AT A REGULAR MEETING OF THE CORTEZ CITY COUNCIL, ACTING AS THE GOVERNING BODY OF THE CITY OF CORTEZ WATER ENTERPRISE.

Karen W. Sheek, Mayor

ATTEST:

Linda L. Smith, City Clerk

CITY OF CORTEZ
ORDINANCE NO. 1257, SERIES 2018

AN ORDINANCE ADOPTING BY REFERENCE THE 2018 WATER CONSERVATION PLAN FOR THE CITY OF CORTEZ, COLORADO, PROMOTING THE EFFICIENT CONSUMPTION OF ALL WATER USAGE BY RESIDENTS, BUSINESSES, AND LOCAL GOVERNMENTS TO MORE BENEFICIALLY USE WATER RESOURCES AND INSURE A FUTURE ADEQUATE WATER SUPPLY

WHEREAS, it is the intent of the City of Cortez to promote water conservation in such way as to have efficient consumption of all water usage by residents, businesses, and local governments and to provide beneficial uses of our water resources; and,

WHEREAS, the following items are the basis for providing a Water Conservation Program:

- Conservation of water and the promotion of efficient usage are important to the City;
- A Water Conservation Plan will help extend existing water supplies to serve more uses;
- Reduction of summer water usage with lower demands can result in deferring future capital expenditures;
- The State of Colorado has determined that each water supplier that treats 2,000 acre feet or more of water must have a Water Conservation Plan; and,

WHEREAS, by Ordinance No. 819, Series 1996, passed and adopted on April June 25, 1996, the City Council (the "Council") of the City of Cortez, Colorado (the "City"), adopted by reference the Water Conservation Plan for the City of Cortez, for the purpose of promoting the efficient consumption of all water usage by residents, businesses, and local governments to more beneficially utilize our water resources and insure a future adequate water supply; and,

WHEREAS, the City reviewed revisions to the original Plan and adopted Ordinance No. 1143, Series 2010, on June 8, 2018, as evidenced in the approved minutes of that Council meeting; and,

WHEREAS, the City has updated the 2010 Water Conservation Plan in accordance with State requirements, and has solicited public comment through public forums at duly-advertised public meetings before the Cortez City Council; and,

WHEREAS, Council has reviewed the 2018 Water Conservation Plan and has considered the evidence and testimony presented at said public hearings, as evidenced in the adoption of Ordinance No. 1257, Series 2018, and the approved minutes of the Council meeting of November 13, 2018.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CORTEZ, COLORADO:

I. REPEAL

City Ordinance No. 1143, Series 2010, adopting by reference the 2010 Water Conservation Plan for the City of Cortez, is hereby repealed and all ordinances or parts of ordinances in conflict with this ordinance are likewise expressly repealed.

II. ADOPTION BY REFERENCE

There is hereby adopted by reference, as though the same were fully printed and set forth herein, the 2018 Water Conservation Plan for the City of Cortez. The 2018 City of Cortez Water

Conservation Plan is designed to be a dynamic document intended to be modified and added to on a regular basis. Modifications to the Plan may be done by resolution.

III. COPIES ON FILE

Three true and exact official copies of the 2018 Water Conservation Plan are on file in the City Clerk's Office, 123 Roger Smith Avenue, Cortez, Colorado 81321, duly certified by the Mayor and attested by the City Clerk, and may be examined, duplicated, or copied by any interested person during the regular business hours of said offices; all such reproduction or copying to be at the expense of the person requesting the same.

PUBLIC HEARING: This Ordinance shall be considered for second and final reading on Tuesday, the 13th day of November 2018, at 7:30 p.m. in City Council Chambers in City Hall, 123 Roger Smith Avenue, Cortez, Colorado, at which time and place all persons desiring to appear and be heard concerning the same may do so.

MOVED AND APPROVED ON FIRST READING THIS 23RD DAY OF OCTOBER 2018.

Orly Lucero, Mayor Pro-Tem

ATTEST:

Linda L. Smith, City Clerk

MOVED, APPROVED, AND ADOPTED ON SECOND AND FINAL READING THIS 13TH DAY OF NOVEMBER 2018.

Karen W. Sheek, Mayor

ATTEST:

Linda L. Smith, City Clerk

APPROVED AS TO FORM:

City Attorney