CITY OF Montrose

Water Conservation Plan

June 2016

ACRONYMS and ABBREVIATIONS

AF	acre-feet
AF/YR	acre-feet per year
AMI	Automated Metering Infrastructure
AWWA	American Water Works Association
cfs	cubic feet per second
City	City of Montrose
CWCB	Colorado Water Conservation Board
gpcd	gallons per capita per day
gpd	gallons per day
gpm	gallons per minute
HOA	Homeowner's Association
MG	million gallons
MGD	million gallons per day
Plan	Water Conservation Plan
SCADA	Supervisory Control and Data Acquisition
sf	square feet
SWSI	Statewide Water Supply Initiative
UGB	Urban Growth Boundary

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ACKNOWLEDGMENTS

The City of Montrose Water Conservation Plan was developed collaboratively by Public Works Department staff. The following staff members significantly contributed to the successful completion of this important document:

- John Harris, Public Works Director
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- Jeff Sheetz, Information Systems Department Director
- Wayne Nation, Network Analyst
- Jeannie Phillips, Public Works Customer Service Representative
- Stephen Alcorn, City Attorney

EXECUTIVE SUMMARY

The Colorado Water Conservation Board (CWCB), through the Office of Water Conservation and Drought Planning, requires each public entity distributing 2,000 acre-feet per year (AF/YR) or more of water to develop and implement a plan to encourage the efficient use of water. This Water Conservation Act of 1991 first established minimum water conservation requirements. In 2004, the State of Colorado revised these minimum requirements through the passing of House Bill 04-1365. Approved Water Conservation Plans are now required to include:

- A detailed description of Plan development, implementation, monitoring, review, and revision processes;
- Planning horizon (seven years maximum);
- Estimated water conservation (percentage or AF) through Plan implementation.

The Goal of the City of Montrose Water Conservation Plan (WCP) is to increase the efficiency of water use practices throughout the City by identifying challenges and methods for overcoming each. Adoption of the Plan provides the framework for evaluation, prioritization, and implementation of activities designed to meet the water conservation goals. The Plan includes:

- A profile of the existing water supply system;
- A profile of water demands and historical demand management;
- Integrated planning and water conservation benefits and goals;
- Selection of water conservation activities, and;
- An implementation and monitoring plan.

The WCP was developed by City Public Works Department staff supported by information contained within the *City of Montrose Water Master Plan* (August 2009, updated January 2016), field observations, and institutional employee knowledge. The WCP follows Colorado Water Conservation Board (CWCB) guidelines, further revised as part of State of Colorado House Bill 10-1051, and includes consideration of the following plan elements:

- Water-efficient fixtures and appliances, including toilets, urinals, showerheads, and faucets;
- Low water use landscapes, drought-resistant vegetation, removal of phreatophytes, and efficient irrigation. Phreatophytes are deep-rooted plants that obtain a significant portion of needed water from saturated soil zones, are supplied with surface water, and often have roots constantly in touch with moisture (i.e. Tamarisk, Russian Olive);
- Water-efficient industrial and commercial water-using processes;
- Water reuse systems;
- Distribution system leak identification and repair;
- Dissemination of information regarding water use efficiency measures, including public education, customer water use audits, and water-saving demonstrations;
- Water rate structures and billing systems designed to encourage water use efficiency in a fiscally responsible manner;
- Regulatory measures designed to encourage water conservation;
- Incentives to implement water conservation techniques, including customer rebates to encourage the installation of water conservation measures.

This is the first formal, comprehensive Plan developed and adopted by the City of Montrose. All conservation measures are voluntary, subject to City Council approval, and funding dependent. The Plan meets minimum requirements of the CWCB Municipal Water Efficiency Plan Guidance Document. This Plan formalizes the City's commitment to conservation of our most

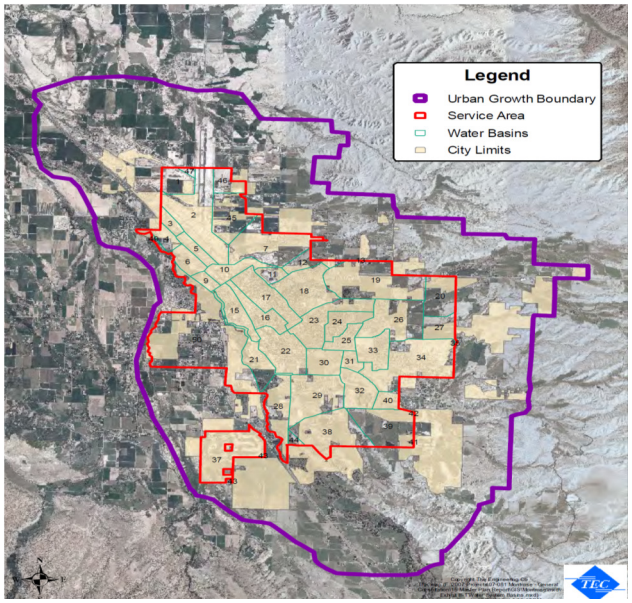
precious natural resource by encouraging water conservation through education, incentives, water distribution operation and management, and regulatory measures. This Plan does not specifically address long-term water supply.

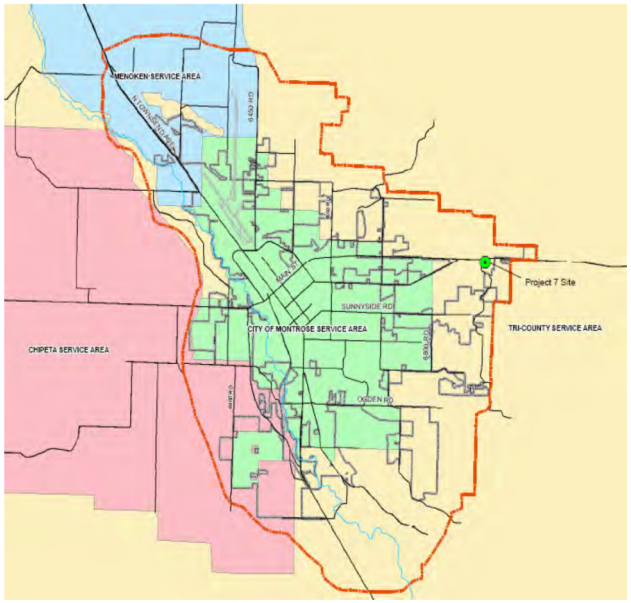
PROFILE OF EXISTING WATER SYSTEM

Overview and History of Existing Water Supply System

The City of Montrose is situated between Grand Junction and Telluride in the southwestern portion of Colorado. Visitors frequent the area to enjoy an abundance of outdoor recreational opportunities in our mild climate. The semi-arid region experiences approximately eleven inches of precipitation annually. The current population within the incorporated City limits is approximately 19,000.

The City of Montrose water service area encompasses approximately 16.4 square miles within the City's Urban Growth Boundary (UGB). The UGB is defined by the City's Comprehensive Plan, encompassing 39.6 square miles in and around the City. This UGB is also served by other water districts to include Tri-County Water Conservancy District, Menoken Water District, Chipeta Water District, and Suburban Water District. Service area agreements with these districts were executed in 1999 and established boundaries for each district.





The majority of the City of Montrose raw water rights are stored in Ridgway Reservoir (10,000 acre-feet/year). The elevation of Ridgway Reservoir is significantly lower than the Project 7 Water Treatment Plant elevation. Therefore, delivery of raw water from Ridgway Reservoir to the Project 7 Water Treatment Plant is not currently economically feasible. Raw water rights are administratively exchanged with the Uncompahgre Valley Water Users Association to provide sufficient supply to the Project 7 Water Treatment Plant.

The City of Montrose purchases treated water from Project 7 Water Authority (Project 7). Project 7 was established on September 29, 1977 as a unique cooperative effort among seven (7) water entities (City of Montrose, Town of Olathe, City of Delta, Tri-County Water Conservancy District, Menoken Water District, Chipeta Water District, and Uncompahgre Valley Water

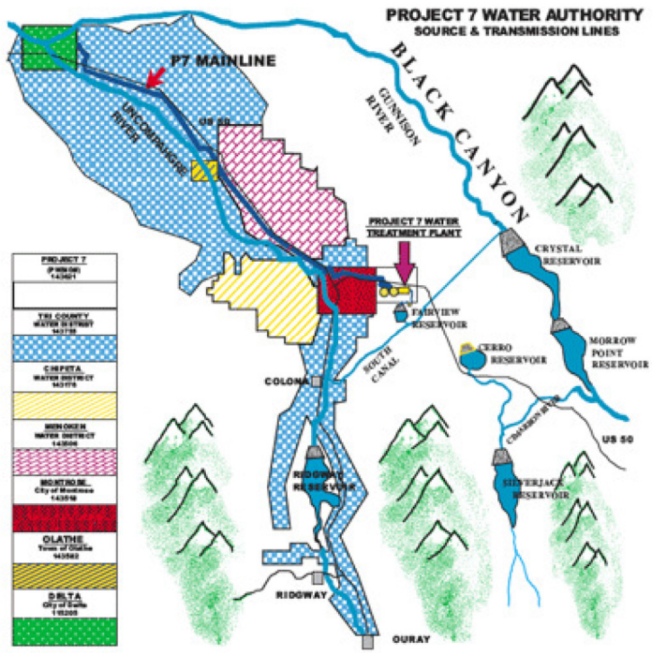
Users Association) to provide high quality potable water to municipalities and rural areas within the Uncompahgre River Valley. Project 7 is governed by a five (5) member Board of Directors. The City of Montrose holds one (1) dedicated Board position and provides one (1) alternate to attend monthly Board of Directors meetings.

During the summer of 1973, the City of Montrose experienced water shortages as a result of insufficient treatment capacity during peak demand periods. At that time, Tri-County Water Conservancy District was almost entirely dependent on Montrose for its water supply. The City of Delta and Town of Olathe were experiencing similar issues. Menoken and Chipeta Water Districts were dealing with outdated treatment facilities and raw water supply shortages. The six entities collaborated to resolve their potable water delivery issues by forming the Project 7 Water Authority. The Uncompahgre Valley Water Users Association joined as the seventh entity due to their involvement in providing the raw water flow to the Project 7 Water Treatment Plant.

Funding to construct the project was obtained from Farmers Home Administration, known today as the Rural Development Administration. The grant/loan combination totaling $14 million was used to purchase an existing water treatment plant and raw water reservoir from the City of Montrose, and construct the necessary water treatment and distribution infrastructure. The treatment plant was later retrofitted and expanded to its current capacity of 20.0 million gallons per day. Additionally, Project 7 constructed approximately 30 miles of water transmission line, pressure regulating stations, and master metering stations to deliver water to the participating entities. The system went on-line in July 1980. Significant improvements have been constructed to the system since 1980; one of the largest was the construction of two (2) five million gallon (5MG) finished water reservoirs built in 1995.

The majority of water supplied to Project 7 for treatment comes from the Gunnison River via the Gunnison Tunnel. Blue Mesa Reservoir and Crystal Reservoir provide storage for downstream water users. A small amount (< 5%) comes from Silverjack Reservoir via Cerro Reservoir. The Gunnison River water travels down the South Canal a short distance and a portion is diverted into Fairview Reservoir. This raw water is filtered, disinfected with chlorine, and stored in above ground tanks. Project 7 treats more than two (2) billion gallons of raw water annually to meet average summer flow rates of 11 – 13 million gallons per day (MGD) and average winter flow rates of 4 – 5 MGD. Project 7 operates within the following capacities:

- Design Hydraulic Capacity 26 MGD
- Effective Treatment Capacity 20 MGD
- Storage Capacity 10 MGD
- Pipeline Capacity 3.4 MGD



The City of Montrose water distribution system includes approximately 123 miles of large (> 10 inch diameter) potable water transmission lines, 256 miles of smaller (< 10 inch diameter) potable water distribution pipelines, 3,424 valves, three (3) storage tanks with a combined capacity of 8.6 MG, four (4) pressure zones, eight (8) pressure reducing valves, and two (2) pumping stations. The City also owns and maintains one (1) raw water storage reservoir at Cerro Summit that supplies untreated water from Silverjack Reservoir to Project 7. The City distributes potable water for consumption and small landscape irrigation to approximately 6,200 residential and 950 commercial customers. No known commercial agricultural users exist within the system.

The City also owns and maintains a wastewater treatment plant (WWTP) in the northwest area of Montrose. The WWTP is capable of aerobically treating 4.3 MGD through a system of three (3) parallel oxidation ditches/clarifiers. Untreated wastewater is supplied to the WWTP by approximately 11 miles of large (>18 inch diameter) gravity trunk pipelines, 124 miles of smaller (<18 inch diameter) gravity collection pipelines, and 15 miles of pressurized pipelines. Within the sanitary sewer collection system, the City also owns and maintains approximately 2,648 manholes, 325 residential pumping stations, and nine regional lift stations.

Water Supply Reliability

The Gunnison River Basin is not listed as a critical water supply shortage area under the Statewide Water Supply Initiative (SWSI). The SWSI was drafted by the Colorado Water Conservation Board (CWCB) in 2010 to provide a comprehensive picture of Colorado's water needs now, and in the future. The City has water rights for raw water supplies to meet projected usage demands beyond 2050. Unused raw water supplies are designated for potential drought reserves, instream flows, and other un-designated uses.

Supply Side Limitations and Future Needs

- The City's raw water reserves are not located within a designated critical water supply shortage area.
- The Gunnison River Basin has no history of significant vulnerability to water shortages, emergencies, and/or safe yield problems for any portion of the system.
- Three percent (3%) of potable water distributed by the City is classified as non-revenue (Unaccounted for water losses). Although the City's goal is to continually reduce non-revenue water, the current percentage is within nationally accepted standards.
- Population and water demand growth rates have declined significantly since 2008, based on U.S. Census data. Realistic projections will be included with updates to the Water Master Plan. The Water Master Plan is updated periodically to guide water storage and distribution system infrastructure development.
- No short-term substantial improvements or additions to the water supply system are currently planned within the seven year planning horizon.
- The City's wastewater treatment plant is capable of meeting projected raw sewage treatment demands through 2035.

- The City has water rights for raw water supplies to meet projected usage demands beyond 2050. Unused raw water supplies are designated for potential drought reserves, instream flows, and other un-designated uses.
- The City's water supply and distribution systems have no known or anticipated drinking water quality issues.
- Capital Improvement Project recommendations identified in the City's Water Master Plan and annual water distribution system maintenance plans implemented by City staff ensure infrastructure is maintained, improved, replaced, and constructed to meet current and projected demands.
- A system of pressure reducing/sustaining valves, flow control valves, and pumps are monitored through a Supervisory Control and Data Acquisition (SCADA) system. Four (4) zones throughout the City are monitored remotely to ensure customers receive water at pressure ranges within American Water Works Association (AWWA) standards.
- The City is not actively seeking additional water supplies.

PROFILE OF WATER DEMANDS AND HISTORICAL DEMAND MANAGEMENT

Demographics and Key Characteristics of the Service Area

The City of Montrose population is approximately 19,000 (2010 U.S. Census data). Customer billing categories include:

Residential

Non-Residential

Landscape

The City distributes potable water to approximately 6,200 residential, 275 landscape, and 950 non-residential (commercial and industrial) customer accounts.

Historical Water Demands

CITY OF MONTROSE HISTORIC WATER USE BY CLASSIFICATION								
YEAR	CLASSIFICATION	TAPS	PERCENT OF TOTAL TAPS (%)	ANNUAL WATER BILLED (Gallons)	MONTHLY AVERAGE BILLED WATER (Gallons)	APPROXIMATE RESIDENTIAL POPULATION	**APPROXIMATE PER CAPITA WATER USE (g/c/d)	ANNUAL WATER USAGE DISTRIBUTION (%)
2015	Residential	6,301	83.78%	643,277,986	53,606,499	15,122	116.55	57.71%
	Non-Residential	935	12.43%	314,272,110	26,189,342			28.19%
	Landscape	285	3.79%	157,116,136	13,093,011			14.10%
	Total	7,521	100.00%	1,111,088,898				100.00%
2014	Residential	6,282	83.78%	583,980,695	53,089,154	15,077	106.12	58.88%
	Non-Residential	942	12.56%	255,800,418	23,254,583			25.79%
	Landscape	274	3.65%	152,103,000	13,827,545			15.33%
	Total	7,498	100.00%	991,884,113				100.00%
2013	Residential	6,233	83.10%	614,437,442	51,203,120	14,959	112.53	57.02%
	Non-Residential	970	12.93%	305,219,087	25,434,924			28.32%
	Landscape	298	3.97%	158,006,862	13,167,239			14.66%
	Total	7,501	100.00%	1,077,663,391				100.00%
2012	Residential	6,213	83.34%	682,631,853	56,885,988	14,911	125.42	57.46%
	Non-Residential	972	13.04%	330,433,761	27,536,147			27.82%
	Landscape	270	3.62%	174,882,858	14,573,572			14.72%
	Total	7,455	100.00%	1,187,948,472				100.00%
2011	Residential	6,189	83.61%	633,758,187	52,813,182	14,854	116.90	58.22%
	Non-Residential	956	12.92%	302,031,537	25,169,295			27.75%
	Landscape	257	3.47%	152,744,390	12,728,699			14.03%
	Total	7,402	100.00%	1,088,534,114				100.00%

** NOTE – Residential Population assumes 2.4 users per residential tap consuming City of Montrose distributed water.

CITY OF MONTROSE HISTORIC TREATED WATER DISTRIBUTION (Thousand Gallons)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
2015	49,987	42,075	54,580	81,689	101,369	155,959	166,185	166,363	129,889	90,357	46,836	45,562	1,130,851
2014	45,167	40,162	49,323	73,562	142,161	157,178	187,188	151,289	120,236	67,594	46,998	44,449	1,125,310
2013	48,593	45,801	50,773	62,319	131,670	186,635	174,909	142,832	111,158	66,413	45,443	47,773	1,114,319
2012	53,738	49,545	62,847	111,229	180,460	212,905	184,871	175,118	146,846	92.232	51,794	52,978	1,374,163
2011	54,483	48,392	56,415	78,702	125,254	188,685	194,333	194,333	142,341	117,031	53,249	54,889	1,289,134
2010	50,794	43,579	49,076	81,368	145,384	186,842	199,328	199,328	145,913	92,454	50,468	52,020	1,247,453
2009	50,528	44,359	52,223	70,618	145,229	158,477	193,630	193,630	142,555	85,342	48,464	49,933	1,239,070
2008	55,121	50,810	54,420	80,788	137,392	181,425	212,087	212,087	150,534	88,056	53,310	49,901	1,309,008
2007	52,329	46,187	58,801	81,659	133,136	187,218	221,289	221,289	142,264	78,581	54,567	52,790	1,281,721
2006	49,436	45,634	54,999	117,029	178,440	197,963	171,929	171,939	121,956	63,666	49,175	51,553	1,261,456
2005	48,080	43,508	53,857	88,793	155,800	165,986	206,429	206,429	123,180	113,087	49,649	50,329	1,248,380
AVG	50,827	45,798	54,273	84,607	147,492	182,290	194,600	166,999	134,698	86,446	50,312	51,350	1,244,557

Past and Current Demand Management Activities and Impact to Demands

Historically, City staff has engaged in foundational activities designed to improve water use efficiency while accomplishing routine maintenance operations. These activities have become standard operating practices and will continue to be refined and improved. Examples include:

- Water Distribution System Master Planning – In 2009, the City adopted its first comprehensive Water Master Plan. A master plan was completed in 1967, but was limited to raw water supply and treatment improvements. The 2009 project evaluated historic water use, evaluated existing infrastructure conditions, projected future demands, and recommended short-term and long-term Capital Improvement Projects. The plan considered demands and infrastructure needs through 2025. City staff has used the master plan as a guiding document to reduce water losses throughout the distribution system through capital and maintenance improvements while constructing infrastructure to support growth. The project also created a hydraulic model of the existing system that is used to evaluate planned infrastructure improvements prior to construction. The master plan was updated in January 2016.
- Irrigation Scheduling – Montrose is known for its outdoor recreation opportunities and inviting, attractive City parks. Parks Division personnel maintain approximately twenty-six (26) City parks, including two-hundred forty-three (243) acres of irrigated turf grasses. Evapotranspiration rates are calculated to create efficient landscape irrigation schedules for specific locations, seasons, and types of vegetation. All irrigation systems are controlled by electric timers and employ rain sensors that interrupt irrigation flow during precipitation events. In 2012, irrigation timers were adjusted to reduce irrigation times by ten percent (10%). Turf grass health was monitored throughout the year and individual irrigation system timers were adjusted as necessary to maintain grass health. These irrigation application durations

became new baselines for future years. The Public Works Department Parks and Special Projects Division will begin formal irrigation audits within City parks in 2016. Audit procedures developed by the Irrigation Association (www.irrigation.org) will be used to ensure efficient irrigation best practices are followed and to identify opportunities for system improvements.

- Water Distribution System Improvements – In 2014, City staff began replacing aging water meters within the distribution system. Twenty percent (20%) of all meters are replaced annually. By the end of 2018, all meters within the distribution system will be replaced. This project has resulted in more accurate customer billings and non-revenue water accounting. In 2014, City staff began implementing a citywide Automated Meter Infrastructure (AMI) project. This project was completed in July 2015 and hourly consumption data from all meters within the distribution system is available to customers, utility billing staff, and distribution system operators. Data is used to educate and inform customers of consumption practices, to quickly identify significant water losses for customer notification or distribution system repair, and to identify and evaluate potential infrastructure improvements and rate system revisions.
- Maintenance Scheduling – For many years, City staff has flushed waterlines and fire hydrants to maintain water quality and prevent excessive accumulation of debris that may cause flow restrictions. In 2014, City staff implemented annual water valve exercising, water valve replacement, and fire hydrant replacement projects. The intent of all three (3) projects is to ensure system reliability and identify necessary infrastructure improvements. These projects have reduced non-revenue water loss by replacing aging infrastructure in a controlled manner and allowing distribution system operators to quickly isolate leaking waterlines for repair. These annual programs will continue in perpetuity.
- Facility Upgrades – In 2014, the City established a facility management team responsible for maintaining, improving, and constructing new City facilities. One (1) goal of the team is to retrofit existing facilities with efficient water fixtures. As a standard practice, malfunctioning fixtures are replaced with more efficient fixtures. All new facilities will be constructed with water conservation considerations such as efficient water fixtures and drought-tolerant landscaping.

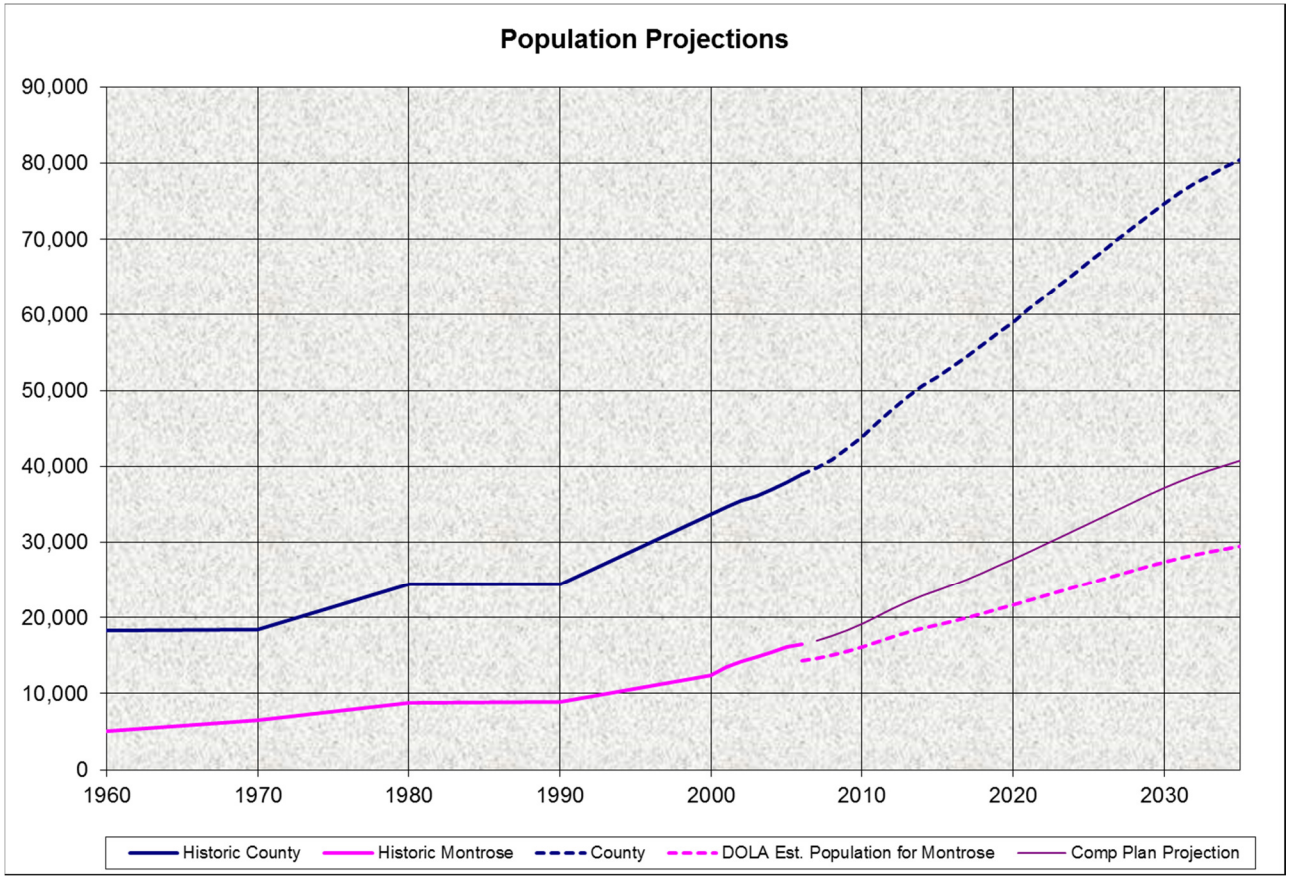
The City intends to construct new Public Works Department and Police Department facilities within the next five (5) years. Each new facility will include efficient water fixtures and low water consuming landscapes.

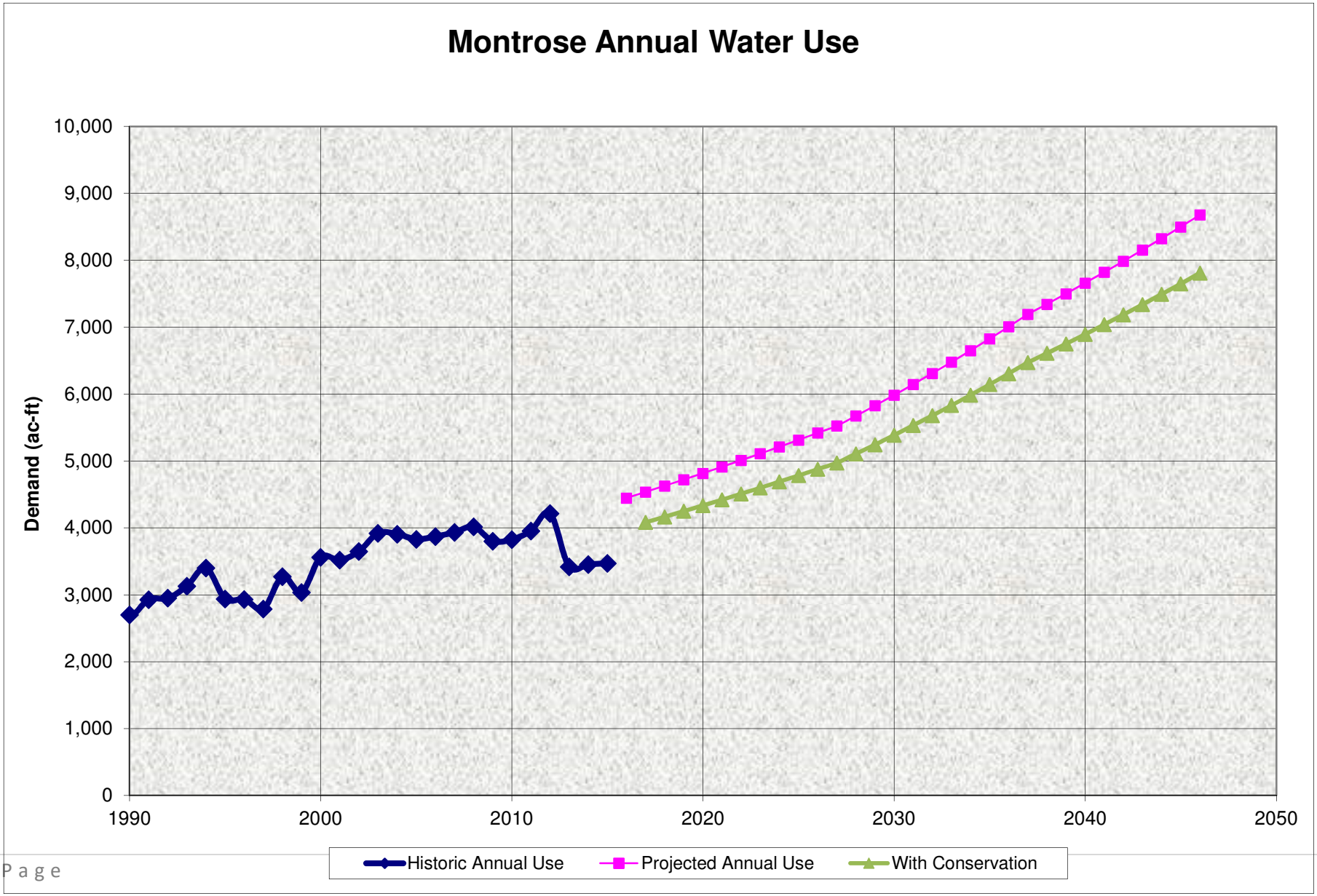
City staff also provides public education about water efficiency. Examples include:

- Mayor's Water Challenge – Since 2012, the City has participated in the National Mayor's Challenge for Water Conservation, hosted by the Wyland Foundation. The program encourages citizens to reduce water consumption by pledging to change daily water use practices throughout the year. Participants pledge to a variety of practice changes offered through several website screens. National averages are used to estimate the amount of water each participant will save by honoring pledges. Estimated water savings are totaled for individual communities and Cities within certain population categories compete nationally. The program is promoted annually at televised City Council meetings, in the local newspaper (typically), and on the City website.
- Natural Resources Festival – City staff participate in this annual festival which educates local elementary school students about the importance of natural resource conservation. The City display encourages students to improve the quality of discharged water and to implement water conservation practices at home. The goal is to encourage children to effect changes at home that reduce water consumption within the City.
- Niagara Community Garden Demonstration – In 2014, the City constructed a community garden. City staff provide operational and management support to a citizen-led garden committee and works closely with local Colorado State Extension Office Master Gardeners to host gardening and irrigation workshops. One raised garden bed is reserved for use by the Master Gardeners as a demonstration garden. Demonstrations are hosted periodically throughout the growing season and include topics such as drip irrigation design, soil moisture requirements, and irrigation technology advancements.

Demand Forecasts

The Water Master Plan projects demand based on information contained in the 2008 City of Montrose Comprehensive Plan, recommendations from the American Water Works Association, the largest non-profit, scientific, and educational U.S. association dedicated to water management and treatment practices, and actual population growth trends. Prior to 2009, the population growth average within the City exceeded four percent (estimated at 4.4%). This rate declined significantly beginning in late 2008 and remains much lower today, between one and two percent. Therefore, the master plan uses more conservative growth rate projections for each of the water service basins in order to develop spatially sensitive growth data for the water service area. The following figures were developed for and are included in the Water Master Plan:


Population Projections
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1960
1970
1980
1990
2000
2010
2020
2030
Historic County
Historic Montrose
County
DOLA Est. Population for Montrose
Comp Plan Projection


Montrose Annual Water Use
Demand (ac-ft)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1990
2000
2010
2020
2030
2040
2050
Historic Annual Use
Projected Annual Use
With Conservation

The water demand projection indicates that the City of Montrose has sufficient rights to raw water supplies to meet projected usage demand beyond 2050 without water conservation. Projected savings with moderate water conservation is 868 AF/YR. Much of this raw water is stored within the Ridgway Reservoir. Currently, infrastructure does not exist to enable this water to be treated at the Project 7 water treatment plant. However, the Project 7 Water Authority Board of Directors includes one (1) voting representative from the City of Montrose. Project 7 is currently collaborating with local water districts to identify infrastructure necessary to provide an emergency or secondary treated water source within the Gunnison River Basin. One (1) leading project candidate under consideration is a second water treatment plant just downstream from the Ridgway Reservoir. This project would allow the use of ten-thousand acre-feet (10,000 Ac-Ft) of raw water rights owned by the City to supply potable water as demands increase.

INTEGRATED PLANNING AND WATER CONSERVATION BENEFITS AND GOALS

Water Conservation and Water Supply Planning

In 2009, the City of Montrose adopted its first comprehensive Water Master Plan. This plan analyzed the existing water distribution system, historic water use, and population data to develop short-term and long-term capital improvement recommendations, projected demands, and storage requirements. The plan was updated in January 2016.

Upon adoption of the Water Master Plan, the City immediately began implementing capital improvement recommendations. Several new water distribution pipelines have been constructed or upsized, a third water storage tank has been constructed, a water valve exercising program has been implemented, water pipeline and fire hydrant flushing programs have been developed, and an Automated Metering Infrastructure (AMI) system has been implemented. One (1) common goal of each of these efforts is to conserve water by reducing water loss throughout the distribution system.

Water Conservation Goals

The City of Montrose Water Conservation Plan is a “living document” that will be updated periodically to meet changing community needs. This dynamic process begins by collecting accurate water use data and implementing strategies to efficiently manage this data. As water use trends within specific distribution zones are carefully evaluated, goals may be revised or added. The initial goals of the City of Montrose Water Conservation Plan are:

Goal 1: Reduce Annual Water Demand Ten Percent (10%) By 2040

The City will continue existing water conservation foundational activities and develop new activities to reduce annual water demand. Citywide annual water use, as well as use within each billing category, is tracked and compared to historical use. City

staff uses this data to refine activities and further reduce water use. Per capita water use is derived from annual residential and landscape water use totals and current population statistics. The per capita five (5) year average (2011 – 2015) is 117.24 gpcd. A reduction of ten percent (10%) would result in per capita consumption of 105.52 gpcd by 2040. The tag line "10 by 40" is used to promote this goal throughout the community.

Goal 2: Educate Citizens, Visitors, and Businesses About the Value of Water

Montrose citizens and visitors enjoy an abundance of outdoor recreational opportunities. Our picturesque mountain lakes and crystal clear rivers are enjoyed by fishers, boaters, rafters, and kayakers during the warmer seasons. Surrounding mountains provide internationally acclaimed ski opportunities throughout the winter. Citizens, visitors, and businesses are encouraged to preserve these opportunities through targeted educational programs.

Goal 3: Recognition as a West Slope Water Efficiency Leader

As an economic hub within the southwestern region of Colorado, Montrose welcomes visitors from around the state and nation. The community's focus on water efficient practices, both indoor and outdoor, presents an under-utilized opportunity to attract additional visitors.

The City developed the following objectives to meet the Water Conservation Plan goals:

1. *Accurate Water Use Data Collection* – During the last half of 2014 and the first half of 2015, the City of Montrose implemented an Automated Metering Infrastructure (AMI) system citywide. The AMI system provides near real-time water use data for residential and commercial customers, allows staff to identify system losses, and improves customer service by alerting customers of excessive, non-typical water use. Throughout 2016, the AMI system will be used to establish annual water consumption baselines for every customer account. Water consumption for each customer

account will be monitored throughout 2017 and compared to the 2016 data. Customers reducing annual water consumption a minimum of ten percent (10%) by volume will be rewarded with an account credit equivalent to one (1) month's base charge. This Water Conservation Rebate Program will continue through the plan horizon.

2. *Rebate Program* – Throughout 2016, City staff will develop a program to provide rebates for the purchase of new, high-efficiency indoor water fixtures and outdoor irrigation equipment. These may include indoor fixtures such as shower heads, toilets, and washing machines, and outdoor equipment such as irrigation controllers, rain sensors, and efficient irrigation systems. Details of the program will be refined in 2016. The Rebate Program will be implemented in 2017.
3. *Water Meter Replacement* - By 2018, staff will complete a five (5) year project to replace all water meters within the system. It is recognized that failing meters are a source for non-revenue water within the system. The goals of the AMI and water meter replacement projects are to collect accurate water use data that will be used in the development of robust water efficiency measures and to reduce water loss within the system.
4. *Water Loss Identification and Elimination* – City staff monitor individual customer utility accounts through the AMI system and routinely notifies customers of excessive, non-typical water use. On numerous occasions, customers have been alerted to apparent water loss events (i.e. leaking toilets, broken water service lines, etc.) identified through the AMI system. As such, customer water consumption is surveyed daily throughout the entire system. Water distribution system efficiency is monitored through a robust Supervisory Control and Data Acquisition (SCADA) system. This system monitors storage tank stage and discharge values, as well as pressure and flow throughout the distribution network. The system alerts City staff of potential water losses through electronic mail and cell phone messaging. With accurate data, staff is equipped to identify, prioritize, and eliminate significant water losses within the system. In 2016, City staff will investigate the use of AWWA M36 methodology to conduct formal water audits aimed at further reducing water loss. A comprehensive annual water audit program following the AWWA M36 methodology will be implemented in 2017.

5. *Education* – The City of Montrose will continue to actively engage citizens and local businesses to promote water conservation. The key tenet of this outreach effort is the preservation of a limited natural resource. In 2016, City staff will develop comprehensive targeted outreach programs for each billing category (Residential, Non-Residential, Landscape). A water conservation web page will be developed and added to the City of Montrose website. This web page will provide indoor and outdoor water conservation tips, rebate program information, and links to additional resources. Successful voluntary water conservation measures will be recognized annually during a public City Council meeting.

SELECTION OF WATER CONSERVATION ACTIVITIES

Summary of Selection Process

Water Conservation Plan activities were selected based on the following measures:

- Long-term benefit
- Public acceptance
- Probability of success
- Cost

City staff reviewed the CWCB guidance document and recently approved Water Conservation Plans developed by other communities, agencies, and water districts within the region and created a list of potential WCP activities. Each activity was further developed and a draft document was presented at a public meeting for review and comment. Public comment was accepted for sixty (60) days after the public meeting.

Water Conservation Plan Activities

1. *Water Efficient Fixtures and Appliances (including toilets, urinals, showerheads, and faucets)* – City of Montrose water conservation education and outreach programs will encourage the use of low-flow, efficient fixtures and appliances such as toilets, urinals, showerheads, and faucets. Approximately seventy five percent (75%) of all City of Montrose water taps were placed in service prior to the establishment of national water efficiency standards detailed in the 1992 U.S. Environmental Protection Agency Energy Policy Act. The number of water efficient fixture and appliance retrofits completed since 1992 is unknown. Assuming that fifty percent (50%) of these end-users have not retrofitted fixtures

and appliances, the potential for substantial water use reductions remains. Beginning in 2017, the City will implement a rebate program to incentivize efficient indoor water fixture and outdoor irrigation equipment retrofits.

2. *Low Water Use Landscapes, Drought-Resistant Vegetation, Removal of Phreatophytes, and Efficient Irrigation* – The City of Montrose is an urban community of large residential subdivisions and commercial areas. Residential properties are typically landscaped with irrigated turf grasses. The City's water conservation education and outreach program includes information about efficient irrigation practices. New commercial developments are encouraged to include low water use landscapes of drought-resistant vegetative varieties within open space areas. An informational packet will be developed and distributed to residential and commercial site development applicants. In 2017, City staff will implement a focused educational outreach program targeted to specific water user classifications.
3. *Water-Efficient Industrial and Commercial Water-Using Processes* – Commercial and industrial water users account for approximately twenty eight percent (28%) of all City of Montrose distributed potable water. Beginning in 2017, the City's water conservation education and public outreach program will target large-volume water users within these sectors. Information about water conserving operations, efficient landscape irrigation, and water efficient fixture retrofits will be provided to targeted users. These users will be encouraged to participate in new rebate programs as an incentive to increase indoor and outdoor water conservation practices.
4. *Water Reuse Systems* – Colorado House Bill 13-1044 authorizes the use of graywater. Sections four and five (4 & 5) give counties and municipalities the discretion to authorize graywater use and the exclusive authority to enforce compliance with their graywater use resolutions and ordinances. The City Engineering and Building Services Division is currently researching existing national building codes and other regulations to evaluate the adoption of local graywater use regulations. City staff intends to adopt the 2015 International Plumbing Code, which includes water reuse and graywater standards, in 2016.

5. *Distribution System Leak Identification and Repair* – With completion of the City of Montrose AMI system implementation, staff will implement a customer leak detection program. Customers will be notified of apparent water losses as they are identified through the AMI system. Similarly, a comprehensive annual water audit program following the AWWA M36 methodology will be implemented in 2017. Significant water losses within the distribution system will be identified, prioritized for repair, and eliminated.
6. *Dissemination of Information Regarding Water Use Efficiency Measures, Including Public Education, Customer Water Use Audits, and Water-Saving Demonstrations* – Beginning in 2017, the City of Montrose will actively engage citizens and community businesses to promote water conservation. The key tenet of this outreach effort is the preservation of a limited natural resource. Public education will include printed informational packets targeting specific community end-users, website postings, televised outreach, and newsprint advertisements. Individual customer water use data is available on-demand through the AMI system interface software, allowing customers to review usage trends graphically. Successful voluntary water conservation measures will be recognized annually during a televised, public City Council meeting.
7. *Water Rate Structures and Billing Systems Designed to Encourage Water Use Efficiency in a Fiscally Responsible Manner* – The City of Montrose charges water customers a nominal base fee plus a usage fee. The nature of this rate structure encourages customers to conserve water to minimize monthly billings. In 2017, the City of Montrose intends to conduct a comprehensive water rate study to evaluate the adoption of a tiered rate structure.
8. *Regulatory Measures Designed to Encourage Water Conservation* – Section 3-5-18 (Restriction of Water Use) of the City of Montrose Municipal Code exists specifically to encourage water conservation. 3-5-18(D) states *"It shall be unlawful to waste City water."* Additional statements within this Municipal Code section identify and prohibit wasteful practices. This section of the Municipal Code also establishes base fees and unit rate charges for residential and non-residential

end-users. The pay-for-use rate structure encourages customers to conserve water to reduce monthly billings. The Municipal Code is reviewed and updated periodically.

9. *Incentives to Implement Water Conservation Techniques, Including Rebates to Customers to Encourage the Implementation of Water Conservation Measures* – Throughout 2016, City staff will develop a program to provide rebates for the purchase of new, high efficiency indoor water fixtures and outdoor irrigation equipment. These may include indoor fixtures such as shower heads, toilets, and washing machines, and outdoor equipment such as irrigation controllers, rain sensors, and efficient irrigation systems. The Rebate Program will be implemented in 2017 and will be evaluated for expansion in future years.

IMPLEMENTATION AND MONITORING PLAN

Implementation Plan

Specific plan activities will be implemented as follows:

PLAN ACTIVITY	ACTIVITY DEVELOMENT	FULL IMPLEMENTATION
Rebate Program	2016	2017
Focused Educational Outreach	2016	2017
Graywater Standards Investigation	2016	2017
Distribution & Irrigation System Auditing	2016	2017
General Public Education	2016	2017
Rate Structure Evaluation	2017	2018

As accurate data is collected through the AMI system, the City will evaluate opportunities to implement additional WCP activities.

Monitoring Plan

As a minimum, the City of Montrose Water Conservation Plan shall be administratively reviewed during the first quarter (January – March) of each year. The plan may be reviewed more frequently as necessary. A comprehensive plan review and update will be accomplished every seven (7) years. System conditions including raw water sources, treatment capacity, distribution system capacity, demand, and water conservation technology/techniques shall be evaluated and updated as

necessary. The City shall evaluate the status and effectiveness of water conservation practices, revising as necessary. The City shall also provide a summary report to the Colorado Water Conservation Board, including adopted revisions.

ADOPTION OF NEW POLICY, PUBLIC REVIEW, AND FORMAL APPROVAL

Adoption of New Policy

On September 14, 2015, City staff presented a first draft of the Water Conservation Plan to the Montrose City Council. The purpose and intent of the plan, as well as specific elements within the plan, were discussed. City Council directed staff to present the plan for public comment. The sixty (60) day public comment period began on September 14, 2015 and ended on November 13, 2015. No public comments were received during this period. However, on November 30, 2015, several pages of comments were received by one Montrose citizen. The plan was revised to address these comments. These public comments are included in the Appendix.

On July 11, 2016, City staff recommended City Council approval and adoption of the plan on July 19, 2016. The 2016 Water Conservation Plan was formally adopted on this date.

Public Review Process

On September 14, 2015, City staff presented a first draft of the Water Conservation Plan to the Montrose City Council during a Council/Staff Work Session. These meetings are publically noticed. Agenda topics and detailed City Council review packets are posted, and the meetings are open to the public.

Additionally, a press release was issued to local television, radio, and news print media outlets announcing the public comment period, and encouraging citizen participation. The same notice was issued through social media venues.

CWCB requires that all approved plans have a minimum sixty (60) day public review process per CRS 37-60-126(5) to ensure the plan is supported and endorsed by the community. City staff complied with this requirement and began a public comment period on September 14, 2015. The official public comment period ended on November 13, 2015. However, City staff received comments from a Montrose citizen on November 30, 2015 which were considered when drafting the final plan.

Local Adoption and State Approval Processes

On July 11, 2016, City staff provided the Montrose City Council the final plan for adoption consideration during the July 19, 2016 City Council meeting. This is a public meeting. City Council formally adopted the 2016 Water Conservation Plan by resolution during this meeting.

In August 2015, City staff submitted a copy of the first plan draft to the CWCB Office of Water Conservation and Drought Planning concurrently with the public comment period for review and approval. In April 2016, CWCB staff issued Conditional Approval of the first plan draft and provided comments which were addressed in this final plan version. The CWCB comments are located in the Appendices. A revised plan dated June 2016 was submitted to CWCB for final review and approval. CWCB issued final plan approval on June 29, 2016.

Periodic Review and Update

The City of Montrose intends to review and update this plan every seven (7) years. The next update is scheduled for 2023. Accurate, detailed water distribution and use data will be collected during this period for use in the 2023 update.

DROUGHT/EMERGENCY CONTINGENCY PLAN

The City of Montrose has obtained surface water rights sufficient to supply raw water for treatment during years of normal precipitation. The City, Tri-County Water Conservancy District, and Project 7 Water Authority monitor and evaluate raw water supply, treatment capacity, storage capacity, and reservoir levels. Water conservation measures may be implemented during periods of drought or emergencies at the discretion of the City Manager. The primary goal of the Drought/Emergency Contingency Plan is to ensure a continuous supply of life-sustaining drinking water through conservation efforts during supply emergencies.

Water conservation efforts within the City of Montrose water district are voluntary. Drought contingency measures are mandatory. The Drought/Emergency Contingency Plan applies to all persons, customers, and property served by the City of Montrose. Restrictions may be revised to reflect changes in the water system at the discretion of the City Manager. All entities that purchase water from the City of Montrose, including City departments, are governed by the following restrictions:

Tier I: Water Watch

Conditions indicate that the probability of a water shortage is rising and steps should be taken to inform customers and ask for voluntary reductions in water use. No serious threat to water supplies is imminent, but the City is closely monitoring the situation.

Triggers:

A **Water Watch** shall be issued when any combination of two (2) or more of the following conditions occurs:

1. Daily water demand for three (3) consecutive days exceeds ninety percent (90%) of available yield;

2. Daily water demand for three (3) consecutive days exceeds ninety percent (90%) of the Project 7 Water Authority treatment capacity;
3. Total system storage does not recover above eighty percent (80%) prior to 5:00 a.m.

Goals:

1. Increase public awareness of existing water system conditions;
2. Obtain voluntary reduction in outdoor water use to avoid implementation of mandatory restrictions;
3. Maintain integrity of the City water supply and distribution system to ensure life-sustaining and fire suppression water capacity is not compromised.

Education:

1. The City shall provide water conservation tips to customers through direct mailings, media releases, Channel 191 programming, and the City website;
2. The City shall issue weekly updates to local media sources detailing existing conditions, the water supply prediction for the upcoming week, and encouraging customers to continue water conservation efforts;
3. The City shall post **Water Watch** information on the City website and on Channel 191.

System Management:

1. System pressure shall be maintained within typical operating ranges;
2. The City shall conserve water by reducing or suspending operational activities such as water line and fire hydrant flushing;

3. The City shall conserve water by reducing or suspending outdoor irrigation of landscaping in parks, medians, and at City facilities;
4. System water demand shall be satisfied by the capacity of the Project 7 Water Authority treatment facility

Regulatory Action:

The City promotes water conservation year-round, particularly during the summer months when outdoor landscape irrigation accounts for as much as twenty seven percent (27%) of total system demand. When conditions require water use reductions to avoid the implementation of mandatory restrictions, customers are encouraged to reduce outdoor water use. When a potential water supply issue is recognized, the following voluntary water conservation measures shall be encouraged:

- Efficient irrigation scheduling
- Limited non-essential water use
- Outdoor irrigation at night, between 6:00 p.m. and 6:00 a.m.
- Reduced or suspended outdoor water use on weekends
- The use of irrigation drip lines or soaker hoses
- Reduced or suspended vehicle washing at home
- The use of commercial vehicle washing facilities that recycle wash water
- Reduced or suspended washing of sidewalks, patios, and driveways

Termination of Tier 1: Water Watch

The **Water Watch** shall be terminated when two (2) or more **Water Watch** triggers cease to exist, or when two (2) or more **Water Warning** triggers exist. The City will continue to promote water conservation efforts.

Tier II: Water Warning

As the severity of the water shortage increases, a **Water Warning** shall be issued. During a **Water Warning**, an actual water shortage exists and water supply is dwindling. Additional water conservation efforts are encouraged and mandatory water use restrictions are implemented. Although the City is able to meet existing water demands, the ability to continue meeting water demands without significant disruption is strengthened through water conservation efforts.

Triggers:

A **Water Warning** shall be issued when any combination of two (2) or more of the following conditions occurs:

1. Daily water demand for three (3) consecutive days exceeds ninety-five percent (95%) of available yield;
2. Daily water demand for three (3) consecutive days exceeds ninety-five percent (95%) of the Project 7 Water Authority treatment capacity;
3. Total system storage does not recover above seventy percent (70%) prior to 5:00 a.m.

Goals:

1. Reduce peak demands to manageable levels;
2. Maintain integrity of the City water supply and distribution system to ensure life-sustaining and fire suppression water capacity are not compromised.

Education:

1. The City shall provide water conservation tips to customers through direct mailings, media releases, Channel 191 programming, and the City website;
2. The City shall issue weekly updates to local media sources detailing water use restrictions, existing conditions, the water supply prediction for the upcoming week, and encouraging customers to continue water conservation efforts;
3. The City Manager shall issue Public Service Announcements as appropriate through local media sources announcing the **Water Warning** condition and detailing water use restrictions.
4. The City shall post **Water Warning** information on the City website and on Channel 191.

System Management:

1. System pressure shall be reduced to provide a minimum of forty five pounds per square inch (45 psi) in each of the pressure zones in Montrose;
2. Review and evaluate water storage levels, precipitation, Project 7 Water Authority treatment volume, and water system demand from the previous week;
3. The City shall suspend the use of potable water for outdoor irrigation of landscape, operation of public drinking fountains, and washing of vehicles;
4. System water demand shall be satisfied by the capacity of the Project 7 Water Authority treatment facility

Regulatory Action:

1. A mandatory odd/even landscape irrigation schedule (or equivalent demand reduction procedures) shall be implemented. Customers with odd-numbered addresses shall only use potable water irrigation on odd-numbered calendar days, and customers with even-numbered addresses shall only use potable water irrigation on even-numbered days. These

restrictions shall not apply to any person or business who/which grows commercial plants or plant products for sale. Exceptions may be considered on a case-by-case basis;

2. Outdoor potable water use, including landscape irrigation and vehicle washing, shall be restricted to hours between 6:00 p.m. and 6:00 a.m.;
3. City and privately owned/maintained parks and golf courses shall be restricted from irrigating with potable water;
4. Alternative potable water conservation measures may be considered on a case-by-case basis.

Termination of Tier II: Water Warning:

The **Water Warning** shall be terminated when two (2) or more **Water Warning** triggers cease to exist for a period of fourteen (14) consecutive days, when substantial changes in weather conditions that affect potable water demand occur, or when two (2) or more **Water Emergency** triggers exist. The City will continue to promote potable water conservation efforts.

Tier III: Water Emergency

As the severity of the water shortage increases, a **Water Emergency** shall be declared. During a **Water Emergency**, severe water shortage conditions exist and supplies are limited. Mandatory restrictions on outdoor potable water use are implemented. System failure is possible if conditions do not improve or demands do not decline.

Triggers:

A **Water Emergency** shall be issued when any combination of two (2) or more of the following conditions occurs:

1. Daily water demand for two (2) consecutive days exceeds one-hundred percent (100%) of available yield;

2. Daily water demand for two (2) consecutive days exceeds one-hundred percent (100%) of the Project 7 Water Authority treatment capacity;
3. Total system storage does not recover above sixty percent (60%) prior to 5:00 a.m.

Goals:

1. Reduce peak demands to manageable levels;
2. Maintain integrity of the City water supply and distribution system to ensure life-sustaining and fire suppression water capacity is not compromised.

Education:

1. The City shall provide water conservation tips to customers through direct mailings, media releases, Channel 191 programming, and the City website;
2. The City shall issue daily updates to local media sources detailing water use restrictions, existing conditions, the water supply prediction for the upcoming week, and encouraging customers to continue water conservation efforts;
3. The City Manager shall issue Public Service Announcements as appropriate through local media sources announcing the **Water Emergency** condition and detailing water use restrictions;
4. The City shall post **Water Emergency** information on the City website and on Channel 191;
5. The City shall host public meetings as necessary to disseminate information quickly.

System Management:

1. System pressure shall be reduced to a minimum of forty pounds per square inch (40 psi) in each of the pressure zones in Montrose;

2. Review and evaluate daily the water storage levels, precipitation, Project 7 Water Authority treatment volume, and water system demand from the previous day;
3. System water demand may exceed the capacity of the Project 7 Water Authority treatment facility, necessitating additional water use restrictions

Regulatory Action:

1. Outdoor potable water use shall be prohibited. This includes, but is not limited to, the following: public or private landscape irrigation (gardens, lawns, trees, shrubs, plants, etc.), golf course and sport turf irrigation, filling of swimming pools or potable water use in other recreational areas, and washing of vehicles, boats, trailers, or the exterior of any building or structure;
2. Only non-potable water sources shall be used for non-essential purposes.

Termination of Tier III: Water Emergency:

The **Water Emergency** shall be terminated when two (2) or more **Water Emergency** triggers cease to exist for a period of fourteen (14) consecutive days. Immediately upon termination of a **Water** Emergency, a **Water Warning** is issued. The City will continue to promote potable water conservation efforts.