



Municipal Drought Management Plan

February 2020



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City of Durango

February 2020



ACKNOWLEDGEMENTS

The City of Durango Utilities Department wants to thank our Water Treatment and Distribution Staff, Engineering Department, members of the Utilities Commission, volunteer members of the Drought Committee, and other contributors to this effort for their time, patience and thought to help prepare and address this pressing topic.

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EXECUTIVE SUMMARY

Purpose

The City of Durango has developed this Drought Management Plan (Plan) to preserve essential public services and minimize the adverse effects of drought on public health and safety, economic activity, environmental resources, and individual lifestyles during a drought event.

The goal is to remove the “crisis” from the City’s drought response efforts, reduce the hardship caused by water shortages, and raise public confidence in the actions taken to address short- and long-term water shortages.

This Plan includes overall objectives and operating principles, an analysis of the City’s current and future vulnerability to drought, a strategy for monitoring drought conditions, and a staged response program that addresses both supply and demand for water resources. Drought mitigation, monitoring of drought indicators, and drought public education are implemented on an annual basis regardless of whether it is a dry or wet year, so as to maximize the effectiveness of all efforts.

Planning Process

The process used to develop this Drought Management Plan is based on guidance from the Colorado Water Conservation Board (CWCB 2010). The Plan was developed in 2019 through an interactive, collaborative process with the participation of stakeholders on a Drought Committee. The Drought Committee was formed to provide input and review components of the draft Plan and inform its development. Led by the Utilities Department, the Drought Committee members represent the City departments and stakeholders that would likely be impacted by drought or involved in drought mitigation and response, including senior staff of various City departments, members of the Utilities Commission, and representation from local water users including Fort Lewis College. The Plan was developed with assistance from a consultant, Wood Environment & Infrastructure Solutions, and funded by a grant from the Colorado Water Conservation Board matched with City funding.

Plan Objectives and Operating Principles

The objectives of the City of Durango Municipal Drought Management Plan, developed collaboratively by the Drought Committee, are:

1. Plan and Prepare:
 - a. Protect the public health and safety and minimize the adverse effects of a water supply shortage through drought planning and preparedness.
 - b. Identify past and potential drought impacts and vulnerabilities to inform the planning process.
2. Identify and Monitor:
 - a. Provide guidelines to identify, anticipate, and monitor drought conditions.
 - b. Determine drought severity through a clear definition of indicators, stages and triggers.
3. Respond, Mitigate and Communicate:
 - a. Provide comprehensive and flexible guidance for drought response, allowing for an appropriate range of actions to respond.

- b. Provide effective communication, drought awareness, and response information to water customers, the public and governmental departments/agencies, so they clearly understand the situation and the actions taken.
 - c. Preserve essential public services during any level of drought severity from mild to critical emergency conditions.
 - d. Reduce the impacts of future droughts through long-term mitigation strategies.
4. Evaluate and Update:
 - a. Provide an efficient means to monitor and improve the effectiveness of the Plan over time.

The Drought Committee prioritized the City's water usage into five categories, ranked from highest to lowest priority:

1. Health and Safety
2. Business Indoor Use
3. Maintain athletic fields and high use/high priority parks
4. Maintain medium priority parks
5. Upkeep of low priority/low use parks

System Profile

Durango's existing water system provides treated water and wastewater services to over 20,000 residents in a 14-square mile service area encompassing incorporated and unincorporated areas around the City. The system is intended to provide enough water to serve a potential population of 40,000 people, or a total treated maximum daily demand of 22 Million Gallons per Day (MGD). The primary source of water for the City are flows from the Florida River, with supplementary water from the Animas River when necessary to meet demand or situational needs. The primary storage is Terminal reservoir, supplied primarily by a nine-mile long pipeline from a diversion on the Florida River and secondarily by a three-and-one-quarter mile pipeline from a diversion on the Animas River.

Historic Drought and Impact Assessment

Droughts are a natural phenomenon of Colorado's climate, and short duration drought occurs somewhere in the state nine out of ten years. Recent major droughts have included the 2002 drought, the 2011-2013 droughts, and the 2018 drought. Colorado's general hydrology and water resources are extremely sensitive to climate, and climate change could significantly reduce overall water availability in the future. While the scientific understanding of climate change is evolving, in general climate change is projected to increase the frequency and intensity of drought events across Colorado. Studies suggest annual streamflow is more likely to decrease in southwestern watersheds and at lower elevations as well. As a result of increasing temperatures, water yields will generally decrease. Warmer temperatures will likely have the compound effect of precipitation occurring as rain rather than snow, decreased high-elevation snowpack, an earlier spring melt of the decreased snowpack, less frequent but more intense and damaging precipitation events, and increased evapotranspiration.

Drought can compromise the supply available from the Florida and Animas Rivers. While Durango has been able to manage water supply during normal and below normal water years to successfully meet demands of the system, the Florida River has had senior water rights calls that affected the City's water supply. Three calls between 2000 and 2018 caused reductions of water supply; fortunately, diversions from the Animas River were able to offset the shortages.

Drought can have regional environmental impacts and affect the local recreation and tourism economy. The City's watersheds have been exposed to significant wildfire hazard in recent years, which have been exacerbated by drought. Wildfires can stress the water supply system in two ways: one, the water resources required to fight a wildfire are significant, and two, the ash and debris left behind by the fire can temporarily pollute water supplies. Wildfires such as the 416 Fire in 2018 and the Missionary Ridge Fire in 2002 occurred during drought when the City needed to pull water from the Animas River, water that was also used for firefighting. Ash and debris in the river affected the quality of the water supply.

Drought Vulnerability Assessment

A drought vulnerability assessment was conducted as part of this planning process. The reliability of the city's water supply depends on a multitude of factors including the seniority of water rights, storage capacities, infrastructure conditions, and the rate of customer demand growth. Important to note is that while the City owns significant senior water rights on both the Florida and Animas Rivers, it doesn't have significant storage. Thus, the City is dependent on instream flow and water delivery to be able to maintain adequate supplies. This flow can be impacted by drought, and the City's senior water rights may only help when there is adequate flow in the river for diversion. Infrastructure failure is another concern that could result in drought-like conditions that would necessitate a similar response to drought to conserve supplies while repairs are made. The pipeline from Durango's diversion on the Florida River to the Terminal Reservoir has experienced breaks that has put the pipeline out of service for several days. The pipeline is aging, and future breaks are likely. The uncertainty will be the size of the breaks and duration to repair them. Historically the City has relied on the Animas River and the Terminal Reservoir as a buffer to water supply disruptions from the Florida. The City has been conducting a capital improvement project from 2016 with expected completion in 2020 to replace the pipeline and headgate structure on the Florida River.

Drought Mitigation and Response Strategy Development

Drought mitigation is defined within the Plan as actions that can be taken before a drought occurs that lessens the impact of future droughts. Drought response includes actions taken during times of drought to conserve water supplies and offset impacts. The City of Durango has been proactive in identifying activities to mitigate the impacts of drought in a variety of previously existing plans including the 2011 Water Efficiency Management Plan and 2015 Municipal Sustainability Action Plan. A compendium of Drought Mitigation Actions from related planning mechanisms is captured in Appendix A. Prioritized mitigation actions are captured in the Mitigation Action Plan in Section 8.5. The methods used to identify and develop drought mitigation and response strategies for Durango are described in Section 5.0.

The Drought Committee identified mitigation and response measures that address both supply and demand-side strategies. Supply-side strategies include technical and financial assistance opportunities, water rights management and cooperative agreements, and improvements to water distribution efficiency. Demand-side response strategies include actions taken by Town staff to conserve water and place water use limitations on residential and commercial/industrial customers. Some of these strategies are already in place, and some would be new strategies employed during drought.

During the 2018 drought, Durango's water demands were significantly reduced due to the effectiveness of drought-related communication, boosted by public awareness of dry conditions. A public drought information and educational campaign will continue to be a key component of the City's drought management efforts.

Drought Monitoring

The Plan outlines a systematic method for diagnosing drought conditions specific to Durango. The City of Durango Utilities department is primarily responsible for monitoring and evaluating drought indicator data. Monitoring data are collected throughout the year. These data are critical in characterizing Durango's water supplies under various hydrologic conditions, and aid in predicting drought in a timely manner. Monitoring frequency may increase during dry periods and in the spring and summer. Durango's Utilities Department specifically monitors trends in snowpack, streamflow, temperature, precipitation, storage tanks and reservoirs, and makes projections of expected future storage. Short-term indicators that directly relate to City water supply are identified in Section 6.0 as well as regional and long-term indicators that also inform drought decision making.

Staged Drought Response Program

Droughts can vary significantly in spatial extent, severity, and duration. The City has developed a four-stage drought response program to capture this variability by comparing reservoir levels based on supply source, total irrigation/supply allotments, and other trigger conditions such as snowpack level. The four stages increase in intensity from Stage 1 (one) through Stage 4 (four) and identify appropriate response actions for each both the City and the public at each stage. The response targets and actions escalate with each stage to reduce usage via restrictions and supply modifications. In all drought stages, the City will have the ability to take measures to both increase supply and decrease demand in accordance with the guidelines outlined in Section 7.0.

Plan Implementation and Monitoring

Declaration, implementation, enforcement, and monitoring of drought stages are crucial components of this program. The following protocol will be followed to implement the above ordinance in declaring the drought stages.

- Utilities Department staff will discuss the drought monitoring data with the Director of City Operations, providing recommendations on the timing of the drought declaration and the appropriate drought stage.
- The Director of City Operations will provide recommendations to the City Manager, who will decide whether or not to declare a water shortage/drought, and what stage restrictions to enact.
- If a water shortage/drought is declared, this decision will be communicated to City Council, City Emergency Management and La Plata County Emergency Management, San Juan Basin Health the CWCB, the Colorado Division of Homeland Security and Emergency Management, and to the public.
- City Council will review and discuss the City Manager's decision at an official public City Council meeting that is either regularly scheduled or scheduled as an emergency specifically to discuss drought conditions.

The same protocol will be followed at the recommendation of the Director of City Operations and discretion of the City Manager to change a drought stage, or to end a drought declaration and return to normal operating conditions.

The purpose of enforcement is to maintain the integrity of the water system during peak periods to ensure positive pressure exists and fire flow demands are met. This code enforcement is conducted to protect the interests of the public, the City, and protect public health and safety. The focus of the program is on encouragement of compliance, as well as education.

Formal Plan Approval and Updates

Durango Utilities will organize an annual drought monitoring meeting. The meeting will review the latest status of potential drought conditions for the coming irrigation year, the status of drought mitigation measures, an overview of public drought campaign efforts, and a review of roles and responsibilities. The meeting will also provide a forum for educating new staff members on their drought-related responsibilities as well as testing the implementation of the Plan by enabling staff members to question and discuss potential challenges and solutions that could arise via implementation of the Plan. This plan will be reviewed annually or following its implementation during an actual drought or exercise and will be formally updated every five years.

1.0 INTRODUCTION

1.1 Purpose and Scope

The City of Durango has developed this Drought Management Plan (Plan) to preserve essential public services and minimize the adverse effects of drought on public health and safety, economic activity, environmental resources, and individual lifestyles during a drought event. The goal is to remove the “crisis” from the City’s drought response efforts, reduce the hardship caused by water shortages, and raise public confidence in the actions taken to address short- and long-term water shortages. This Plan includes overall objectives and operating principles, an analysis of the City’s current and future vulnerability to drought, a strategy for monitoring drought conditions, and a staged response program that addresses both supply and demand for water resources. Drought mitigation, monitoring of drought indicators, and drought public education are implemented on an annual basis regardless of whether it is a dry or wet year, so as to maximize the effectiveness of all efforts.

1.2 Drought Management Planning Overview

Drought is commonly defined as “a period of abnormally dry weather sufficiently long enough to cause a serious hydrological imbalance.” This occurs when precipitation is below average based on historical weather records and there are not sufficient supplies to satisfy a water provider’s typical customer water demands, which results in a water shortage. A drought’s impacts on society and the surrounding environment can be tempered through drought preparedness. Drought management planning plays an integral role in this preparedness by defining a systematic approach to drought monitoring, long term drought mitigation and short-term drought response.

Durango’s water supplies are almost exclusively based on surface water sources. Durango’s water supply consists primarily of raw water from the Florida River, often supplemented by water from the Animas River. Lack of winter snowfall during times of drought can make these water sources potentially less reliable. This can result in greater reliance on storage, which can also be significantly reduced during droughts due to below-average snowpack and runoff coupled with above-average evaporation. Storage reserves can be stressed to a greater extent during multi-year droughts, which emphasizes the benefit of having sufficient storage to meet demands over multiple years. On the demand side, outdoor water uses can increase if the summer irrigation season is exceptionally dry. Effective drought management planning is necessary to ensure adequate water supplies for the community and reduce drought related impacts. This includes more severe water shortages that may occur as a result of multi-year droughts or even the inability to treat or deliver water due to infrastructure failure.

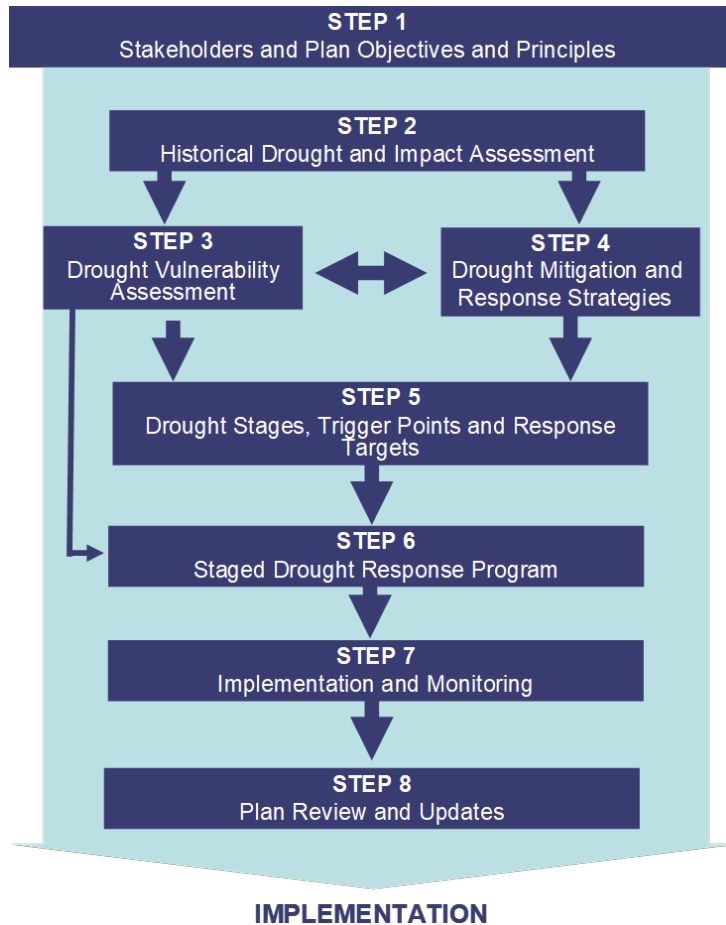
The main purpose of drought mitigation and response planning is to preserve essential public services and minimize the adverse effects of drought on public health and safety, economic activity, environmental resources, and individual lifestyles during a drought event. Effective drought management plans remove

the “crisis” from drought response efforts, reduce the hardship caused by water shortages, and raise public confidence in the actions taken to address the water supply shortage. Drought mitigation refers to actions taken in advance of a drought that reduce potential drought-related impacts when the event occurs. Conversely, drought response planning refers to the conditions under which a drought-induced water supply shortage occurs and specifies the actions that should be taken in response.

This Drought Management Plan (Plan) includes both drought mitigation and response planning; however, it does not address emergency water shortage events as a result of acute catastrophes such as an unexpected failure of a major raw water conveyance facility. It is also important to note that this Plan is effective in both drought and non-drought years. Drought mitigation, monitoring of drought indicators, and drought public education are implemented on an annual basis regardless of whether it is a dry or wet year, so as to maximize the effectiveness of all efforts.

The process used to develop this Drought Management Plan are based on guidance from the Colorado Water Conservation Board (CWCB 2010). below graphically summarizes the eight-step process that was followed per the CWCB guidance. Essentially, the drought planning process begins with setting plan objectives and principles by community stakeholders and participants. A study of the past droughts and water availability issues is conducted next, to derive vulnerability information for the community and hence be able to set mitigation and response strategies based on the community’s needs, resources, and specific context. Next, drought stages, trigger points, and response targets are created so that an appropriate drought response program may be integrated and implemented into the community’s planning mechanisms and functions. Monitoring of the drought plan’s effectiveness, along with frequent review of the plan and incorporation of necessary updates and changes is also critical, to ensure a successful drought management cycle for the community. The following section describes the planning committee and workshops utilized to develop the Plan.

Figure 1: Eight Steps to Municipal Drought Management Planning



Source: CWCB Municipal Drought Management Plan Guidance 2010.

1.2.1 Drought Planning Committee

The Plan was developed through an interactive, collaborative process through the participation of stakeholders on a Drought Committee. The Drought Committee was formed to provide input and review components of the draft Plan and inform its development. Led by the Utilities Department, the Drought Committee members represent the City departments and stakeholders that would likely be impacted by drought or involved in drought mitigation and response. The following members include senior staff of various City departments, members of the Utilities Commission, and representation from local water users including Fort Lewis College (see Table 1). The Plan was developed with assistance from a consultant, Wood Environment & Infrastructure Solutions, Inc. (Wood) and funded by a grant from the Colorado Water Conservation Board matched with City funding.

Table 1: Drought Committee Members

Name	Agency	Position
Jarrod Biggs	Utilities	Assistant Director
Levi Lloyd	Utilities	Director of Operations
Jason Fast	Utilities	Chief Water Plant Operator
Scott McClain	Parks & Recreation	Assistant Parks Director
Imogen Ainsworth	Sustainable Services	Sustainability Coordinator
John Ballew	Utilities Commission	Utilities Commission Chairman
Paul O'Neil	Utilities Commission	Utilities Commission Vice Chair
Scott Shine	Community Development	Planning Manager
Patrick Farrell	Collections and Distribution	Superintendent
Shannon Waggoner	Public Information	Public Information Specialist
Terry Hoecker	Emergency Management	Emergency Manager
Marc Huber	Fort Lewis College/PPS	Assistant Director
Carl Gregg	Fort Lewis College /PPS	Ground Manager
Keith Dougherty	Engineering	Assistant City Engineer

Two meetings were held with the Drought Committee as the Plan was developed. These meetings focused on the development of the Plan objectives and operating principles and facilitated a means to collect and review data and receive feedback on specific aspects of the Plan. The Drought Committee also had the opportunity to review and comment on the draft Plan in its entirety prior to finalization. The meetings focused on the following material:

- Meeting No. 1 – Introductions and development of a drought definition, water use priorities, plan objectives, and operating principles.
- Meeting No. 2 – Historical drought information, lessons learned from past droughts, identification of historical and potential future drought impacts, and development of preliminary mitigation and response strategies. Screening of mitigation and response measures as well as development of drought stages, trigger points, and response targets were mentioned. Development of staged drought response plan.

1.3 Profile of Existing System

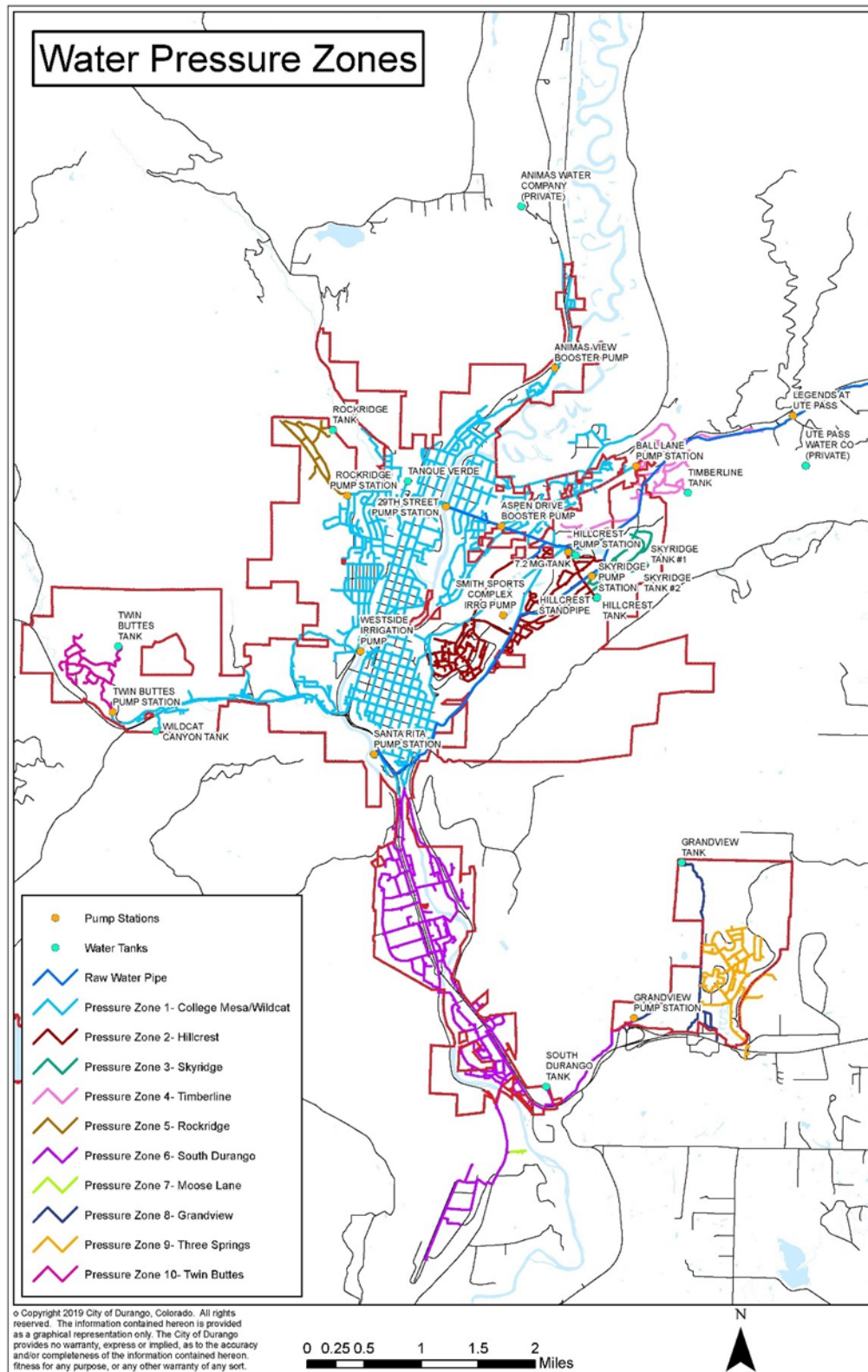
The City of Durango (Durango) is in southwest Colorado in La Plata County, about 45 miles east of Cortez (Montezuma County) and 60 miles west of Pagosa Springs (Archuleta County). Formed in 1880 by the Denver and Rio Grande Railroad Company along the banks of the Animas River, Durango's existing water system provides water to over 20,000 residents in both incorporated and unincorporated areas around

the City. Durango provides treated water and wastewater services to approximately a 14-square mile service area.

The City of Durango is fortunate to have two sources of water supply. The City of Durango primary water source is the Florida River, and is augmented with water from the Animas River. The City has senior water rights in both rivers. The City has 8.92 C.F.S. direct flow rights in the Florida River, and 46.9218 C.F.S direct flow rights in the Animas. Durango's current raw water is preferentially obtained from the Florida River first, then excess water needs are supplemented from the Animas River. In accordance, it is standard that a supply of about 5.764 MGD comes from the Florida River, with a possible additional 30.324 MGD from the Animas River (though usually up to 10 MGD are diverted). Water from the Animas is pumped from the Santa Rita Pump Station near downtown Durango to the Terminal Reservoir. Figure 2 provides an overview of the City's pump stations, water distribution system lines, and storage tanks. At the Santa Rita Pump Station, the City maintains three vertical turbine pumps with a capacity of 6.684 C.F.S. each; future expansion may include a 4th pump. Water from the Florida is fed by gravity via a nine mile pipeline North East of Durango to the Terminal Reservoir. Terminal Reservoir is the City's primary storage facility; the City's water treatment facility is located adjacent to the reservoir.

The City of Durango aims to be able to provide enough water to serve a potential population of 40,000 people, or a total treated maximum daily demand of 22 Million Gallons per Day (MGD). The current population is expected to grow at a rate of 2% per year through the year 2040, as indicated by Colorado's State Demographer's Office.

Figure 2: City of Durango Water System Overview



Source: City of Durango Information Services, 2019

The City of Durango's total treated water for 2010 was 1,287,105 gallons, with another 255,195 in raw water deliveries. Overall, 2010 saw a 1,542,300-gallon water use, which equals to about 4,733 acre-feet (AF). The summary of water usage by customer type over the years (from 2006 to 2010) is displayed in Figure 3 below.

Figure 3: Durango Water Use by Customer Type, 2006-2010

	Service Area Population	Treated Water Use (1,000 gallons per year)											Total Raw Water Deliveries	Total Water Use	
		Single Family Residential Inside City	Single Family Residential Outside City	Duplex Inside City	Duplex Outside City	Commercial Inside City	Commercial Outside City	Compound Commercial Meters	Animas Water Company Deliveries	Fort Lewis Deliveries	Non-Revenue Water	Total Treated Water		1,000 gals per year	Acre-Feet
2006	19,054	349,014	35,885	26,976	358	505,199	22,107	6,862	1,042	32,642	281,383	1,261,468	263,607	1,525,075	4,680
2007	19,344	353,056	35,111	25,423	477	517,078	26,790	6,556	968	34,336	254,830	1,254,625	259,784	1,514,409	4,648
2008	19,636	359,699	35,937	26,611	470	539,535	25,137	7,088	1,182	36,648	250,675	1,282,982	297,203	1,580,185	4,849
2009	19,636	380,750	36,243	26,780	169	522,271	36,007	5,057	1,383	33,761	231,226	1,273,647	249,623	1,523,270	4,675
2010	20,239	379,512	36,792	25,031	439	484,239	45,269	4,254	1,503	31,985	278,080	1,287,105	255,195	1,542,300	4,733

Source: City of Durango Water Efficiency Management Plan, 2011.

In more recent years, however, retail water deliveries have slightly increased. The statistics on treated water to distribution from 2013 to 2017 can be found in the table below.

Table 2: Retail Water Delivery from 2013-2017 in Durango

Year	2013	2014	2015	2016	2017
Treated Water to Distribution (AF)	4,566.36	4,157.7	3,385.92	3,577.91	3,567.59
Billed Residential (AF)	1,385.32	1,352.93	1,406.73	1,259.36	1,217.32
Billed Commercial (AF)	1,822.38	1,831.33	1,808.81	1,873.37	1,797.71
Raw Irrigation Water Supplied (AF)	691.72	805.27	587.21	740.69	808.31
TOTAL (AF)	8,465.78	8,147.23	7,188.67	7,451.33	7,390.93

Source: Durango Drought Mitigation Plan Grant Application, 2017

The City has been proactive in its planning efforts to ensure the community's water future and obtain a continuous, sustainable water supply. Durango has strategies and objectives concerning water (such as related to conservation and the protection of streams) outlined in its Comprehensive Plan, current as of 2017. Additionally, the Municipal Sustainability Action Plan (SAP), adopted in 2015, reflects Durango's commitment to the environment and natural resources. Objectives outlined in the SAP aim to effectively manage and reduce municipal water consumption, promote sustainable water and wastewater systems, and promote responsible use of municipal water resources.

Water management capabilities should be redefined in the new stormwater management plan the city will soon publish, as will infrastructure capabilities and upcoming enhancements to the utility elements in the City (such as outlined in the 2015 Facilities Master Plan and other mechanisms and in the Comprehensive Plan). The City's Utilities Report from 2007, which was a Comprehensive Plan Update element from the previous plan version, reported the modeled alternatives from the Water Supply Alternatives Investigation and Preliminary Engineering Study to evaluate water facilities and supply capabilities, taking into account population growth in the coming years. As such, the City has been engaged in raw water and stormwater studies assessing supply and demand projections, especially because development is going to be a key factor in the City's existing water system and how it will operate. Collaborations and partnerships with other entities, such as the Animas-La Plata Water Conservancy District, La Plata-Archuleta Water District,

Animas Water District, Southern Ute and Ute Mountain Ute tribes, other water purveyors and conservancy programs are expected to also play central roles to the City's ability to continue water supplies with coming growth and development. In the future the City has the potential to supplement supplies with water from Lake Nighthorse, which could provide an additional buffer during times of drought. However, infrastructure would need to be built to physically obtain and treat the water for Durango's use.

Based on the assessments indicated on the Water Efficiency Management Plan, as noted in Figure 3, the largest customers in Durango in terms of treated water use are:

1. Commercial users
2. Single family residential
3. Non-revenue water users
4. Fort Lewis College
5. Duplexes
6. Compound commercial meters (note: deliveries to the Animas Water Co. have been discontinued as of September 2019.)

1.4 Population

Population data from the past three decennial censuses are presented in Table 3, and projections out to the year 2040 (noted in the City's latest Comprehensive Plan Demographics Annex) are presented in Table 4.

Table 3: Past Population in Durango per U.S. Decennial Census

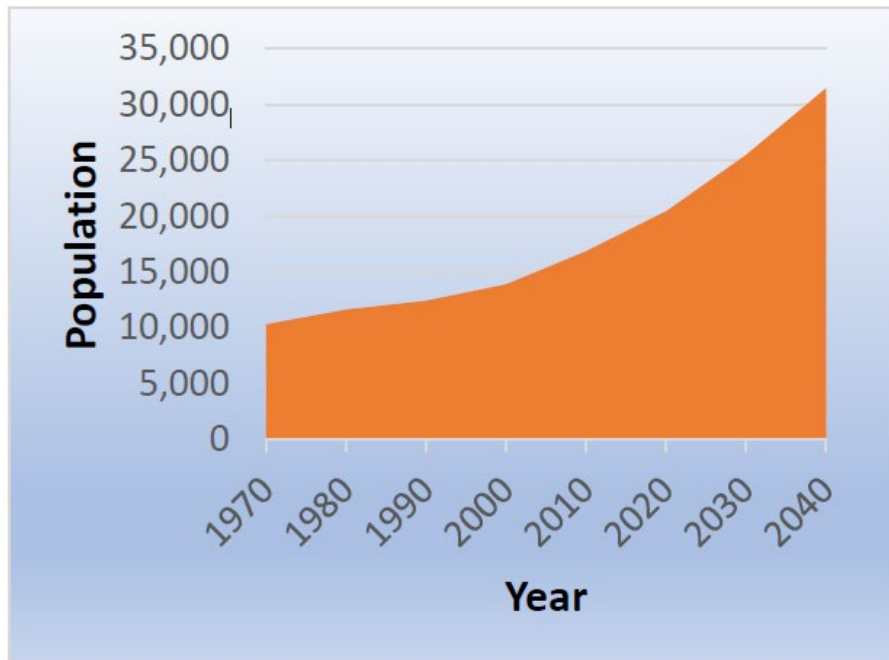
Census	Population
1990	12,430
2000	13,922
2010	16,887

Table 4: Projected Population in Durango, 2015-2040

Year	Population
2015	18,685
2030	24,080
2040	27,676

Projected annual population growth is expected to remain at just over 2% for the next twenty years. Figure 4 below displays the growth trends historically and over time.

Figure 4: City of Durango Growth Trends and Projections



Source: City of Durango Comprehensive Plan, Appendix C: Demographic Profile, 2017

In addition, the City's 5-year water delivery rate (from 2013-2017) averages 7,728.79 acre-feet; looking at the per capital annual water use for these years the system total averages 0.114 acre-feet per capita. However, estimates from the comprehensive plan expect a 1.95% increase in the annual retail demand for the upcoming years (with projections to the year 2022), which, coupled with the expected population growth, would stress the municipal water system and require water efficiency measures to be implemented as well as water savings targets to be reached (particularly in times of water scarcity).

1.5 Relationship to Other Planning Mechanisms

This Plan builds upon and complements water resources, water conservation, and drought related aspects in related planning mechanisms. This includes:

- 2017 City of Durango Comprehensive Plan and all related utilities reports
- 2017 Raw Water/Terminal Reservoir Management Plan Management Plan
- Facilities Master Plan
- 2011 Water Efficiency Management Plan
- 2015 Municipal Sustainability Action Plan (SAP)
- 2018 La Plata County Hazard Mitigation Plan
- 2015 Southwest Basin Implementation Plan

This Plan incorporates city or county-level drought impact information presented in these plans, as well as water efficiency and conservation actions that relate to long-term drought mitigation. Drought mitigation actions from these plans are discussed further in Section 5.0 and detailed in Appendix A.

1.6 Previous Drought Planning Efforts

Durango has dealt with drought in past decades and most recently in 2018, but this 2019 plan represents the first plan of its kind for the City. The plan builds upon drought related aspects of the previously noted planning mechanisms. The 2017 Raw Water/Terminal Reservoir Management Plan provided base level information for existing City drought response. From May to October, the Terminal Reservoir Plan outlines irrigation allotments based on reservoir levels as well as available supply. Along with these criteria are four action stages at the city and public levels (for a total of eight sets of rules combined), which help guide efforts related to conserving and restricting water use, even at times enforcing water distribution or splitting among interested parties of water users. This helped form the basis of the staged drought response plan detailed in Section 7.0 of this plan.

As mentioned in the previous section, Durango has been involved in other planning efforts dealing with water conservation and diversification to prepare for times of scarcity. The City's SAP, Comprehensive Plan, and Water Efficiency Management Plan are examples where specific actions, strategies, objectives, and guidelines are outlined in regard to managing water resources. These proactive approaches and planning will help mitigate the consequences of drought.

Other elements of drought contingency planning that was already in place include the City of Durango Code of Ordinances. Sections 25-33 and 25-30 defines a process for declaring a water shortage, restrictions on water use and penalties for violation, and drought surcharges. When declared by the City Manager and confirmed by the City Council, emergency drought surcharges may be imposed to residential, commercial, and industrial users in addition to the water rates in effect at the time of the declaration, to discourage excessive irrigation, water waste, unnecessary use, etc. during identified drought periods. This is discussed further in Section 8.0 of this plan.

Furthermore, the City has been proactive in engaging the public and encouraging water savings and smart water use with education and awareness efforts. The 'Are You Water Smart?' resources available online at <https://www.durangogov.org/index.aspx?nid=924>, recommends water savings techniques that can lead to reductions in residential water usage during a time of drought or when water restrictions are enforced. The City also provided this information in utility billing mailings during the 2018 drought.

On July 16-17, 2018, the City of Durango participated in a Vulnerability, Consequences, and Adaptation Planning Scenarios (VCAPS) workshop, organized by Western Water Assessment (WWA), an applied research program based at the University of Colorado Boulder. This two-day workshop focusing on ways to build resilience to weather and climate impacts, including two discussion-based exercises built around drought scenarios.

- **2018-Type Drought Scenario:** This exercise focused on ways to deal with reduced water supply, conservation trade-offs, impacts to river health, economic and cultural impacts of impaired river health, use of and increased reliance on secondary water source (Animas River), affordability issues if rates/taxes too high, and planning for restrictions and prioritizing water uses. A significant portion of the discussion focused on "upstream" actions related to conservation that serve to mitigate multiple issue areas.
- **Multi-Year Drought Scenario:** This exercise what focused on acute water supply limitations resulting from a multi-year drought. The discussion addressed issues of water supply limitations, mandated restrictions, complete reliance on Animas River if Florida is curtailed, and a spill on Animas when Florida is curtailed.

The results of the VCAPS workshop were summarized in a Workshop Report (WWA 2018). The report included a table of potential drought mitigation and response actions that were identified during the workshop.

1.7 Drought Planning and Water Conservation

Water conservation and drought planning both involve a combination of strategies for reducing water demand. However, the main objective of a water conservation plan is to achieve continuing, long-term improvement in water use efficiency while reducing overall water demands. A drought management plan focuses on long-term drought mitigation in addition to response strategies that provide short-term responses to temporary drought-related water supply shortages. Nevertheless, conservation measures that result in an ongoing reduction in water demand can provide long-term drought mitigation benefits and can be considered as both conservation and drought mitigation measures. Strategies proposed and implemented also include incentive-based programs that encourage existing properties to be water efficient and aesthetically pleasing. Many water efficiency activities put in place by the City are noted in the 2011 Water Efficiency Management Plan.

2.0 PLAN OBJECTIVES AND OPERATING PRINCIPLES

2.1 Drought Definition

For the purposes of this plan drought is defined as:

"A condition of insufficient water supply caused by a deficit precipitation, other water supply or delivery impairment, or the inability to maintain or deliver adequate water supplies to meet demand."

This definition was developed based on input from the Drought Committee and includes other circumstances beyond the traditional hydrologic shortage, such as unanticipated increases in water demand or damage to water supply infrastructure that could trigger responses and restrictions similar to a drought response.

2.2 Objectives of the Drought Management Plan

The objectives state the purpose of the plan and were developed collaboratively by the Drought Committee. The objectives are summarized as follows:

1. Plan and Prepare:
 - a. Protect the public health and safety and minimize the adverse effects of a water supply shortage through drought planning and preparedness.
 - b. Identify past and potential drought impacts and vulnerabilities to inform the planning process.
2. Identify and Monitor:
 - a. Provide guidelines to identify, anticipate, and monitor drought conditions.
 - b. Determine drought severity through a clear definition of indicators, stages and triggers.
3. Respond, Mitigate and Communicate:
 - a. Provide comprehensive and flexible guidance for drought response, allowing for an appropriate range of actions to respond.

- b. Provide effective communication, drought awareness, and response information to water customers, the public and governmental departments/agencies, so they clearly understand the situation and the actions taken.
 - c. Preserve essential public services during any level of drought severity from mild to critical emergency conditions.
 - d. Reduce the impacts of future droughts through long-term mitigation strategies.
4. Evaluate and Update:
 - a. Provide an efficient means to monitor and improve the effectiveness of the Plan over time.

2.3 Operating Principles

Operating principles provide a set of guidance criteria that the Drought Committee can return to while developing and updating the plan and when making decisions in times of drought. Based on the input from the Drought Committee these operating principles are as follows:

- Drought response and mitigation actions will be carried out in a way that respects the priorities established by the plan, with the highest priority being health and safety.
- Drought response and mitigation actions need coordination and communication for success. This includes coordination and communication with staff across the City's various departments. The City's water customers and the public need to have a clear understanding of any actions taken.
- The development and implementation of the Plan should not be conducted in a vacuum. Feedback from the Drought Committee, City staff, and the public is crucial to developing and implementing a well-rounded and effective Plan.
- When possible, efforts should be taken to preserve the environmental and recreational value of the surrounding lands which are important to the values and livelihoods of City residents.
- Where possible, efforts should be made to allocate the costs associated with water use restrictions among all customers in an equitable manner.
- Effective coordination and collaboration among City staff is crucial to the success of the Plan. This Plan provides a comprehensive framework for implementation of the drought mitigation and response based on available information. Exceptions/adjustments to this framework may be necessary during a drought if proven to be of greater benefit. However, all changes should be clearly communicated and coordinated among relevant City staff.

This plan is intended to be a guide to facilitate decision making. Decision makers should remain flexible and respond as needed to each drought event on a case-by-case basis.

2.4 Water Use Priorities

During times of water scarcity, it will be necessary to conserve water wherever possible; this could require restrictions on certain uses so that key needs are met by limited supplies. The Drought Committee prioritized the City's water usage through a collaborative process into the five categories shown in Table 5 below. Essential uses for the health and safety of the community were given the highest priority. Water uses for existing businesses (in the form of indoor use) were assigned a second priority, and outdoor irrigation (for parks and athletic/recreation fields) were assigned lower priorities as indicated.

Table 5: Water Use Priorities

Priority	End Use	Description
1	Health and Safety	Indoor residential, water treatment plants, hydrants (for emergency use), wastewater treatment plants, schools, hospitals, and other health, safety and emergency services.
2	Business Indoor Use	Indoor use by the commercial and public sector, stores, offices, hotels, restaurants, etc.
3	Maintain athletic fields and high use/high priority parks	Maintain in the usual ways as possible. Parks in this category: Santa Rita Playground, and Buckley Park.
4	Maintain medium priority parks	Reduce watering and/or manage parks as warm season dormant as needed to maintain availability. Parks list in this category: Chapman/BMX track, Animas City, Brookside, Confluence, Fanto, Folsom, Jenkins Ranch, Mason, Memorial, Pioneer, Rotary, Rank, Fassbinder, Needham, Iris, Schneider, Viles, Santa Rita Whitewater Park, Greenmount Cemetery and Historic Tram Park.
5	Upkeep of low priority/low use parks	Warm season dormant, hand water trees and shrubs as needed. Parks in this category: Crestview, Hillcrest View, Riverfront, Roosa, Third Avenue Parkway, Downtown Brown, Top of Westside, W. 3rd and Park, and H.G. Trailhead.

Note: City water dock water usage spans multiple purposes; restrictions and cutoffs could occur to water dock users based on the noted priorities; these potential restrictions should be posted at the water dock and noted in water dock user agreements.

3.0 HISTORIC DROUGHT AND IMPACT ASSESSMENT

3.1 Historical Assessment of Drought, Available Supplies and Demands

Droughts are a natural phenomenon of Colorado's climate, and short duration drought occurs somewhere in the state nine out of ten years.

While Durango has been able to manage water supply during normal and below normal water years to successfully meet demands of the system, the Florida River has had calls that impacted the City's water supply. Three calls between 2000 and 2018 caused reductions of water supply, which were thankfully met by augmentations from the Animas River supply, even when the Animas River has suffered from daily low flow measurement records as indicated by the USGS 9th St. gauging station.

Extreme weather events and increasing occurrences of drought compromise the two city water sources, namely the Florida and Animas Rivers. Recent local fires such as the 416 Fire in 2018 and the Missionary Ridge Fire back in 2002 forced the city to pull from the Animas River, greatly reducing firefighting capabilities and generally affecting the quality of the water supply.

Before 2018, major droughts included the 2002 and 2011-2013 droughts. In 2002, the United States Department of Agriculture (USDA) declared La Plata County a primary county disaster area. Along with the Missionary Ridge Fire, the Valley Fire compounded, collectively causing 70,662 acres to be burned which in turn destroyed 56 homes and caused \$40.8 million in property damages. The 2011-2013 drought years saw a great reduction in precipitation. For example, by the end of 2012 the Durango-La Plata Airport had 8 inches below normal precipitation. Three major calls on the Florida River took place between 2002 and 2012, which resulted in 0.5-0.75 Cubic Feet per Second (CFS) reduction towards the city water supply. The Gold King Mine spill incident in 2015 affected the Animas River water by compromising its quality, which

resulted in emergency bottled water distribution to community members to increase potable water availability.

The City's ability to provide water at a more regional level can be stressed in times of drought. Customers and neighbors such as water haulers or others just outside city limits (including those who may rely on the water dock's supply) may experience cutbacks during drought periods when servicing city residents is prioritized. Regional growth will also become more of a factor. For example, the fact that La Plata County as a whole expects demand increases of 6,800 to 10,800 acre-feet of water per year will impose added stress on municipal and industrial needs in particular (i.e. large water users), even with planned allocations or augmentation efforts such as those pushed forth by the Animas-La Plata Water District, La Plata West Water Authority, and the Florida Water Conservancy District as noted in the 2015 Southwest Basin Implementation Plan. Even though these districts and partnerships have evaluated Identified Projects and Processes (IPPs) and conducted various water studies, such as for the Florida River Basin where a multi-purpose and cooperative IPP was developed, gaps in environmental or recreational water needs could grow in the future given the growth expectations across Colorado's southwest (Southwest Basin Implementation Plan, 2015).

The City's aging infrastructure and major dependence on a main vulnerable waterline has also been an issue recently, as a failure of this central water conveyance pipeline from the Florida River could cause an emergency, even during a wet period.

Overall, main concerns over water supply in times of drought include:

- Reduction in surface water supply
- Lack of additional water sources since the City does not have wells (groundwater)
- Negative impacts to tourism economy and city budgets seeing lower revenue due to decreased tourism/recreational activities
- General environmental impacts such as increased wildfires, wind, heat, and debris flow/flooding. Debris flows in turn can affect water quality such as turbidity, taste, and odor
- Dust-on-snow effects which lead to earlier snowmelt
- Potential issues with conveyance infrastructure and related decay/increased maintenance costs. Conveyance of supply could become more vulnerable, dependent on a single waterline that is more susceptible to drought and non-drought emergencies
- Reliance on a central water conveyance structure from the Florida River and hence lack of a more redundant water supply system
- Potential reduction in supply to water haulers, water dock users, and those otherwise without an existing service account with the City during dry times when priority is given to key city water users
- Possible compromise in firefighting capabilities due to lack of water

3.1.1 The 2018 Drought

The City has been exposed to significant wildfire hazard in recent years, which have been exacerbated by drought. Wildfires can stress the water supply system in two ways: one, the water resources required to fight a wildfire are significant, and two, the ash and debris left behind by the fire can pollute water supplies (particularly sedimentation in reservoirs) for years to come. The 2018 drought led to several fires which caused millions of dollars' worth of revenue losses. In past years other negative effects to due to

drought included calls on the Florida River which resulted in significantly reduced water supply flows for the City.

The 2018 drought affected the city in various ways. Damaging fires such as the 416 Fire resulted in estimated losses of \$26 million to the tourism industry, with central industries such as the Durango & Silverton Narrow Gauge Railroad reporting \$6 million in revenue losses due to fire-induced closures that affected 40,000 trips. That same year there were 17 calls on the Florida River alone, and additional water supply from the Animas River was also compromised by increased silt and ash from local fires. Based on the La Plata County Hazard Mitigation Plan (2018) there have been eight USDA Secretarial Disaster Declarations related to drought from 2003-2018. Two of those (the latest ones in 2018) were of the Fast Track kind, which means drought conditions were severe enough to provide for an automatic disaster designation due to them taking place during the growing season and lasting more than eight consecutive weeks. Additional details on these types of Fast Track drought declarations please visit the U.S. Drought Monitor website (NDMC, 2019; La Plata HMP, 2018). From the historic data, it is apparent that there has been a shift in trend with regards to occurrences of drought in the last few decades, where dry periods are becoming more common/frequent.

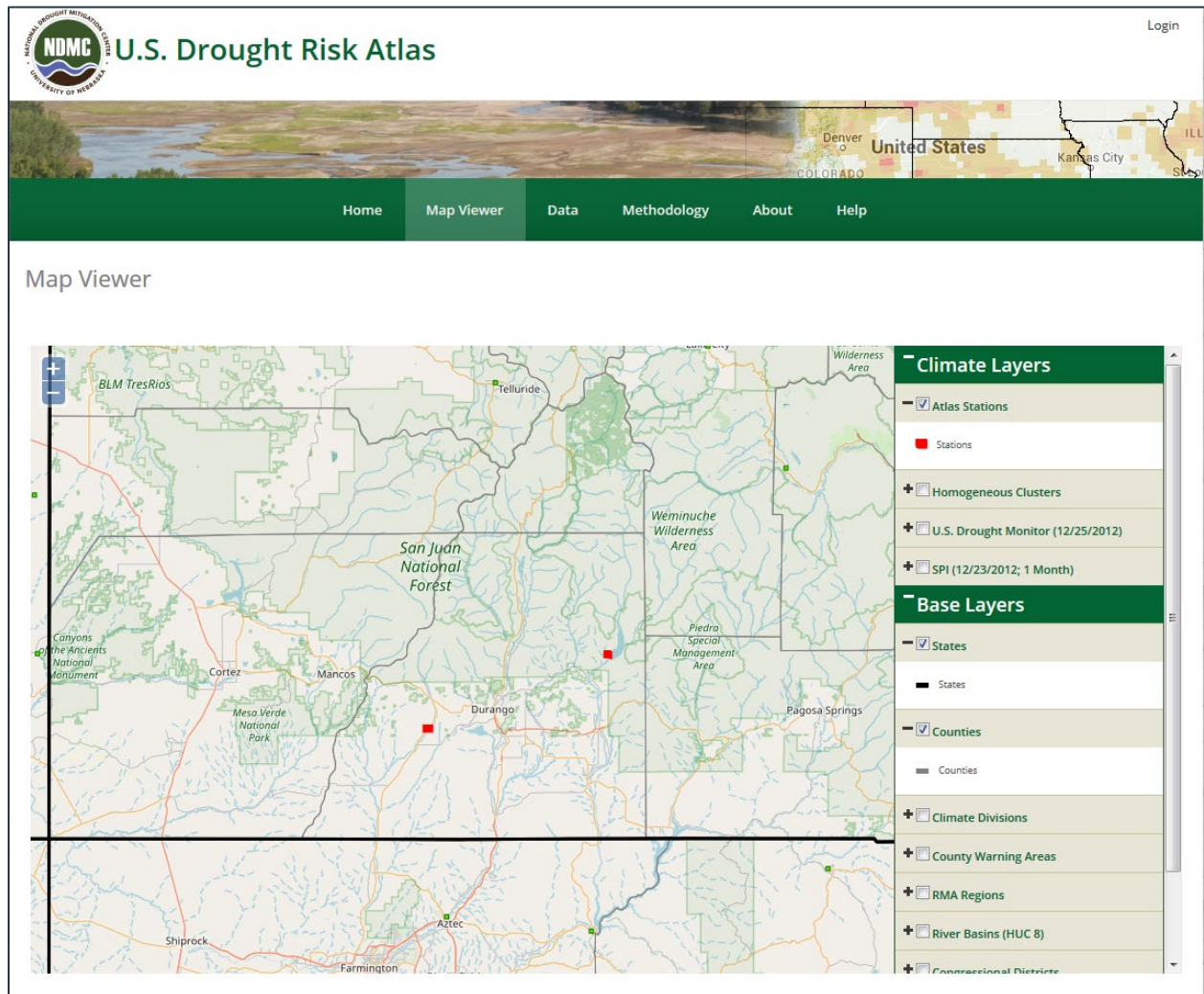
The Exceptional Drought conditions (D4 conditions as designated by the US Drought Monitor) in southwest Colorado in 2018, led to the Florida River (the primary source of water supply for Durango) to become subject to 17 calls, 7 of which impacted the City's water supply. All these reductions in water supply required that the City obtain additional water from the Animas River. However, the silt and ash flows from the 416 Fire reduced the City's capacity to pull from the Animas River, further stressing an already compromised system.

Four USDA drought declarations were also enacted in 2018 in La Plata County, classified as Fast Track events when the US Drought Monitor exceeds D2 (Severe Drought) conditions for a period of eight consecutive weeks, or when D3 (Extreme Drought) or higher during the growing season: S4300 (approved as of March 30), S4320 (approved as of May 10), S4329 (approved as of May 25), and S4347 (approved as of July 18).

3.1.2 Other Historic Droughts

The National Drought Mitigation Center's Drought Risk Atlas contains online tools that allow the quantification of drought-related information, including historical drought periods, based on specific monitoring stations across the U.S. The two climate stations closest to the City of Durango are the Ft. Lewis station, located about 10 miles southwest of Durango (Station ID 053016), and the Vallecito Dam station, about 15 miles northeast of Durango (Station ID 058582). These two stations' locations are displayed in Figure 5 below, where the Vallecito Dam one is shown as a red square towards the northeast of Durango (close to the Hinsdale and Archuleta County boundaries), and the Ft. Lewis station is also a red square but this one is on the southwest of the City, closer to the Montezuma County boundary. While Durango does not utilize Vallecito Reservoir or the Los Pinos River as a water supply source, the station is near the Florida River watershed and provides representative regional climate conditions.

Figure 5: Drought Risk Atlas Monitoring Stations



Source: NDMC Drought Risk Atlas

Summaries about multi-year drought periods near Durango based on these two stations was obtained and is included in Table 6 below. Both stations' information was pulled for droughts that were of magnitude -2 or worse, using the Standard Precipitation Index (SPI), at a timestep of 36 months (3 years), and again lasted more than one consecutive year. In total, the Vallecito Dam station experienced four multi-year droughts in its entire period of record (September of 1942), while the Ft. Lewis station has seen two droughts of this magnitude or worse in its entire period of record (since January of 1949).

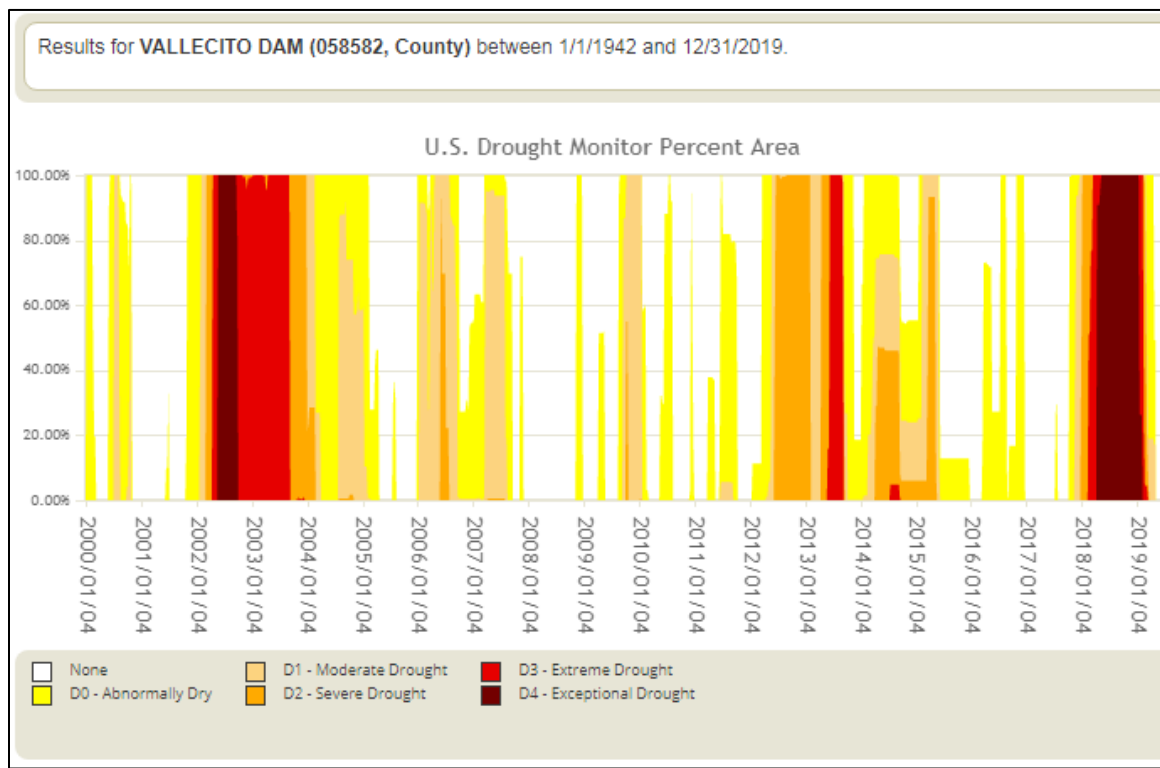
Table 6: Historical Droughts Near Durango Based on the Vallecito Dam and Ft. Lewis Stations

Station	Drought Start Date	Drought End Date	Drought Duration (In Weeks)	Average Duration of Drought Period (in Weeks)
Vallecito Dam	10/15/1951	7/23/1954	144	108
	12/23/1956	10/15/1957	42	
	2/5/1990	4/29/1992	116	
	7/23/2002	2/5/2005	132	
Total Weeks in Drought			434	
Ft. Lewis	1/1/1978	1/15/1979	54	96
	6/4/2002	2/5/2005	139	
Total Weeks in Drought			193	

Source: NDMC's Drought Risk Atlas

The multi-year droughts noted in Table 6 and more recent ones are also apparent in the following time series graph for both the Vallecito Dam and Ft. Lewis stations (Figure 6). This graphic highlights droughts near Durango based on the U.S. Drought Monitor's classification of drought (from no drought, or areas of white, to Exceptional Drought, or a category of D4 where areas are noted in swaths of dark red). The period of record for the Drought Monitor dataset starts on January of 2000 till present time (accessed for this plan in April 2019). Multi-year droughts of severe or worse categorization are noticeable from 2002 to 2004 on both stations' data, 2012 to 2013 (with patches of 2014 and 2015 popping up in the severe or extreme drought categories), and finally the 2018 to early 2019 extreme and exceptional drought period.

Figure 6: Historic Droughts at the Vallecito and Ft. Lewis Dam Stations Based on the U.S. Drought Monitor



Source: NDMC's Drought Risk Atlas, pulling from the U.S. Drought Monitor

4.0 DROUGHT VULNERABILITY ASSESSMENT

Durango may be increasingly vulnerable to water scarcity and supply impediment issues due drought, growth and development, an aging conveyance infrastructure, and a changing climate. Historical evidence from recent years has shown that the City is exposed to various drought related impacts such as increased temperatures, lack of precipitation, wildfires, and water quality issues. These issues are summarized further as part of a drought vulnerability assessment completed as part of this drought management planning effort in 2019.

4.1 Water Supply Reliability and Drought Management Planning

Durango's water servicing planning efforts include a focus on the long-term sustainability of the City's water supply. The Durango 2015 Municipal Sustainability Action Plan promotes water reduction and sustainable water management practices, in addition to other sustainability objectives. Water related objectives stated in the Sustainability Action Plan include:

- the ability to effectively manage and reduce municipal water consumption,
- the promotion of sustainable water and wastewater systems, and
- promotion of responsible use of municipal water resources overall.

As part of these main objectives, key action items that seek to improve water resource management, demand adjustments, and overall supply distribution also take into account the concept of drought.

The reliability of the city's water supply depends on a multitude of factors including the seniority of water rights, storage capacities, infrastructure conditions, and the rate of customer demand growth. Important to note is that while the City owns significant senior water rights, it doesn't have significant storage. Thus, the City is dependent on instream flow and water delivery to be able to maintain adequate supplies. This flow can be impacted by drought, and senior water rights only help when there is adequate flow in the river for diversion. Infrastructure failure is another concern that could result in drought-like conditions that would necessitate a similar response to drought to conserve supplies while repairs are made. The nine mile long pipeline from Durango's diversion on the Florida River to the Terminal Reservoir has experienced breaks that has put the pipeline out of service for several days. The pipeline is aging, and future breaks are certain. The uncertainty will be the size of the breaks and duration to repair them. Historically the City has relied on the Animas River and the Terminal Reservoir as a buffer to water supply disruptions from the Florida. The City relies on the Santa Rita Pump Station for pumping Animas River water to Terminal Reservoir. While the pump station has three pumps to meet water demands and redundancy, the city is relying on large electric motors and pumps; replacement parts for these devices have long lead times and require contractors outside the city to perform the work. Pumping capacity can be reduced during these events and could result in water shortages if combined with a Florida River Pipeline failure. The City has advanced a capital improvement project to replace the pipeline and headgate structure. 2020 construction on phase three phase to complete the replacement of the aged headgate infrastructure.

Water supply reliability planning is an important component in ensuring sufficient supplies during times of drought and, to some extent, overlaps with this drought management planning process. However, this Plan focuses on drought within the context of drought monitoring, mitigation actions, and drought response to lessen drought impacts. Consequently, this Plan does not take the place of water supply reliability planning but rather is closely coordinated with Durango's water supply reliability planning efforts.

4.2 Drought Impact Assessment

Durango could experience a variety of drought-related impacts in the future, which may be similar to those experienced in the past. The past and possible future impacts and level of severity are outlined in Table 7. The potential severity of many of these impacts could be significant depending on the magnitude and duration of the drought, climate variability trends, and as how effectively the drought mitigation and response efforts reduce the impact.

Table 7: Historical and Potential Future Drought Impacts in Durango and Possible Response (short-term or during drought) and Mitigation Strategies (long-term and pre-drought)

Typical Drought impacts	Historic (H) or Potential (P) Impact	Ranking of Drought Impact Severity*	Past or Potential Response Strategies	Past or Potential Long-Term Mitigation Actions
Water Provider				
Disruption of water supplies	H	H	Implement watering restrictions	Enhance supply and delivery infrastructure to minimize disruptions
Aging and limited water conveyance infrastructure which could lead to inability to service users from failure or breakage/leaks	H	H	Rely on emergency/backup infrastructure or resources	Capital improvements to enhance infrastructure, minimize leaks and increase efficiency
Lower quality of water supply due to silt and ash flows from rain events	H	M	Monitor water quality more closely	Increase filtration/sanitation mechanisms/conveyance infrastructure
Loss of revenue from reduction in water sales	P	M	Use reserve water	Budget for reserve water or methods to offset revenue loss
Increased costs and staff time to implement drought plan	P	M	Budget for additional resources (e.g. staff time, reserves)	Budget for increased costs
Increased data/information needs to monitor and implement drought mitigation plan	P	M	Budget for additional resources (e.g. staff time, reserves)	Partner with other agencies (e.g. Reclamation) doing drought monitoring
Reduction in storage reserves	H	L	Implement watering restrictions	Decrease reliance and overall water use (conservation); alternative supplies and additional storage
Degraded water quality	H	L	Utilize other water sources; increase water treatment	Utilize other water sources; enhance treatment facilities
Higher water treatment costs	H	L	Utilize alternative water resources	Budget for additional costs

Typical Drought impacts	Historic (H) or Potential (P) Impact	Ranking of Drought Impact Severity*	Past or Potential Response Strategies	Past or Potential Long-Term Mitigation Actions
Sediment and fire debris loading to reservoirs following a wildfire	H	L	Utilize alternative water resources	Increase filtration/sanitation mechanisms/conveyance infrastructure; diversify supply
Costs to acquire/develop new water supplies/water rights transfers	P	L	Utilize staff to address data/information needs	Acquire and develop additional supplies; develop water sharing agreements
Costs to maintain and increase water use efficiency	P	L	Increase public awareness of the need	Implement education and public awareness long-term. Establish special fees
Public favorable/unfavorable perception of provider regarding drought response	P	L	Increase public education and reference drought plan	Maintain transparency and education efforts, maintain and update drought plan
Scarcity of equipment and other water related services (e.g. contractors to repair water infrastructure)	P	L	Utilize multiple contractors	Develop an emergency services contract for on call contractors
Community, Societal, and Health Related				
Lower quality drinking water (e.g., poor taste and odor) and increased turbidity	H	H	Monitor water quality more closely	Enhance treatment capabilities; Identify and utilize alternative supplies
Public safety from wildfires	H	H	Maintain firefighting capabilities	Evacuation planning and Firewise education and awareness
Increased pollutant concentrations	H	M	Increased sampling and monitoring	Meet primary drinking water standards at all times
Heightened awareness about water conservation and the fact that everyone has a part and shared sacrifice	H	M	Increase public education about drought plan conservation targets	Develop pre-scripted messaging
Additional pressure of providing water for haulers outside city limits from the water dock	H	M	Increase public education	Drought Planning. Increase public education

Typical Drought impacts	Historic (H) or Potential (P) Impact	Ranking of Drought Impact Severity*	Past or Potential Response Strategies	Past or Potential Long-Term Mitigation Actions
Cross-connection contamination as a result of lower pressures	P	M	Monitor water quality more closely or increase sampling	Increase filtration/sanitation mechanisms/conveyance infrastructure
Domestic landscaping stressed or killed	H	L	Drought tolerant landscaping	Continue to implement drought tolerant landscaping
Public landscaping stressed or killed	H	L	Drought tolerant landscaping	Continue to implement drought tolerant landscaping
Increased respiratory ailments	H	L	Provide public education and resources	Provide public education and resources
Mental and physical stress	H	L	Promote mental health services to affected sectors (ag, rec and tourism)	Build partnerships with public health entities
Reduction or modification of recreational activities	H	L	Promotion of alternate activities when snowpack and streamflows are low	Develop pre-scripted messaging for alternate recreation and tourism during drought
Changes to population growth trends (more likely during a long-term drought)	H	L	N/A	Account for drought in long term water supply planning
Change in water use behavior to conserve water	H	L	Awareness and implementation and enforcement of water restrictions	Drought planning; develop pre-scripted messaging
Reduced firefighting capability	P	L	Minimize restrictions on fire-flows	Enhance or identify additional or alternate supplies
Increased disease caused by wildlife concentrations	P	L	Provide public education and resources	Provide public education and resources
Increased political conflict over water	P	L	Water rights administration, awareness of drought plan and water priorities	Secure an adequate water rights portfolio, develop water sharing agreements
Economic				
Loss to recreation and tourist industry (e.g., reduced tourism and visitation)	H	H	Promotion of alternate activities when snowpack and streamflows are low	Develop pre-scripted messaging for alternate recreation and tourism during drought

Typical Drought impacts	Historic (H) or Potential (P) Impact	Ranking of Drought Impact Severity*	Past or Potential Response Strategies	Past or Potential Long-Term Mitigation Actions
Impacts to large scale commercial water users (e.g., golf courses, car washes)	H	M	Reference priorities established through drought planning. Public education	Consider using gray-water or recycled water with associated public awareness
Maintaining equitable distribution of costs and water to preserve quality of life and local economy	H	M	Reference priorities established through drought planning. Public education	Long term water supply planning incorporating drought considerations.
Decreased water quality from mine or other spills leading to emergency potable water distribution	H	M	Temporary water intake cutoff or use of alternate supplies. Bottled water distribution. Public education	Monitoring or treatment of potential problem areas.
Income loss to ag industry workers	H	L	Insurance	
Reduced crop yields (e.g., winter wheat)	H	L	Crop insurance	
Restrictions/limitations on landscaping affecting landscaping companies	H	L	Reference priorities established through drought planning. Public education	Consider using gray-water or recycled water with associated public awareness
Environmental and Recreational				
Increased risk of frequency and severity of wildfires	H	H	Maintain firefighting capacity	Partner on watershed fuel reduction/ watershed protection efforts
Increased wind, heat, debris flows, erosion, and flooding	H	H	Erosion control	Watershed planning and wildfire mitigation
Tree mortality and increased susceptibility to pests	H	M	Public education	. Monitoring and fuels reduction/removal of hazardous trees
Air quality effects (e.g., dust and pollutants)	H	M	Public education	Wildfire mitigation
Stress to fish and other wildlife	H	M	Fishing restrictions. Hunting restrictions	Drought planning and coordination with wildlife agencies
Fire and Campfire bans	H	M	Follow municipal code	Follow municipal code
Stress to surrounding natural environment	H	L	Public education. Restrictions on use of parks and public lands.	Public education. Drought planning

Typical Drought impacts	Historic (H) or Potential (P) Impact	Ranking of Drought Impact Severity*	Past or Potential Response Strategies	Past or Potential Long-Term Mitigation Actions
Loss of wetlands	H	L		Long term wetland protection
Lower streamflows	H	L	Public education. Drought planning	Drought planning
Lower lake/reservoir levels	H	L	Extension of docks; additional pumps to access water if intake is left dry	Infrastructure modifications
Increased susceptibility to plant disease	H	L	Drought resistant landscaping	Drought resistant landscaping and xeriscape incentives
Diminished visual and landscape quality (e.g., dust, vegetative cover)	H	L	Public education	Drought tolerant landscaping
Lower water quality in streams/ lakes/reservoirs	H	L	Increase monitoring/sampling. Drought planning	Drought planning

*Drought Severity Definitions:

(L) – Low: very little impact, did not require much staff time

(M) – Medium: some impact, required more staff time to address

(H) – High: key impact, occupied significant staff time

The Durango community could also experience a variety of future drought-related impacts. Some of the more significant impacts include:

- Damage to public and private landscaping.
- Unequal impacts of water restrictions and other drought response measures upon certain businesses/individuals. For example, large irrigators that depend on irrigation may be more vulnerable.
- A wildfire similar to the Missionary Ridge event has the possibility of affecting both supply watersheds (Florida and Animas) at the same time, which could compromise water quality.
- Increased risk of wildfire also threatens the safety, air quality and overall environment of the surrounding area.
- Increased public awareness on drought response efforts, importance of water conservation and positive reduction in water usage.
- Loss of use of public and private infrastructure such as swimming pools.

While some of these impacts are beyond the immediate control of the City of Durango Utilities Department, drought mitigation activities and daily operational adjustments during future droughts may be made to alleviate some of these impacts. This is discussed in further detail in Section 7.0.

4.3 Climate Change Considerations

Colorado's general hydrology and water resources are extremely sensitive to climate and climate change could reduce overall water availability in the future. The state's climate has already warmed by about 2°F in the last 30 years and projected warming occurring around the globe is expected to push temperatures outside 20th century ranges for Colorado, further exacerbating climate change related hazards such as drought, wildfire, and flash flooding (Lukas et. al, 2014). It is also expected that by the middle of the 21st century (years 2035-2064) the annual mean temperatures in this southwest portion of Colorado will rise by 2.5°F to 5°F even under a moderate greenhouse emissions scenario (Lukas et. al, 2014). While the scientific understanding of climate change is evolving, in general, climate change is projected to increase the frequency and intensity of drought events across Colorado. The interannual variability of the snow resource, the impacts of rapidly emerging factors such as dust-on-snow, and the possibility that climate change could cause substantial long-term reductions in Colorado's seasonal snow cover highlight the vulnerability of the state's mountain snowpack and the economies that depend on the predictable storage and release of the water supply from snowmelt. Just in 2012 and 2018, for instance, daily high temperatures during the summertime in Durango and southwest Colorado were 5°F above normal.

The 2018 Colorado Drought Mitigation and Response Plan includes an annex on Climate Change with additional details, but in general, the climate change implications summarized in said document suggest future drought vulnerability will increase for a broad array of water users. Studies summarized in the report suggest annual streamflow is more likely to decrease in southwestern watersheds and at lower elevations as well. As a result of increasing temperatures, water yields will generally decrease. Warmer temperatures will likely have the compound effect of resulting in precipitation occurring as rain rather than snow, decreased high elevation snowpacks, an earlier spring melt of the decreased snowpack, more intense and damaging precipitation events (e.g., flash floods), and increased evapotranspiration (CWCB, 2018).

The City of Durango, due to its location in southwest Colorado, is particularly at risk of several climate- and weather-related natural hazards such as wildfire, extreme precipitation, and drought. Per this plan, drought has been a high concern area for the City and stakeholders, and efforts are being put towards

improving the long-term sustainable management and conservation of water supplies on which the City and surrounding communities rely. While efforts to raise awareness and engage the community members in promoting conservation have occurred, several challenges still exist related to the changing climate situation in the southwest of Colorado. Therefore, prioritization of infrastructural improvements to irrigation systems and stormwater utilities, incentivization of conservation-oriented strategies, and low-impact development measures will be key in the short- and long-term future of the City's water systems to minimize climate change-related impacts. A 2018 Vulnerability, Consequences, and Adaptation Planning Scenarios report contains additional information related to this topic (VCAPS, 2018), based on a workshop conducted by the Western Water Assessment and City of Durango staff.

5.0 DROUGHT MITIGATION AND RESPONSE STRATEGY DEVELOPMENT

As previously mentioned, drought mitigation refers to actions taken in advance of a drought that reduce potential drought-related impacts when the event occurs. In contrast, drought response planning refers to the conditions under which a drought-induced water supply shortage occurs and specifies the actions that should be taken in response.

Mitigation and response strategies that focus on the management of the water supply system are generally referred to as supply-side actions; whereas demand-side mitigation and response strategies focus on actions that the City of Durango can take to promote or enforce reductions in customer water demands. This section presents the mitigation and response strategies selected following a screening process as part of the drought management planning process, based on CWCB Drought Management Plan Guidance Document worksheets. The response strategies are further refined into a staged drought response program discussed in Section 7.0.

5.1 Drought Mitigation Measures

As mentioned in the Relationship to Other Planning Mechanisms and Previous Drought Planning Efforts sections (Sections 1.5 and 1.6 respectively), the City of Durango has been proactive in identifying activities to mitigate the impacts of drought by maximizing available water supply or reduce water consumption in related plans. Foundational measures and programs have been set forth for the City of Durango within these existing planning mechanisms, which provide an effective means to manage, mitigate, and act with regards to drought and water efficiency issues. A compendium of Drought Mitigation Actions from related planning mechanisms is captured in Appendix A. Some ongoing strategies are outlined below.

- **Conservation measures specified in both the Water Efficiency Master Plan and Durango Municipal Sustainability Action Plan (MSAP)** – The conservation measures noted in these plans and summarized below serve the dual purpose of conserving water while also providing drought protection. These conservation and mitigation measures are enforced by the City staff.
 - System wide, city facility, and outdoor irrigation water audits
 - Implementation of recommendations noted from the system wide water audits
 - Distribution system repairs and general maintenance
 - Meter testing, repair, and replacement
 - Conducting of water rate studies and water rate increases
 - General data collection on usage statistics, changes in system technology, etc.
 - Provision of technical assistance

- Rebates and retrofits for City facilities and water users/customers
- Enactment and enforcement of ordinances
- Education and outreach to water customers
- Watering and irrigation restrictions through landscape ordinances – Per the water efficient landscape standards, “All automated overhead sprinkler irrigation during the period beginning on May 1 and ending on October 1 of each year must occur between 7:00 p.m. and 9:00 a.m. This restriction does not apply to drip irrigation and low precipitation bubblers, hand watering, or watering of containerized plants and plant stock. This restriction also does not apply to periodic maintenance and repair of overhead systems.”
- Staged actions for both water supplier (the City) and water users (the public) in times of resource scarcity during the months of May through October
- Drought surcharge during times of water scarcity

As of 2019 there are no conceptual storage options for any of the water saved through conservation efforts. These efforts are viewed more as an expanded capacity to serve rather than a hedge against drought. The City promotes responsible stewardship of water resources within the region and recognizes the importance of conserving this resource when drought is affecting the local environment (fish and wildlife), the recreation and tourism-based economy, and other downstream users.

- **Standard practices of Durango Staff** – Durango’s management and operations reflect the City’s values of sustainability and environmental stewardship. Many of the Utility Department’s standard operations focus on water conservation and efficient water use guidelines, providing multi-year water savings and drought mitigation during dry periods.

The vulnerability assessment summarized in Table 7 in Section 4.2 provides additional ideas to mitigate specific drought impacts. The list was developed using the Colorado Water Conservation Board’s (CWCB) Drought Management Guidance Document and accompanying worksheets (CWCB 2010), as well as incorporating Durango’s water supply reliability and conservation planning efforts. Other long-term drought mitigation considerations noted by the Drought Committee during the development of this plan include:

- **Water reuse** – Several actions in the City MSAP identify maximizing water reuse, such as recycled use of graywater for outdoor irrigation, to stretch water supplies. Water rights would need to be reviewed for reuse applicability.
- **Develop cooperative sharing agreement opportunities** with neighboring communities during periods of drought. The City has a normally closed tie in with Animas Water Company. But their system can only supply the main pressure zone and is unable to supply the higher portions of the City’s distribution system, such as Hillcrest.
- The City is looking at developing a redundant water treatment facility, which could reduce overall vulnerability and bolster water treatment capabilities.
- **Development of new water supplies** – A mitigation action specific to Durango and drought from the 2018 La Plata County Hazard Mitigation Plan is to “Develop City’s available water supply resources for production and distribution as to hedge against drought conditions.” The 2015 Southwest Basin Implementation Plan also notes specific Identified Projects and Processes that would enhance Durango’s water supplies in the future. The City is presently in the initial planning stages of site location and engineering for a redundant treatment plant and distribution connection at Lake Nighthorse.

- La Plata County has funding for resiliency initiatives (\$500k) that could be leveraged to reduce drought vulnerabilities.

There are nearly 100 actions aggregated into Appendix A from the related plans that have a drought mitigation component. This preliminary mitigation list was screened and further refined using the following criteria:

- **Technical feasibility** – Is the selected mitigation or response strategy technically feasible and will it work as intended? Can implementation occur in a timely manner? Is there staff to implement the action?
- **Perceived benefits** – Will the selected mitigation or response strategy provide an adequate amount of water supplies and/or water savings?
- **Cost effectiveness** – How does the implementation cost compare with the benefits? This may simply be a qualitative assessment or quantitative comparison of ratios of implementation costs to the water savings cost benefit.
- **Public acceptance** – How favorably will the public react to the select mitigation/response strategy? A review process of alternative means to engage the public would be beneficial to assess general public acceptance.
- **Environmental sensitivity and other impacts** – What are the environmental benefits/costs to implementing the mitigation and/or response strategy? Is there an environmental issue or other impacts that should be further considered?

The final step of the screening process assessed the selected group of mitigation actions to ensure that the final combination collectively met the following criteria:

- Compatible with Durango's water supply system and is feasible from an implementation standpoint;
- Consistent with the operating principles and objectives of the drought management plan;
- Fairly represents the needs of affected individuals and groups; and
- Sufficiently addresses potential water shortages and future impacts.

The highest priority actions based on the above criteria are noted in Section 8.5 Mitigation Action Plan.

5.2 Supply-Side Response Strategies

The same process and screening criteria used for mitigation measures described in Section 5.1 were used to identify and select the final supply-side response strategies. The final supply-side response strategies in Table 8 consist of technical and financial assistance opportunities, water rights management and cooperative agreements, and improvements to water distribution efficiency. Some of these strategies are already in place and some would be new strategies employed during drought. Each of these strategies reflects the operating principles in Section 2.1 and is refined into a staged drought management program in 7.0.

Table 8: Supply-Side Response Strategy Examples by Category

Category	Response Strategy
Seek technical and financial assistance opportunities	Identify state, federal, county, and private entity assistance. This could include grants or loans for emergency drought related planning, drought relief, water use efficiency improvements, etc.
Execution of existing water rights management and cooperative agreements and development of new opportunities	- Assess new water rights management and cooperative agreement opportunities - Purchase or lease water from other entities (i.e. federal projects). - Arrangement and/or execution of exchanges. - Lease irrigation rights from farmers. - Negotiate purchases or "options". - Jointly develop water transfers with other entities. - Trade water supplies with other entities to increase yield. - Pay upstream water user to allow diversion of more water.
Improvements to water use efficiency	Change pattern of water storage and release operations to reduce net evaporation, optimize efficiencies in Durango's water supply system, and reduce drought related impacts.
Water restrictions	<u>Stage 3</u> - Restrict Florida Pipeline raw water users to 16,000 gallons per month unless noted in exceptions - Restrictions on the source of supply for the public water system and irrigation use will be enacted for the Ute Pass <u>Stage 4</u> - Discontinue all use of raw water from the Florida pipeline for irrigation purposes
Pumping & Allotment	<u>Normal Operations</u> - One pump until reservoir is topped off <u>Stage 1</u> - Pump restarted when reservoir drops to 81 MG <u>Stage 2</u> - Pumping continues with second pump added when reservoir drops to 70 MG - Second pump remains on until reservoir is raised to 85 MG <u>Stage 3</u> - Total allotment reduced to 1.0 MGD when reservoir drops to 75 MG - Total allotment reduced to 0.5 MGD when reservoir drops to 58 MG - Increase efforts to locate and repair leaks in distribution system <u>Stage 4</u> - Loss of Florida and/or Animas supply or when reservoir drops to 45 MG and potable water demand is greater than 5 MGD

5.3 Demand-Side Response Strategies

The same process and screening criteria used to develop the mitigation measures described in Section 5.1 were used to identify and select the final demand-side response strategies. The final demand-side response strategies shown in Table 9 consist of actions taken by Town staff to conserve water and place water use limitations on residential and commercial/industrial customers. Some of these strategies are already in place and some would be new strategies employed during drought. Each of these strategies

reflects the operating principles disclosed in Section 2.1 and is refined into a staged drought management program in Section 7.0.

Table 9: Demand-Side Response Strategy Examples by Category

Category	Response Strategy*
City operations and maintenance activities (actions taken by City staff to conserve water)	<u>Normal Operations</u> - Water conservation education - Standard irrigation practices on City-owned properties that promote efficient water use <u>Stage 1</u> - Washing of City-owned field vehicles is limited to once every two weeks and washing of all other vehicles is limited to once per a month - Reduce frequency of hydrant washing and flushing - Turf irrigation on City-owned property from September 30 to May 1 is prohibited - Ornamental fountains and drinking fountains in City-owned parks are turned off from 10:00 am to 4:00 pm - Power washing and spraying on impervious surfaces (driveways and sidewalks) should be minimized <u>Stage 2</u> - Notice of potential water restrictions - Washing of City-owned vehicles is prohibited - Use of all water for fire training and of water from the hydrant is prohibited unless essential for public safety - Turf irrigation on City-owned property is restricted/prohibited. - Sports fields, trees and shrubs, and preferred "green areas" specified via community outreach efforts may be irrigated on a pre-determined limited basis - All ornamental fountains and drinking fountains on City-owned property and City-owned buildings are to be turned off - Power washing and spraying on impervious surfaces (driveways and sidewalks) is prohibited <u>Stage 3</u> - City manager to invoke Section 25-33 of City Code: declare a water shortage and establish enforcement authority - Notice of water restrictions in effect - Hydrant washing and flushing is prohibited unless necessary for public safety reasons - Use of all water for fire training and of water from the hydrant is prohibited unless essential for public safety - All watering & irrigation is prohibited, unless necessary for emergency response operations - Use of water for street sweeping is prohibited <u>Stage 4</u> - Public notice for City of Durango and Ute Pass to eliminate all non-essential potable water use (Stage 4) - All outdoor water use is prohibited, unless necessary for emergency response operations - All watering & irrigation is prohibited, unless necessary for emergency response operations - All outdoor and indoor fountains must be turned off

Category	Response Strategy*
	Use of all water for fire training and of water from the hydrant is prohibited unless essential for public safety
Residential	<u>Normal Operations</u> - All private swimming pools and hot tubs should be covered when not in use and maintained to prevent leaks <u>Stage 1</u> - Residents are encouraged to forego the installation of new sod, seeding, and landscaping - Power washing and spraying on impervious surfaces (driveways and sidewalks) should be minimized - Residents are encouraged to turn off residential fountains from 10:00 am to 4:00 pm. - Washing of personal vehicles should be minimized - Adjust room temperatures to reduce use of water-cooled air conditioning <u>Stage 2</u> - New sod, seeding, and landscaping is prohibited - Limit number of watering days per week and the duration of watering time. - Power washing and spraying on impervious surfaces (driveways and sidewalks) is prohibited - Residential fountains must be turned off - All washing of personal vehicles is prohibited except at commercial car washes - The filling of private swimming pools and hot tubs is discouraged <u>Stage 3</u> - Restrictions on lawn watering - Limit watering to hand-held hose or no-volume non-spray device. - Restrictions on washing of driveway/parking lot - Power washing and spraying on impervious surfaces (driveways and sidewalks) is prohibited - All washing of personal vehicles is prohibited except at commercial car washes (which are limited to using up to 20 gallons per vehicle) - The filling of private swimming pools and hot tubs is prohibited - Residents are limited to 30 gallons per person per day <u>Stage 4</u> - All outdoor water use and irrigation is prohibited, unless necessary for emergency response operations - All outdoor and indoor fountains must be turned off - The filling of all swimming pools and hot tubs is prohibited (residential and commercial/industrial) - Indoor water use is heavily restricted to critical uses only (e.g. drinking, cooking, bathing), and may be periodically shutoff as necessary
Commercial & Institutional	<u>Normal Operations</u> - Conserve and prevent wasting of bulk water and construction water - All commercial swimming pools and hot tubs should be covered when not in use and maintained to prevent leaks - Commercial car washes encouraged to reduce water use by 10% where technically feasible - Vehicles at car dealerships should be washed using bucket and hand-held hose with shut-off nozzle - Restaurants encouraged to only serve water when requested by customer

Category	Response Strategy*
	- Lodging establishments are encouraged to promote conservation and limit frequency of linen washings <u>Stage 1</u> - All non-recirculating outdoor fountains must be turned off at night - Commercial car washes required to reduce water use by 10% where technically feasible <u>Stage 2</u> - Bulk Water Station use limited to indoor use volume - Use of all construction water is prohibited unless necessary for air quality and construction reasons - All outdoor and indoor fountains must be turned off - All commercial car washes are required to implement best management practices and limit water use to 20 gallons per vehicle - All washing of vehicles on car dealership property is prohibited - All restaurants are not to serve water unless customers specifically ask for it - All lodging establishments must place water conservation cards in every room promoting water conservation (e.g. short showers) as well as not changing linens and towels unless a customer specifically requests the service - Encourage indoor water use limitations to achieve 20% water savings - Promote indoor and outdoor water audits where applicable. <u>Stage 3</u> - Bulk Water Station use limited to Indoor use quantities. - The filling of commercial swimming pools and hot tubs is prohibited - All car washing is prohibited, unless necessary for emergency response operations - Encourage indoor water use limitations to achieve 30% water savings - Require indoor and outdoor water audits where applicable. <u>Stage 4</u> - Bulk Water Station use restricted to public health and emergency protection only - All non-critical water use, including construction water, is prohibited until further notice - All swimming pool filling is prohibited - All outdoor water use including vehicle washing is prohibited, unless necessary for emergency response operations - All restaurants are not to serve water unless customers specifically ask for it and there is availability - All lodging establishments must place water restriction cards in every room, warn about possible periodic water shutoffs, and avoid changing linens and towels - Indoor water use is heavily restricted to critical uses only (e.g. drinking, cooking, bathing), and may be periodically shutoff as necessary

*The response strategies listed above are activities City staff can perform during drought periods to save water in addition to the standard practices and conservation measures specified in the Conservation Plan.

5.4 Drought Public Information and Educational Campaign

Durango's water demands were reduced during the latest 2018 drought as a result of the public's awareness and responsiveness to reduce water consumption due to the effectiveness of drought-related communication, boosted by public awareness of dry conditions that helped fuel the 416 Fire. However,

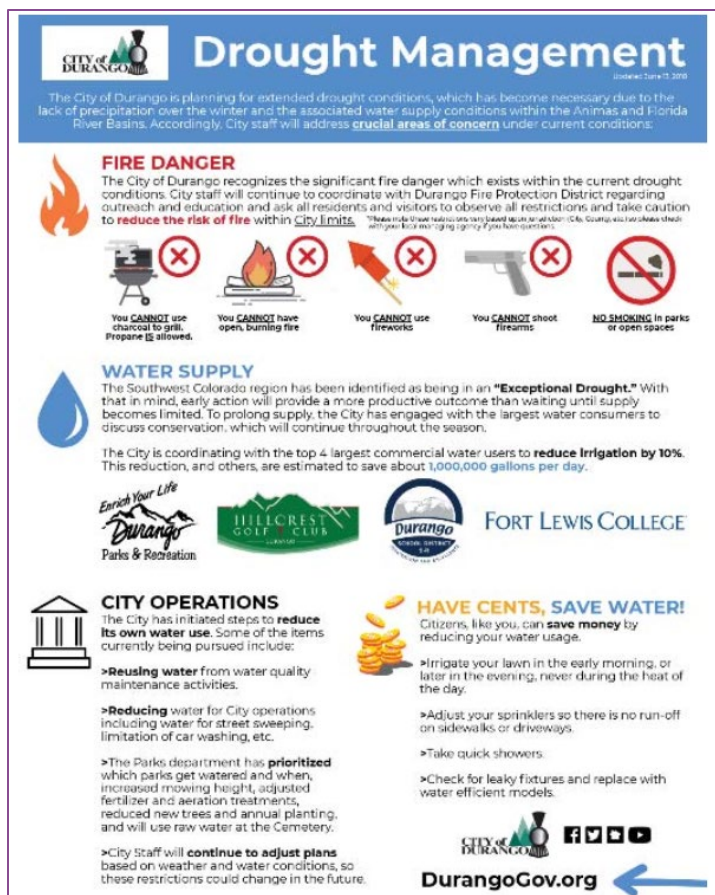
the decrease in demand was not sustained in the long term. A more significant source of demand reduction was the City's monthly outreach efforts with the top 20 water users. Regardless, the public drought information and educational campaign (public drought campaign) will be a key component of the City's drought management efforts.

Currently, the Water Smart program is the City's ongoing campaign related to educating customers on water conservation, the value of water, and general watering, planting, and xeriscaping guidelines. This program can be leveraged during drought to provide additional information to the public. During the 2018 drought the City included "Drought Management" topics. The City hopes to be able to "address crucial areas of concern" related to drought with these informational fliers, as well as provide water use reminders to encourage savings, smart usage, and sustainability.

The public drought campaign will be closely coordinated with the City's current conservation education programs and other related programs providing information on sustainability, weather, climate change, etc. When reasonable, these programs may be integrated into a single program by the Community Development, City Operations, and Administrative Services Departments and Durango's Utilities Department to coordinate efforts and enhance efficiencies. These program(s) will promote the importance of conserving water and achieving water savings in both normal and drought years. During non-drought years the drought campaign component will simply provide a general overview on drought and the importance of drought preparedness. During a drought, the drought messages will increase in frequency and will be expanded to include information on the staged drought response program and the necessity to conserve supplies.

The general objectives of the public drought campaign are:

- Provide concise effective drought information to Durango water customers (individuals as well as the commercial/industrial sectors) and the media.
- Adjust the frequency and breadth of the public outreach effort in accordance to the severity of the drought (drought stage).
- Coordinate campaign efforts with nearby municipal, county, and water provider entities as well as other conservation-oriented entities to capitalize on synergistic opportunities and convey, where appropriate, a consistent drought message and resources.
- Advise residents, elected officials, business owners, potential property buyers, and visitors to the City about drought related hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property.



CITY OF DURANGO

Drought Management

Issued: June 15, 2018

The City of Durango is planning for extended drought conditions, which has become necessary due to the lack of precipitation over the winter and the associated water supply conditions within the Animas and Florida River Basins. Accordingly, City staff will address **crucial areas of concern** under current conditions:

FIRE DANGER

The City of Durango recognizes the significant fire danger which exists within the current drought conditions. City staff will continue to coordinate with Durango Fire Protection District regarding outreach and education and ask all residents and visitors to observe all restrictions and take caution to **reduce the risk of fire within City limits**. *These rules are not meant to be taken as an ultimatum. City of Durango will continue to check with you for emergency spring if you have questions.

- You **CANNOT** use charcoal to grill. Propane is allowed.
- You **CANNOT** have open, burning fire.
- You **CANNOT** use fireworks.
- You **CANNOT** shoot firearms.
- NO SMOKING** in parks or open spaces.

WATER SUPPLY

The Southwest Colorado region has been identified as being in an "Exceptional Drought." With that in mind, early action will provide a more productive outcome than waiting until supply becomes limited. To prolong supply, the City has engaged with the largest water consumers to discuss conservation, which will continue throughout the season.

The City is coordinating with the top 4 largest commercial water users to **reduce irrigation by 10%**. This reduction, and others, are estimated to save about **1,000,000 gallons per day**.

Enrich Your Life
Durango
Parks & Recreation

HILLCREST GOLF CLUB

Durango
SPECIAL DISTRICT

FORT LEWIS COLLEGE

CITY OPERATIONS

The City has initiated steps to **reduce its own water use**. Some of the items currently being pursued include:

- > **Reusing water** from water quality maintenance activities.
- > **Reducing water** for City operations including water for street sweeping, limitation of car washing, etc.
- > The Parks department has **prioritized** which parks get watered and when, increased mowing height, adjusted fertilizer and aeration treatments, reduced new trees and annual planting, and will use raw water at the Cemetery.
- > City staff will **continue to adjust plans** based on weather and water conditions, so these restrictions could change in the future.

HAVE CENTS. SAVE WATER!

Citizens, like you, can **save money** by reducing your water usage.

- > Irrigate your lawn in the early morning, or later in the evening, never during the heat of the day.
- > Adjust your sprinklers so there is no run-off on sidewalks or driveways.
- > Take quick showers.
- > Check for leaky fixtures and replace with water efficient models.

CITY OF DURANGO    

DurangoGov.org 

The public drought campaign will provide foundational drought information during non-drought periods outlined in Table 10. Durango Utilities will monitor the drought messages and information conveyed by other local providers to ensure that differences in drought-related messages may be explained, if necessary, and additional resources provided where appropriate.

Table 10: Public Drought Campaign Messages (Before Drought and During Drought Periods)

Drought Messaging / Information	Additional Details or Coordination with Other Entities
Status of current drought conditions and corresponding drought stage	Be aware of messages conveyed by neighboring providers in order to explain, if necessary, why there are differences in the messages as well as in the overall drought response.
Long-term sustainability of water supply system	Coordination with water partners (e.g. Animas-La Plata Water District, La Plata West Water Authority, Florida Water Conservancy District).
Location of where customers may access the Drought Management Plan	Provides justification and basis for water restrictions.
Factors that could influence water supply services and cost of services	Neighboring communities and providers.
Water provider's actions to save water and/or acquire new water	Be aware of other local providers' drought mitigation efforts. This may be helpful to generate new ideas to improve the City's public drought campaign and overall mitigation efforts.
Drought policies, requirements, and penalties	Other City Departments such as Parks & Recreation or Community Development.
Historical consumption information on water bills or official City websites	City Departments such as Durango's Information Services (to update/maintain websites).
Measures and/or impacts that customers can expect if drought continues or intensifies	Be aware of the drought response measures implemented by other local providers. This will assist in addressing public concerns and questions.
Fishing restrictions	Communicate in coordination with Colorado Division of Parks and Wildlife and local outdoor retailers' restrictions on timing of fishing, or bans, to reduce stress on fish during times of low flow and high heat.
Fire restrictions	Communicate in coordination with USFS and La Plata County burn bans, campfire restrictions etc. to reduce potential for wildfires during drought.
Alternative recreation promotion	Coordinate messaging with local chamber of commerce and local recreation and tourism industry. Messaging should promote alternative recreation when water levels are too low for boating or when low snowpack may deter ski tourism or when closures of the Durango Silverton Railroad occur due to fire concerns.

Drought Messaging / Information	Additional Details or Coordination with Other Entities
Increase advertisement of water conservation promotion and incentives specified in the conservation and drought plans	Identify synergies/benefits of working with other entities on this advertisement campaign.
Landscaping tips during a drought (e.g. which plants to convert to drip, which to save, which to let die)	Research information that is currently available and identify whether there are other entities that can assist with this effort.
Encourage public discussion and media involvement concerning ways to reduce water use while minimizing impacts (e.g. landscaping impacts before or after drought). Also publicize efforts of individuals and businesses as examples of how to reduce water use.	Administrative Services, City Operations.
Post-drought landscape revival information	Research information that is currently available and identify whether there are other entities that can assist with this effort.
Explain rate increases/drought surcharges if applicable (this can concern both drought and post-drought years)	Be aware of other provider's rates and drought surcharges, if applicable.
Inform citizens of the progress on drought related mitigation efforts and ongoing/planned projects to reduce drought impacts either locally or at the county/regional level	La Plata County departments and government entities (e.g., Emergency Management), Durango's Emergency Management Department, Durango Community Development Department.

During drought periods, the messaging intensity of both the conservation public education program and public drought campaign will increase. Particular messages as well as the means in which the information is conveyed to the public will be customized to the severity of the drought and public informational needs at that time. Information the City of Durango intends to convey to the public during drought periods, as shown in Table 10, consists of educating customers of drought policies (water restrictions), enforcement, landscaping tips, and an expansion of the Water Smart Program. The Water Smart Program advertises and promotes practices that portray a strong water conservation ethic and encourage sustainable use. This may encompass installing water efficient appliances/fixtures, xeriscape landscaping, water conservation education to staff, etc. During droughts, this program will be expanded to advertise and promote efforts or even businesses that are going the extra mile to conserve water and adhere to voluntary drought response measures.

Coordination with other entities will be an important component of the public drought campaign during periods of drought. Efforts will be made to take advantage of synergies associated with consistent drought-related messages shared among neighboring providers and communities, to collectively contribute to a regional standard drought outreach effort. During this period, it will also be important to be aware of neighboring providers' drought-related response activities, water use restrictions, and means of enforcement, such as Bayfield's. During drought, information on municipalities with water restrictions will be obtained via the CWCB's drought response portal at www.coh2o.co. This will enable Durango to explain any differences among their drought response efforts and maintain integrity with the public. Additionally, other entities may be able to provide assistance with the advertisement of drought related

information. For example, several landscaping companies in Durango may be able to provide landscaping tips during a drought and what to do to revive landscaping following droughts.

Durango's Utilities will coordinate efforts with the Administrative Services and City Operations Departments to ensure that accurate information is being conveyed to the media and to customers, and that educational and outreach opportunities are maximized. These departments will be responsible for developing regular action plans detailing the specific drought-related messages delivered to the targeted audiences both prior to and during a drought. This will be an evolving process that could change on a seasonal basis depending on weather, water availability, and public concerns. The basic targeted audiences and communication tools intended to be used by these two City departments are shown in Table 11. Outreach will mainly consist of website communications, Social Media, potential letters to water users, and emailing lists with informational emails during non-drought periods. Communication tools will likely be expanded to newspaper articles, television ads, water bill inserts, emails targeted to specific water users, the introduction of a drought or water-related hotline, booths at special events, public meeting or special events, and school programs during a drought.

Table 11: Public Drought Campaign Audiences and Communication Tools

Targeted Audience	Communication Tools	
	Long-term Mitigation	Short-term Response Strategy
Decision/policy makers, City departments (Parks and Recreation, Finance, etc.)	Email	- Email - Meetings
Media	- Website - Social Media - Interviews - Materials library	- Websites - Newspaper articles - Social Media - Interviews - Television ads
Water Customers (Single and multi-family, HOAs, commercial)	- Website - Broadly distributed emails - Social Media - Water Wiser program - Contests	- Websites - Broadly distributed emails - Social Media - Public meetings - Bill inserts - Newspaper articles - Billboards - Booths at special events
Targeted business owner customers (recreation facilities, nurseries, health facilities, schools)	- Website - Social Media - Water Wiser program	- Websites - Emails targeted for business owners - Social Media - Phone calls - Meetings - Direct mailings for targeted audiences

Targeted Audience	Communication Tools	
	Long-term Mitigation	Short-term Response Strategy
Large water users (golf courses, water-intensive industrial/commercial customers, Fort-Lewis College)	- Website - Social Media - Water Wiser program	- Websites - Emails targeted for large water users - Social Media - Meetings - Phone calls - Direct mailings for targeted audiences
Commercial business employees	- Website - Broadly distributed emails - Social Media	- Websites - Broadly distributed emails - Social Media
School children	- Water educational curricula for teachers - Water educational programs for students - Water festivals - Hazard expositions	- School programs - Booths at special events for children
All city citizens	- Water and drought hazard risk assessments - Water and drought educational programs - Water and drought hazard expositions	- Real estate disclosures - Water and drought hazard expositions
Visitors and Tourists	- Website - Social Media - Water conservation messaging with local hotel industry	- Website - Social Media - Water conservation messaging with local hotel and restaurant industry - Traditional media

6.0 DROUGHT MONITORING

This section of the Plan summarizes the various methods used to monitor drought throughout the City. The City of Durango Utilities department is primarily responsible for monitoring and evaluating drought indicator data. Monitoring data are collected throughout the year. These data are critical in characterizing Durango's water supplies under various hydrologic conditions, and aid in predicting drought in a timely manner. Table 13 summarizes direct drought indicators used to monitor drought in the City. These are primarily short-term indicators that directly relate to City water supply. Regional and long-term indicators, as well as long-term climate monitoring, can also inform drought decision making. These supplemental drought indicators are summarized in Table 13.

Typically, the drought monitoring and indicator data are recorded and assessed at an appropriate frequency dictated by the city staff based on local conditions, development trends, and other such motivators for decision-making. However, the recording frequency may increase during dry periods and in the spring and summer when runoff and river administration conditions are likely accounted for in the overall availability of Durango's supplies. Timelines and key dates are noted in the tables below. Starting in early May and continuing through October, Durango's Utilities Department specifically monitors trends

in streamflow, temperature, precipitation, storage tanks and reservoirs, among others, and makes projections of expected future supply.

Table 12: Direct Drought Monitoring – Short-Term Indicators

Drought Indicators	Type of Data	Timing/ Key Dates	Responsible Staff
Reservoir Levels	Levels and conditions in the main Terminal Reservoir, City Reservoir No. 1, and the new Nighthorse Reservoir. Lemon Reservoir's levels would also be used for long-term monitoring as it is a smaller and less used reservoir for water resources in Durango.	May-October	Utilities – Water Treatment Superintendent
Snowpack	SNOTEL Snowpack, precipitation, temperature, and other climatic conditions related to snow accumulation. Specific SNOTEL sites of interest to Durango's water supply include: Stump Lakes (site 797)	November-June Key date: April 1 snowpack	Utilities - Water Treatment Superintendent
Stream flow	Streamflows including average daily flow rates and discharge statistics of the main water resource streams. Both the Florida River and Animas River have USGS gages at Durango and near the city available for data collection. Specific gages include: Florida River – above and below Lemon Reservoir Animas River at Durango	May-October; Weekly during drought	Utilities - Water Treatment Superintendent
Weather Station Data	These are land-based stations where observations are collected that include details on temperature, dew point, humidity, precipitation, wind speed, atmospheric pressure, and other such weather-related components. Specific stations include: Durango Airport City Hall.	May-October; Weekly during drought	Utilities – Water Treatment Superintendent Parks and Recreation – Asst. Parks Dir. City Engineer

Table 13: Supplemental Drought Monitoring – Regional and Long-Term Indicators

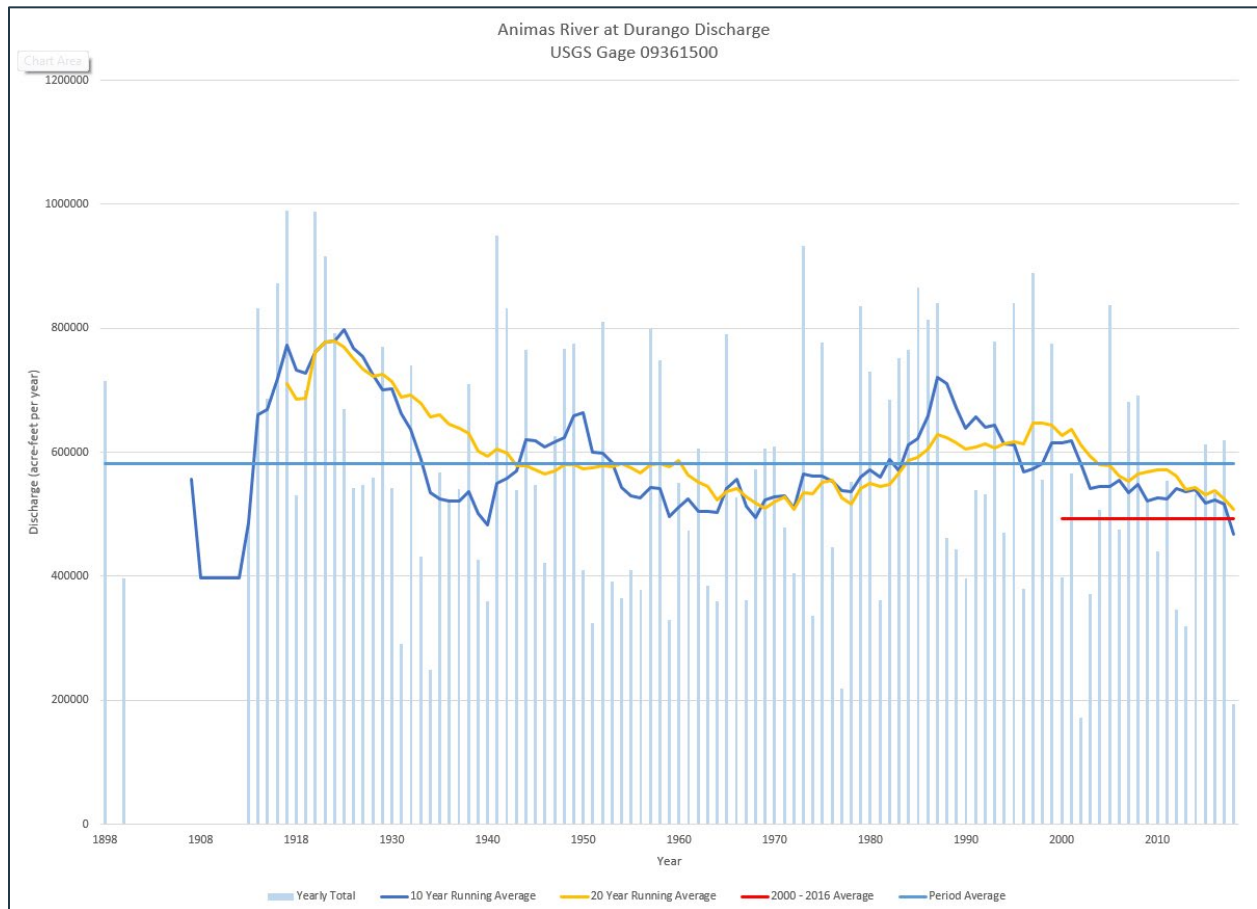
Drought Indicators	Type of Data	Timing
U.S. Drought Monitor	Aggregate of a variety of indices, data, and expert opinion updated on a weekly basis.	Weekly
Dust-On-Snow Monitoring	Colorado's Dust-on-Snow Program (CODOS) operates on behalf of Colorado and regional water management agencies and could be a resource of data related to monitoring the presence or absence of dust layers at various sites throughout the state. With these data sources Durango will be able to better analyze the potential of snowmelt timing, influences on snowmelt, and snow runoff rates during melting	November-June

Drought Indicators	Type of Data	Timing
	season. Other local sources for dust-on-snow monitoring are also available.	
Nearby Communities' Water Availability and Drought Conditions	The ability to factor in nearby communities' drought or water availability, storage, and quality conditions will be useful in determining potential short- and long-term effects on the City, even if these external conditions may not directly affect Durango's water supply or other secondary impacts and resources.	Monthly during drought
General Water Quality Monitoring	Quality monitoring currently conducted for the Animas River. Soon to come online with the completion of phase 2 of Florida River Headgate Improvements.	May-October
Colorado's Division of Water Resources (DWR) Calls History Data and Decision Support System Resources	"Calls" are ways to communicate administrative statuses of natural stream systems, particularly priorities of water rights within streams, in order to make water available to various water rights holders.	May-October
NRCS and DWR Surface Water Supply Indices	The Natural Resources Conservation Service (NRCS) and Colorado's DWR use surface water supply indices (SWSI) by basin, as indicators of surface water supply conditions across the state. The SWSI compares total volume of water in a basin against volumes available in the same month of previous years. These volume metrics can take into account streamflows, forecasts, and reservoir storages in the basins.	Year round
NRCS Runoff Forecasts	The NRCS publishes precipitation and snowfall accumulation information with known probabilities based on past records, that are useful in predicting runoff forecasts and help potentially predict future drought. Various levels of probability are available with these forecast products.	Spring
Standardized Precipitation Index (SPI)	This index is commonly used to characterized meteorological drought on various timescales, so that the index can portray soil moisture on short timescales and groundwater and even reservoir storage at longer timescales. Some key strengths of this SPI are that it relies on precipitation information to relate to drought or abnormal wetness and is less complex than other indices such as the Palmer Drought Severity Index (PDSI).	Monthly at various time scales; 6 month and 36 month useful for short- and long-term monitoring
NOAA's U.S. Seasonal Drought Outlook	The National Oceanic and Atmospheric Administration (NOAA) publishes a seasonal drought outlook product that informs, at state or regional levels in the U.S., of drought tendencies and patterns based on probability studies, and short- and long-term statistical and dynamical forecasts. Areas of improvement or where	Three-month outlook updated monthly

Drought Indicators	Type of Data	Timing
	drought may be becoming worse are highlighted in the generated maps.	
Additional resources provided by CWCB and Water Availability Task Force and Drought Impact Task Forces associated with The Colorado Drought Mitigation and Response Plan	The Colorado Water Availability Task Force (WATF) is the state's drought monitoring collective of climate and water experts. Periodic summary reports of categorize conditions related to snowpack, reservoir storage and streamflow by major basins statewide. Long term projections are also discussed, as well as insight into El Nino and La Nina conditions. During drought, specific Impact Task Forces may be activated to assess impacts to sectors such as municipal water, agriculture etc. Periodic summary reports can inform statewide response efforts. In addition, the 2018 Colorado Drought Mitigation and Response Plan contains useful climate change and paleo climate analyses and resources by major water basin, which can provide insight for Durango's long-term climate monitoring goals. The Colorado Water Conservation Board (CWCB) maintains a drought response website (www.coh2o.co) with a variety of drought monitoring information and data updated on a regular basis. This site will be assessed to identify monitoring information/data useful for the City's drought monitoring purposes, as it supplies a variety of municipal water supply and restriction alerts based on drought conditions.	Quarterly drought summaries or more frequent during drought
National Drought Mitigation Center's Drought Risk Atlas	This NDMC tool helps identify drought recurrence intervals based on local climate stations. This tool provides flexible climatological data that can be scaled down to offer more applicable insight in regional and local contexts, as well as varying temporal station analysis records.	Variable
Reclamation Reservoir Forecasts	The US Bureau of Reclamation	Monthly
Durango Animas River Corridor Management Plan	General guidelines on water quality monitoring, standards, potential stakeholder processes to follow given certain drought situations, etc.	Quarterly
Major infrastructure or water supply service interruptions	Information on major interruptions to water services or infrastructure that may prevent water from being pumped, processed (e.g. sanitized), or delivered to users, including water conveyance or storage infrastructure that may need maintenance or upgrading to prevent water shortages.	A relatively robust SCADA tracking of supply at the headgate, delivery to the reservoir, then treatment processing. To be enhanced through smart metering.

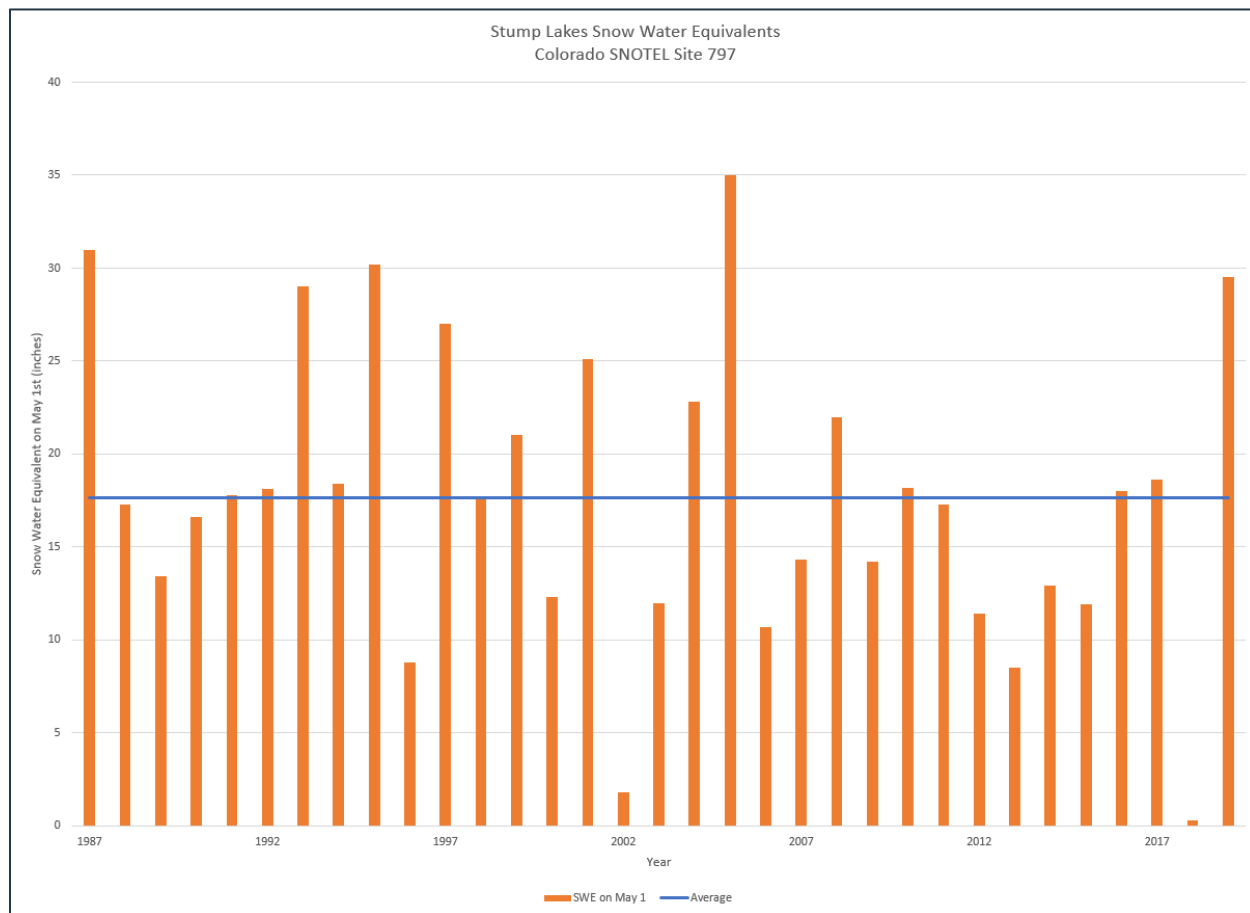
The following graphics represent the variability in long-term (i.e. historical) conditions at select stream gages and monitoring sites for the Animas River streamflow (Figure 7) and snow accumulation from a key SNOTEL site (Figure 8). These kinds of statistics and summaries can be used as reference during future monitoring to determine the level of departure from averages compared to baseline conditions.

Figure 7: Historic Discharge at the Animas River at Durango Gage



Source: Wood analysis based on USGS Gage 09361500 data

Figure 8: SNOTEL Historic May 1st Snow Water Equivalents at Stump Lakes Site



Source: Wood analysis based on Colorado SNOTEL Site 797 data

7.0 STAGED DROUGHT RESPONSE PROGRAM

The staged drought response program defines the specific response measures to be taken during each drought stage. This section outlines the supply and demand-side measures and associated enforcement levels by drought stage. It is important to note that crucial components of this program include the declaration, implementation, enforcement, and monitoring, which are discussed in Sections 8.2 - 9.4, respectively.

Droughts can vary significantly in spatial extent, severity, and duration. The City has developed four drought stages to capture this variability. The four stages increase in intensity from Stage 1 (one) through Stage 4 (four) and identify appropriate response actions for each both the City and the public at each stage. The response targets and actions escalate with each stage to reduce usage via restrictions and supply modifications.

The drought trigger points are based on the Raw Water/Terminal Reservoir's Management Plan for the City, which was approved in 2017 and applies to the months from May to October (to encompass the peak demand months). Table 14 below summarizes the reservoir levels based on supply source, total irrigation/supply allotments, and finally drought stages (or action levels) that the City will enforce to conserve or restrict water use during times of drought. Table 15 summaries actions that will be taken by

both the City and the public at each stage, to encompass both water supply and water demand. Table 16 contains a summary of the four drought stages with their related response strategies by supply side and demand side measures.

Table 14: Drought Stages and Trigger Point Guidelines Based on Terminal Reservoir Levels During May-October

Action Level	Reservoir Level			Supply		Total Irrigation Allotment	Other Trigger Conditions	Water Savings Target
	Feet	Million Gallons	Percent Capacity	Florida	Animas Pumps	FLC/GC/Smith Field/29th St Parks		
Normal Operation	25.0	91	100 %	Max	None	1.58 MGD	Snowpack 100% of average or higher	0%
	24.0	82	90 %	Max	1 On as needed	1.58 MGD		
Stage 1	24.0	82	90 %	Max	1 On as needed	1.58 MGD	Snowpack 90% of average	5%
	23.0	74.6	82 %	Max	1 On	1.58 MGD		
Stage 2	22.4	70	77 %	Max	2 On	1.25 MGD	Snowpack 75% of average	10%
Stage 3	21.5	63	69 %	Max	2 On	1.0 MGD	Snowpack 50% of average	25%
	20.7	58	63 %	Max	2 On	1.0 MGD		
	19.5	50	55 %	Max	Max	0.5 MGD		
Stage 4	18.8	46	50 %	Max	Max	0.0 MGD	Snowpack 25% of average	60%

Source: City of Durango 2017 Raw Water/Terminal Reservoir Management Plan for May-October

Note: MG: Millions of Gallons. MGD: Millions of Gallons per Day. FLC: Fort Lewis College. GC: Golf Course.

Further clarifications on maximum allotments and other descriptions:

- Max (maximum) allotment for Fort Lewis College and Golf Course is 0.7 MGD each; the entities will manage the split
- Max allotment for the Smith Sports Complex is 0.1 MGD; the supply will come from the Golf Course storage pond
- Max allotment for 29th St Parks and Riverview Sports Complex is 0.08 MGD
- The Golf Course's minimum needs to maintain greens and T-boxes is 0.25 MGD
- Animas Pumping usually begins June 1st with reservoir levels around 70 MG
- When the Florida River is "On Call" the Max supply is 5.76 MGD
- The Animas River pumping performance is highly dependent on river levels, pumping condition, and wet well sediment loading. Major facility improvements were completed in 2016 to ensure Animas River water availability.
- The City of Durango is contractually obligated to provide FLC and Hillcrest Golf Course with raw water for irrigation purposes. Florida River water will be dispersed as available October 1 through March 31.

Full irrigation allotments may not be available until after the Animas River pumping season begins, no earlier than April 1.

- The Utilities Director will oversee and may authorize deviations in the plan to maintain raw water availability for drinking and fire protection.

In addition to the triggers noted in Table 15, other direct and indirect indicators should be considered in evaluating the City's water supply and current and projected drought conditions. These are discussed in Section 6.0.

The drought trigger levels in Table 14 are general guidelines. Sustained, multi-year droughts could require a significant modification to the drought triggers based on the duration and severity of the drought as well as Durango staff's historical experience managing the City's water supply systems. In addition, future weather change events could additionally affect water restoration levels, or have an impact on water demands, water infrastructure, or service interruptions. The declaration of a drought, timing of the declaration, and corresponding drought stage will ultimately be a decision based on a combination of factors and informed judgement. The decision will be based on a combination of the drought trigger guidelines in Table 14, the effectiveness of the actions from the drought stages indicated in Table 15, historical City staff experience, and other drought indicator data. Drought declaration procedures are discussed in Section 8.1.

Table 15: Staged Drought Response Program – Summary of City and Public/Water User Actions*

Stage	City Actions	Public/Water User Action Requirements
Normal Operations	• No action	• No action
1	• Normal operations: 1 pump until reservoir is topped off. • Pump restarted when reservoir drops to 82 MG	• No action
2	• Pumping continues with second pump added when reservoir drops to 70 MG • Second pump remains on until reservoir is raised to 85 MG	• Water conservation education • Notice of potential water restrictions
3	• Total allotment reduced to 1.0 MGD when reservoir drops to 75 MG • Total allotment reduced to 0.5 MGD when reservoir drops to 58 MG • Increase efforts to locate and repair leaks in distribution system • No hydrant flushing or street sweeping that use water • Reduced city park (potable) watering	• Restrictions of lawn watering and washing of driveway/parking lot • City manager to invoke Section 25-33 of City Code: declare a water shortage and establish enforcement authority • Restrict Florida Pipeline raw water users to 16,000 gallons per month unless noted in exceptions • Restrictions on the source of supply for the public water system and irrigation use will be enacted for the Ute Pass • The Langefel and Candiotti Properties will have limited shared ¾ inch tap to 16,000 gallons per month each. 2-inch shared tap will not have restrictions each due to deeded agreement • The Griffin Property will not have restrictions due to deeded agreement

Stage	City Actions	Public/Water User Action Requirements
4	Loss of Florida and/or Animas supply or when reservoir drops to 45 MG and potable water demand is greater than 5 MGD	- Public notice for all water system customers to eliminate all non-essential potable water use. - Discontinue all use of raw water from the Florida pipeline for irrigation purposes.

Based on the Drought Stages during May-October

Source: City of Durango 2017 Raw Water/Terminal Reservoir Management Plan

In all drought stages, the City will have the ability to take measures to both increase supply and decrease demand. The following subsections present more details on the specific measures to be taken in each stage, from both the supply and demand sides.

Table 16 contains a summary of the four drought stages with their related response strategies by supply side and demand side measures.

Table 16: Staged Drought Response Program - Specifics by Water Usage and Stage

Water Usage	Normal Operations	Stage 1	Stage 2	Stage 3	Stage 4
Supply-Side Measures					
Technical and financial assistance	Seek technical and financial assistance opportunities	Seek technical and financial assistance opportunities	Seek technical and financial assistance opportunities	Seek technical and financial assistance opportunities	Seek technical and financial assistance opportunities
Water rights and cooperative agreements	Assess new water rights management and cooperative agreement opportunities	Assess new water rights management and cooperative agreement opportunities	Assess new water rights management and cooperative agreement opportunities at a regional and national level	Restrict Florida Pipeline raw water users to 16,000 gallons per month unless noted in exceptions Restrictions on the source of supply for the public water system and irrigation use will be enacted for the Ute Pass The Langefel and Candiotti Properties will have limited shared ¾ inch tap to 16,000 gallons per month each. 2-inch shared tap will not have restrictions each due to deeded agreement The Griffin Property will not have restrictions due to deeded agreement	Discontinue all use of raw water from the Florida pipeline for irrigation purposes

Water Usage	Normal Operations	Stage 1	Stage 2	Stage 3	Stage 4
Pumping & Allotment	One pump until reservoir is topped off	Pump restarted when reservoir drops to 81 MG	Pumping continues with second pump added when reservoir drops to 70 MG Second pump remains on until reservoir is raised to 85 MG	Total allotment reduced to 1.0 MGD when reservoir drops to 75 MG. Total allotment reduced to 0.5 MGD when reservoir drops to 58 MG. Increase efforts to locate and repair leaks in distribution system	Loss of Florida and/or Animas supply or when reservoir drops to 45 MG and potable water demand is greater than 5 MGD
Demand-Side Measures City Measures					
Authority and Declaration	n/a	n/a	n/a	City manager to invoke Section 25-33 of City Code: declare a water shortage and establish enforcement authority	
Public Education & Communication	Water conservation education	Water conservation education	Water conservation education Notice of potential water restrictions	Notice of water restrictions in effect	Public notice for City of Durango and Ute Pass to eliminate all non-essential potable water use
Washing of City-Owned Vehicles	n/a	Washing of City-owned field vehicles is limited to once every two weeks and washing of all other vehicles is limited to once per a month	Washing of City-owned vehicles is prohibited	Washing of City-owned vehicles is prohibited	All outdoor water use is prohibited, unless necessary for emergency response operations
Hydrants	n/a	Reduce frequency of hydrant washing and flushing	Reduce frequency of hydrant flushing	Hydrant washing and flushing is prohibited	

Water Usage	Normal Operations	Stage 1	Stage 2	Stage 3	Stage 4
			Use of all water for fire training and of water from the hydrant is prohibited unless essential for public safety	unless necessary for public safety reasons Use of all water for fire training and of water from the hydrant is prohibited unless essential for public safety	Use of all water for fire training and of water from the hydrant is prohibited unless essential for public safety
Outdoor Watering & Irrigation	Standard irrigation practices on City-owned properties that promote efficient water use	Turf irrigation on City-owned property from September 30 to May 1 is prohibited	Turf irrigation on City-owned property is restricted/prohibited. Sports fields, trees and shrubs, and preferred "green areas" specified via community outreach efforts may be irrigated on a pre-determined limited basis	All watering & irrigation is prohibited, unless necessary for emergency response operations	All watering & irrigation is prohibited, unless necessary for emergency response operations
Fountains	n/a	Ornamental fountains and drinking fountains in City-owned parks are turned off from 10:00 am to 4:00 pm	All ornamental fountains and drinking fountains on City-owned property and City-owned buildings are to be turned off	All ornamental fountains, drinking fountains on City-owned property and City-owned buildings are to be turned off	All outdoor and indoor fountains must be turned off
Other Outdoor Water Uses	n/a	Power washing and spraying on impervious surfaces (driveways and sidewalks) should be minimized	Power washing and spraying on impervious surfaces (driveways and sidewalks) is prohibited	Use of water for street sweeping is prohibited Power washing and spraying on impervious surfaces (driveways and sidewalks) is prohibited	All outdoor water use is prohibited, unless necessary for emergency response operations

Water Usage	Normal Operations	Stage 1	Stage 2	Stage 3	Stage 4
Demand-Side Measures Residential Measures					
Outdoor Watering & Irrigation	n/a	Residents are encouraged to forego the installation of new sod, seeding, and landscaping	New sod, seeding, and landscaping is prohibited Limit number of watering days per week and the duration of watering time.	Restrictions on lawn watering Limit watering to hand-held hose or no-volume non-spray device.	All outdoor water use and irrigation is prohibited, unless necessary for emergency response operations
Washing (Personal Vehicles and Impervious Surfaces)	n/a	Power washing and spraying on impervious surfaces (driveways and sidewalks) should be minimized Personal vehicles should be minimized	Power washing and spraying on impervious surfaces (driveways and sidewalks) is prohibited All washing of personal vehicles is prohibited except at commercial car washes	Restrictions on washing of driveway/parking lot Power washing and spraying on impervious surfaces (driveways and sidewalks) is prohibited All washing of personal vehicles is prohibited except at commercial car washes (which are limited to using up to 20 gallons per vehicle)	All outdoor water use is prohibited, unless necessary for emergency response operations
Fountains	n/a	Residents are encouraged to turn off residential fountains from 10:00 am to 4:00 pm.	Residential fountains must be turned off	Residential fountains must be turned off	All outdoor and indoor fountains must be turned off
Swimming Pools and Hot Tubs	All private swimming pools and hot tubs should be covered when not in use and maintained to prevent leaks	All private swimming pools and hot tubs should be covered when not in use	The filling of private swimming pools and hot tubs is discouraged	The filling of private swimming pools and hot tubs is prohibited	The filling of all swimming pools and hot tubs is prohibited

Water Usage	Normal Operations	Stage 1	Stage 2	Stage 3	Stage 4
		and maintained to prevent leaks			(residential and commercial/industrial)
Air Conditioning	Adjust room temperatures to reduce use of water-cooled air conditioning	Adjust room temperatures to reduce use of water-cooled air conditioning	Adjust room temperatures to reduce use of water-cooled air conditioning	Adjust room temperatures to reduce use of water-cooled air conditioning	No outdoor or indoor water use not strictly necessary is prohibited
Indoor Restrictions	n/a	n/a	n/a	Residents are limited to 30 gallons per person per day	Indoor water use is heavily restricted to critical uses only (e.g. drinking, cooking, bathing), and may be periodically shutoff as necessary
Demand-Side Measures Commercial and Institutional Measures					
Bulk Water Station Use	Conserve and prevent wasting of bulk water	Conserve and prevent wasting of bulk water	Bulk Water Station use limited to indoor use volume	Bulk Water Station use limited to indoor use volume	Bulk Water Station use restricted to public health and emergency protection only
Construction Water	Conserve and prevent wasting of construction water	Conserve and prevent wasting of construction water	Use of all construction water is prohibited unless necessary for air quality and construction reasons	Use of all construction water is prohibited unless necessary for air quality and construction reasons	All non-critical water use, including construction water, is prohibited until further notice
Fountains	n/a	All non-recirculating outdoor fountains must be turned off at night	All outdoor and indoor fountains must be turned off	All outdoor and indoor fountains must be turned off	All outdoor and indoor fountains must be turned off
Swimming Pools and Hot Tubs	All commercial swimming pools and hot tubs should be covered when not in use and maintained to prevent leaks	All commercial swimming pools and hot tubs should be covered when not in use and maintained to prevent leaks	All commercial swimming pools and hot tubs should be covered when not in use and maintained to prevent leaks	The filling of commercial swimming pools and hot tubs is prohibited	All swimming pool filling is prohibited

Water Usage	Normal Operations	Stage 1	Stage 2	Stage 3	Stage 4
Vehicle Washing	Commercial car washes encouraged to reduce water use by 10% where technically feasible Vehicles at car dealerships should be washed using bucket and hand-held hose with shut-off nozzle	Commercial car washes required to reduce water use by 10% where technically feasible Vehicles at car dealerships should be washed using bucket and hand-held hose with shut-off nozzle	All commercial car washes are required to implement best management practices and limit water use to 20 gallons per vehicle All washing of vehicles on car dealership property is prohibited	All car washing is prohibited, unless necessary for emergency response operations	All outdoor water use including vehicle washing is prohibited, unless necessary for emergency response operations
Restaurants	Restaurants encouraged to only serve water when requested by customer	Restaurants encouraged to only serve water when requested by customer	All restaurants are not to serve water unless customers specifically ask for it	All restaurants are not to serve water unless customers specifically ask for it	All restaurants are not to serve water unless customers specifically ask for it and there is availability
Lodging Services	Lodging establishments are encouraged to promote conservation and limit frequency of linen washings	Lodging establishments are encouraged to promote conservation and limit frequency of linen washings	All lodging establishments must place water conservation cards in every room promoting water conservation (e.g. short showers) as well as not changing linens and towels unless a customer specifically requests the service	All lodging establishments must place water conservation cards in every room promoting water conservation (e.g. short showers) as well as not changing linens and towels unless a customer specifically requests the service	All lodging establishments must place water restriction cards in every room, warn about possible periodic water shutoffs, and avoid changing linens and towels
Indoor	n/a	n/a	Encourage indoor water use limitations to achieve 20% water savings	Encourage indoor water use limitations to achieve 30% water savings	Indoor water use is heavily restricted to critical uses only (e.g. drinking, cooking, bathing), and may be periodically shutoff as necessary
Water Audits			Promote indoor and outdoor water audits where applicable.	Require indoor and outdoor water audits where applicable.	

8.0 PLAN IMPLEMENTATION AND MONITORING

8.1 Drought Declarations

Drought can appear quickly or slowly, last for a season or many years, and can occur locally, regionally, or statewide. Furthermore, a drought does not usually have a clearly defined beginning or end and is often difficult to predict. Following the 2002 drought in Colorado, snowpack accumulation in early 2003 was again abnormally low, and if not for a large single massive snowstorm event in late March 2003, many providers throughout Colorado would have been seriously stressed and under significant water restrictions for the summer of 2003 and beyond.

As such, it is important to ensure that the official drought declaration and corresponding drought stage designation occurs in a timely manner. If a drought is declared too late or actions are not taken early enough to reduce water use based on assessments of the local conditions and water demands, supplies can be severely depleted and strict water restrictions and economic impacts may be required that could have been avoided. Conversely, premature drought declarations can result in unnecessary mandatory water restrictions and associated impacts, while customers can lose confidence in the declaration and possibly the water management procedures in place.

Prior to the development of this Plan the City did not have a pre-defined method for declaring drought. City of Durango Code of Ordinances Section 25-33 does define a process for declaring a water shortage:

Whenever, in the opinion of the city manager, a shortage of the city's water supply exists or is threatened from any cause, the city manager may, by order published in a daily newspaper circulated within the city, prohibit the use of city water for irrigation, shorten the hours for irrigation, change the hours of permitted irrigation, provide for the irrigation of different parts of the city on different days, or impose other restrictions necessary to preserve the city's water supply. Such restrictions, including prohibition of the use of city water for irrigation, shall remain in effect until the next meeting of the city council, at which time the council, by resolution, shall confirm, modify or annul the order of the city manager. The resolution adopted by the city council shall be published in the same manner as the original order promulgated by the city manager.

Section 25-30 further authorizes the City to apply an "emergency drought surcharge" to residential, commercial, and industrial water use when a water shortage has been declared.

The following protocol will be followed to implement the above ordinance in declaring the Drought Stages defined above in Table 14.

- Utilities Department staff will discuss the drought monitoring data with the Director of City Operations, providing recommendations on the timing of the drought declaration and the appropriate drought stage.
- The Director of City Operations will provide recommendations to the City Manager, who will decide whether or not to declare a water shortage/drought, and what stage restrictions to enact.
- If a water shortage/drought is declared, this decision will be communicated to City Council, City Emergency Management and La Plata County Emergency Management, the CWCB, the Colorado Division of Homeland Security and Emergency Management, and to the public.
- City Council will review and discuss the City Manager's decision at an official public City Council meeting that is either regularly scheduled or scheduled as an emergency specifically to discuss drought conditions. The Council will confirm, modify or annul the water shortage/drought declaration.

Council's resolution on the matter will be promulgated as outlined in ordinance and in the previous bullet.

The same protocol will be followed at the recommendation of the Director of City Operations and discretion of the City Manager to change a drought stage, or to end a drought declaration and return to normal operating conditions. A drought stage may be raised or lowered based on evolving conditions and the triggers outlined in Table 14. The drought declaration may be terminated if storm events or other hydrologic conditions sufficiently reduce stress to the City's water supplies. This type of decision will be based on drought monitoring data, the various drought indices and indicators detailed in Section 6.0, and Durango Utilities staff's historical experience and professional judgment in managing the City's water supplies. A thorough review of supply conditions and implementation of the drought response program shall be conducted by the Utilities Department following such declaration.

8.2 Implementation of the Staged Drought Response Program

The staged drought response program requires actions to be taken by multiple City departments. The roles and responsibilities are provided below in Table 17.

Table 17: Roles and Responsibilities of City Departments

Department	Roles and Responsibilities
Utilities	Administer, implement, and enforce the staged drought response program. The Director of Utilities will ultimately be responsible for facilitating necessary communication and coordination with other departments
Parks and Recreation	Coordinate outdoor irrigation efforts on City-owned property closely with Utilities
Community Development	Communicate with appropriate state and federal agencies regarding drought conditions and responses, convey the drought declaration and key messages to the public, and aid in implementing the public drought campaign
Finance	Closely monitor revenue and coordinate with Utilities to develop and implement drought surcharges if necessary
All City Departments and Staff	Follow water use restrictions imposed by the staged drought response program, and enforce water use guidelines and all other imposed regulations and ordinances

Monthly to weekly staff meetings will be initiated by the City Utilities Director among key departments and City staff at the onset of a drought, to ensure that the program is carried out in a coordinated manner. The initial staff meetings will focus on implementation of the staged drought response program and public drought information and educational campaigns, and will include:

- Review of City budget and funds available for implementation of the Plan.
- Actions necessary to initiate the designated staged drought response measures to achieve the appropriate response target.
- Specific drought messages to convey to the public and methods used for education using the framework provided in this Plan (See Section 5.4).
- Actions necessary for enforcement (See Section 8.3).
- Review of roles and responsibilities of each staff member.

- Coordination needs with other entities and agencies.

8.3 Enforcement of the Staged Drought Response Program

The purpose of enforcement is to maintain the integrity of the water system during peak periods to ensure positive pressure exists and fire flow demands are met. This code enforcement is conducted to protect the interests of the public, the City, and protect public health and safety. The focus of the program is on encouragement of compliance, as well as education. City of Durango Code of Ordinances Section 25-33 specifies the following:

Any use of city water for irrigation purposes in a manner or to an extent which is prohibited by the city manager's order or the resolution adopted by the city council is declared to be a violation of this Code and shall be punishable in accordance with the following schedule:

Offenses Within 12-Month Period

- *1st Offense: Written warning*
- *2nd Offense: \$50.00 fine*
- *3rd Offense: \$100.00 fine*
- *4th Offense: \$300.00 fine and disconnection from water system*

The city manager shall designate such officers or employees of the city as he may deem appropriate to enforce the provisions of this section. The penalties set forth herein shall be in lieu of and not in addition to the general penalties for violations of chapter 25, as set forth in section 25-58.

Monitoring and enforcement will consist of several strategies, such as: a call-in service where customers have an opportunity to report infractions, patrolling of neighborhood and business districts to identify owners/residents that are in violation of mandatory restrictions/requirements, the implementation of a neighborhood watch program, issuance of citations and appropriate penalties based on the drought stage and number of violations, and at times even resorting to temporary or permanent water shutoffs as necessary. Each staff member responsible for patrol will be continually trained to ensure that a consistent drought message is conveyed, and that conflicts are handled and conducted in a responsible, orderly fashion.

The Utilities Director staff will be responsible for administering the enforcement of the staged drought response program and ensuring that accurate, consistent information concerning enforcement is conveyed to the public.

8.4 Revenue Implications and a Financial Budgeting Plan

A reduction in customer water use during periods of drought reduces water sales and consequently could result in a revenue shortfall for Durango. Increased costs associated with implementation of the staged drought response program, public drought education and awareness campaign, and enforcement could further intensify the shortfall. City of Durango Code of Ordinances Section 25-30 defines a process for declaring a water shortage and drought surcharges. The main objective of this surcharge would be to provide additional financial incentives to conserve water; however, as a secondary benefit, the drought surcharge could also be used to help compensate for reduced water sales and increased drought response costs. If drought conditions and corresponding water sale reductions are severe enough to warrant the increase of water rates, an intensive public outreach campaign would be implemented to convey the reasoning behind why the water rates are being raised and inform about the status of the

City's financial condition. Other possible uses for a drought surcharge may be determined by the City staff, as deemed appropriate on a situational basis.

Durango currently has access to a water emergency reserve account, which could be utilized during the staged drought response program to alleviate surcharges to customers, for example. These funds may also be applied to implement the public drought education and awareness campaign and other aspects tied to this drought management plan. In addition to the emergency reserve account, the City plans to seek financial drought-related assistance (public drought-related loans, grants, etc.) where needed and available.

8.5 Mitigation Action Plan

Many of the mitigation measures are either a component of this Drought Management Plan, are specified in Durango's other water related plans (e.g. 2011 Water Efficiency Management Plan, 2015 Municipal Sustainability Action Plan), or are standard practices conducted by City staff. These measures are generally conducted and/or tested on a routine annual basis. The following table summarizes the highest priority drought mitigation actions being considered for implementation, along with the relevant periods of implementation and the customer class they may affect. Table 18 outlines only those high priority actions, though Appendix A contains the comprehensive table which additionally contains medium and low priority mitigation actions.

Table 18: High Priority Mitigation Action Plan

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments
County HMP CoD-06-2018	Develop formal Drought Management Plan	Plans and Regulations	All	Both	2019	Utilities	Currently in progress with expected completion of initial report fall of 2019.
County HMP CoD-07-2018	Develop City's available water supply resources for production and distribution as to hedge against drought conditions	Structure and Infrastructure Projects	All	Supply	Ongoing	Utilities	Continued work to maintain and improve existing raw water supply infrastructure; design of expanded raw supply underway.
County HMP CoD-08-2018	Develop redundancies for various water supply delivery systems within the City of Durango	Structure and Infrastructure Projects	All	Supply	2023	Utilities	Engineering evaluation currently being conducted to site and develop a base plan for an additional treatment plant.
City MSAP 8.1.1	Conduct water use audits and assessments as part of the Facilities Master Plan process to better understand the City's water use.	Plans and Regulations	Municipal	Both		City Operations/ Utilities/ Sustainability Office	1. Average annual indoor and outdoor water use at City facilities. 2. Average annual per employee indoor and outdoor water use.
City MSAP 8.1.2	Identify and replace inefficient water fixtures in City Facilities with high-efficiency and/or low-flow touchless fixtures	Structure and Infrastructure Projects	Municipal	Demand		City Operations / Sustainability Office / Parks and Recreation	1. Plan and budget for infrastructure improvements to reduce water use in City facilities. 2. Develop a systematic approach to retrofitting existing fixtures with low-flow fixtures. As part of this process, the infrastructure's compatibility with low flow fixtures should be analyzed. 3. Install low-flow fixtures in all new facilities. 4. Where possible, transition to touchless systems.

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments
							5. Ensure that water fountains are installed in all new facilities, where there are no existing water fountains in existing facilities, strategically install water bottle fill stations.
City MSAP 8.1.3	Encourage facilities and irrigation managers to use Planet Footprint to track and manage water use and costs	Education and Awareness	Municipal	Demand		Sustainability Office	1. Provide access to water tracking and monitoring through Planet Footprint, 2. Continue to monitor and manager water use through the Maxicom irrigation system to provide centralized, rain-sensor irrigation control for City-owned lands.
City MSAP 8.2.1	Review and update utility rates and fees for all customer classes. Maintain and enhance tiered rate structure to encourage conservation.	Plans and Regulations	All	Demand	2020	City Council/Utilities Department / Finance Department / CMO	Current rate study being finalized. Updates to all classes and continuation of Tiered rates within the plan.
City MSAP 8.3.2	Promote drought resiliency and enhance water use efficiency	Education and Awareness	All	Both		Utilities Department / Sustainability Office / Library	1. Conduct a drought master plan, 2. Conduct modeling to understand the impacts of climate change on the City's water resources, 3. Provide access to resources and information on water conservation and efficiency techniques.
City MSAP 8.3.4	Maintain a conservation-oriented water rate structure	Plans and Regulations	All	Demand		CMO / Utilities Department	Conservation has been integrated into rate structure since 2015 and was reaffirmed in current 2019 rate study.

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments
City WEMP	Metering: AMR Installation and Operations	Structure and Infrastructure Projects	All	Demand	2020	Utilities/ Customer Service/Finance	The City has AMR technology in place at 99% of all its customer meters and uses central read and drive by reading methods to collect water use data. The City is in the process of converting all its meter reading devices to those that will utilize fixed receiver system to eliminate the need for drive-by water use data collection. The City is currently reading customer meters and billing monthly.
City WEMP	Metering: Identify Unmetered and/or Unbilled Treated Water Uses	Plans and Regulations	All	Demand	2021		The City needs to identify current unmetered and/or unbilled treated water uses and remedy the situation with new meter installations and/or processes to minimize unbilled treated water. The City needs to improve its understanding of nonrevenue water.
City WEMP	Metering: Meter Upgrades (to higher accuracy/lower incremental reading)	Structure and Infrastructure Projects	All	Demand			The City is interested in improving the accuracy of its meters to less than 1,000-gallon increments; however, the large-scale replacement of 6,000 meters is cost prohibitive.
City WEMP	System Water Loss Control: System Wide Water Audit (AWWA M-36 Methodology)	Plans and Regulations	All	Supply	2019		The City may benefit from conducting an AWWA audit of its system wide water uses and tracking to help identify sources and magnitude of non-revenue water, characterization of unaccounted for water and discrepancies between billing and water department monthly reports. The City may benefit from changing some of its monitoring and tracking methods - and in revising some policies that allow for unbilled uses of water on metered accounts. Currently working with CWCB and Cavanaugh consultants to complete initial year of AWWA M36 Water Audit Methodology.

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments
City WEMP	Data Collection Monitoring & Verification: Monthly Meter Reading and Billing	Plans and Regulations	All	Demand			The City currently reads all meters in the City on a monthly basis. It will be improving its ability to collect water use data more often and in a more explicit fashion that will allow for detecting bad meters, doing analyses, etc. in the future using the AMR fixed receiver technology currently being installed.
City WEMP	Data Collection Monitoring & Verification: AMR Installation and Operations	Structure and Infrastructure Projects	All	Demand			The City has installed AMR devices on the meters of 95% of its customers. The City will work to improve its data collection and data mining efforts as the fixed receiver data collection system is installed and operated. Current effort to install metering and AMI system to be complete in 2020.
City WEMP	City Facility Evaluations & Retrofits: Irrigation Equipment Upgrades	Structure and Infrastructure Projects	Municipal	Demand			The City conducted water audits in 2003 at all its facilities. The recommendations from these audits will be recommended for implementation. Replace sprinkler heads, install pressure reducing valves, upgrade controllers, fix leaks and improve valves/value boxes
City WEMP	Existing Customer Rebates & Retrofits: Residential Indoor Fixture and Appliance Rebates/Retrofits	Plans and Regulations	Residential	Demand			Based on the findings of the audits, the City may choose to implement selected indoor fixture and/or appliance rebates. Residential indoor per capita water use is currently about 60 gpcd.
City WEMP	Existing Customer Rebates & Retrofits: Commercial Indoor Fixture and Appliance Rebates/Retrofits	Plans and Regulations	Commercial	Demand			Based on the findings of the audits, the City may choose to implement selected indoor fixture and/or appliance rebates

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments
City WEMP	Water Waste Ordinance: Time of Day Watering Restrictions	Plans and Regulations	All	Demand			Utilize existing ordinance that includes time of day water restrictions from 9 am to 7 pm for all days in the months from May to September for new and rehabilitated non-residential landscapes. City may consider expanding the ordinance to include all outdoor irrigation including residential and City facilities.
City WEMP	Water Waste Ordinance: Day of the Week Watering Restrictions	Plans and Regulations	All	Demand			Utilize "Day of the Week" watering restrictions limiting watering to every second or third day.
City WEMP	Education: Rules for Existing Construction: Bill stuffers, Newsletter, Mailings	Education and Awareness	All	Demand			City currently maintains a website with water conservation tips, newsletters and bill stuffers. Need to link any expenditures for printing and mailing to overall City water messaging campaign
City WEMP	Education: K-12 Education	Education and Awareness	Residential	Demand			The City is interested in supporting local K-12 water education. The City will evaluate methods to create K-12 education programs

8.6 Monitoring of Plan Effectiveness

Monitoring provides the information and data necessary to improve the effectiveness of updates to Durango's Drought Plan. This process will be key to improving the City's ability to prepare and respond to drought. Monitoring will be both an ongoing and post-drought evaluation process. Ongoing monitoring should include testing components of the drought management plan when a drought is not occurring as well as tracking and following through with the drought mitigation measures.

In the first quarter of each year, Durango Utilities will organize an annual drought monitoring meeting. The meeting will entail the latest status of potential drought conditions in the upcoming irrigation year based on the current drought monitoring data, the status of the drought mitigation measures specified in this Plan, an overview of the public drought campaign efforts, and a review of individual staff member's roles and responsibilities if a drought does occur. The meeting will also provide a forum for educating new staff members on their drought-related responsibilities as well as "testing" the implementation of the Plan by enabling staff members to question and discuss potential challenges and solutions that could arise via implementation of the Plan.

Durango Utilities staff will also present or publicize the results from monitoring data collected to assess the effectiveness of the drought mitigation, response measures and enforcement (if applicable), and the public drought campaign. The following monitoring data will be collected and made available publicly by Durango Utilities staff, on an annual basis (note that some of these data may not be applicable if a drought has not occurred):

- **Demands** – Comparison of the demands during historical droughts relative to the current year's annual demands. These demand data will include monthly water usage by high water users, customer types, total per capita water usage, residential per capita water usage, and the Parks and Recreation Department's monthly irrigation use, on City parks and open spaces. Also, records on new development that can influence water demands (e.g. new housing developments, parks, commercial buildings) will be maintained on an annual basis. If a drought occurred, information will also be presented on how effectively the water savings target response was achieved.
- **Lessons learned** – Key issues, challenges, and concerns arising during the implementation of the staged drought response program (if applicable), drought monitoring, mitigation activities, and public drought campaign. Durango Utilities staff will interview City staff members from other departments also involved with the Plan implementation to get a full inter-departmental spectrum of lessons learned.
- **Conditions of the water supply system** – This will include the drought indicator data such as storage levels, water and drought monitoring details, data about water infrastructure conditions, water obtained from direct flow rights, storage rights, etc.
- **Drought mitigation measures** – Status of the mitigation related activities to date and other relevant factors (e.g. budget).
- **Public perceptions and response to the drought** – This will include documenting comments provided at public meetings, City council/board meetings, and electronic emails/letters sent to the City's public regarding the drought response. Formal public surveys may also be used to gather public input depending on the magnitude of the drought and City budget available for the survey. These surveys will be developed in advance of a drought to ensure that there is sufficient time to develop a well thought out survey.
- **Administrative staged drought response program data** – This will include administrative summaries such as the number of citations delivered to customers, number of incentives distributed,

number of hotline calls received, etc. Records will also be maintained on the level of effort the staff put into facilitating the staged drought response measures and public education campaign, to help make predictions and budget allotments for the future.

The monitoring data will help assess the effectiveness of the Plan and will provide a means to adjust mitigation and response measures if necessary, so that the City may ultimately develop recommendations for updating and improving the plan.

9.0 FORMAL PLAN APPROVAL AND UPDATES

9.1 Public Review Process

The City facilitated a public review process providing the public an opportunity to review and provide feedback on the Plan. Prior to finalization of the Plan the City of Durango and specifically the Utilities Department prepared a “Public Review Draft” of its Municipal Drought Management Plan in September of 2019. A public comment period was opened on the 11th of September 2019 and continued for more than 60 days until November 15th, 2019. This process was important in developing an effective Plan that is reflective of the community’s values and could mitigate potential conflict during a future drought event. The City sent out emails to large consumers, used social media, and posted on its website that a draft Drought Management Plan was available for the public to review and comment. An online comment form was posted with the draft. Ten comments were received. The public comments in their entirety along with a response is included and documented in Appendix B.

9.2 Ordinances and Official Agreements

The following drought-related ordinances are currently in place and apply to the implementation and enforcement of the water restrictions outlined in this Plan. However, the City of Durango reserves the right to create, modify, or remove any specific ordinances to suit the needs of the community.

9.2.1 Ordinances from the Municipal Code

- *Section 25-18 (Code 1962, § 3-3-1)* - The city manager has general control of the waterworks and sewers of the city as well as the management and supervision of such systems.
- *Section 25-19 (Code 1962, § 3-3-2)* - The public works director, under the direction of the city manager, shall have charge of the water and sanitary sewer systems.
- *Section 25-30 (multiple codes)* – Residential, commercial, and industrial water service billing consists of monthly service charges and volumetric flow charges. Emergency drought surcharges will be applied to water users during periods when the city manager determines that an emergency drought exists. City council will confirm the action at the next council meeting after the declaration.
- *Section 25-33 (Code 1962, § 3-3-17; Ord. No. O-2002-22, § 1, 9-17-02)* – Restrictions on water use under shortage conditions. The city manager can impose restrictions on water use based on shortages of supply, hence prohibiting irrigation or enacting other restrictions. Violations of the restrictions are punishable in accordance to guidelines stated in the codes/ordinances under Section 25-33, ranging from small fines/penalties to disconnection from the main water system. In addition, the city manager is able to designate officers or employees of the city deemed appropriate to enforce the restrictions and provisions. (Note: the specific fines are detailed in Section 8.3 of this Plan.)

9.2.2 Agreements

Other than the Lake Nighthorse conceptual agreement, Durango currently does not have any official agreements with other entities related to drought. However, these agreements may be an important component of drought mitigation and/or response in the future. Durango's water supply yields may be increased by making some adjustments to how water rights are traditionally managed and through other synergies developed via cooperative agreements with local water users. Where possible, these agreements will be established in advance of a drought as part of the mitigation effort and activated during drought periods. Future agreements to partner with other kinds of entities regarding water and drought may include exploring Alternative Transfer Mechanisms, or ATMs, as a water sharing mechanism between agricultural and municipal water interests.

Within Lake Nighthorse, a shared pool agreement has been in development where various members not utilizing the whole of their water rights agree to allow other members to utilize quantities not identified for use in that immediate or subsequent water year.

9.3 Drought Management Plan Approval

The Drought Management Plan was formally approved by City Council. Each member had the opportunity to review the Plan and comment prior to finalization and formal approval of the Plan. The Plan was also reviewed by the Colorado Water Conservation Board and found to be in compliance with state planning guidelines and with grant requirements.

9.4 Periodic Review and Update

Drought management planning is most effective when viewed as an ongoing process rather than a discrete process that results in a shelved document reviewed only at the onset of a drought.

Periodic Review:

- The plan should be reviewed annually in advance of spring runoff, preferably in the first quarter of each year prior to the annual drought monitoring meeting (see Section 8.6 Monitoring of Plan Effectiveness).
- Mitigation actions in Appendix A should be monitored annually for progress.
- The plan should be reviewed more frequently during emerging drought conditions, following the drought monitoring procedures and schedules noted in Section 6.0.

Plan Effectiveness Review:

- The Plan should be reviewed for effectiveness following its implementation during an actual drought or drought simulation/exercise.

Formal Updates:

- The Plan will be updated every five years (or more frequently if the City deems appropriate).

The next general update is scheduled for 2025. The Director of Utilities will be responsible for initiating the update. Utilities staff in charge of the majority of the facilitation. The update will consist of a similar stakeholder process outlined in Section 1.0, where the stakeholder group will be responsible for reviewing the Plan objectives and operating principles in light of the Plan monitoring data and conclusions presented in the annual monitoring reports. This group will be charged with providing recommended changes to the goals and operating principles as well as identifying key changes necessary to improve the overall effectiveness of the revised Plan; important changes to future Plan updates may include holding

additional City meetings or requesting feedback from community members and water users. This plan should be updated to reflect the City's diversification in water supply, as well as other demographic, cultural, or transitional changes. As the City's water supply portfolio changes over time, the monitoring indicators and response measures may need to be modified accordingly.

10.0 REFERENCES

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Appendix A: Drought Mitigation Actions in Related Plans

APPENDIX A: DROUGHT MITIGATION ACTIONS IN RELATED PLANS

The City of Durango has been proactive in identifying activities to mitigate the impacts of drought by maximizing available water supply or reduce water consumption in related plans. Table A-1 lists actions consolidated from the following plans that relate to drought mitigation:

- 2018 La Plata County Multi-jurisdictional Hazard Mitigation Plan (HMP)
- 2015 City of Durango Municipal Sustainability Action Plan (MSAP)
- 2011 Water Efficiency Management Plan (WEMP)

The 2017 City Comprehensive Plan also contains a number of high-level policies related to long term drought mitigation. Since these are more policies as opposed to specific actions they are not included in the following table. Other related documents include the 2015 Southwest Basin Implementation Plan (SWBIP), which also notes specific Identified Projects and Processes that would enhance Durango's water supplies in the future.

The City can utilize this appendix as a reference to the mitigation actions in related planning processes, and as a way to track implementation of these actions moving forward.

Table A-19: Drought Mitigation Actions in Related Plans

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
County HMP CoD-06-2018	Develop formal Drought Management Plan	Plans and Regulations	All	Both	2019	Utilities	Currently in progress with expected completion of initial report fall of 2019.	High
County HMP CoD-07-2018	Develop City's available water supply resources for production and distribution as to hedge against drought conditions	Structure and Infrastructure Projects	All	Supply	Ongoing	Utilities	Continued work to maintain and improve existing raw water supply infrastructure; design of expanded raw supply underway.	High
County HMP CoD-08-2018	Develop redundancies for various water supply delivery systems within the City of Durango	Structure and Infrastructure Projects	All	Supply	2023	Utilities	Engineering evaluation currently being conducted to site and develop a base plan for an additional treatment plant.	High

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City MSAP 8.1.1	Conduct water use audits and assessments as part of the Facilities Master Plan process to better understand the City's water use.	Plans and Regulations	Municipal	Both		City Operations/ Utilities/ Sustainability Office	1. Average annual indoor and outdoor water use at City facilities. 2. Average annual per employee indoor and outdoor water use.	High
City MSAP 8.1.2	Identify and replace inefficient water fixtures in City Facilities with high-efficiency and/or low-flow touchless fixtures	Structure and Infrastructure Projects	Municipal	Demand		City Operations / Sustainability Office / Parks and Recreation	1. Plan and budget for infrastructure improvements to reduce water use in City facilities. 2. Develop a systematic approach to retrofitting existing fixtures with low-flow fixtures. As part of this process, the infrastructure's compatibility with low flow fixtures should be analyzed. 3. Install low-flow fixtures in all new facilities. 4. Where possible, transition to touchless systems. 5. Ensure that water fountains are installed in all new facilities, where there are no existing water fountains in existing facilities, strategically install water bottle fill stations.	High
City MSAP 8.1.3	Encourage facilities and irrigation managers to use Planet Footprint to track and manage water use and costs	Education and Awareness	Municipal	Demand		Sustainability Office	1. Provide access to water tracking and monitoring through Planet Footprint, 2. Continue to monitor and manager water use through the Maxicom irrigation	High

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
							system to provide centralized, rain-sensor irrigation control for City-owned lands.	
City MSAP 8.1.4	Utilize the most efficient method to heat water in City Facilities to reduce energy loads and conserve water	Education and Awareness	Municipal	Demand		City Operations		Medium
City MSAP 8.1.5	Improve quarterly water use monitoring efforts in partnership with Planet Footprint.	Education and Awareness	Municipal	Demand		Sustainability Office / Finance Department	1. Complete data integration with new financial reporting system.	Medium
City MSAP 8.1.6	Reduce indoor water use at City facilities by an average of 18% by 2020.	Education and Awareness	Municipal	Demand		City Operations/ Utilities/ Sustainability Office / Facility Managers	1. Track water use though Planet Footprint. 2. Engage responsible parties in tracking and reporting efforts.	Medium
City MSAP 8.1.7	Reduce outdoor water use at City facilities by an average of 3% by 2020.	Education and Awareness	Municipal	Demand		Parks and Recreation/ Utilities / Sustainability Office / Facility Managers	1. Track water use though Planet Footprint; 2. Engage responsible parties in tracking and reporting efforts; 3. Install drip systems at the Library where drip systems are not currently in place.	Medium
City MSAP 8.2.1	Review and update utility rates and fees for all customer classes. Maintain and enhance tiered rate structure to	Plans and Regulations	All	Demand	2020	City Council/Utilities Department / Finance	Current rate study being finalized. Updates to all classes and continuation of Tiered rates within the plan.	High

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
	encourage conservation.					Department / CMO		
City MSAP 8.2.2	Reduce unaccounted for water system losses from approximately 20% to 13% by 2020.	Structure and Infrastructure Projects	Municipal	Supply		Utilities Department	1. CIP replacement of infrastructure 2. Reduction in non-metered/unaccounted water system losses	Medium
City MSAP 8.2.3	Reduce real losses from the water distribution system by 30% by 2020.	Structure and Infrastructure Projects	Municipal	Supply		Utilities Department	1. CIP replacement of infrastructure 2. Reduction in real water system losses	Medium
City MSAP 8.2.4	Reduce unbilled treated water use by 50% by 2020.	Plans and Regulations		Demand		Utilities Department		Medium
City MSAP 8.2.5	Reduce unbilled raw water use by 80% by 2020.	Plans and Regulations		Demand		Utilities Department		Medium
City MSAP 8.2.6	Install radio read technology on 93% of meters by 2015.	Plans and Regulations		Demand	Complete	Utilities Department	Radio read technology with granular read ability being implemented in 2018/2019	Low
City MSAP 8.2.7	Implement master meters to enhance water accounting.	Plans and Regulations		Demand				Medium
City MSAP 8.2.8	Expand sub-metering and system testing	Plans and Regulations		Demand		Utilities Department		Medium
City MSAP 8.2.9	Upgrade and improve wastewater treatment facility to meet current and foreseeable needs	Structure and Infrastructure Projects	Municipal	Demand		Utilities Department / CMO	Completion of treatment plant improvements to be finished in October 2019.	Low

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City MSAP 8.2.11	Maximize (re)use of effluent and treated byproducts	Structure and Infrastructure Projects	All	Supply		Utilities Department / Parks and Recreation	1. Explore opportunities to sell City produced treated byproducts; 2. Review water rights for reuse applicably; 3. Evaluate opportunities to install infrastructure to accommodate effluent distribution for irrigation purposes.	Low
City MSAP 8.2.12	Expand raw water use for irrigation purposes on City-owned land	Structure and Infrastructure Projects	Municipal	Supply		Utilities Department / Parks and Recreation		Medium
City MSAP 8.3.1	Support effort to improve water use efficiency with the City's residential, commercial, institutional, and industrial customers	Plans and Regulations	All	Demand		Utilities Department	1. Provide incentives for smart irrigation controls, and other technologies that reduce water use.	Medium
City MSAP 8.3.2	Promote drought resiliency and enhance water use efficiency	Education and Awareness	All	Both		Utilities Department / Sustainability Office / Library	1. Conduct a drought master plan, 2. Conduct modeling to understand the impacts of climate change on the City's water resources, 3. Provide access to resources and information on water conservation and efficiency techniques.	High
City MSAP 8.3.3	Promote the use of drought resistant plants and native species vegetation on	Education and Awareness	All	Demand		Parks and Recreation / Community Development	1. Provide demonstration gardens and other public education opportunities	Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
	City-owned properties and new developments					/ POST / Sustainability Office / Library / City Operations		
City MSAP 8.3.4	Maintain a conservation-oriented water rate structure	Plans and Regulations	All	Demand		CMO / Utilities Department	Conservation has been integrated into rate structure since 2015 and was reaffirmed in current 2019 rate study.	High
City MSAP 1.3.5	Bolster outreach efforts to educate the community on sustainability-related topics	Education and Awareness	All	Demand		Sustainability Office	1. Further develop on-line resources for residents and business to learn more about how they can participate in sustainability efforts, 2. Develop and expand partnership with community organizations.	Medium
City MSAP 2.1.3	Promote the use of permeable pavement and other porous paving materials (i.e. pavers, pervious concrete, porous asphalt, etc.)	Education and Awareness	All	Supply		Community Development / POST / Engineering Divisions / City Operations	1. As new parking areas are added or old parking spaces redone, promote permeable solutions to enhance water quality, 2. Employ best practices in implementing/ building new Storm Water Quality facilities, 3. Promote permeable systems to enhance water quality and reduce sediment-laden discharge into the Animas River.	Medium
City MSAP 2.3.3	Adopt policies to support green	Plans and Regulations	All	Demand		Community Development /	1. Consider encouraging voluntary efforts, offering incentives, or requiring new	Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
	building standards and practices					Sustainability Office	homes to meet Energy Star standards (15% energy reduction from standard builds).	
City MSAP 3.3.4	Encourage facility managers to use Plant Footprint to track and manage energy and water use and costs	Education and Awareness	Municipal	Demand		Sustainability Office		Medium
City MSAP 3.3.5	Incorporate climate and sustainability literacy into the City's training programs	Education and Awareness	Municipal	Both		HR / Sustainability Office		Medium
City MSAP 3.3.7	Reflect sustainability goals and objectives in capital projects planning process and the annual budget document	Plans and Regulations	Municipal	Both		All Departments		Medium
City MSAP 5.1.3	Consider energy and water consumption implications when designing and installing new infrastructure components	Plans and Regulations	Municipal	Demand		All Departments		Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City MSAP 5.2.1	Design and maintain a network of green infrastructure features that integrate with the built environment to manage stormwater, promote ecosystem functions, and improve resiliency	Structure and Infrastructure Projects	Municipal	Both		Community Development / Engineering / POST / City Operations / Parks and Recreation / Utilities	1. Implement green stormwater management practices and solutions; 2. Use green infrastructure to reduce imperviousness, and preserve the natural environment throughout the Animas River watershed, at the neighborhood scale, and at the site level; 3. Implement policies and programs that protect water resources and add value to the community, this includes investments in both natural systems (i.e. habitat corridors, greenways, open spaces, natural surface trails, and street trees) and built systems (low-impact development, green roofs, bioswales, pervious pavement, etc.) as alternatives to piped stormwater and combined sewer overflows (CSOs); 4. Where appropriate, allow and encourage the use of green infrastructure practices in new developments and redevelopments; 5. Assess the impacts of adding impervious surfaces to existing transportation	Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
							infrastructure systems (e.g. streets, alleys, sidewalks); 6. Consider implementing Green Street practices in these areas to serve as multi-purpose urban greenways.	
City MSAP 6.1.5	Participate in the STAR Community Rating System. Utilize the system's metrics to measure sustainability progress and integrate metrics into annual reports.	Plans and Regulations	Municipal	Demand		Sustainability Office	Currently participating in STAR system and transitioning to the LEED system in 2020.	Low
City MSAP 9.1.2	Build, sustain and leverage partnerships with local and regional stakeholders to ensure collective investment, efficient action and shared responsibility in building local resiliency.	Plans and Regulations	All	Both		All Departments	1. Work with various regional committees: (1) SWIM Team, (2) SW Regional Communication Committee, (3) SW All Hazards Council, (4) Local Emergency Planning Committee; 2. Execute and maintain MOU's and agreements with regional entities for community sheltering locations.	Low

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City MSAP 9.1.3	Develop a hazard mitigation action plan that includes an all-hazards vulnerability assessment of the City's primary hazard threats	Plans and Regulations	Municipal	Both		All Departments Lead Departments for Implementation: Police Department / Emergency Management Division / Sustainability Office	1. Implement highest priority utility and infrastructure improvements listed in the hazard mitigation plan	Low
City MSAP 9.2.1	Conduct a vulnerability and risk assessment of City operations to weather and climate	Plans and Regulations	Municipal	Both		Emergency Management/ Sustainability Office / CMO	1. Develop a vision and a path to enhance organizational resiliency, 2. Establish priority planning areas to guide the City's climate adaptation and resiliency efforts, 3. Include economic vulnerabilities that may be triggered or exacerbated by climate impacts, 4. Utilize work conducted as part of the COOP, with a focus on weather and climate related events.	Low
City MSAP 9.2.2	Promote fiscal responsibility through preparing now to be more resilient to climate variability and reducing costs in the future	Plans and Regulations	All	Both		All Departments		Low

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City MSAP 9.2.4	Assess the City's capacity to adapt to the impacts of climate variability and understand the existing economic, natural, institutional, and community resources available to accommodate this adaptation	Plans and Regulations	All	Both		All Departments	1. Integrate climate change considerations into planning processes, 2. Assess the impact of the 2020 climate predicted warming scenarios especially as it relates to current infrastructure investment (water and wastewater treatment facilities, stormwater infrastructure, etc.), 3. Assess the adaptability and impacts to the recreation sector of earlier spring runoff and lower average flows.	Low
City MSAP 9.3.3	Integrate information about future conditions (i.e. population, economy, weather) into community planning and decision making and make municipal operations and plans flexible to accommodate a range of possible future conditions and scenarios	Plans and Regulations	All	Both		All Departments		Low

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City MSAP 9.3.7	Fight the introduction and spread of invasive species in city-owned land	Structure and Infrastructure Projects	Municipal	Both		Parks and Recreation	1. Continue invasive species mitigation efforts, including monitoring by Park Rangers and volunteer Park Ambassadors, 2. Maintain and expand tree spraying program to reduce the spread of invasive species, 3. Continue to budget for invasive species eradication in maintenance and upkeep efforts	Low
City WEMP	Metering: Submetering of Large Water Users for Indoor and Outdoor Uses	Plans and Regulations	All	Demand			The City has not separated its commercial indoor and outdoor uses for those entities using potable water supplies; although some of the City's largest outdoor water users (e.g., Ft. Lewis, City parks, Golf Course) are on non-potable supplies and those uses are separately metered. New and rehabilitated landscape over 2,000 square feet (for non-residential customers) are required by 2007 ordinance to have separate meters. Additional submetering of existing landscapes needs to be evaluated by the City for its commercial and institutional customers.	Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City WEMP	Metering: AMR Installation and Operations	Structure and Infrastructure Projects	All	Demand	2020	Utilities/Customer Service/Finance	The City has AMR technology in place at 95% of all its customer meters and uses drive by reading methods to collect water use data. The City is in the process of converting all its meter reading devices to those that will utilize fixed receiver system to eliminate the need for drive-by water use data collection. The City would benefit from having the radio-read technology in place, which should be completed in 2011. The City is currently reading customer meters and billing monthly.	High
City WEMP	Metering: Identify Unmetered and/or Unbilled Treated Water Uses	Plans and Regulations	All	Demand			The City needs to identify current unmetered and/or unbilled treated water uses and remedy the situation with new meter installations and/or processes to minimize unbilled treated water. The City needs to improve its understanding of nonrevenue water.	High
City WEMP	Metering: Meter Testing and Replacement	Structure and Infrastructure Projects	All	Demand			The City currently has a meter repair and replacement budget. Repairs and replacements are conducted upon request. The City would benefit from more aggressive meter	Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
							testing and replacement especially for its larger water use customers	
City WEMP	Metering: Meter Upgrades (to higher accuracy/lower incremental reading)	Structure and Infrastructure Projects	All	Demand			The City is interested in improving the accuracy of its meters to less than 1,000-gallon increments; however, the large-scale replacement of 6,000 meters is cost prohibitive.	High
City WEMP	Conservation Oriented Rates: Water Rate Increase	Plans and Regulations	All	Demand	Complete		The City will need to re-evaluate its cash flow needs in light of water conservation, metering and billing needs, and overall revenue projections by 2015.	Low
City WEMP	Conservation Oriented Rates: Inclining Block Rate Adjustments	Plans and Regulations	All	Demand	Complete (in use since 15)		The City, which has tiered rate structure for all its customer classes, could benefit from adding an additional tier to discourage very high water uses. The City has been utilizing inclining block rate tiers since the 2015 rate adjustments.	Low
City WEMP	Conservation Oriented Rates: Water Budgets	Plans and Regulations	All	Demand			The City does not currently have the means to develop lot and customer specific water budgets.	Low

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City WEMP	Conservation Oriented Rates: Tap Fees with Water Conservation Incentives	Plans and Regulations	All	Demand			The City currently provides a 10% discount to non-residential developers that can demonstrate a 20% reduction of typical water demand during summer months through the use of "water saving fixtures and landscape efficiencies." City could benefit from expanding this program to cover residential development.	Medium
City WEMP	System Water Loss Control: System Wide Water Audit (AWWA M-36 Methodology)	Plans and Regulations	All	Supply	2019		The City may benefit from conducting an AWWA audit of its system wide water uses and tracking to help identify sources and magnitude of non-revenue water, characterization of unaccounted for water and discrepancies between billing and water department monthly reports. The City may benefit from changing some of its monitoring and tracking methods - and in revising some policies that allow for unbilled uses of water on metered accounts. Currently working with CWCB and Cavanaugh consultants to complete initial year of M36.	High

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City WEMP	System Water Loss Control: Leak Detection Programs Using Isolation Valving and Meters	Structure and Infrastructure Projects	Municipal	Supply			The City plans to better characterize real and apparent water losses to reduce its non-revenue water using isolation valving and metering to test and evaluate portions of its distribution system. The City may need to increase the level of accuracy used for preliminary analysis and commit more resources to better characterize non-revenue water	Medium
City WEMP	System Water Loss Control: Improved Water Use Monitoring	Plans and Regulations	Municipal	Supply			The City desires permanently improving the accuracy and regularity of data collection used to characterize it and its customer water use. This is linked to better meter testing and replacement for large water users, data collection and tracking, and AMR fixed receiver installs and operation.	Medium
City WEMP	System Water Loss Control: Pipe Replacement	Structure and Infrastructure Projects	Municipal	Supply			The City currently has budgeted a number of pipeline replacement projects budgeted over the next 10 years.	Medium
City WEMP	System Water Loss Control: Leak Detection and Repair Programs	Plans and Regulations	Municipal	Supply			The City would benefit from a more aggressive infrastructure replacement program; which will identify the time period for the entire	Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
							replacement of its water transmission and distribution system and set aside funds for that replacement schedule on a yearly basis. The City will need to perform this task independent of the Water Conservation Plan but should include language in the Plan related to it being conducted.	
City WEMP	Data Collection Monitoring & Verification: Customer Categorization in Billing System	Plans and Regulations	All	Demand			The City currently tracks residential single family and duplex, commercial and irrigation water use. It could benefit by more specific tracking of City water use(s) and tracking of commercial and irrigation water uses by industry code, including separating multi-family use from other commercial uses. The City is large enough that these additional customer tracking efforts would benefit the City in the management of its water sales and customer water use behaviors	Medium
City WEMP	Data Collection Monitoring & Verification: Monthly Meter Reading and Billing	Plans and Regulations	All	Demand			The City currently reads all meters in the City on a monthly basis. It will be improving its ability to collect water use data more often and in a more explicit	High

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
							fashion that will allow for detecting bad meters, doing analyses, etc. in the future using the AMR fixed receiver technology currently being installed.	
City WEMP	Data Collection Monitoring & Verification: AMR Installation and Operations	Structure and Infrastructure Projects	All	Demand			The City has installed AMR devices on the meters of 95% of its customers. The City will work to improve its data collection and data mining efforts as the fixed receiver data collection system is installed and operated. Current effort to install metering and AMI system to be complete in 2020.	High
City WEMP	Data Collection Monitoring & Verification: Integrated Resource Planning	Plans and Regulations	All	Demand			The City currently links its water conservation plan with its water supply planning, wastewater planning, and its overall water resources planning. IRP is currently occurring at the City.	Medium
City WEMP	Data Collection Monitoring & Verification: Conservation Coordinator	Plans and Regulations	Municipal	Demand			The City is not large enough to support a full-time water conservation professional.	Medium
City WEMP	City Facility Evaluations & Retrofits: Facility Indoor Audits	Plans and Regulations	Municipal	Demand			The City conducted water audits in 2003 at all its facilities. The recommendations from these audits will be	Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
							recommended for implementation to the extent that the recommendations have not already been implemented. Will need to perform some follow-up audits to determine extent to which 2003 recommendations were implemented	
City WEMP	City Facility Evaluations & Retrofits: Facility Retrofits - Indoor	Structure and Infrastructure Projects	Municipal	Demand			The City conducted water audits in 2003 at all its facilities. The recommendations from these audits will be recommended for implementation. Replace faucet aerators, showerheads, toilets and/or urinals; fix and repair leaks	Medium
City WEMP	City Facility Evaluations & Retrofits: Irrigation Equipment Upgrades	Structure and Infrastructure Projects	Municipal	Demand			The City conducted water audits in 2003 at all its facilities. The recommendations from these audits will be recommended for implementation. Replace sprinkler heads, install pressure reducing valves, upgrade controllers, fix leaks and improve valves/value boxes	High
City WEMP	Existing Customer Water Audits:	Plans and Regulations	Residential	Demand			Residential per capita water use is currently about 60 gpcd, which indicates a level	Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
	Conduct residential indoor water audits.						of water efficiency is already in place.	
City WEMP	Existing Customer Water Audits: Conduct residential outdoor irrigation audits	Plans and Regulations	Residential	Demand			Residential outdoor water use may be unmetered in some cases; such that audits may be helpful in identifying those unmetered accounts	Medium
City WEMP	Existing Customer Water Audits: Conduct commercial facility indoor and outdoor water audits	Plans and Regulations	Commercial	Demand			Focus on high water use facilities	Medium
City WEMP	Existing Customer Water Audits: Conduct indoor and outdoor water audits at the College	Plans and Regulations	Commercial	Demand			Connect with current on-campus sustainability efforts; focus on treated water uses	Medium
City WEMP	Existing Customer Water Audits: Conduct irrigation customer audits	Plans and Regulations	Irrigation	Demand			Focus on high water use facilities	Medium
City WEMP	Existing Customer Technical Assistance: Focus workshops on landscape design for homeowners, HOA Boards, landscape designers	Education and Awareness	All	Demand			Requires tracking of participants and their water use before and after the workshop - difficult to track non-resident businesses and contractors.	Medium
City WEMP	Existing Customer Technical Assistance: Create and maintain City sponsored Xeriscape Garden	Education and Awareness	Municipal	Demand			Could be a value program sponsored by the City and conducted by the High School	Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City WEMP	Existing Customer Technical Assistance: Focus workshops on residential outdoor water use and xeriscape concepts	Education and Awareness	Residential	Demand			Requires tracking of participants and their water use before and after the workshop	Medium
City WEMP	Existing Customer Technical Assistance: Focus workshops on specific types of commercial water use - e.g., restaurants and bars, etc.	Education and Awareness	Commercial	Demand			Requires tracking of participants and their water use before and after the workshop; however, corporations are biggest water users, not local store owners, so workshops may not be effective	Medium
City WEMP	Existing Customer Technical Assistance: Focus workshops on irrigation practices and technologies for HOA Boards, irrigation contractors, landscape contractors	Education and Awareness	All	Demand			Requires tracking of participants and their water use before and after the workshop	Medium
City WEMP	Existing Customer Rebates & Retrofits: Residential Indoor Fixture and Appliance Rebates/Retrofits	Plans and Regulations	Residential	Demand			Based on the findings of the audits, the City may choose to implement selected indoor fixture and/or appliance rebates. Residential indoor per capita water use is currently about 60 gpcd.	High
City WEMP	Existing Customer Rebates & Retrofits: Residential Outdoor Meter Installations	Structure and Infrastructure Projects	Residential	Demand			Based on the findings of the audits, the City may choose to install meters on unmetered outdoor residential uses. No	Low

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
							additional unmetered outdoor accounts exist per the City Database.	
City WEMP	Existing Customer Rebates & Retrofits: Commercial Indoor Fixture and Appliance Rebates/Retrofits	Plans and Regulations	Commercial	Demand			Based on the findings of the audits, the City may choose to implement selected indoor fixture and/or appliance rebates	High
City WEMP	Existing Customer Rebates & Retrofits: Irrigation Equipment Rebates/Retrofits	Plans and Regulations	Irrigation	Demand			Based on the findings of the audits, the City may choose to implement selected outdoor irrigation upgrades and/or rebates	Medium
City WEMP	Existing Customer Rebates & Retrofits: Turf Replacement Programs/Xeriscape Incentives	Plans and Regulations	All	Demand			The City may decide to provide incentives for its customers to remove turf and replace it with native plant materials and/or Xeric landscaping. City will focus on new construction controls of plant materials as more cost effective than turf replacement programs to manage future demand	Medium
City WEMP	Water Waste Ordinance: Time of Day Watering Restrictions	Plans and Regulations	All	Demand			Utilize existing ordinance that includes time of day water restrictions from 9 am to 7 pm for all days in the months from May to September for new and rehabilitated non-residential landscapes. City may consider expanding the ordinance to include all	High

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
							outdoor irrigation including residential and City facilities.	
City WEMP	Water Waste Ordinance: Day of the Week Watering Restrictions	Plans and Regulations	All	Demand			Utilize "Day of the Week" watering restrictions limiting watering to every second or third day is not something that City Council will pass.	High
City WEMP	Water Waste Ordinance: Water Overspray Limitations	Plans and Regulations	All	Demand			Utilize existing ordinance that includes avoidance requirements for overspray, low head drainage, and other conditions for new and rehabilitated non-residential landscapes. City may consider expanding the ordinance to include all outdoor irrigation including residential and City facilities.	Medium
City WEMP	Water Waste Ordinance: Commercial Wise Water Use Certifications (Car Washes, Restaurants, etc.)	Plans and Regulations	Commercial	Demand			Develop certification program for water efficient commercial businesses in City. Cost is for seasonal employees. City does not have the staff to do any inspections or site visits.	Medium
City WEMP	Landscape Design and Installation Rules & Regulations: Landscaper Certification and Training	Education and Awareness	All	Demand			Develop and implement landscaper certification program - must be connected with City permitting and planning processes (including inspections and awarding of	Low

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
							certificates of occupancy). City lacks resources at this time to implement; however, City has landscape requirements for new construction, so planning and permitting efforts address future irrigation practices	
City WEMP	Landscape Design and Installation Rules & Regulations: Irrigation System Installer Certification and Training	Education and Awareness	All	Demand			Develop and implement irrigation installer certification program - must be connected with City permitting and planning processes (including inspections and awarding of certificates of occupancy). City lacks resources at this time to implement; however, City has landscape requirements for new construction, so planning and permitting efforts address future irrigation practices	Low
City WEMP	Rules for New Construction: Reduced Water Use Incentives	Plans and Regulations	All	Demand			The City current operates a Water Treatment Investment Fee incentive program for non-residential construction that provides a 10% reduction in the investment fee with a demonstration of 20% reduced water demand. City may consider expanding	Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
							the ordinance to include all residential construction.	
City WEMP	Rules for New Construction: Indoor Plumbing Requirements	Plans and Regulations	All	Demand			The City current operates a Water Treatment Investment Fee incentive program for non-residential construction that provides a 10% reduction in the investment fee with a demonstration of 20% reduced water demand. City may consider expanding the ordinance to include all residential construction. Enhanced plumbing requirements have been implemented in part by neighborhoods (3 Springs) and by the 2015 International Building Code Adoption.	Medium
City WEMP	Rules for New Construction: Outdoor Irrigation Requirements	Plans and Regulations	All	Demand			City has landscape ordinance that requires irrigation and landscape plan, and certification of finished compliance with the plans, for new and rehabilitation of non-residential landscapes. City may consider expanding the ordinance to include all residential construction.	Medium

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City WEMP	Rules for New Construction: Commercial Cooling and Process Water Requirements	Plans and Regulations	Commercial	Demand			Develop and implement commercial cooling and process water requirements for new homes and/or businesses - must be connected with City permitting and planning processes (including inspections and awarding of certificates of occupancy). City lacks resources at this time to implement, and the City has few commercial customers with cooling tower uses.	Low
City WEMP	Rules for New Construction: City Facility Requirements	Plans and Regulations	Municipal	Demand			Develop and implement City facility water use requirements for new facilities - must be connected with City permitting and planning processes (including inspections and awarding of certificates of occupancy). The City has no current plans to construct new municipal facilities.	Medium
City WEMP	Point of Sales (POS) Requirements	Plans and Regulations	All	Demand			Develop and implement POS requirements for real estate sales and transactions. City lacks resources at this time to implement.	Low

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
City WEMP	Rules for Existing Construction: Alternative Water Supply Options (greywater, rainwater harvesting)	Plans and Regulations	All	Supply			Develop and implement alternative water supply regulations for City. The State of Colorado is currently working on new regulations for greywater use, etc. It is premature for the City to evaluate this program until the State completes its efforts.	Low
City WEMP	Rules for Existing Construction: Commercial Cooling and Process Water Requirements	Plans and Regulations	Commercial	Demand			Develop and implement commercial cooling and process water requirements for existing facilities. City lacks resources at this time to implement, and the City has few commercial customers with cooling tower uses.	Low
City WEMP	Rules for Existing Construction: Outdoor Irrigation Requirements	Plans and Regulations	Irrigation	Demand			Develop and implement outdoor irrigation system requirements (e.g., ET Controller requirements). The City has residential per capita water use currently and it will decrease in the future as passive savings are realized	Low
City WEMP	Education: Rules for Existing Construction: Bill stuffers, Newsletter, Mailings	Education and Awareness	All	Demand			City currently maintains a website with water conservation tips, newsletters and bill stuffers. Need to link any expenditures for printing	High

Source & ID	Mitigation Action	Mitigation Type	Sector or Customer Class	Supply, Demand, or Both	Implementation Period	Responsible Agencies	Implementation Strategies & Comments	2019 Prioritization
							and mailing to overall City water messaging campaign	
City WEMP	Education: K-12 Education	Education and Awareness	Residential	Demand			The City is interested in supporting local K-12 water education. The City will evaluate methods to create K-12 education programs	High
City WEMP	Education: Message Development/ Campaign	Education and Awareness	All	Demand			The City does not have a water messaging campaign; it relies on messaging within the media shed. The City would benefit from a messaging campaign to link its various water conservation efforts with water rates; water waste ordinances; etc.	Medium
City WEMP	Education: Citizens Advisory Group	Education and Awareness	All	Demand			The City current maintains a Citizens Advisory Board on water and other issues. The City currently maintains a Water Commission in addition to the City Council.	Medium
City WEMP	Education: Customer Surveys	Education and Awareness	All	Demand			The City does not currently utilize surveys	Medium

Appendix B: Public Comment Response

Public Comments and Response - January 2, 2020

The City of Durango and specifically the Utilities Department prepared a "Public Review Draft" of its Municipal Drought Management Plan in September of 2019. A public comment period was opened on the 11th of September 2019 and continued for more than 60 days until November 15th, 2019.

Common responses covered the following:

- Support for watering restrictions during drought (responses 5, 6, 7, 8, 9 and 10)
- Comments related to land use planning, growth and water supply (responses 7, 9)
- Support for drought mitigation including xeriscaping, water reuse and conservation (responses 1, 4, 7, 10)

Additional items have been taken into consideration. The Public comments in their entirety along with a response is included below.

1. I could not open the document, so here's my wish list: 1. I hope the plan addresses the City's huge waste of water for watering turf in parks. Take for example Jenkins Ranch Park. I've been trying for years with no luck to get the City to stop overwatering the park to to point where most of it is barely useable due to extremely soggy soils even in during the drought of 2018. 2. I hope the plan includes City involvement, perhaps even leadership, in determining when the D&SNGR stops running the cinder-spewing locomotives during a drought. Do not be fooled into thinking someone else is in charge on this issue and is willing to step up to the plate. Do not buy the line that the train is doing "everything humanly possible." The City has a lot at stake in this matter and should be involved. 11/15/2019 9:35 PM

Response: We had received no other comments in regard to inaccessibility of the PDF document available on our website. Park water use was considered in context of this Drought Management Plan, taking into consideration the significant amounts of use that is made up by park irrigation and the ability to manage demand with Park participation. Prioritization of park watering was identified as a portion of section 2.4 on Water Use Priorities, identifying City uses and breaking out park use between level 3, 4 and 5 priority of various parks related to the various levels of drought which may initiate action according to this plan.

2. Thank you for the opportunity to comment on the City of Durango's proposed Drought Management Plan during the public review period. These comments are submitted on behalf of San Juan Basin Public Health (SJBPH), the local public and environmental health agency serving the city of Durango and the surrounding communities in La Plata and Archuleta Counties. SJBPH recommends the following amendments, clarifications or additions to the Drought Management Plan: On page 4, add SJBPH as an agency that will receive a drought declaration On page 11, note that the 'duplex' category includes multi-family residences with more than 2 units On page 11, we recommend that "nonrevenue water users" be broken up into categories based on use, for sake of consistency with rest of category list On page 11, provide clarification: Which water use category is the water dock in? It should probably be its own category as water is used for multiple (and untracked) purposes after purchase at dock. On page 14, should the objectives be numbered 1-4? Is there a reason they start at 5? On page 16, table 5, priority 1 should be changed from "other emergency services" to "other health and safety services." Many health and safety services, like elder care, urgent care, dialysis, may not qualify as "emergency services." On page 16, the note below Table 5 needs more detail in this plan - what form will water dock restrictions take? Some examples include no new users, water budgets per user, and capping overall use per day, week or month. What is allowed under terms of user agreements? SJBPH recommends, if feasible,

restricting water use through the development of water budgets per user. We further recommend the water budget be based on the number of bedrooms per household rather than historical use per user. If possible, adjust a user's water budget to accommodate increased water usage needs for medical purposes. This system will limit bulk water usage while preserving the city's highest priority, health and safety. On page 17, does "potential reduction in supply to... those outside city limits... when priority is given to key city water users" imply that water tap holders (NOT bulk water customers) who are outside the city limits may face earlier service reductions during times of drought? If so, this appears to treat customers paying into the same enterprise fund differentially even when they are in the same use category on page 17, what impacts are foreseen due to septic systems as it specifically relates to drought? Why is this separated from other water quality impacts? On page 23, add "increased demand at bulk water station as regional wells reduce or cease production" as an expected impact On page 24, add "coordinate with local and state public health on a response" as a strategy to deal with expected health-related impacts On page 25, add "financial impact to water fund as restrictions increase and use declines" as an expected impact. We recommend adding a strategy of reducing non-revenue water use or requiring payments from non-revenue water users to offset losses in revenue. On page 27, add "coordinate with local and state public health on a response" as a strategy for expected air quality impacts on page 33, we recommend include more water-saving strategies under "normal operations." On page 35, Table 9, how will bulk water station indoor volume restrictions be measured and enforced? Finally, as a general comment, we recommend that the City coordinate response strategies with neighboring public water systems to avoid public confusion and arbitrage by water haulers between sources with different restrictions. Thank you again for the opportunity to comment. We commend the City's foresight in acting to prepare for a drought and its attendant impacts to public health. Sherri Dugdale Environmental Public Health Director San Juan Basin Public Health. 11/15/2019 2:07 PM

Response: We have integrated references to SJBH. The "Duplex" category does not include multi-family housing as that housing type falls in as commercial use for account classification. Non-Revenue water users consist predominantly of raw water customers. Water dock use is included as a commercial category. Corrected numbering integrated into the plan. Inclusion of broadened "health and safety" services for Table 5. Water dock restrictions have not been fully formed as additional functionality is being developed for that amenity. Discussion of water dock restrictions have ranged from quantity limitations for general indoor consumption to discontinuance of various classifications of users based on their registration information. A water budget methodology may be available with additional information and functionality as well. Clarification of reduced supply outside of City limits to those obtaining water without existing accounts with the City; no restriction of existing tap owners is contemplated. Septic impacts to water supplies are generally considered a heightened issue during drought as water quality. Individually for the City of Durango exposure to septic system impacts to supply is limited. The reference to Septic impacts has been removed. Amendments to Table 7 have been and will continue to be considered for revisions to the plan. We have conducted water audits on various city facilities and are integrating additional water savings measures into our "normal operations" as we move forward addressing both Drought and general sustainability efforts. As we had observed in the 2018 drought, each water system in La Plata County have and are faced with different supply and demand management issues at different times; we agree regional coordination would provide clearer understanding, however the different situations each provider faces may cause coordination to be infeasible.

3. See email sent 11.14.19. 11/14/2019 5:51 AM (As follows)

John Simpson 1831 Crestview Drive Durango, CO 81301 (970) 946-5423
jds_honduras@yahoo.com November 14, 2019 Via email to jarrod.biggs@durangogov.org and levi.lloyd@durangogov.org City of Durango 949 E. 2nd Ave Durango, CO 81301 Dear City of Durango: This letter serves to provide comments related to the Drought Management Plan. OVERALL COMMENTS This report is overly complicated for Durango and will cause less water to be available when needed most. The plan should have focused on: 1. Recharging the aquifer north of the Animas River pumping plant when water is legally and physically available so that water returns to the river when it is needed during a drought. The simplest method to recharge the aquifer is irrigate as much land as possible. 2. Increasing the supply from the Florida River. 3. If there is a legitimate water shortage, the city can issue an emergency ordinance to stop irrigation with the understanding that stopping irrigation will only provide a short-term benefit. There are long term negative implications from eliminating irrigation. A water conservation plan should not be a virtue signaling platform nor a document to justify previous decisions. Rather it should be an engineering analysis that operates within the legal system of how to best use water and conserve it for later use. This report appears to try to justify previous decisions made by city management, such as punitive water rates, Ridges Basin Water Treatment Plant, and fruitless water restrictions in 2018. Most water conservation plans are designed to keep as much water stored up in the basin as possible, preventing excess water from flowing downstream. This plan is different; it results in water intentionally and without compensation bypassing Durango. The water that is bypassed could be considered wasted. If there is an immediate need to help users downstream, then Durango should consider releasing the water in Lake Nighthorse or build a connection from Lake Nighthorse to Santa Rita Pumping Plant. This 1 plan does not identify who the downstream user will be or why they need the small amount of water this conservation plan might provide. Many downstream users have access to Navajo Reservoir. This plan does not increase the capacity of the system. During a drought, pain should not be shared but rather resources should be shared. If Durango would work with Bayfield, LAPLAWD, Edgemont, Animas Water, Ignacio, and the SUIT, there could be a connected system with direct access to Lemon Reservoir, Vallecito Reservoir, Animas River, Florida River, Pine River and groundwater. Access to Lake Nighthorse through exchange would serve as insurance against a downstream call as long as Ridges Basin Water Treatment Plant isn't built. During the drought in 2002, the City made arrangements with Florida Water Conservancy District to store water in Lemon Reservoir. Since that time, relations with other water users have steadily eroded. There is insufficient discussion of improving groundwater resources. Animas Water Company has proven it is possible to supply water with a groundwater source. There are improvements in supply that can be made but are not discussed in necessary detail. The supply from the Florida should be increased in order to eliminate the need to use the Animas. Increasing the capacity of the Florida will first require an increase in the capacity of the pipeline. Many times there is "free river" available on the Florida and does not require a water right to divert. However, a junior water right should be obtained. Also there is storage water in Lemon Reservoir available for purchase. Furthermore, as farms on the Florida are converted to residences, there could be the ability to obtain irrigation water rights that can be changed to municipal. There is a push to install a hydro-electric plant on the diversion from the Florida; water conservation and the goal to create electricity would then conflict. Durango is moving towards 100% green energy and this report conflicts with that goal by recommending the use of Lake Nighthorse. The plan does not discuss in enough detail the water rights of the Animas -La Plata project. The city can divert directly from the Animas River to College Mesa once a pipeline is connected to the A-LP pumping plant. The benefits of this would be pumping redundancy and ability to purchase cheaper electricity. However, the A-LP water right has federal bypass limitations that prevent the diversion of water during periods of low-flows. A

firm analysis of the storage available in Lake Nighthorse should occur. It is possible it could take years to refill once drained. In support of my position, we should remember Ed Zink, long time resident and water user. He spoke publicly to city council regarding the poor decision to limit access to the water dock. Limiting access to the water dock in 2018 was a conservation decision that was criticized widely. He also would divert water early in the season and apply it to land in the Animas Valley in order to help Durango later in the year. DETAILED COMMENTS Page 1 - The drought committee should include an expert in water rights in southwestern Colorado. Page 2 - If the current population is 20,000 and the maximum demand is 7 MGD, why would 40,000 people need 22 MGD? Consider the negative trajectory of water demand. Consider the decrease of irrigated land in Durango due to infill. 2 Page 2 - The word "augmentation" in Colorado water management usually means the supply of water to an out of priority diversion. Rather than "augmentation", the word "Diversion" or "Non-preferential Diversion" from the Animas would avoid confusion with "augmentation." Page 2 - Diversions from the Animas occur every year, not just in droughts. There is a shortage from the Florida every year, regardless if senior water rights on the Florida are not in priority. There isn't sufficient capacity in the supply pipeline from the Florida. Durango's goal should be to be able to supply all of Durango from each river to provide a fully redundant source. Groundwater could provide another redundant source. Page 3 - Stating "water that was also needed for firefighting" seems to be written to cause alarm. Page 3 - It should be noted that the city has the most senior water rights on the Florida; and the Animas River has never had a call on the river. There has been sufficient quantity in the Animas every day available for diversion. Only a few days did the City opt to not divert, which will occur less frequently as the burn scar heals. Page 4 - Is the city trying to do too much by implementing 4 stages of drought when there has never been a drought in Durango that limited the supply of water to Durango? Simplify. Page 5 - Multi-year droughts will not be mitigated by storage unless storage provides years of water. Storage usually helps during short duration droughts, not multi-year droughts. There are a lot of generalities about water storage in this report, but Durango hasn't ever needed additional storage. Page 5 - Remove discussion of infrastructure failure. Attempting to cover all possible failure scenarios in one document is too difficult. Page 8 - It would be beneficial to state the maximum demand is 6-7 MGD and has been decreasing. It might be useful to also discuss the punishing water rate structure and how it compares to other cities. Page 8 - It should be noted that there has never been a call on the Animas River. It should also be noted that there are many years the Florida River has excess water that could be diverted without a water right. There are also possibilities to purchase water from Lemon. Page 10 - 2010 water usage is out of date. 2019 data is most current. Water usage has been declining. Page 10 - Key collaborators that were left out are other water suppliers. Bayfield, Edgemont, Ignacio, and Animas Water Company in particular. We are close to having a system with 5 treatment plants. Page 12 - More advanced water predictions are being used compared to Durango's model. 3 Page 12 - 2017 Comprehensive Plan did not use an updated water supply plan. The water supply plan was written in 2003. The planner who wrote the Comp Plan was not an engineer. The Comp Plan was written under a city manager who was forced out and utilities director who wasn't an engineer. Reliability of Comp Plan should be questioned. Page 13 - Spills on the Animas should not be confused with a multi-year drought. Spills and ash-flows are events that last for days, not years. VCAP did not include water rights expert. Page 16 - The 5 tiered priority system is too complex. Simply either allow irrigation or don't. Page 33 - Washing of vehicles and power washing uses a negligible amount of water. Page 33 - Irrigating from September through May allows water to return in the fall when flows are lowest. Page 41 - All the supplemental drought monitoring indicators don't help to provide additional water. Although interesting, the use of that data will likely cause staff to make a bad decision. Simplify the study. Page 44 - Figure 7. The

departure from normal at Animas River does not relate to the available supply to the City of Durango. Durango's Animas water rights have always been available at all flows. What is the 4 purpose of the discussion departure from normal as it relates to water availability to the city? The discussion should mention even on the lowest day ever recorded in 2018, the Animas River was not on call; the city was able to divert sufficient water. Durango water rates should be set up to encourage water to be stored when water is available (i.e. encourage irrigation). It appears the authors of this report don't understand the unique situation of Durango. Page 45 - In addition to reservoir levels, the action level should be based on availability of water supply. The College Mesa Reservoir level indicates the severity and duration that the supply has been limited. For example, if the Animas is unavailable for water supply and the reservoir is full, there should be an action level put in place. Consider using action levels that are based on the % of needed supply. For example, if there is 200% of the supply needed and the reservoir is empty, there is no need to worry. But if there is no supply available and the reservoir is full, that is a problem. Page 45 - Using snowpack data has little correlation to water availability for direct flow users with senior water rights, like Durango. Snowpack is important to reservoir owners and those interested in peak flows. Durango's water supply is limited in late summer, when there is no snow. Implementing water restrictions based on snowpack is counter-productive for Durango. Durango and upstream irrigators should overwater in the spring during dry years so that return flows to the river occur later in the summer. Page 47 - Multi-year droughts have less impact on Durango than other communities reliant on storage. Durango's water supply depends on how much water is in the river, whether it be during a 1 year drought or 10 year drought. If there is a multi-year drought, Durango should consider encouraging watering to maintain a vegetative cover that prevents heat island effects. Page 59 - Adding Ridges Bains Water Treatment Plant could decrease the amount of water available in a drought. If the treatment plant operates during a wet year and consumes all the stored water, that water won't be available during the subsequent dry year. A treatment plant could cause harm. Page 60 - The 2019 rate study was written under the supervision of the previous city manager and financial director. The city council has shown significant concerns with the rate study. Clearly staff feels there is a need to justify a rate study in the drought plan by saying it was reaffirmed in 2019. Page 60 - This conservation plan reduces demand yet the city's water rate study assumes a steady growth of water use. The goals of these two plans don't harmonize with each other. This conservation plan also doesn't harmonize with the water quality manual that encourages green spaces. Page 63 - Days of the week watering does not help as much as one expects. It prevents everyone from using water on the same day, which would help a treatment plant running at capacity. Durango's water treatment plant is at about 50% capacity, so this suggestion may not be applicable. Sincerely, VIA EMAIL - John Simpson, P.E., M.S.

Response: The Drought Management Plan is a planning and preparedness document for drought conditions as defined within the document, and while not specifically a water conservation or water engineering master plan, the Drought Management Plan references and considers concepts from other water plans including conservation as a method to limit exposure to Drought. No provision of the Drought Management Plan precludes the City from additional efforts to enhance and develop redundancy in supply and treatment through any means that are both efficient and effective for those purposes. These efforts are ongoing, have and may further involve partnerships with regional partners where such partnerships make sense, and will contribute toward future iterations of the Drought Management Plan as conditions change.

4. The Plan appears well organized and professionally approached. A few suggestions: 1. Encourage grey water systems. Provide educational opportunities and relax building codes to allow. 2. Plant trees and shrubs in abundance. Choose appropriate species for our changing climate. That's it, Thanks, 10/2/2019 11:57 PM

Response: In a number of instances within the document, education as a component of drought management and preparedness is identified. This includes efforts to identify water savings methods and smart water use to include selection and planting of drought tolerant and reduced water demand foliage; as well as potential reuse where it meets code and legal requirements.

5. I think that while it is important to plan for worst case scenarios, things like saying in stage 4 no watering is allowed, only 30 gallons/person/household are just unenforceable and not realistic. People who have years of effort into their yards will just water on the sly. And how is one to know how much water they are using a day? Meters are sometimes difficult to access, inaccurate, and confusing to read. People with different circumstances, health issues, young children, etc. all need differing amounts of water. I think you need to be realistic. Most of us are glad to conserve as much water as possible in drought conditions, but not willing to sacrifice our years of work to develop our property, trees, and plants or the health and even safety of ourselves and family with 30 gallon restrictions, even if we could somehow know this number on a hourly basis. 9/26/2019 3:38 PM

Response: The plan's educational components include water use education to enhance water users' ability to understand their own water consumption patterns. There was specific discussion of trees and shrubs as a higher priority use for City facilities and this was considered as well for other water uses. The ability to read meters with daily and in some cases hourly granularity do allow for recognition and understanding of water consumption to deeper level which may aid in outreach and ultimately enforcement where it may become necessary.

6. I support restricting watering of residential and commercial property. In 1982 the City had watering on MWF _ T TH Sat. The rules were followed, or you received a ticket from the Police department. There was no water served by restaurants. It was serious and we all helped. I support a new Water treatment Plant even more for the city. Drought will return to Durango. Durango must be prepared. 9/25/2019 7:38 PM

Response: No response

7. Why not be proactive? We're creating subdivisions that roll out the green turf and run away, leaving residents to water, water, water. New homes should be required to be built with xeriscaping. Look at Three Springs. It's terrible. Then the drought plan restricts watering the green turf. Let's get rid of it to start with. We redid our lawn with astro turf in the back yard. People with money are re-doing their lawns to be xeriscaping (quite a few in the past two years in Hillcrest), but the less affluent residents can't afford the average \$10K to re-do their yards. New yards, no Kentucky Blue grass. It's cheaper and faster for the developers, but the developers aren't paying those water bills or suffering when we hit those droughts. I didn't see anything in the Drought Plan addressing being proactive. 9/23/2019 10:09 AM

Response: The plan as well as other reference documentation (specifically the Water Efficiency Management Plan and Sustainability Action Plan) have taken into consideration the impact of new development on water supply and how conservation of water resources through design may be incentivized.

8. It's overdue and now welcomed for outdoor watering restrictions to be part of our life.
9/23/2019 6:49 AM

Response: No response

9. Slow development All the hotels and new houses use Lots of water Put a limit based on water consumption Maybe we do not have enough water to continue to grow 9/17/2019 1:02 PM

Response: The City of Durango has worked both to plan for future growth in procuring and managing water resources to enable that capacity while also preparing for periods of resource limitation where it may occur. Additionally, see response to Number 7.

10. Overall the draft is great; however, I would take a look at the following areas. In table 5 (water use priority) I would split out a subset and give it its own category. I would split out residential into its own and put it priority 2 and move everything else down. Also, while in emergencies it is nice to have Lake Nighthorse, I would caution against having this be the de-facto plan with the way the Southern Ute Tribal government works. Depending on the council in place this may not be a viable option when it is needed. I would also encourage Durango to have this be a first step into better water management. Durango should be also looking to reduce water in non drought years as well. I think the residential side is going to be the biggest sticking point and also area to reduce water use. Case in point. I have a friend who rents from a landlord who forces them to water the lawn and they can be kicked out if it is not watered. So, during a drought they would have to forced to between watering the lawn and getting kicked out by the landlord or facing fines from the city. I think more can be done with the Watersmart program. Durango should spearhead or partner with a company to start some water reduction programs. One I can think of is offering some way for residents to pull out turf and replace it with either xeriscaping or native drought resilient plants that do not have to be watered. This could be a one time property tax break, or other incentives to help lower the cost to residents to get rid of the turf.

Response: As was previously mentioned, the Drought Management Plan is not specifically a conservation plan, but the concepts are inherently tied. The City of Durango will look for water efficiency measures as one method to hedge against drought and as part of that effort look for ways to both incentivize conservation as one of the methods.