RESOLUTION #9 (2014)

A RESOLUTION OF THE TELLURIDE TOWN COUNCIL, TELLURIDE, COLORADO, ADOPTING THE *WATER EFFICIENCY PLAN 2014*

WHEREAS, a staff task force, the Ecology Commission, Town Council, the interested public, Kevin Reidy—the Colorado Water Conservation Board staff liaison, and Resource Engineering—the Town's Consultant have worked collaboratively to develop this Water Efficiency Plan; and

WHEREAS, the Water Efficiency Plan contains all of the plan elements that are required by the Colorado Water Conservation Board; and

WHEREAS, the plan clearly details the activities that will be undertaken by the Town and a detailed schedule to implementation those activities over the next 5 years; and

WHEREAS, the Water Efficiency Plan has undergone a 60-day public comment period with no public comments received.

NOW THEREFORE, BE IT RESOLVED THAT THE TOWN COUNCIL OF THE TOWN OF TELLURIDE, COLORADO,

adopts Telluride's *Water Efficiency Plan 2014*.

DONE AND APPROVED, by the Town Council of the Town of Telluride, Colorado, on the 26th day of August, 2014.

TOWN OF TELLURIDE

Stuart Fraser
Mayor of Telluride

Attest:

Lauren Bloemsma
Town Clerk

TOWN OF TELLURIDE
SEAL
SAN MIGUEL COUNTY
COLORADO

Water Efficiency Plan 2014

Adopted by the Telluride Town Council on August 26, 2014, after 60-day Public Comment Period

Town of Telluride

P.O. Box 397

Telluride, Colorado 81435

Executive Summary

The Town of Telluride (Town) is located in the southwest corner of the State of Colorado in San Miguel County; west of HWY 550 between Montrose and Durango. The Town is situated at the end of a three-mile spur off State Highway 145. It is comprised of roughly fifty square blocks and serves approximately 2,360 residents. Its visitor population can be significantly larger than this.

Telluride has been planning for and managing its water supplies and their use since the 1980s. It was not until Telluride's 1994 Water Plan Update (Resource Engineering, 1994) that conservation was formally considered a viable strategy to help decrease or delay the need for new water supply facilities. More recently, the Town identified the need to consider water efficiency as essential to its stewardship of the water that the community puts to use from its watershed. Simply put, using water wisely is the right thing to do. Like CWCB's mission in Colorado, a primary goal of the Town of Telluride is to conserve, develop, protect, and manage its water resources for present and future generations. To accomplish this, the Town is working to optimize water use efficiencies in its water diversion, transmission, distribution, and treatment systems to satisfy water supply needs without compromising desired water services. End use efficiencies are also a part of this strategy.

To develop this Water Efficiency Plan (2014), the Town of Telluride determined to follow the Colorado Water Conservation Board's *Water Conservation Plan Guidelines*, which are used when reviewing and approving Water Efficiency Plans submitted to the Office in accordance with §37-60-126(7). While the Town of Telluride does not meet the criteria for being a "Planning Entity" under the State Statute, the systematic and transparent approach provided in the Guidelines was appealing. Under the State Statute, a "Planning Entity" is defined as any municipality, agency, utility, including any privately owned utility, or other publicly owned entity with a legal obligation to supply, distribute, or otherwise provide water at retail to domestic, commercial, industrial, or public facility customers that has a total demand for such customers of more than two thousand acre-feet. At present, the Town's total annual water demand is approximately 500 acre-feet.

Water Efficiency Goals

By the end of 2014, Telluride's major municipal water system components will include:

- Three (3) water treatment facilities (Mill Creek, Stillwell, and Pandora);
- Water collection and distribution system piping, valves, fire hydrants, and appurtenances; and
- Three (3) water storage reservoirs (Pandora Tank and two tanks at the Stillwell site);
- One (1) wastewater treatment facility (Telluride Regional Wastewater Treatment Plant);
- Wastewater collection system piping and appurtenances; and
- Two (2) non-potable groundwater wells in Town Park that are used for irrigation, street cleaning, and periodic dust suppression.

Developing an ambitious, yet attainable, water efficiency goal for this relatively complex municipal water system was a daunting task. The scope was compounded when staff recognized that Telluride's municipal water system includes all of the users connected to the public system, as well. Public Works Department staff developed draft goals and objectives, which were presented to the Town's Water Efficiency Plan Task Force for review and comment, and subsequently, presented to the Telluride Ecology Commission and the Telluride Town Council for formal consideration. The final goal and supporting objectives for the next 5 years are as follows:

***Goal* – Optimize water efficiency throughout the water and wastewater system, which includes all water users as well as traditional infrastructure. This will:**

- Minimize energy use for pumping and treatment and use of chemicals for treatment; thereby minimizing operational costs;
- Demonstrate leadership to the community that decreasing waste is the right thing to do.
- Provide "insurance" that there will be more water and wastewater capacity available for the local tourist economy, as drought protection, and as in-stream flows to protect or enhance environmental and recreational values that benefit the local economy.

Objectives for the Next 5 Years –

1. Decrease use of potable water for outdoor irrigation by 5%.
2. Reduce wastewater discharges by decreasing indoor residential water use by 5%.
3. Reduce peak day summer demand by 5%
4. Better quantify non-revenue water by applying appropriate principals and methodologies from AWWA M36.

Water Efficiency Activities

A total of 89 water efficiency activities were identified through a brainstorming process that included government staff, and public meetings of the Telluride Ecology Commission and Telluride Town Council. Worksheets D through H in the appendices provide a detailed list of all of the water efficiency activities that were identified during this process. The community also identified selection criteria, which staff applied to the universe of activities to prioritize 38 water efficiency activities for implementation over the next 5 years.

Of the 38 water efficiency activities that were selected for implementation, 25 activities are ongoing. That is, they were implemented in the past and will continue into the future. These include, but are not limited to: metered water usage, bi-monthly billing, implementation of a tiered water service rate structure, and the development of a Water Conservation Ordinance and supporting regulations that require the installation of water efficient plumbing fixtures and irrigation systems.

Approximately 13 new water efficiency activities were identified for implementation. The activities include: providing targeted technical assistance to large water users, improving the quality and integrity of collected water use data, and the development of six (6) educational activities that are aimed at increasing community understanding of the water system and the importance of using water wisely. Targeted water users include the Town's Cemetery, Telluride School District and the Shandoka Affordable Rental Housing Development. Worksheet I in the Appendices provides a detailed list of the water efficiency activities that were selected, estimated water savings—when possible, and estimated cost for each activity.

Implementation & Monitoring

Worksheet J in Appendix 3 provides a detailed Implementation Plan for all of the water efficiency activities identified by the community and staff and prioritized by applying a series of selection criteria. The Environmental and Engineering Division of the Public Works Department will be responsible for monitoring the progress of staff on the implementation plan and whether water use does change as predicted by this Water Efficiency Plan. Worksheets K and L in Appendix 3 provide details of the Monitoring Plan, but overall, monitoring will occur annually when a full year of data are available for analysis from the Water-Wastewater Division of the Public Works Department and from the Finance Department (from the billing files).

Table of Contents

Executive Summary 1

1.0 Profile of Existing Water Supply & Wastewater Treatment System 1

1.1 Overview of Existing Water Supply & Wastewater Treatment System 1

1.2 Water Supply Reliability 7

1.3 Supply-side Limits and Future Needs 10

2.0 Profile of Water Demands and Historical Demand Management 11

2.1 Demographics and Key Characteristics of the Service Area 11

2.2 Historic Water Demands 12

2.3 Past and Current Demand Management Activities and Impact to Demands 20

2.4 Demand Forecasts 21

3.0 Integrated Planning and Water Efficiency Benefits and Goals 25

3.1 Water Efficiency and Water Supply Planning 25

3.2 Water Efficiency Goals 25

4.0 Selection of Water Efficiency Activities 27

4.1 Summary of Identification & Selection Process 27

4.2 Demand Management Activities 27

4.3 Status of Foundational Activities 29

4.3.2 Metering 29

4.3.2 Demand Data Collection and Billing Systems 29

4.3.3 Water Efficiency Oriented Rates and Tap Fees 30

4.3.4 System Water Loss Management and Control 30

4.4 Targeted Technical Assistance and Incentives 30

4.4.1 Level 1: Utility/Municipal Facility Water Efficiency 30

4.4.2 Level 2: Management of Largest Customer Demands 31

4.4.3 Level 3: Management of Remaining Customer Demands 31

4.5 Ordinances and Regulations 31

4.5.1 Level 1 Existing Service Area 31

4.5.2 Level 2 New Construction Regulations 32

4.5.3 Level 3 Point of Sales Ordinances on Existing Building Stock 32

4.6 Education Activities 32

4.6.1 Level 1 One-Way Education Activities 32
4.6.2 Level 2 One-Way Education with Feedback 33
4.6.3 Level 3 Two-Way Education 33
5.0 Implementation and Monitoring Plan 34
5.1 Implementation Plan 34
5.2 Monitoring Plan 34
6.0 Adoption of New Policy, Public Review and Formal Approval 35
6.1 Adoption of New Policy 35
6.2 Public Review Process 35
6.3 Local Adoption and State Approval Processes 35
6.4 Periodic Review and Update 35
References 36
Glossary & Acronyms 38
Appendices 39
APPENDIX 1 Telluride Water Service Rates Ordinance 40
APPENDIX 2 Telluride Municipal Code Section 13 Article 5 Water Conservation Code 41
APPENDIX 3 Statewide Water Supply Initiative Worksheets 42

1.0 Profile of Existing Water Supply & Wastewater Treatment System

1.1 Overview of Existing Water Supply & Wastewater Treatment System

Development of the Town's municipal water system began in 1886 in Cornet Creek. Sanitary sewer was added around 1913. In 1977, the Town completed a Water System Master Plan to develop a long-range strategy that would "assure the Town of having a high-quality water supply of sufficient capacity" (Wright-McLaughlin Engineers, 1977). The study concluded that it was difficult to accurately estimate historical per capita water consumption for the Town's service area because there were no meters or flow measuring devices at the diversion points or at the water treatment plant. General observations by the Wright-McLaughlin Engineers at that time indicated the Town appeared to use an unusually large amount of water, likely because of the deteriorated condition of water lines, bleeding of service lines to prevent freezing in winter, and water wasted by overflowing storage tanks. Today, service meters and water and wastewater plant flow monitoring devices are standard. Service lines are no longer bled in winter and the storage tanks do not overflow. In 1994, the Town updated its Water System Master Plan, including guidelines for implementing numerous water conservation measures (Resource Engineering, 1994). While several of the recommended conservation measures have been implemented by the Town, there is room for improvement to existing water efficiency efforts and it may be time to consider new activities.

The paragraphs below provide a synopsis of Telluride's municipal water system as it is today.

The Town of Telluride has no reclaimed water supplies at this time. It does have two (2) non-potable groundwater wells that it uses for irrigation, street cleaning, and periodic dust suppression. At the end of 2014, Telluride's major existing treated water system components will be:

- Three (3) water treatment facilities or plants (Pandora, Mill Creek, and Stillwell);
- Collection and distribution system piping, valves, fire hydrants, and appurtenances; and
- Three (3) water storage reservoirs (Pandora Tank and two tanks at the Stillwell site).

Its major wastewater treatment system components will be:

- One (1) wastewater treatment facility (Telluride Regional Wastewater Treatment Plant); and
- Collection system piping and appurtenances.

Pandora Water Treatment Plant (WTP) will become the primary source of drinking water for the Town of Telluride and the existing Mill Creek WTP will provide supplemental treated water during peak demands. The Stillwell WTP is anticipated to be normally off line; however, it will remain available for service.

Figure 1.1 shows the general arrangement and capacity of these facilities.

<u>MILL CREEK WATER TREATMENT PLANT</u>

The Mill Creek WTP was completed in 1987. Treatment consists of pre-sedimentation; coagulation; flocculation; sedimentation; filtration with one 0.5 million gallons per day (MGD) conventional sand filter and one 0.5 MGD membrane filter (ultrafiltration); and chlorination disinfection. Water is diverted to the plant from Mill Creek through a diversion structure located on the creek just above the plant. The concrete diversion structure includes a radial gate spanning the creek and a two-level slide gate structure that diverts water into the plant's pre-sedimentation pond. The radial gate is raised occasionally to flush sediment from the structure.

Water treated on site is conveyed in a 10-inch steel pipe to two (2) 250,000-gallon storage tanks located north of Town at the Stillwell WTP. The pipeline, approximately 13,000 feet long, was constructed in 1965 as a raw water

flow line to convey untreated Mill Creek water to the Stillwell WTP for treatment. At the time the Mill Creek WTP was constructed, new air and vacuum relief valves were installed in the line. Inspection of the pipeline at that time found the pipe in generally good condition.

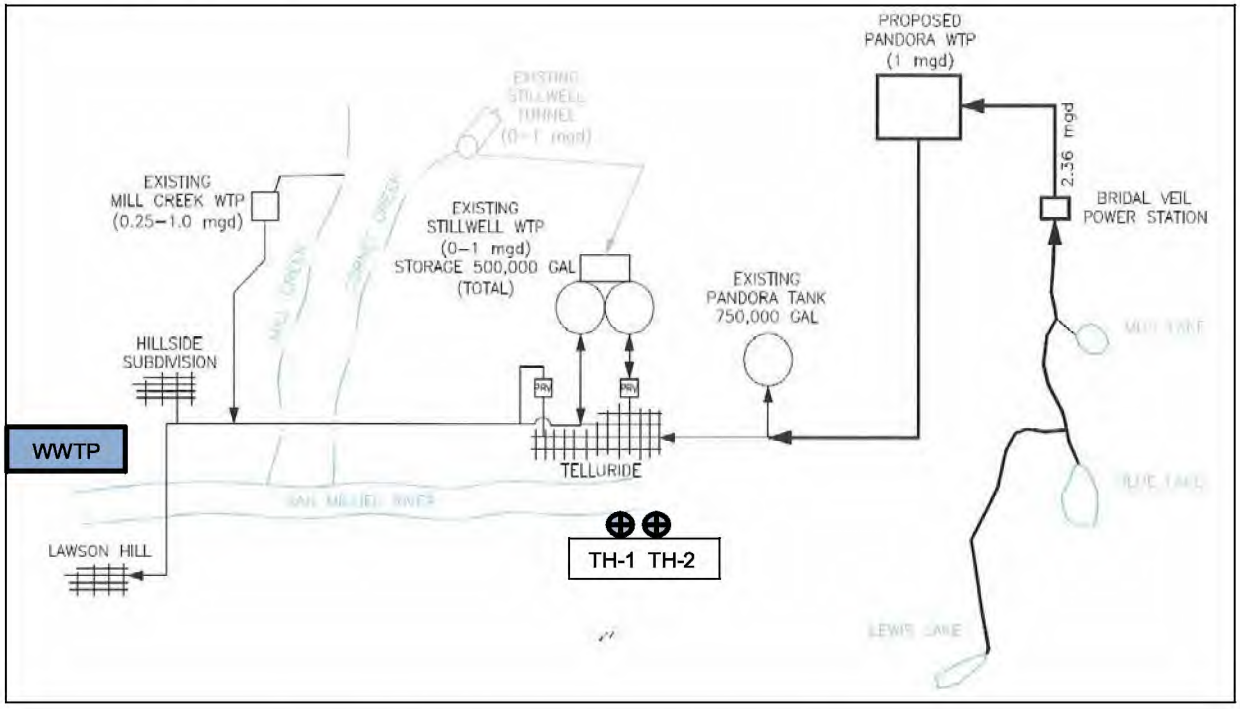

Figure 1.1 Telluride's Water Sources and Major Facilities (URS, 2010)

The Mill Creek WTP's current treatment capacity is 1.0 MGD or approximately 1.5 cfs. The WTP was designed to allow the addition of a third 0.5 MGD filtration unit to increase treatment capacity to 1.5 MGD (2.3 cfs). While the plant has been designed to be expanded to a capacity of 1.5 MGD (2.3 cfs), the raw water supply is not reliable. The amount of available water in the creek can drop to approximately 0.7 MGD. In addition, during periods of high turbidity, such as the spring run-off season, the plant capacity reduces to 0.25 MGD. Therefore, expansion of the Mill Creek WTP is considered infeasible.

Overall, the Mill Creek WTP is in fair condition and consistently produces water that meets drinking water standards (URS, 2010).

STILLWELL WATER TREATMENT PLANT

The Stillwell Water Plant has been in use and serving the Town of Telluride for over 100 years. It consists of the treatment plant itself and two treated water storage tanks. It maintains an important role in water treatment, treated water storage, and water delivery to all of Telluride's water users. The plant sits at an elevation of 9200 feet on the hillside directly north of town.

The Stillwell WTP is used approximately 5 months per year during periods of peak water demand. The current capacity of the Stillwell WTP is 1.0 MGD, with two (2) 0.5 MGD conventional sand filters and chlorine disinfection. The treatment facility has seen upgrades over the years and most recently in 2010, Telluride installed an absorptive media filtration system to remove arsenic.

The two (2) treated water storage tanks are each 250,000 gallon tanks and these remain full and in use year round. They provide the hydraulic water grade line for the Town of Telluride's highest water pressure zone, which then

cascades down to the middle and lower pressure zones. The treated water stored in these tanks supplies Telluride with water for domestic use and fire protection.

Expansion of the Stillwell WTP capacity was rejected due to a constricted site and the unreliability of the raw water supply, which fluctuates between 0.02 and 1.0 MGD. When temperatures reach freezing, Stillwell's raw water supply can be zero (URS, 2010).

PANDORA WATER TREATMENT PLANT

The Pandora WTP will initially have a capacity of 1 MGD or 1.55 cubic feet per second (cfs). The facility will be able to be expanded to 2 MGD or 3.0 cfs in the future. It will house a 700 gallons per minute (gpm) membrane filter, with space provided for a second future 700 gpm membrane unit, clean-in-place (CIP) equipment, ultraviolet (UV) and sodium hypochlorite disinfection systems, other chemical systems. The water supply to the Pandora WTP comes from the Bridal Veil Basin, which adds raw water storage to the Town's water supply through the Blue Lake Reservoir and other associated smaller reservoirs. This new portion of the water system connects to the Pandora Storage Tank, which has capacity to store 750,000 gallons of treated water.

EXISTING TREATMENT & WATER STORAGE SUMMARY

In summary, with the Town's new Pandora Plant coming on-line in late 2014, the total reliable production of the three existing water treatment plants will vary from 1.75 to 3.0 MGD depending upon the season. As a general rule, with the three plants operational, the seasonal production will total 1.75 MGD during the spring and winter, and 3.0 MGD during the summer. If additional sources of raw water supply are required to meet existing and future water demands, it will be possible to increase the capacity of the Pandora WTP by an additional 1 MGD (URS, 2010).

The Town has a total treated water storage capacity of 1,750,000 gallons as summarized in Table 1.1 below.

Table 1.1
Town of Telluride Treated Water Storage Capacity

Water System Component	Water Type	Total Capacity, gallons
Pandora Water Storage Tank	Treated	750,000
Stillwell Water Storage Tank No. 1	Treated	250,000
Stillwell Water Storage Tank No. 2	Treated	250,000
TOTAL		1,750,000

WATER DISTRIBUTION SYSTEM

Telluride retained Farnsworth Group to develop a Capital Asset Maintenance Plan for the existing water and wastewater systems in 2011. The primary purpose of the plan was to prioritize annual infrastructure replacement, keeping in mind the Town's budget constraints. The assessment was based on an inventory of pipe location, pipe age, and pipe construction material (Farnsworth, 2012). The inventory was created in a geographic information system. For this report, relevant elements of the Pandora Water System have been added to the original water distribution system analysis

The Town of Telluride's water distribution system is summarized in Table 1.2 and described below:

- Approximately 109,610 lineal feet (103,710 plus 5,900), or 20.8 miles of pipe with diameters of 4-inch and larger.
- Eight pressure reducing valves.

- One booster pump station
- Approximately 272 isolation valves
- Two pressure zones

Table 1.2

Telluride's Water Distribution Pipe Length by Diameter and Material (updated 2014)

Diameter (m)	Material	Length (ft)
6	AC (Asbestos cement)	3,724
8	AC	888
4	DIP (Ductile Iron Pipe)	3,399
6	DIP	21,206
8	DIP	23,788
10	DIP	23,166
12	DIP	4,647
4	HDPE (High Density Polyethylene	1,541
6	HDPE	23
4	PVC (Polyvinyl Chloride)	5,129
6	PVC	288
10	PVC	787
10	Spiral Wound Steel	11,494
10	Unknown	3,628
12	DIP (Pandora TWL)	5,900
	TOTAL	109,608

Source: Farnsworth Group, 2012

WATER COLLECTION SYSTEM (BRIDAL VEIL BASIN)

The new Pandora WTP and its associated collection system are contemplated to be the Town's primary water supply into the future. The Town divides the collection system for the Pandora WTP into two sections: (1) the Bridal Veil Water System; and (2) the Pandora Raw Water Pipeline, which originates below a Concrete Junction Box located immediately downstream from the Bridal Veil Power House tailrace. The raw water pipeline consists of 12 inch diameter steel and ductile iron pipe extending 10,200 feet and ranging in elevation from 10,295 feet at the power house to an elevation of 9,222.5 feet at the Pandora WTP.

Bridal Veil Water System

The Bridal Veil Water System is located in the watershed above the Concrete Junction Box upstream of the Bridal Veil Power House tailrace. Effective January 8, 2013, Idarado Mining Company and the Town entered into a Comprehensive Settlement Agreement regarding the Bridal Veil Water System, which was recorded September 16, 2013, at Reception No. 429773 of the records of the San Miguel County Clerk and Recorder. The provisions of the CSA contemplate and govern the shared operation and maintenance activities of the Bridal Veil Water System, with the Town "owning" 15/39^{ths} of the system and Idarado Mining Company "owning" 24/39^{ths} of the system. The Bridal Veil Water System includes, but is not limited to, the following components:

1. Blue Lake Reservoir Nos. 1 and 2 (together referred to as "Blue Lake").

2. Blue Lake Pipeline. Beginning at the outlet of Blue lake Reservoir and terminating at the Bridal Veil Power Station.

3. Mud Lake Creek Pipeline. From the head gate on Mud Lake Creek approximately 1500 feet upstream from its confluence with Bridal Veil Creek.

4. Blue Lake Supply Pipeline, Bridal Veil Branch (a/k/a "Lewis Pipeline").

5. Head of Bridal Veil Reservoir (ak/a "Lewis Lake").

6. Bridal Veil Power Station Bypass Conduit. This conduit can be used to divert water in the Blue lake Pipeline around the Bridal Veil Power Station.

7. Falls Crest Diversion Point (a/k/a "Bridal Veil Pipeline and Water Right").

Telluride owns a total of 1,500 acre feet of relatively senior storage rights in the Bridal Veil Basin as follows:

- 920 acre feet in Blue Lake under 8-25-1899 appropriation;
- 413 acre feet in Blue Lake under 7-15-1903 appropriation;
- 67 acre feet in Lewis Lake (Head of Bridal Veil reservoir) under appropriation 7-2-1916.

Telluride also owns 6,198.7 acre feet of junior conditional water storage rights in the basin.

All of the storage rights owned by the Town in Bridal Veil Basin are subject to limitations contained in various water right decrees, as well as the 2013 Comprehensive Settlement Agreement with Idarado Mining Company.

Pandora Raw Water Pipeline

The Pandora Raw Water Pipeline starts at a location identified as the Concrete Junction Box, which is situated just downstream from the Bridal Veil Power Station tailrace. It includes 119 feet of 16-inch ductile iron pipe and 10,081 feet of 12-inch steel and ductile iron pipe, which drops from an elevation of 10,295 feet at the Concrete Box to an elevation of 9,222.5 feet at the Pandora Water Treatment Plant.

TOWN PARK GROUNDWATER WELLS

Telluride owns and operates two (2) non-potable groundwater wells located in the Town Park adjacent to the San Miguel River. The wells are developed in alluvial materials consisting of interbedded rock, sand, and gravel. They are recharged by Bear Creek and the San Miguel River (Resource Engineering, 1994). During periods of prolonged pumping, the wells are hydraulically connected to San Miguel River streamflow. These water supplies are considered reliable from a quantity perspective.

Telluride's Parks and Recreation Department uses water from these wells in spring, summer, and fall for non-potable water uses such as parkland irrigation and for periodic street cleaning, and dust suppression on construction sites and roadways. Telluride Well TH-1 is metered and has been read manually on a somewhat regular basis since 2003. Telluride Well TH-2 is metered and has been read manually on a somewhat regular basis since 2000. Figure 1.2 presents the recorded water usage for these wells over time.

Telluride Well TH-1 is located approximately 400 feet south of the San Miguel River and 1,200 feet down the San Miguel River from its confluence with Bear Creek. Drill Date – started August 3, 1977 and ended on October 7, 1977. Total depth – 90.5 feet. Diameter – varies from 19 inches down to 20 feet, to 12 inches down to 90.5 feet. Volume capacity – 250 – 500 gpm (WWE, 1977). Long term pumping tests indicated a sustainable yield of 230 gpm (0.33 MGD) (Resource Engineering, 1994).

Telluride Well TH-2 is located approximately 150 south of the San Miguel River and 1200 feet down the San Miguel River from its confluence with Bear Creek. Drill Date – started on September 21, 1977 and ended on October 7, 1977. Total depth – 116 feet. Diameter – 10 inches for entire depth. Volume capacity – 1,000 gpm (WWE, 1977). Long term pumping tests indicated a sustainable yield of 640 gpm (0.9 MGD) (Resource Engineering, 1994).

It is unlikely that these water sources will be used for potable water needs in the future. The ground water in the vicinity of the wells was contaminated by mining and milling activities shortly after their construction. Water quality analyses found hexavalent chromium in excess of safe drinking water standards, as well as measurable amounts of lead. Water quality analyses in 2012 indicated that the groundwater from the wells is no longer contaminated; however, the Colorado Department of Public Health and Environment has historically advised Town that the wells do not represent a safe drinking water source (Resource Engineering, 1994).

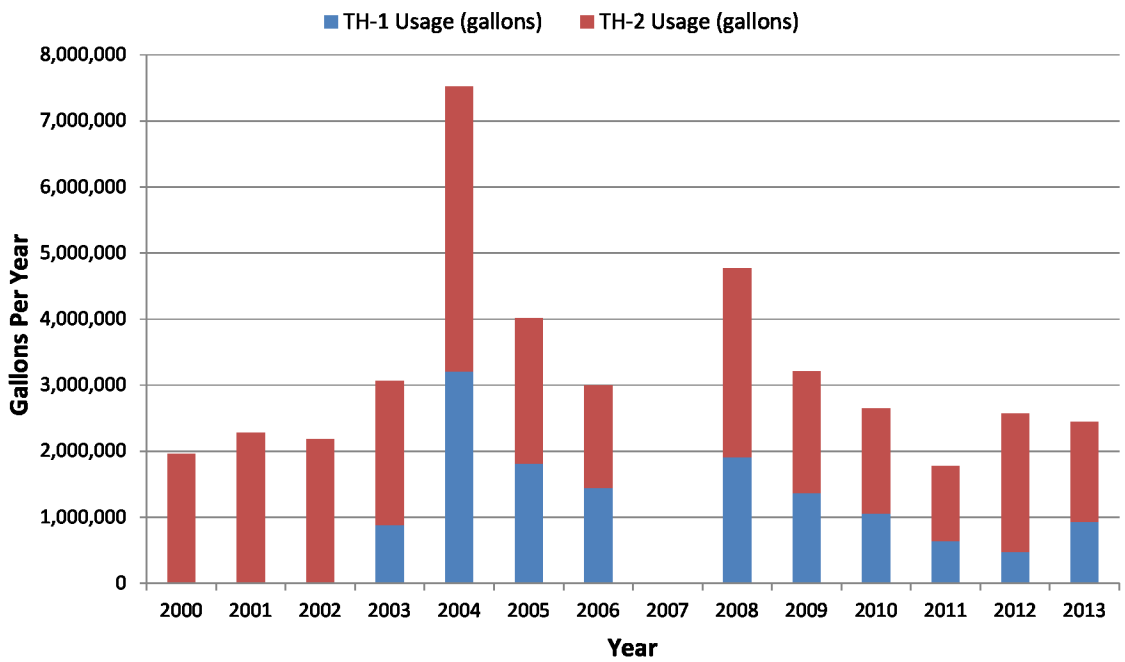

Figure 1.2 Town Park Wells Water Usage Data Over Time

TELLURIDE REGIONAL WASTEWATER TREATMENT PLANT

The Town of Telluride operates and maintains the Telluride Regional Wastewater Treatment Plant (Telluride WWTP), collecting and treating wastewater from the Town of Telluride, the Town of Mountain Village, Aldasoro Ranch, Lawson Hill, Hillside Subdivision, Sunset Ridge Subdivision, and Eider Creek Subdivision. It is an aerobic secondary treatment facility that has a rated capacity of 2.1 MGD.

The Town of Mountain village contributes 35 percent of capital and operating expenses in exchange for 35 percent of the plant's treatment capacity. The treatment plant operates under standards of the National Pollution Discharge Permit System administered by the State of Colorado.

Biosolids (i.e., solids that remain after treatment) from the Telluride WWTP are transported 65 miles west to a land application site and incorporated into the soil as a fertilizer at an agronomic rate for beneficial use. In 2012, this rate was approximately 0.53 tons biosolids per acre or 4.5 percent solids. This equated to approximately 40 pounds of nitrogen per acre based on the *Guide to Fertilizer Recommendation in Colorado, 1985 Co-op Extension Service, C.S.U. Publication No. XCM-37*. This approach to biosolids management is currently being re-assessed.

WASTEWATER COLLECTION SYSTEM

Farnsworth Group developed a Capital Asset Maintenance Plan for Telluride's existing water and wastewater collection and distribution systems in 2011. The primary purpose of the plan was to prioritize annual infrastructure replacement within the Town's budget constraints. The assessment was based on an inventory of pipe location, pipe age, and pipe construction material was created in a geographic information system (Farnsworth, 2012)

The Town of Telluride's wastewater collection system is made of up the following components:

- Approximately 129,068 lineal feet or 24.4 miles with pipe diameters of 3-inches and larger;
- Six (6) sewer lift stations; and
- Approximately 625 manholes.

A more detailed inventory list of the Town's wastewater collection system is shown in Table 1.3 below.

Table 1.3

Telluride's Wastewater Collection Pipe Length by Diameter and Material (2014)

Diameter (m)	Material	Length (ft)
3	Steel	217
4	Clay	722
4	DIP (Ductile Iron Pipe)	280
4	PVC (Polyvinyl Chloride	808
4	Yelomine PVC	1,559
6	AC (Asbestoc Concrete)	1,873
6	Clay	1,385
6	PVC	3,696
8	Clay	16,754
8	DIP	104
8	PVC	72,748
10	PVC	2,856
12	Clay	546
12	PVC	4,211
14	DIP	278
18	Clay	10,211
18	DIP	1,734
18	PVC	7,720
21	PVC	346
24	PVC	1,020
	TOTAL	129,068

Source: Farnsworth Group. 2012

1.2 Water Supply Reliability

Telluride is located within the Colorado and San Juan/Dolores River Basin, which falls within the Colorado Statewide Water Supply Initiative's (SWSI) Southwest Basin. The latest SWSI report (CDM, 2007) has estimated water shortfalls in the range of 5,100 -16,000 acres feet per year by 2050 for the Southwest Basin as a whole, depending on what projects are completed. However, based on SWSI 1 analyses, existing supplies and water rights are anticipated to be adequate to meet future needs in Montrose, San Juan, and San Miguel counties (CDM, 2007).

Telluride began to formally plan for its future water needs with its first Water System Master Plan Report (Wright-McLaughlin, 1977). Since that time, the Town has adhered to the idea that using multiple water sources can

Telluride Municipal Code Section 13-5-40 Water shortages and conservation

(a) Water shortage defined. A water shortage is declared to existing if one (1) or more of the following circumstances exist:

(1) When the Town's total water treatment capacity and potable water consumption are approaching or at eighty percent (80%) for voluntary conservation and ninety percent (90%) for mandatory conservation ; or the Town Manager otherwise determines that the Town's raw water supply or water treatment system is insufficient to satisfy the daily water use demands for the applicable time period. Total water treatment capacity shall be determined by the Public Works Director utilizing the total combined treated water available from the Town's Mill Creek Plant, the Stillwell Tunnel Plant and such other potable water supply systems as may be developed by the Town.

(2) When the Town is unable to treat sufficient water to maintain its treated water storage reservoirs at Stillwell, the Falls at Telluride or any other raw or treated water storage reservoirs developed by the Town, at their maximum capacity.

(3) When an emergency condition arises such as a mechanical breakdown or reduced treatment capacity due to high stream turbidity, insufficient raw water supply or fire flow requirements.

(4) When any or all of the above is anticipated to occur in the near future and it is determine that immediate imposition of the conservation measures is necessary to ensure adequate time for public awareness and education to ensure the level of compliance required.

(5) When implementation of water conservation measures is required by reason of any water court decree or stipulation.

optimize the Town's water rights and area water resources, thereby increasing system reliability while also protecting the overall ecosystem (Wright-McLaughlin, 1977).

Telluride has historically determined water supply reliability through real-time analysis of water demand versus water source volumes and treatment capacity. As a resort community, Town staff conducts limited projections of water supply reliability for high-tourist volume periods, such as the Annual Bluegrass Festival toward the end of June and during the winter holidays. These projections/predictions include no safety factors in the calculations.

Telluride uses water conservation to improve overall water supply reliability, but to date has not relied on conservation to use saved water to support future population growth.

To date, the Town of Telluride has not included potential changes to water availability from climate change as a factor in its water supply planning.

When Telluride's water supply is adversely impacted by source water reliability or drought, specific criteria that trigger water conservation measures are identified in the Town's Municipal Code at §13-5-40 *Water shortages and conservation*, which is provided in the text box above.

MILL CREEK

To date, Mill Creek has been the primary water source for the Town of Telluride. Mill Creek water is generally good, but quality decreases due to turbidity seasonally with spring runoff. This increase in turbidity results in a necessary temporary reduction of Mill Creek WTP capacity in order to maintain treatment standards and backwash demands. The quantity of water in Mill Creek also varies seasonably and at times does not provide sufficient raw water to meet the capacity of the Mill Creek WTP and the Town water demand (URS, 2010).

As there is no method to store water within the Mill Creek system, excess Mill Creek flows continue downstream into the watershed supplementing flows in-stream.

STILLWELL TUNNEL

To date, the Stillwell WTP has been the Town's secondary source of treated water. The Stillwell WTP is fed from groundwater accumulated in the Stillwell Tunnel. This water supply is influenced by historic mining activities and at times has elevated levels of arsenic. Water from the Stillwell WTP must be blended with water from the Mill Creek plant to meet standards (URS, 2010).

There is 1 million gallons of storage capacity within the Stillwell Tunnel WTP system. Any excess flows from the Stillwell tunnel that cannot be stored continue downstream into Cornet Creek and then into the San Miguel River, supplementing in-stream flows.

Firm yield is the amount of water that can be diverted and beneficially used each year including during drought periods and the driest years of record. Data have indicated that the reliable production of the Mill Creek and Stillwell WTPs in a dry year is 0.86 MGD (1.3 cfs) in summer and 0.92 MGD (1.4 cfs) in winter (Resource Engineering, 1994). The Resource Engineering Water Plan Update (1994) noted that an additional winter supply of 1.15 MGD (1.8 cfs) was needed to supply the projected winter peak day demand and an additional summer supply of 1.75 MGD (2.7cfs) was needed to supply the projected summer peak day demand. For this reason, the Town moved forward to develop the Bridal Veil Water System to provide for this shortfall through production at the Pandora Water Treatment Plant.

PANDORA WATER TREATMENT PLANT & THE BRIDAL VEIL WATER SYSTEM

Due to the inability of the raw water supplies in Mill Creek and the Stillwell Tunnel to meet the quality and quantity demands of the Town, additional raw water sources are being developed in the Bridal Veil Basin. Water from the Bridal Veil Basin, which includes Mud Lake, Blue Lake, and Lewis Lake, will provide a high quality, more reliable supply to the Town of Telluride (URS, 2010).

Water from Bridal Veil Basin will supply the Pandora WTP, rectifying problems with the Mill Creek and Stillwell water system components that were identified in previous water system master plans and evaluations. These problems were primarily associated with a lack of a reliable raw water supply.

The Idarado Mining Company also owns water rights and diversion and storage facilities in the Bridal Veil Basin. Many of the facilities are jointly owned with the Town and the two entities are in the midst of coordinating their water supply activities. Historically, the Town has estimated that the firm yield of the Bridal Veil Basin is approximately 2,000 to 2,250 acre feet annually. However, these estimates are based upon hydrologic modeling of the basin, not upon actual operations within the basin. As a result, the Town of Telluride and Idarado Mining Company have agreed to share data and other information relating to the firm annual yield of the Bridal Veil Water System and to periodically update their estimates of firm yield through analysis of multiple years of operations and water supply.

The Town plans to store excess water supplies in the Bridal Veil Water System as drought reserves.

TOWN PARK GROUNDWATER WELLS

As described earlier, the Town uses untreated water from groundwater wells TH-1 and TH-2 for irrigating its playing fields at the Town Park. The wells have been developed in alluvial sands and gravels adjacent to the San Miguel River and production from these wells is considered very reliable even during drought years when surface streams are low.

1.3 Supply-side Limits and Future Needs

Supply-side limits and future water needs of the Telluride water service area are summarized in the paragraphs below. As well, Worksheet A in Appendix 3 provides a summarized tabulation of these water supply limits and future water needs.

FACILITY ENHANCEMENTS

The Town updated its Water Supply Master Plan in 2010. This update substantiated conclusions outlined in the Town's 1994 and 2002 Water Master Plan updates—without the development of additional water supplies, the Town could experience water shortages in the foreseeable future. These findings support the Town's continuing work to complete the construction of the Pandora WTP and its associated water collection and distribution system components.

The Pandora WTP is designed to house future capacity increase of 1.0 MGD, if demand requires. Specifically, the Pandora WTP when it begins operations in November 2014 is sized for 700 GPM. A Phase 2 future expansion will add another 700 GPM, which will result in a total capacity of 1,400 GPM or 2 MGD. However, the Comprehensive Settlement Agreement with Idarado Mining Company at Section XIII.3 (page 19 of 108) states "that in the event Telluride determines it is necessary to increase the capacity of the PWTP, it will give Idarado one year notice prior to operating the PWTP at a capacity greater than 1.0 MGD."

WATER ACQUISITION

The Town owns an extensive water rights portfolio that supports various direct flow and storage diversion sites located throughout the valley. At this time, the Town does not have plans to acquire additional water rights.

As well, with the completion of the Pandora WTP and associated water supplies available from the Bridal Veil Creek Basin, the Town believes that it will have an adequate water supply to meet current and future needs. No future water acquisitions are planned. During the term of the Comprehensive Settlement Agreement with Idarado Mining Company, which continues for 20 years starting January 2012, pursuant to Section XIX.6 (page 25 of 108) Telluride and Idarado have both agreed not to appropriate additional water rights in the upper San Miguel River basin without advance written consent of the other Party.

WATER EFFICIENCY

At this time, it is unclear how water efficiency measures might quantitatively help address the water supply and limits and future needs of Telluride.

2.0 Profile of Water Demands and Historical Demand Management

Telluride's treated water supply is primarily used for domestic in-house purposes and lawn irrigation by residents within the Town's water service area. The Town's geographic water service area remains the same as described in the 1993 Master Plan (Resource Engineering, 1993). Generally, it includes those areas that can be logically serviced through a gravity distribution system including the downtown core, the Falls Subdivision, Brown Homestead, Hillside/Goldking, Sunset Ridge Subdivision, the valley floor (north of Highway 145), and Lawson Hill (Resource Engineering, 2010). It is important to note that Goldking is now called Eider Creek. It is also important to note that a large portion of the valley floor area north of Highway 145 has been proposed for development providing its own water. Figure 2.1 presents a map of the Town of Telluride's water service area.

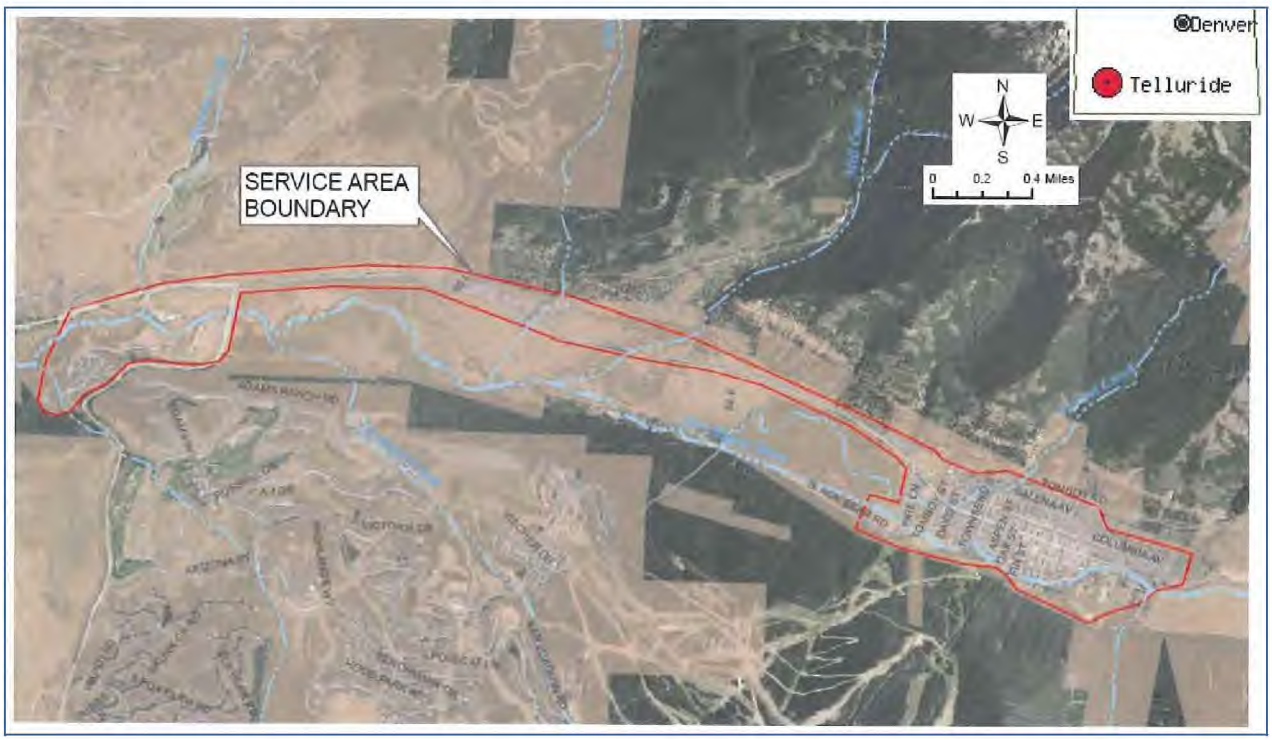

Figure 2.1 Map of the Town of Telluride's Water Service Area (URS, 2010)

2.1 Demographics and Key Characteristics of the Service Area

<u>WATER CUSTOMER CATEGORIES</u>

As of January 1, 2014, as a result of the Water Services Rate Study (Burns & McDonnell, 2013), the Town of Telluride has the following ten (10) customer categories:

1. In-Town Residential
2. In-Town Commercial
3. Construction Discount
4. Out-of-Town Residential
5. Out-of-Town Commercial
6. Commercial – Hillside
7. Hillside (residential)
8. Lawson (residential)

9. Size & Deed Restricted Residential
10. Irrigation Only

SERVICE AREA POPULATION

The 2010 census places the Telluride Service Area Population at 3,300 individuals. Because the Town of Telluride service area is part of a resort economy, the sample population for State of Colorado permits is 9,500 individuals.

AGE OF HOUSING STOCK

The Town of Telluride has no reliable data on the age of housing stock and/or of indoor appliances and fixtures.

AGE OF WATER DISTRIBUTION SYSTEM INFRASTRUCTURE

Pipe age and pipe material were the two main factors used to assess the water system for the Water/Wastewater Capital Asset Maintenance Plan (Farnsworth Group, 2012). Based on as-built records, the Farnsworth Group created layer attribute data tables for use in a Geographic Information System that include pipe material, pipe diameter, and date of construction. Figure 2.1 depicts the age of the pipe that makes up Telluride's water distribution system. In general, it ranges from less than 1 year old (the Pandora treated water line) to over 60 years old (sections of pipe associated with the Mill Creek Water Treatment Plant.

Figure 2.1 Water Distribution Pipe Age

2.2 Historic Water Demands

Table 2.1 presents 26 years of maximum (MDD) and average daily demand (ADD) in gallons per day for each year, for the winter season (October through March), and for the summer season, (April through September). Figure 2.2 and Figure 2.3 compare 5-year averages for the yearly, winter, and summer ADDs and MDDs, respectively.

Overall, the ADDs during the summer season have increased over time, while the winter ADDs have decreased. ADDs have been decreasing since 2003. Winter use appeared to peak in the period between 1994 and 1998, while

summer use peaked in the period between 1999 and 2003. The MDDs for all seasons increase over time by approximately 7 percent.

TABLE 2.1

Average Day Demand (ADD) and Estimated Maximum Day Demand (MDD) in gallons per day

Year	Total MDD[1]	Total ADD[2]	Winter MDD[3]	Winter ADD[4]	Summer MDD[5]	Summer ADD[6]
1988		440,518	696,600		883,700	
1989	508,017	461,833	508,017	461,833	969,850	554,254
1990	464,467	422,243	646,567	368,428	886,710	480,837
1991	465,556	423,233	592,526	403,689	888,790	442,375
1992	530,030	481,845	674,583	445,536	1,011,875	518,200
1993	410,332	373,029	522,240	398,981	783,360	347,656
1994	534,366	485,788	680,103	425,734	1,020,154	545,443
1995	535,504	486,821	681,550	434,864	1,022,325	537,798
1996	612,242	556,584	779,217	467,368	1,168,825	645,298
1997	629,541	572,310	801,234	486,549	1,201,851	655,948
1998	645,216	586,560	821,184	497,607	1,231,775	674,239
1999	675,158	613,780	859,292	520,826	1,288,937	707,191
2000	598,813	544,375	762,125	462,185	1,143,188	625,565
2001	587,232	533,848	747,387	429,850	1,121,080	637,058
2002	556,177	505,615	707,861	428,717	1,061,792	581,520
2003	548,212	498,374	697,724	411,348	1,046,586	585,219
2004	570,907	519,006	726,608	403,468	1,089,913	656,997
2005	588,300	534,819	748,746	426,661	1,123,119	642,410
2006	486,183	441,984	618,778	365,290	928,167	519,450
2007	500,269	454,790	636,707	395,055	955,060	514,565
2008	522,208	474,735	664,629	375,312	996,943	573,569
2009	482,318	438,471	613,859	347,458	920,788	528,506
2010	526,357	478,506	669,909	364,490	1,004,863	590,871
2011	527,521	479,564	671,390	366,541	1,007,085	592,105
2012	507,819	461,654	646,315	339,597	969,473	582,390
2013	509,239	462,945	648,123	358,815	972,184	565,780
AVERAGE	540,879	491,708	685,067	415,448	1,032,588	572,210

Source: Water production data provided by the Telluride Water-Wastewater Division (2013)

Column Explanations:

Column 1 – Estimated total maximum day demand is calculated as the sum of the measured maximum day demands for each month, divided by 365 days and then multiplied by 1.1.

Column 2 – Total average day demand is calculated as the sum of the measured annual water production, divided by 365 days.

Column 3 – Estimated winter maximum day demand is calculated as the sum of the measured maximum day demands for each month, divided by 365 days and then multiplied by 1.4.

Column 4 – Estimated winter average day demand is calculated as the average of the measured water production from October through March.

Column 5 – Estimated summer maximum day demand is calculated as the sum of the measured maximum day demands for each month, divided by 365 days and then multiplied by 2.1.

Column 6 – Estimated summer average day demand is calculated as the average of the measured water production from April through September.

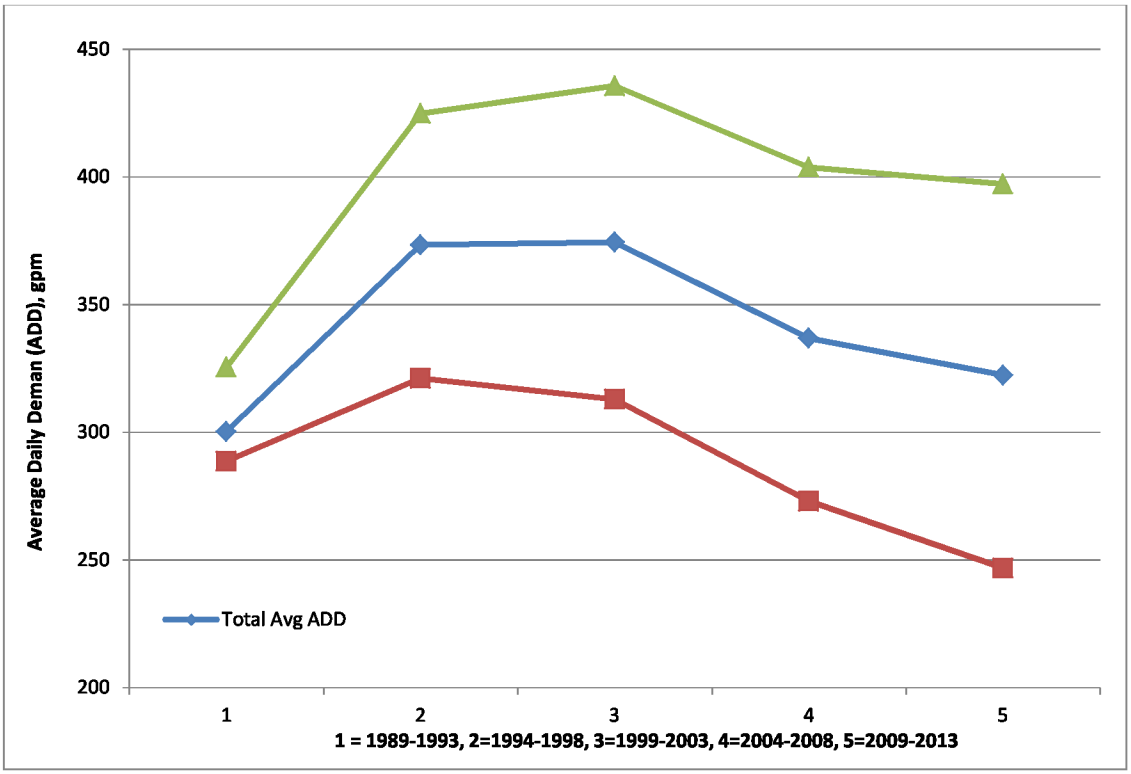

Figure 2.2 Average daily demand for treated water over time (5-year averages)

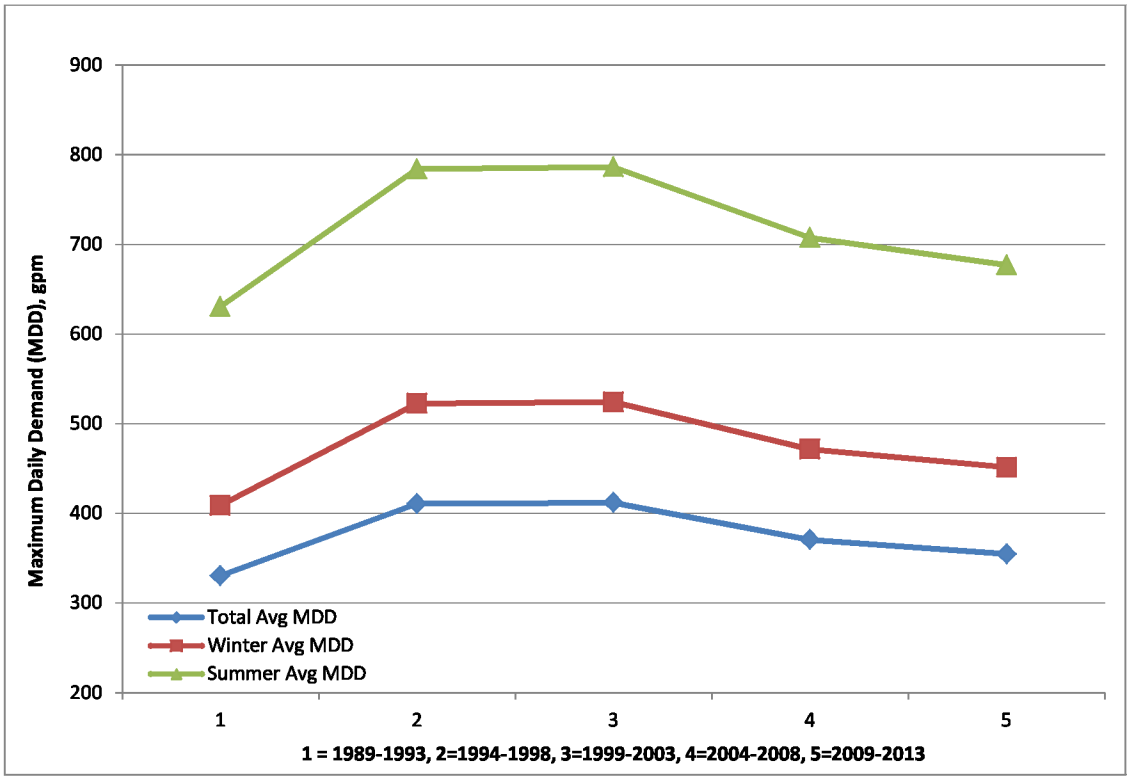

Figure 2.3 Maximum daily demand for treated water over time (5-year averages)

LIMITS ASSOCIATED WITH THE AVAILABILITY OF THE DEMAND DATA

Table 2.2 summarizes the Town's total treated water volume and allocates the distributed water into billed and non-billed categories for the period 2009 through 2013.

TABLE 2.2

Total Annual Distributed Treated Water Volume[1] Billed and Non-Billed Volume[2], millions of gallons, 1989 – 2013

	Treated Water Volume			Billed Volume of Distributed Treated Water			Non-revenue Water Volume	Raw Distributed[3] Non-potable Water & Reclaimed Water
Year	Total	Winter (Oct-Mar)	Summer (Apr-Sep)	Total	Winter (Oct-Mar)	Summer (Apr-Sep)		
1989	169	67	102	-	-	-	-	-
1990	154	66	88	-	-	-	-	-
1991	154	73	81	-	-	-	-	-
1992	176	81	95	-	-	-	-	-
1993	136	58	64	-	-	-	-	-
1994	177	62	103	-	-	-	-	-
1995	178	64	100	-	-	-	-	-
1996	203	70	118	-	-	-	-	-
1997	209	71	123	66	27	31	143	-
1998	214	73	124	-	-	-	-	-
1999	224	77	129	107	-	-	117	-
2000	199	66	116	-	-	-	-	2
2001	195	63	118	110	53	57	85	2
2002	185	63	107	124	55	69	61	2
2003	182	60	108	-	-	-	-	3
2004	189	56	121	115	53	63	74	8
2005	195	62	120	-	-	-	-	4
2006	161	54	94	123	56	67	38	3
2007	166	59	94	142	66	77	24	0
2008	173	52	108	125	60	64	48	5
2009	160	51	97	123	55	69	37	3
2010	175	53	109	118	54	64	57	3
2011	175	51	111	118	54	63	57	2
2012	169	48	110	110	49	61	59	3
2013	169	65	104	115	53	62	54	2
AVERAGE	**179**	**63**	**106**	**115**	**53**	**62**	**66**	**3**

Source: Water production data provided by the Telluride Water-Wastewater Division (2013)

[1] Based on billed water volume sales from metered accounts.
[2] Based on treated water data from the water treatment plant
[3] Based on meters on the Town Park Wells TH-1 and TH2, which are used only for irrigation of Town Park playing fields

The Telluride Parks and Recreation Department uses raw water from the Town's wells TH-1 and TH-2 to irrigate the playing fields in the park. This usage is metered. Both Lawson Hill and the Hillside subdivision use raw water sources, which are completely independent from the Towns water service, for landscaping irrigation. The Town of Telluride has no data regarding water volumes used.
There is currently no reclaimed water use within the Telluride Water Service Area.

The Town currently has no method to account for non-revenue water use that is more specific than subtracting the total billed water volume from the total produced water volume.

WATER DEMAND BY CUSTOMER CATEGORIES

Prior to January 1, 2014, the Town divided its customers into 8 categories. Two additional categories – irrigation only and small deed-restricted – were added starting in 2014. These two new categories will not be part of this 2014 analysis, but will be included in future updates of Telluride's Water Efficiency Plan.

Table 2.3 shows the annual treated metered water use by customer category from 2001 through 2013. Note that data from 2003 are not available. Continuing to maintain such data into the future will enable more robust long-term data analysis of water use trends by customer type. The only raw water/reclaimed metered water use within the Town's Service Area is by the Telluride Parks and Recreation Department, which uses raw water from the Town's wells TH-1 and TH-2 to irrigate the playing fields in the park. These annual data are presented in Table 2.2, but are not included in Table 2.3.

Both Lawson Hill and Hillside Subdivision use raw water to irrigate. Lawson Hill uses its water rights from Skunk Creek, diverting approximately 0.25 cfs to irrigate landscaping on common areas of the Property Owners' Association. Hillside uses Telluride's right to Eider Creek, when it is not being used by the Town to irrigate the Valley Floor. They also make use of a spring that goes to a tank and into a water system used by the Subdivision prior to it being connected to Telluride's treated water system. It is estimated that the subdivision uses between 6,000 and 7,000 gallons per day during the irrigation season.

TABLE 2.3

Telluride Water System Historical Demand Volume by Customer Category
Thousands of Gallons, 2001 - 2013

Year & Billing Period	Com-mercial In-Town	Com-mercial Hillside	Com-mercial Out of Town	Con-struction Discount	Hillside	Lawson	Residential	Residential Out of Town	Total
2001 Jan-Feb	11,247	37	413	0	502	883	5,273	0	18,355
2001 Mar-Apr	12,186	36	426	0	317	878	4,630	0	18,473
2001 May-Jun	10,068	35	506	0	466	1,534	8,598	0	21,207
2001 Jul-Aug	12,347	21	543	0	290	779	6,717	0	20,697
2001 Sep-Oct	11,294	15	465	0	342	885	5,856	0	18,857
2001 Nov-Dec	7,397	18	252	0	303	831	3,650	0	12,451
2001 TOTAL	64,539	162	2,605	0	2,220	5,790	34,724	0	110,040
2002 Jan-Feb	14,110	8	385	0	352	988	5,261	0	21,104
2002 Mar-Apr	11,883	15	401	0	324	925	4,521	0	18,069
2002 May-Jun	11,024	3	383	0	302	969	16,608	0	29,289
2002 Jul-Aug	14,619	0	658	0	401	1,126	8,369	0	25,173
2002 Sep-Oct	10,063	0	454	0	263	899	5,562	0	17,241
2002 Nov-Dec	7,531	0	249	0	277	842	4,273	0	13,172

Year & Billing Period	Com-mercial In-Town	Com-mercial Hillside	Com-mercial Out of Town	Con-struction Discount	Hillside	Lawson	Residential	Residential Out of Town	Total
2002 TOTAL	69,230	26	2,530	0	1,919	5,749	44,594	0	124,048
2004 Jan-Feb	11,078	23	319	0	369	769	5,674	0	18,232
2004 Mar-Apr	10,563	24	366	0	435	1,040	3,741	35	16,204
2004 May-Jun	9,959	49	391	0	414	1,088	9,665	186	21,752
2004 Jul-Aug	13,391	55	381	0	371	1,036	10,458	150	25,842
2004 Sep-Oct	10,396	39	364	0	340	926	7,255	113	19,433
2004 Nov-Dec	7,675	27	322	0	321	837	4,695	11	13,888
2004 TOTAL	63,062	217	2,143	0	2,250	5,696	41,488	495	115,351
2005 Jan-Feb	10,955	20	320	0	376	892	5,189	13	17,765
2005 Mar-Apr	11,100	18	339	0	340	812	4,873	11	17,493
2005 May-Jun	11,100	31	380	0	446	1,164	9,805	133	23,059
2005 Jul-Aug	15,552	34	436	0	390	1,132	10,818	255	28,617
2005 Sep-Oct	10,329	12	306	0	307	832	6,768	118	18,672
2005 Nov-Dec	0	0	0	0	0	0	0	0	0
2005 TOTAL				0					
2006 Jan-Feb	12,255	48	353	0	380	952	6,032	11	20,031
2006 Mar-Apr	10,046	400	316	0	335	858	4,930	31	16,916
2006 May-Jun	12,624	134	593	0	412	1,372	10,220	174	25,529
2006 Jul-Aug	15,485	49	421	0	428	934	8,525	108	25,950
2006 Sep-Oct	10,798	40	369	0	527	979	6,460	115	19,288
2006 Nov-Dec	8,944	13	309	0	477	897	4,757	12	15,409
2006 TOTAL	70,152	684	2,361	0	2,559	5,992	40,924	451	123,123
2007 Jan-Feb	13,490	19	415	0	554	987	5,986	32	21,483
2007 Mar-Apr	9,880	20	553	0	491	822	5,061	12	16,839
2007 May-Jun	10,290	389	450	0	463	1,306	7,724	96	20,718
2007 Jul-Aug	16,984	258	392	0	572	1,259	11,858	142	31,465
2007 Sep-Oct	0	0	0	0	0	0	0	0	37,975
2007 Nov-Dec	7,916	464	119	0	975	4,420	60	0	13,954
2007 TOTAL				0					142,434
2008 Jan-Feb	13,301	343	101	0	547	989	6,390	8	21,679
2008 Mar-Apr	10,790	331	110	0	423	967	5,599	6	18,226
2008 May-Jun	9,858	331	146	0	466	1,091	0	0	20,650
2008 Jul-Aug	13,688	369	149	0	529	1,126	11,726	118	27,705
2008 Sep-Oct	9,559	348	181	0	479	1,024	7,823	51	19,465
2008 Nov-Dec	9,482	263	529	0	492	972	5,124	15	16,877
2008 TOTAL	66,678	1,985	1,216	0	2,936	6,169	36,662	198	124,602
2009 Jan-Feb	10,505	291	87	0	449	951	5,454	16	17,750
2009 Mar-Apr	8,372	278	216	0	414	957	5,016	58	15,311
2009 May-Jun	12,648	390	638	14	428	941	7,417	127	22,603
2009 Jul-Aug	15,466	1,182	403	0	492	1,141	10,947	145	29,776
2009 Sep-Oct	10,623	440	647	2	404	1,029	9,179	68	22,392

Year & Billing Period	Com-mercial In-Town	Com-mercial Hillside	Com-mercial Out of Town	Con-struction Discount	Hillside	Lawson	Residential	Residential Out of Town	Total
2009 Nov-Dec	8,217	286	209	0	414	987	5,317	17	15,445
2009 TOTAL	65,831	2,867	2,200	16	2,601	6,006	43,330	431	123,277
2010 Jan-Feb	10,313	418	205	0	426	917	5,474	30	17,783
2010 Mar-Apr	10,222	324	285	0	506	1,042	5,501	70	17,950
2010 May-Jun	9,960	449	304	0	456	1,177	9,535	136	22,017
2010 Jul-Aug	12,824	507	445	0	492	1,063	11,743	132	27,206
2010 Sep-Oct	9,019	456	223	0	319	819	7,079	141	18,056
2010 Nov-Dec	8,311	289	261	0	395	984	5,112	21	15,373
2010 TOTAL	60,649	2,443	1,723	0	2,594	6,002	44,444	530	118,385
2011 Jan-Feb	10,989	409	247	0	486	889	6,045	28	19,093
2011 Mar-Apr	8,604	341	213	0	422	847	5,473	22	15,922
2011 May-Jun	10,035	415	281	0	474	1,030	8,782	99	21,116
2011 Jul-Aug	13,004	453	324	0	364	1,047	11,454	189	26,835
2011 Sep-Oct	9,421	416	289	0	420	868	8,360	121	19,895
2011 Nov-Dec	7,282	384	283	0	378	805	5,495	13	14,640
2011 TOTAL	59,335	2,418	1,637	0	2,544	5,486	45,609	472	117,501
2012 Jan-Feb	10,176	429	321	0	417	934	6,504	17	18,798
2012 Mar-Apr	7,217	321	284	3	398	768	5,171	20	14,182
2012 May-Jun	8,786	453	271	21	485	1,094	10,431	175	21,716
2012 Jul-Aug	11,948	618	268	11	459	1,006	10,070	112	24,492
2012 Sep-Oct	10,106	438	499	1	341	1,223	6,562	57	19,227
2012 Nov-Dec	5,525	294	187	1	311	947	3,937	13	11,215
2012 TOTAL	53,758	2,553	1,830	37	2,411	5,972	42,675	394	109,630
2013 Jan-Feb	10,129	380	425	22	429	1,296	7,062	38	19,781
2013 Mar-Apr	7,714	326	375	19	345	1,180	5,170	22	15,151
2013 May-Jun	9,873	411	385	8	387	1,368	9,123	119	21,674
2013 Jul-Aug	12,693	473	414	6	393	1,393	10,933	131	26,436
2013 Sep-Oct	8,737	352	353	6	377	1,478	6,360	21	17,684
2013 Nov-Dec	7,072	299	339	8	420	1,227	4,982	13	14,360
2013 TOTAL	56,218	2,241	2,291	69	2,351	7,942	43,630	344	115,086

Source: Finance Department Billing Records Data

Figures 2.4 and 2.5 present data for residential and commercial water users over time by billing period. Not surprisingly, the July-August use/billing period is highest for all user groups. This summer period is when summer irrigation is greatest and only a small proportion of irrigation usage is metered separately. The commercial users' secondary peak usage is during the peak holiday season.

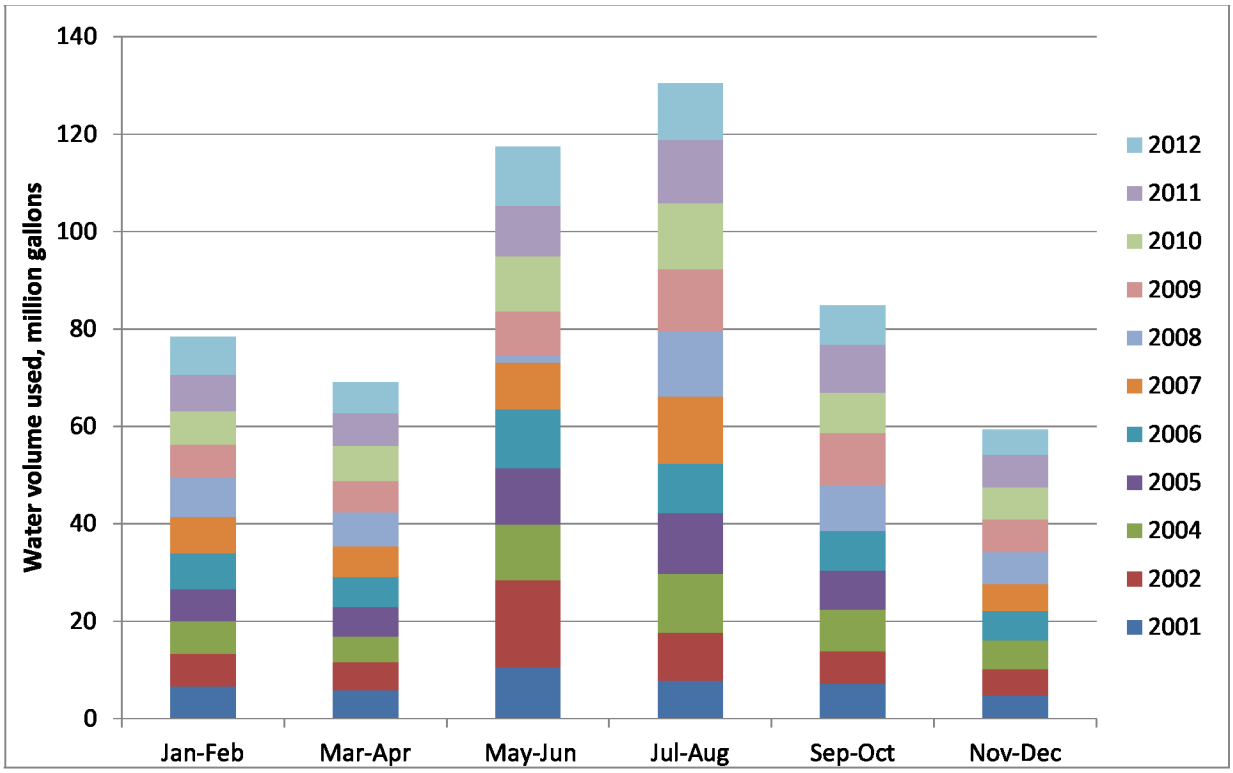

Figure 2.4. Residential water usage by billing period, 2001 through 2012.

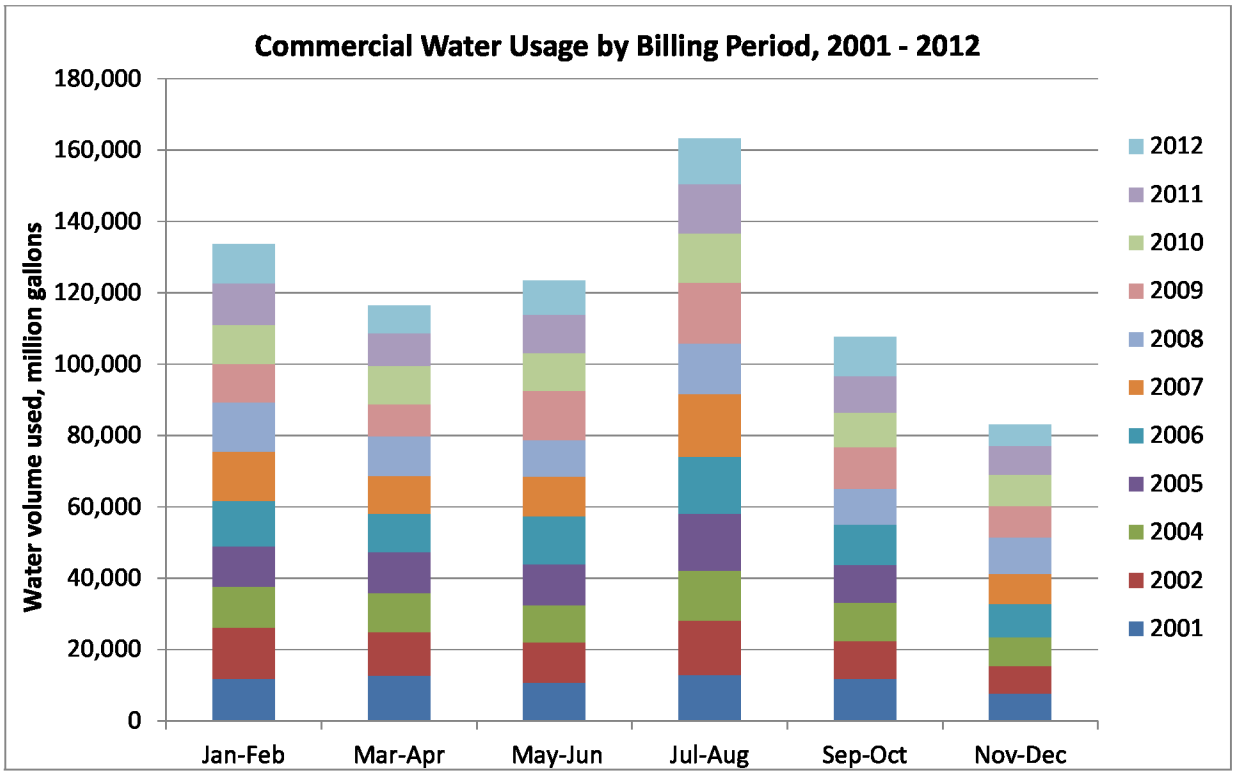

Figure 2.5 Commercial water usage by billing period, 2001 through 2012.

LARGEST WATER USER GROUPS

The largest water user groups by volume are in-town commercial and in-town residential, respectively. It should be noted that the term "commercial" is applied not only to businesses, but also to hotels and condominium complexes of 8 units or more. Both in-town commercial and in-town residential water users implemented basic water efficiency appliances and devices as required in Telluride's building codes when the spaces were built or remodeled. No one water user customer category has been targeted for specific water efficiency activities. Therefore, it is not possible to attribute reductions in water use over time to specific activities.

2.3 Past and Current Demand Management Activities and Impact to Demands

In its report on water demand (2010), Resource Engineering noted an observed decline in overall domestic water use. Water demand peaked in 1999 followed by a general decline through 2013. See figures 2.2 and 2.3. Although overall average water demand has declined in recent years, peak day water use patterns, both summer and winter, have remained similar over the last 13 years.

CONSERVATION MEASURES

Resource Engineering (2010) attributed the decline in domestic water demand to a series of water conservation measures implemented by the Town of Telluride. From a broader perspective, it may be that the Town was also seeing the results of the Energy Policy Act of 1992, which mandated the manufacture of low flow toilets and showerheads. These measures, which are classified as "Foundational Conservation Measures" by the Colorado Water Conservation Board, are detailed below.

- *Metering*. Historically, like many small, mountain towns, Telluride did not meter treated water use. The first attempts to meter potable water use were in the 1970s. The success of this early program was limited, at best. The 1993 Master Plan recommended trying metering again. This last round was completed between 2003 and 2006, over 10 years later. According to the available data, only a few water users remain unmetered due to the difficulty of meter installation. As opportunities arise, these accounts are being metered over time.

- *Water Conservation Ordinance*. Telluride developed and implemented a Water Conservation Ordinance within its Municipal Code in 2002-2003 in response to the 2002 drought and concerns that the Town's existing water supplies would not meet demand in times of drought. The Ordinance is broken into three parts: (1) Installation of high-efficiency fixtures; (2) Landscaping; and (3) Water shortages and conservation (i.e., emergency conservation measures). Telluride's Green Building Code also requires specific high-efficiency standards for plumbing that supplement the Water Conservation Ordinance.

- *Water Main Replacement*. The Town replaced the aging, leaky water main along Colorado Avenue from Willow Street to Aspen Street in the summer 2009. Water service lines to individual buildings were updated as part of a coordinated effort during the main line replacement. The water savings that resulted from this major replacement/repair project has not been quantified.

- *Systematic Leak Detection and Repair*. The Public Works Department implemented a leak detection and repair program in the mid-1980s. Currently, a new leak detection survey is conducted every 18 months. Repairs are then scheduled to occur soon thereafter to minimize system losses due to leaks.

- *Rate Structure*. The Town completed a water rate analysis in 2004, which culminated in the adoption of an increasing block rate structure that penalizes excessive water usage. The Town updated this study in 2013 (Burns & McDonnell, 2013), creating two new rate categories and making fees for excessive water use even steeper. Figure 2.5 presents the changes in cost for increasing water use under the previous

billing system and the current billing system and compares these rates with the rates charged by other jurisdictions.

- *Green Building Code*. Telluride developed and implemented a Green Building Ordinance within its Municipal Code in 2006. The Ordinance requires specific low-flow appliances for new construction and significant remodels.

The above-described improvements and conservation measures appear to have had a noticeable impact on average day demand (ADD), decreasing ADD overall by approximately 25 percent, winter ADD by approximately 31 percent, and summer ADD by approximately 20 percent since demand peaked in 1999.

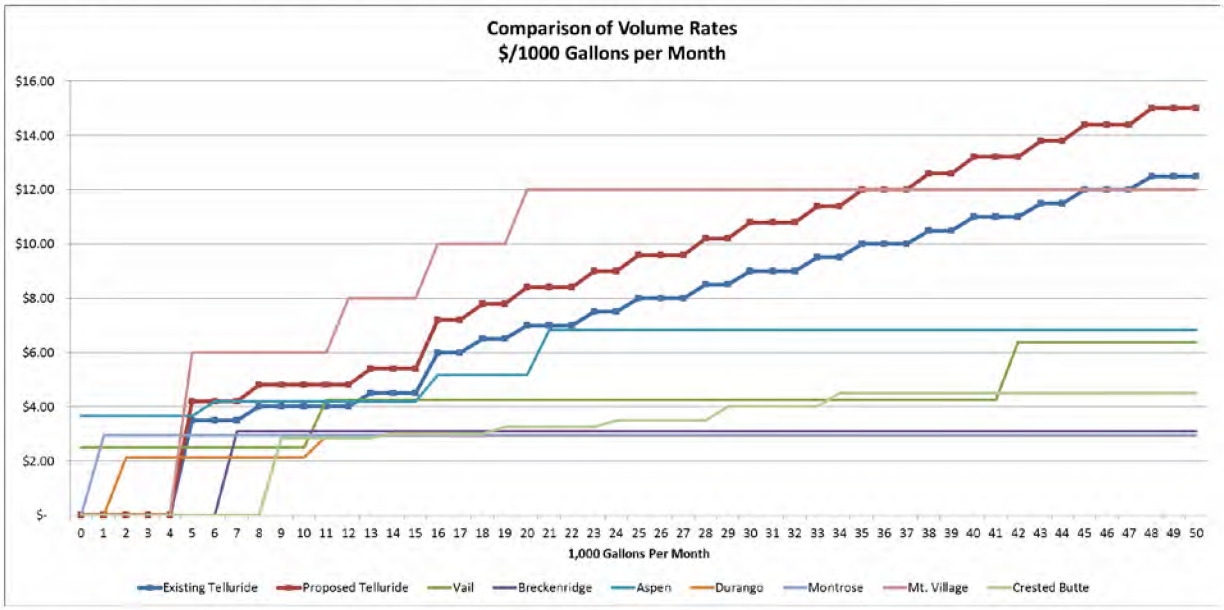

Figure 2.5 The increasing block rate structure proposed to the Telluride Town Council (the red line) as part of water service rate adjustment discussions in fall 2013 was adopted and put into effect starting January 1, 2014.

2.4 Demand Forecasts

The planning horizon for this Water Efficiency Plan is 5 years (i.e., through 2019), which is intended to coincide with the planning horizon of the Town's utility rate studies (Burns & McDonnell, 2013a and 2013 b).

The Town has updated its Water Supply Master Plan and associated demand forecasts on three occasions: 1993, 2002, and 2010. Each demand forecast was based upon the most recent water use records, existing and projected populations, and limits associated with the Town's water service area. As noted earlier, the studies have documented a decline in per capita water use due to a variety of factors including leak detection and repair and water conservation. The future demand forecast for each of the referenced studies is summarized in Table 2.4 below.

TABLE 2.4

Telluride's Projected Water Demand at Build-Out Within its Service Area

	Winter				Summer			
	Avg. Day		Peak Day		Avg. Day		Peak Day	
	mgd	cfs	mgd	cfs	mgd	cfs	mgd	cfs
1993 Master Plan	1.49	2.31	2.08	3.22	1.80	2.79	2.61	4.05
March 2002 Update	1.15	1.78	1.61	2.49	1.43	2.22	2.08	3.22
April 2010 Update	1.08	1.67	1.52	2.34	1.34	2.07	1.96	3.02

Source: Resource Engineering, 1993, 2002 and 2010.

As shown in the above in Table 2.4, it is projected that the Town will need to divert approximately 2.0 mgd (3.0 cfs) of water during peak day summer demands at build-out conditions. Public Works has determined that there have been no significant changes between 2010 and early 2014 to require revising these projections. The assumptions regarding population, residential and commercial uses and associated water demands that were used in the Town's 2010 Master Plan update is summarized in Table 2.5 below.

TABLE 2.5

Population and Water Demand Projections for Town of Telluride Geographical Water Service Area (Resource Engineering, 2010)
(In-House and Irrigation Demand Reduced by 10.6% from 2/12/2002 Update to Reflect Town Conservation Measures)

LOCATION Use Type	PROJECTED POPULATION			PROJECTED IN-HOUSE DEMAND				PROJECTED IRRIGATION DEMAND		PROJECTED MAXIMUM DEMAND (In-House + Irrigation)		
	No. of Units or Sq. Ft.	Persons per Unit	Projected Population	Gal/Day per Unit	Units	Avg. Day (gal)	Peak Day (gal)	Area (acres)	Avg. Day (gal)	Peak Day (gal)	Avg. Day (gal)	Peak Day (gal)
Town of Telluride												
Single/Multi Family	2,658	2	6,087	98	Person	598,578	838,009					
Comm. / Public	680,000			0	Sq. Ft.	91,188	127,663					
Lodging	545	3	1,690	98	Person	166,145	232,604	13.1	153,437	260,843	1,009,348	1,459,119
The Falls												
Single Family	5	3	13	98	Person	1,229	1,721	0.275	3,221	5,476	4,450	7,197
S.M.V.C.												
Society Turn Comm.	98,800	3		0	Sq. Ft.	13,249	18,549	4	46,851	79,647		
Employee Housing	49		123	98	Person	12,047	16,865	0	-	-	72,147	115,061
Brown Homestead												
Single Family	21	3	53	98	Person	5,163	7,228	0.25	2,928	4,978	8,091	12,206
Eider Creek (formerly Goldking)												
Condominium	58	3	145	98	Person	14,259	19,963	0.67	7,848	13,341	22,107	33,304
Hillside												
Single Family	50	3	125	98	Person	12,293	17,210	1.06	12,416	21,106	24,708	38,316
Lawson Hill												
Single / Multi Family	277	3	693	98	Person	68,100	95,341	1.74	20,380	34,646	133,136	192,504
Public/Lt. Industrial	33,000			0	Sq. Ft.	44,655	62,517					
Total			8,926			1,026,907	1,437,669	21	247,081	420,037	1,273,987	1,857,707
Total, cfs						2	2.22				1.97	2.87

Note: The projected population and projected in-house demand data were verified in February 2014 by Michelle Haynes, Telluride Planning Director, using the following resources: 2003 Commercial and Accommodations Land Use Study; 1995 Telluride Regional Growth Study, Building Permit Data

Column Explanations:

Column 1 – Unit projections per CPAC and Lawson Hill Agreement with updated square footage projections per Steve Ferris, Telluride Planning Director. S.M.V.C development level per Chase Appraisal.

Column 2 – Residential densities per 2000 Housing Needs Assessment. Lodging per CPAC. Both provided by Steve Ferris, Telluride Planning Director.

Column 3 – Col 1 X Col 2

Column 4 – Unit average daily water demand rates from 1993 Draft Water Master Plan and March 2002 Update reduced by 10.85% to reflect observed per capita usage reduction.

Column 5 – Units, in persons or square footage, associated with the daily water demand.

Column 6 – Average winter day demand. Col. 3 X Col. 4 for population and Col. 1 X Col. 4 for commercial / public / industrial.

Column 7 – Projected peak winter day demand. Col. 6 X 1.4. This is the minimum projected winter water supply requirement.

Column 8 – Projected irrigated area based on existing acreage plus future acreage with future area established as follows:
Single/Multi Family: 1,000 Sq. Ft. per unit (Except in Town where total irrigated acreage is expected to be no more than 13.1 acres.)

Column 9 – Average daily irrigation demand assuming a 6-inch July application requirement and 40% application efficiency or 0.484 inch daily application then reduced by 10.85% to reflect observed per capita usage reduction.

Column 10 – Peak day irrigation demand. Col 9 X 1.7

Column 11 – Projected average summer day demand. Col. 6 + Col. 9

Column 12 – Projected peak summer day demand. Col. 7 + Col 10

3.0 Integrated Planning and Water Efficiency Benefits and Goals

3.1 Water Efficiency and Water Supply Planning

C.R.S. 37-60-126 (4) requires a description of how long-term water savings garnered through water efficiency activities are incorporated into water supply planning and decision making. At this time, the Town has indicated it has no plans to secure additional water supplies. This raises the importance of ensuring existing water supplies are used as efficiently as possible. The Town of Telluride has identified the following five (5) benefits to implementing an effective water efficiency program:

1. *Keeps more water in the ecosystem, providing habitat benefits for the local biome*.

2. *Decreases energy use per capita to supply water needs and to manage the resulting wastewater*. This is an important in reaching the carbon reduction goals set by the Town Government for its facilities and operations, as well as for the broader community.

3. *Decreases operating costs for the water and wastewater facilities due to lower energy bills, fewer needed chemicals, etc.* This in turn will serve to keep water and wastewater service rates as low as possible for customers over time.

4. *Tangibly demonstrates the community's commitment to sustainability*.

5. *Meets contractual obligations to neighbors* (i.e., Idarado Mining Company Comprehensive Settlement Agreement, 2013)

The primary benefit associated with increased water efficiency by Telluride Water Service Area users is protection of the visual and aquatic values associated with stream flows within the San Miguel River and its headwater tributaries. There is an extended distance between the Town's points of diversion and the point of return flow to the river at its wastewater treatment plant at Society Turn. Within this reach, the Town's in-house diversions are 100 consumptive to the river. Any water savings gained through conservation efforts directly benefit the river ecosystem, which is an amenity that attracts thousands of visitors annually.

The use to which saved water will be put depends on which Town of Telluride water source is affected. Water that is not used from Blue Lake maintains or improves the stored raw water reserves for the Town and Idarado Mining Company, ensuring water in times of drought and ensuring water to create energy at the Bridal Veil Power House and the Pandora Hydroelectric Generation Facility. Water that is not used from the Bridal Veil Basin at the Falls Diversion will remain in the San Miguel River, sustaining the ecosystem and benefiting all associated natural and recreational uses in and near the river. Water that is not used from Stillwell Tunnel will maintain/enhance flows in Cornet Creek, benefiting the creek and its ecosystem throughout the Town. Alternatively, the water not used also ensures that the storage at Stillwell remains full and available for use when needed for fire protection, drought, and peak demands for festivals. Water that is not used in Mill Creek will maintain/enhance flows downstream along the Mill Creek corridor, benefiting wetlands and riparian areas until its confluence with the San Miguel River.

3.2 Water Efficiency Goals

The Public Works Department personnel worked collaboratively to develop a single, achievable goal for the water and wastewater system that serves the Telluride community. This water and wastewater system includes not only the water and wastewater treatment plants and their associated distribution and collection piping, but all of the users connected to the public system. The goal and objectives were presented to the staff Water Efficiency Plan Task Force for review and comment, and then the Telluride Ecology Commission and the Telluride Town Council for consideration. The final goal and specific objectives for moving toward the goal are presented below.

<u>Goal</u> – Optimize water efficiency throughout the water and wastewater system, which includes all water users as well as traditional infrastructure. This will:

- Minimize energy use for pumping and treatment and use of chemicals for treatment, thereby minimizing operational costs.
- Demonstrate leadership to the community that decreasing waste is the right thing to do.
- Provide "insurance" that there will be more water and wastewater capacity available for the local tourist economy, as drought protection, and as in-stream flows to protect or enhance environmental and recreational values that benefit the local economy.

<u>Objectives for the Next 5 Years</u> –

1. Decrease use of potable water for outdoor irrigation by 5%.

2. Reduce wastewater discharges by decreasing indoor residential water use by 5%.

3. Reduce peak day summer demand by 5%.

4. Better quantify non-revenue water by applying appropriate principals and methodologies from AWWA M36.

The success of Objective 1 and Objective 2 will be measured by analyzing billing data for specific entities. It is anticipated that the success of Objective 3 will be measured using treatment volume data for specific days during peak summer demand. The success of Objective 4 will be measured using program metrics, such as installation and monthly reading of a specific number of new meters on Town-owned buildings that currently have no metering.

4.0 Selection of Water Efficiency Activities

4.1 Summary of Identification & Selection Process

The process of identifying and selecting potential water efficiency activities for this report began with the collection of general information on Telluride's current water conservation efforts and other aspects of the water supply system and service area. The next step involved educating Town staff and the general public through Ecology Commission and Town Council meetings about these water system basics. Agendas for all public meetings were posted at Rebekah Hall and on the Town's website no less than one (1) week prior to the meeting. As well, Town Council meetings are televised and broadcast over the local television and radio station so those who cannot attend in person can still listen. Therefore, it is reasonable to assume that a good portion of the community has been educated.

Next, the identification of potential new water efficiency activities and selection criteria was undertaken at four levels: (1) informal staff discussions using the Colorado Water Conservation Board guidance worksheets as a template; (2) staff Water Efficiency Plan Task Force meetings; (3) public work sessions with Telluride's Ecology Commission at their regularly scheduled meetings; and (4) public work sessions with Telluride's Town Council at their regularly scheduled meetings. The universe of potential activities that were identified is provided in worksheets D through G, which are provided in Appendix 3.

Staff qualitatively screened the universe of potential activities that were identified using the following four primary or qualitative criteria (QC).

QC1 – Under the Town's direct control
QC2 – Very likely to measurably decrease water use
QC3 – Builds on an ongoing activity
QC4 – Provides positive reinforcement to conserve

Worksheet D in Appendix 3 shows how various activities compare to each other when these four selection criteria were applied.

The final phase of activity selection required staff to use the evaluative criteria and then the additional qualitative criteria listed below to prioritize potential activities. Note that the additional qualitative criteria correspond directly to the 5-year objectives identified to help meet the Water Efficiency Plan goal.

EC1 – Can be accomplished with current staffing
EC2 – Technically feasible
EC3 – Relatively low cost
EC4 – Can be completed within the 5-year window of Water Efficiency Plan

QC5 – Decrease outdoor irrigation
QC6 – Reduce wastewater discharge by reducing indoor water use
QC7 – Reduce peak day summer demand
QC8 – Better quantify non-revenue water

As well, for this final sorting, the staff WEP Task Force applied a final polishing of potential activities by discussing each activity in detail to make sure that the final results of the identification, evaluation, and prioritization process made sense and were in line with the goals and objectives for the water efficiency program.

4.2 Demand Management Activities

It is important to note that this subsection presents the demand management activities selected for implementation. It focuses on the screening and evaluation results; not the process. Documentation on

the screening and evaluation process for each water efficiency activity is included in tabular format in worksheets D through H in Appendix 3.

A summary list of the selected water efficiency activities that will be continued, expanded, and/or initiated by the Town of Telluride during the 5-year window of this Water Efficiency Plan is provided below.

1. Continue Unchanged

    a. Meter reading and bimonthly billing
    b. Water Efficiency oriented water service rates, tiered increasing block rates composed of a base rate and volume used.
    c. Distribution system leak detection and repair program
    d. Water Conservation Ordinance landscaping and irrigation system requirements
    e. Native plant demonstration garden

2. Expanded

    a. Billing – Investigate changing from bimonthly billing to monthly billing
    b. Metering

        i. Investigate changing remaining manual read meters to autoread meters (~100)
        ii. Install and read meters on all Town-owned facilities.
        iii. Create a "new" category under the billing program entitled "Town" for Town-owned facilities to facilitate tracking and to separate this as a user category.
        iv. Investigate the potential range of inaccuracy of existing "typical" meters used throughout the water system to refine quantification of "non-revenue" water.
        v. Investigate cost and administrative challenges of changing all meters to a new system.

    c. Change the Water Conservation Ordinance to require limited water times throughout the season (e.g., 8 pm to 8 am), not just during identified water shortages.

    d. Assess potable water usage at the Telluride Regional Wastewater Treatment Plant.

3. Initiated

    a. Appliance Replacement - replace old-style toilets at Shandoka Affordable Rental Housing

    b. Irrigation System Upgrade Program

        i. Work with the cemetery (i.e., an identified large irrigation system using potable water) to

            1. improve overall irrigation system efficiency; and
            2. investigate moving them to an alternative source of water for irrigation.

        ii. Work with the Telluride High School / Middle School (i.e., an identified large irrigation system using potable water) to

            1. improve overall irrigation system efficiency; and
            2. investigate moving them to an alternative source of water for irrigation.

    c. Public Awareness Program

        i. Complete 1 KOTO Radio Access discussion per year about wise use of water in Town (and anywhere).

ii. Create a public service announcement newspaper advertisement about being wise with water use.
iii. Create an insert for the water bill one time each year about wise use of water.

4.3 Status of Foundational Activities

4.3.2 Metering

C.R.S. 37-60-126 (4) requires a description of current and planned metering programs. Historically, like many small, mountain towns, Telluride did not meter treated water use. The first attempts to meter potable water use were in the 1970s. The success of this early program was limited, at best. The 1993 Master Plan recommended installing automatic read (AMR) meters. This program was completed between 1995 and 2006, over 10 years later. As of 2013, there are approximately 1742 metered water accounts. Only a few water users remain completely unmetered, largely due to the difficulty of meter installation. As opportunities arise, these users are being metered over time.

There are nearly 100 meters that require manual reading every other month, which is time consuming. These meters are also quite old and at the end of their life cycle, which means they are not reading accurately and are even likely to be under-reading by over 30 percent. Staff feels strongly that the costs and benefits of requiring these meters to be replaced be investigated as a new activity.

C.R.S. 37-60-126 (4) requires that modifications and/or new metering programs selected as a result of the water efficiency planning effort include anticipated implementation costs, estimated water savings, and any additional information beneficial to refer to during implementation. It is unclear at this time whether it would be beneficial to change out the existing meters used throughout Town with new meters that read more accurately. It is therefore proposed at this time to conduct this analysis to determine the costs and the benefits of a meter replacement program.

The most significant unmetered uses of potable water over the past several years have been process uses of potable water at the Telluride Regional Wastewater Treatment Plant and irrigation for the regional cemetery. In mid-2013, a meter was installed and is being read monthly at the wastewater plant. A manual-read meter was installed at the cemetery in fall of 2013. This cemetery meter must be read monthly starting in May and continuing through the irrigation season in October.

4.3.2 Demand Data Collection and Billing Systems

C.R.S. 37-60-126 (4) requires a description of the demand data that is available through the billing system, including, water usage by customer category and billing frequency. Subsection *Water Demand by Customer Category* under **Section 2.2 Historical Water Demand** in this Water Efficiency Plan provides this information and use data in detail. Telluride currently reads meters every other month and aggregates these data to bill every two (2) months for a number of customer categories. Prior to 2014, the number of customer categories was 8. In fall 2013, the number of customer categories was increased to 10. Staff determined that it would be beneficial to investigate the costs and benefits of moving to a monthly billing cycle from the current bi-monthly cycle.

The Billing System that is currently in place dictates the type of water use data that can be collected over time. If the detailed user-specific data are not shared with the Public Works Department during the billing cycle, these data are effectively lost. However, it is possible to retrieve all data related to general user categories per billing cycle (every two (2) months) for a given year for up to three (3) years after it is generated.

C.R.S. 37-60-126 (4) requires a description of any planning modifications to the data collection and billing system that results from the water efficiency planning effort. One user category that is lost in the course of the billing cycle is metered facilities that are not billed, such as Town-owned facilities and the Historical Museum. A request

to the meter reader to read and down load these data, submit them to the Finance Department, and then to have the Finance Department include them in the detailed water user data download each billing period will allow Public Works to account for this water use and further refine its estimate of "non-revenue" water.

4.3.3 Water Efficiency Oriented Rates and Tap Fees

C.R.S. 37-60-126 (4) requires billing systems designed to encourage water efficiency in a fiscally responsible manner to be fully evaluated. The Town of Telluride instituted an increasing block rate structure in 2004 for water use in its service area according to multiple customer categories. A Water Services Rate Study (Burns & McDonnell, 2013) recommended water service rate increases over a 5-year period, which the Town Council approved. These rate increases made the increasing block rate structure even steeper than the previous rates. See Figure 2.5 for an illustrated comparison of Telluride's increasing block rate structure compared to similar communities in the region. Appendix 1 includes the Town Water Service Rates Ordinance, which details the existing water service rate structure by customer category and the anticipated rate of service increases over the next five (5) years.

Telluride proposes no new adjustments to its water rate structure and/or rates as a result of this Water Efficiency Plan, rather the Town Council has already committed to water service rate adjustments over the next five (5) years that are based on the project operations and maintenance and capital demands of the system over time.

The current Tap Fee structure does not take into account or reward or incentivize water efficiency at this time. It is widely held that Tap Fees pay for the existing infrastructure, which is not impacted by water efficiency and that incentives or rewards for installing water efficient appliances will be seen through lowered water usage and therefore in lower water service rates.

4.3.4 System Water Loss Management and Control

C.R.S. 37-60-126 (4) requires that a distribution system leak identification and repair system designed to encourage water efficiency in a fiscally responsible manner be fully evaluated and requires a description of current and planned system water loss management and control programs. Examples of system water loss management and control programs include: system-wide water audits; investigation of apparent losses; leak detection and repair programs; and water line replacement programs.

Telluride's Public Works Department has had a distribution system leak identification and repair system in place since 1998. Each year a specific section of the water distribution system is inspected using cameras to develop a list of required repairs. The *Town of Telluride Water/Wastewater Capital Asset Maintenance Plan* (Farnsworth Group, 2012) identified pipes that require replacement due to age. This report has informed development of the Public Works Department capital planning. In more recent years, Public Works has been coordinating closely with the Finance Department when a meter reading for a specific customer is significantly different than previous readings, which sometimes indicates that there is a leak in either the distribution or service line to that specific meter or perhaps in an appliance within the structure.

4.4 Targeted Technical Assistance and Incentives

4.4.1 Level 1: Utility/Municipal Facility Water Efficiency

Analysis of the current water service systems indicates that there are many opportunities to improve efficiency of water use at Town facilities. Improving water efficiency at Town facilities will position the Town as a leader in water efficiency who is leading by example. This is an important component of the overall goal for Telluride's water system. Water efficiency activities that will be pursued, which fall under this categorization, include:

- 2.b.ii Install and read meters on all Town-owned facilities.
- 2.b.iii Create a "new" category under the billing program entitled "town" for Town–owned facilities to facilitate tracking and to separate this as a user category.

2.b.iv Investigate the potential range of inaccuracy of exiting "typical" meters used throughout the water system to refine quantification of "non-revenue" water.
2.d Assess potable water usage at the Telluride Regional Wastewater Treatment Plant
3.a Appliance Replacement – replace old-style toilets at Shandoka Affordable Rental Housing

The first notable large demand customer is the Telluride Regional Wastewater Treatment Plant. Potable water use has not historically been metered at this Town-managed facility. A meter was installed in mid-2013 and use will be closely tracked by staff.

A second notable large demand customer is the Shandoka Affordable Rental Apartments, which are managed by the Town. These four buildings were constructed in the late 1980s and most of the apartments have no water saving toilets in them. Refrigerators and dishwashers have been replaced within the last five (5) or ten (10) years for every apartment. There is a central laundry room for the complex, which is managed by an outside party. It was rehabilitated in 2006 with efficient machines.

4.4.2 Level 2: Management of Largest Customer Demands

The "largest customer demands" cannot be identified using the broad customer use categories applied for billing. Staff believes targeting specific customers within the overall database will prove more effective, at least initially. Water efficiency activities that will be pursued, which fall under this categorization, include:

3.b.i Work with cemetery (i.e., an identified large irrigation system using potable water) to improve overall irrigation system efficiency; and investigate moving them to an alternative source of water for irrigation.
3.b.ii Work with the Telluride High School / Middle School (i.e., an identified large irrigation system using potable water) to improve overall irrigation system efficiency; and investigate moving them to an alternative source of water for irrigation.

4.4.3 Level 3: Management of Remaining Customer Demands

Demand management activities that focus on the customer service area as a whole are more difficult to monitor and less cost effective than focusing on the Level 1 and 2 customers. From a business perspective, at this time, it makes the most sense for Telluride to focus on Level 1 and 2 customers and then target other Level 3 customer categories within the service area at a later time.

4.5 Ordinances and Regulations

4.5.1 Level 1 Existing Service Area

There are several ordinances, regulations, and guidelines in place that apply to Telluride's existing water service area. These include (1) the Telluride Municipal Code Section 13 Article 1 Municipal Utilities (MUC §13-1); (2) the Telluride Municipal Code Section 13 Article 5 Water Conservation Code (MUC §13-5); (3) the Streetscape Manual of Standards (TOT, 2007) Right of Way Landscaping Guidelines, which were adopted by the Town Council in 2007; and (4) a long-time local landscaping guide entitled, *Gardening and Landscaping at High Altitude, An Ecological Approach to Landscaping in the Telluride Region* (Gick, 1998).

MUC §13-1, Utilities, was adopted by the Telluride Town Council as part of the original Municipal Code. It applies to all services provided within the water and sewer service areas. While these service areas do overlap, they are not identical. This is the section of the municipal code that specifies water and sewer tap fees and water and sewer rates and billing protocols, and requires metering for water service. Water efficiency activity identification yielded no immediate changes to this section of the Code.

MUC §13-5, Water Conservation Code, was adopted by the Telluride Town Council in 2002. It is provided in its entirety in Appendix 2 of this Plan. Its preface recognizes water as a finite and precious resource and that water

waste is to be discouraged and water conservation encouraged. Section 13-5-40 pertains to water conservation measures that are needed when a water shortage is declared by the Town Manager or Town Council. During the Water Efficiency Activity Identification phase of the Water Efficiency Plan development, the Town Council determined that this code should be carefully reviewed by staff for potential revisions. Of particular interest was changing the restrictions on irrigating to include a year-round ban on irrigation between during the heat of the day (e.g., between 8 am and 6 pm).

The *Streetscape Manual of Standards Right of Water Landscaping Guidelines* applies to the green strips that are located in the publicly-owned right of way, but are planted and managed by fronting property owners. It re-iterates the landscaping requirements from MUC §13-5 and includes landscaping information that is also available in *Gardening and Landscaping at High Altitude, An Ecological Approach to Landscaping in the Telluride Region* (Gick, 1998).

4.5.2 Level 2 New Construction Regulations

There are several ordinances, regulations, and guidelines in place that apply to new construction within Telluride's water service area. These include (1) the Telluride Municipal Code Section 13 Article 1 Municipal Utilities (MUC §13-1); (2) the Telluride Municipal Code Section 13 Article 5 Water Conservation Code (MUC §13-5); (3) the Telluride Municipal Code Section 15 Article 9 Energy Codes (MUC §15-9); (4) the Streetscape Manual of Standards (TOT, 2007) Right of Way Landscaping Guidelines; and (5) the local landscaping guide entitled, *Gardening and Landscaping at High Altitude, An Ecological Approach to Landscaping in the Telluride Region* (Gick, 1998).

MUC §13-5, Water Conservation Code, was adopted by the Telluride Town Council in 2002. It is provided in its entirety in Appendix 2 of this Plan. Section 13-5-20 applies to all new construction, requiring the installation of high-efficiency fixtures. Section 13-5-30 requires high efficiency irrigation systems and drought-tolerant plantings if potable water is to be used for watering new landscaping.

MUC §15-9, Energy Code, was adopted by the Telluride Town Council in 2006. MUC §15-9-f-ii requires specific water efficiencies for showerheads, bathroom faucets, kitchen faucets, and irrigation systems. Several of these requirements are more strict than those specified in MUC §13-5. During water efficiency activity identification exercises, staff identified the need to reconcile these two sections of the code so they are consistent moving into the future. At that time, staff will also compare the efficiency specifications in the Town's code to those in the EPA WaterSense Program and the most recent edition of the International Building Code.

4.5.3 Level 3 Point of Sales Ordinances on Existing Building Stock

Point of sales ordinances on existing building stock were eliminated from discussions early in the development process for Telluride's Water Efficiency Plan. Such a program was considered overly burdensome not only on existing staff regarding potential tracking and administration, but also on the local real estate market. Building Department records indicate that a good portion of the existing building stock has been renovated within the last ten (10) to fifteen (15) years, usually after the point of sale. Staff believes that the limited number of properties that need to be upgraded can be addressed through a future targeted audit and rebate program.

4.6 Education Activities

4.6.1 Level 1 One-Way Education Activities

The Town Government and other community resources are currently engaging in several Level 1 One-Way Educational Activities, which are focused on creating water efficient landscapes. These include (1) the native planting demonstration garden; (2) the Streetscape Manual of Standards (TOT, 2007) Right of Way Landscaping Guidelines; and (3) the local landscaping guide entitled, *Gardening and Landscaping at High Altitude, An Ecological Approach to Landscaping in the Telluride Region* (Gick, 1998). The native planting demonstration garden, which is prominently located in the Town Park along the River Trail, was planted by the regional Cooperative Extension Office several years ago. The native planting demonstration garden, the Streetscape Landscaping Guidelines, and

the local landscaping guide all work in concert and are common references when local property owners and local landscapers work with staff on new landscaping. These outreach activities are planned to continue into the future.

4.6.2 Level 2 One-Way Education with Feedback

Water efficiency activity identification exercises identified several Level 2 One-Way Education Activities. A K-12 Water Fair was one that the Telluride Ecology Commission thought would be useful and fun. The prioritization process eliminated the water fair, interactive websites, and K-12 teacher and classroom education programs because it was believed these activities would be difficult to implement (i.e., the Town does not have sufficient personnel resources) and were not likely to yield significant results compared to other potential new activities.

4.6.3 Level 3 Two-Way Education

Focus groups, customer surveys, and citizen advisory boards were discussed during the water efficiency activity identification exercises. The Ecology Commission, the Telluride Town Council, and staff all agreed that these activities would be difficult to implement (i.e., the Town does not have sufficient personnel resources) and were not likely to yield significant results compared to other potential new activities.

5.0 Implementation and Monitoring Plan

5.1 Implementation Plan

Worksheet J – Implementation Plan – 2014, which is provided toward the end of Appendix 3, details the Water Efficiency Activities that were selected for implementation as a result of brainstorming, applying selection criteria, and then troubleshooting the final list. Ultimately, the Water Efficiency Activities are intended to help achieve the adopted goal and objectives shown in the text box. The estimated savings, as shown on Worksheet I of Appendix 3 is approximately 26 million gallons annually or 15 percent of current annual water production.

TELLURIDE'S WATER & WASTEWATER SYSTEM

GOAL

Optimize water efficiency throughout the water and wastewater system, which includes all water users as well as traditional infrastructure. This will:

- Minimize energy use for pumping and treatment and use of chemicals for treatment; thereby minimizing operational costs;
- Demonstrate leadership to the community that decreasing waste is the right thing to do.
- Provide "insurance" that there will be more water and wastewater capacity available for the local tourist economy, as drought protection, and as in-stream flows to protect or enhance environmental and recreational values that benefit the local economy.

OBJECTIVES FOR THE NEXT 5 YEARS

1. Decrease use of potable water for outdoor irrigation by 5%.
2. Reduce wastewater discharges by decreasing indoor residential water use by 5%.
3. Reduce peak day summer demand by 5%
4. Better quantify non-revenue water by applying appropriate principals and methodologies from AWWA M36.

5.2 Monitoring Plan

The Environmental and Engineering Division of the Public Works Department will be responsible for monitoring the progress of staff on the implementation plan and whether water use does change as predicted. In general, monitoring will occur annually when a full year of data are available for analysis from the Water-Wastewater Division of the Public Works Department and from the Finance Department (from the billing files). It should be noted that the Finance Department will send the detailed bi-monthly billing data to the Environmental and Engineering Division throughout a given year. Worksheets K, L, and M, as presented in Appendix 3, will be used to assist with the analysis.

6.0 Adoption of New Policy, Public Review and Formal Approval

6.1 Adoption of New Policy

Under the Telluride Town Charter, the Telluride Town Council is charged with the creation and adoption of new policies. Seeking to optimize the water and wastewater system throughout the Town's service areas is not new policy, but it is evolving over time. Such evolution requires periodic discussions about the means of achieving goals identified by the overarching policy of keeping water use as efficient as possible, minimizing water waste, and providing stewardship of the water resources in the Town's charge.

6.2 Public Review Process

Public input has been solicited on a three-tier track. The Ecology Commission was an important public venue for obtaining input on the document and for moving through the steps to select and prioritize efficiency activities. The Commission's monthly meetings are open to the general public. The agenda for each meeting is posted in two locations in the Town and on the Town's web site, and a notice of the agenda postings are sent via email to those who have signed up for the service. The Water Efficiency Plan was on the Ecology Commission's agenda on each of the following dates: October 2, 2013; November 6, 2013; December 11, 2013; March 5, 2014; April 2, 2014.

The Telluride Town Council at their public, monthly meetings was also an essential element regarding development and local adoption of the plan. The agenda for each Town Council meeting is posted in two locations in the Town and on the Town's web site, and a notice of the agenda postings are sent via email to those who have signed up for the service. The Water Efficiency Plan was discussed at Town Council on the following dates: February 18, 2014; March 11, 2014; April 22, 2014; June 3, 2014.

Finally, the public was invited to review the final draft document for a 60-day public comment period at the Town Council meeting on June 3, 2014. The document was made available first in the Town Council Packet on May 30, 2014, and then from June 3 close-of-business through August 3, 2014, close-of-business on line at the Town's website under "News" and in hard-copy at Rebekah Hall and Old Town Hall.

6.3 Local Adoption and State Approval Processes

The Public Works Department coordinated with Colorado Water Conservation Board staff to develop the Water Efficiency Plan early in the development and update process to ensure that the plan contained all required elements and was approvable by the Colorado Water Conservation Board. After the Public Review Process, the Town Council formally adopted the plan by resolution at one of its regularly scheduled meetings. The plan was then submitted to the Colorado Water Conservation Board for formal review and approval at the State level.

6.4 Periodic Review and Update

The Public Works Department will schedule a review and update of Telluride's Water Efficiency Plan to coincide with the review and update of its Water Service Rate Study and its Wastewater Service Rate Study every five (5) years (i.e., 2020, 2025, 2030, etc.)

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Glossary & Acronyms

Active Water Conservation Savings: Water savings from utility-sponsored water conservation programs. Such measures and programs may include education programs, incentives and rebates, fixture replacement programs, audits and conservation rates and surcharges (CDM, 2004)

CWCB: Colorado Water Conservation Board

Firm Yield: The amount of water that can be diverted and beneficially used each year including during drought periods and the driest years of record.

ADD, Average Daily Demand: The potable water produced to meet the demand averaged over a 24-hour period.

MDD, Estimated Maximum Daily Demand: The potable water produced to meet the demand. Calculated by averaging the maximum daily demand from winter and the maximum daily demand from summer.

Passive (or naturally-occurring) Water Conservation Savings: Water savings that result from the impacts of plumbing codes, ordinances, and standards that improve the efficiency of water use. These conservation savings are called "passive" savings because water utilities do not actively fund or implement programs that produce these savings. (CDM, 2004)

SWSI: Statewide Water Supply Initiative

Water Conservation: Water use efficiency, wise water use, water transmission and distribution system efficiency, and supply substitution. The objective of water conservation is a long-term increase in the productive use of water supply in order to satisfy water supply needs without compromising desired water services.

WEP: Water Efficiency Plan

Water Reuse: Use of reclaimed water for a beneficial use constitutes water reuse. Direct water reuse includes treating wastewater and piping it directly into a water system without intervening dilution in natural water bodies. Indirect reuse includes an intermediate step between the generation of reclaimed water and reuse, which may be through discharge, retention, and mixing with another water supply.

Water-Saving Measures and Programs: This includes any device, fixture, practice, hardware, or equipment that reduces water demands and a program that uses a combination of measures and incentives that provides for an increase in the productive use of a local water supply.

Appendices

Appendix 1 Town of Telluride Ordinance No. 1393 Series of 2013. An Ordinance of the Town Council of the Town of Telluride, Colorado, Establishing Certain Water & Wastewater Rates and Charges for 2014 and Approving Automatic Specified Rate increases over a Period of Five (5) Years Thereafter.

Appendix 2 Telluride Municipal Code Article 13 Section 5 Water Conservation Code

Appendix 3 Statewide Water Supply Initiative Work Sheets

APPENDIX 1 Telluride Water Service Rates Ordinance

ORDINANCE NO. 1393
Series of 2013

AN ORDINANCE OF THE TOWN COUNCIL OF THE TOWN OF TELLURIDE, COLORADO ESTABLISHING CERTAIN WATER & WASTEWATER RATES AND CHARGES FOR 2014 AND APPROVING AUTOMATIC SPECIFIED RATE INCREASES OVER A PERIOD OF FIVE (5) YEARS THEREAFTER.

WHEREAS, Chapter 13, Article 2 of the Telluride Home Rule Charter authorizes the Town Council to establish rates by ordinance for water and wastewater services rates; and

WHEREAS, the Town Council has determined that increases in water and wastewater service rates are necessary to support water and wastewater operations and maintenance, system improvements and existing debt; and

WHEREAS, the Town Council also finds it necessary for a debt support surcharge for out-of-Town water and wastewater users comparable to the debt support mill levy assessed on in-town properties.

NOW, THEREFORE, BE IT ORDAINED BY THE TOWN COUNCIL OF THE TOWN OF TELLURIDE, COLORADO as follows:

Section 1.

There are hereby established, amended, fixed and modified, effective January 1, 2014, the following water and wastewater utility user rates and charges.

. *Levy*. A service charge is levied and assessed for water and/or sewer service to any lot, parcel of land, water and/or sewer using unit that receives water and/or sewer from the Town at the following rates:

A. In–Town Rates: Bi-Monthly In–Town Water and Wastewater Rate Schedule

Rate Class	Meter Size	Water			Wastewater Charge
		Bi-Monthly Base Fee	Usage Block (Gallons)	Charge Per 1,000 Gallons	
Residential - InTown		$46.14	0-8,000 8,000-12,000 12,000-15,000 15,000-100,000+ >100,000	$0.00 $4.45 $5.05 $5.05 + $0.60 per 5000 gal. $15.25	$50.25 (all levels of usage)
Residential - InTown Size & Deed Restricted		$30.00	0-8,000 8,000-12,000 12,000-15,000 15,000-100,000 >100,000	$0.00 $4.45 $5.05 $5.05 + $0.60 (a) per 5000 gal. $15.25	$37.50 (all levels of usage)
EMT & Firefighter		$0.00	0-8,000 8,000-12,000 12,000-15,000 15,000-100,000 >100,000	$0.00 $4.45 $5.05 $5.05 + $0.60 per 5000 gal. $15.25	0 (all levels of usage)
Commercial	5/8"	$62.88	0 - 8000 8,000 - 30,000 over 30,000	$0.00 $3.60 $4.80	$50.25 $5.65 per 1,000 gallons above base
Commercial	3/4"	$71.45	0 - 12,000 12,000 - 33,000 over 33,000	$0.00 $3.60 $4.80	$75.23 $5.65 per 1,000 gallons above base
Commercial	1"	$101.45	0 - 16,000 16,000 - 33,000 over 33,000	$0.00 $3.60 $4.80	$100.40 $5.65 per 1,000 gallons above base
Commercial	1.5"	$235.76	0 - 32,000 32,000 - 64,000 over 64,000	$0.00 $3.60 $4.80	$200.71 $5.65 per 1,000 gallons above base
Commercial	2"	$392.93	0 - 48,000 48,000 - 150,000 over 150,000	$0.00 $3.60 $4.80	$301.11 $5.65 per 1,000 gallons above base
Commercial	3"	$621.54	0 - 72,000 72,000 - 160,000 over 160,000	$0.00 $3.60 $4.80	$451.67 $5.65 per 1,000 gallons above base
Commercial	4"	$828.73	0 - 96,000 96,000 - 310,000 over 310,000	$0.00 $3.60 $4.80	$602.23 $5.65 per 1,000 gallons above base

B. Out–of–Town Rates: All out–of–Town customers will be charged rates of one hundred and twenty-five percent (125%) of the in-Town rates.

Bi-Monthly Out-of-Town Water and Wastewater Rate Schedule

Rate Class	Meter Size	Water			Wastewater Charge
		Bi-Monthly Base Fee	Usage Block Gallons	Charge Per 1,000 Gallons	
Residential - Out-of-Town		$57.67	0-8,000 8,000-12,000 12,000-15,000 15,000-100,000+	$0.00 $5.56 $6.31 $6.31 + $0.75	$62.81 (all usage levels)
Commercial Out-of-Town	5/8"	$78.60	0 - 8000 8,000 - 30,000 over 30,000	$0.00 $4.50 $6.00	$62.81 $7.06 per 1,000 gallons above base
Commercial Out-of-Town	3/4"	$89.31	0 - 12,000 12,000 - 33,000 over 33,000	$0.00 $4.50 $6.00	$94.04 $7.06 per 1,000 gallons above base
	1"	$126.81	0 - 16,000 16,000 - 33,000 over 33,000	$0.00 $4.50 $6.00	$125.50 $7.06 per 1,000 gallons above base
	1.5"	$294.71	0 - 32,000 32,000 - 64,000 over 64,000	$0.00 $4.50 $6.00	$250.89 $7.06 per 1,000 gallons above base
	2"	$491.16	0 - 48,000 48,000 - 150,000 over 150,000	$0.00 $4.50 $6.00	$376.39 $7.06 per 1,000 gallons above base
	3"	$776.93	0 - 72,000 72,000 - 160,000 over 160,000	$0.00 $4.50 $6.00	$564.59 $7.06 per 1,000 gallons above base
	4"	$1035.92	0 - 96,000 96,000 - 310,000 over 310,000	$0.00 $4.50 $6.00	$752.79 $7.06 per 1,000 gallons above base

C. Irrigation Only Rates: Irrigation Only accounts will be charged the same minimum bill that is applicable to their class (Residential or Commercial; In-Town or Out-of-Town) and meter size. For use in excess of the minimum allowance, volume rates will be one hundred twenty five percent (125%) of the inclining block rates applicable to their respective class and meter size.

D. Out-of-Town Debt Support Surcharge: In addition, unless otherwise required by an ordinance or contract authorizing water and/or sewage service, or pre-existing annexation agreement, to out-of-Town users there shall be imposed upon each out-of-Town customer an annual service rate surcharge of One Hundred Ninety and 50/100 Dollars ($190.50) payable in six equal bimonthly installments.

E. Automatic Water Utility Rate Increases: Water Utility Rates are approved to automatically increase after 2014, over the next five (5) years through 2019 as indicated below. The indicated revenue increases would be implemented by raising the applicable water base fees and volume charges by the percentages shown in Table D-1. These rate actions would be implemented January 1 of each of the indicated years, unless either Town Council or the Public Works Director indicates alternative rates should be considered during each year's budget preparation.

Table D-1: Automatic Water Revenue Increases

Year	Proposed Revenue Increase
2015	10.0%
2016	8.0%
2017	6.0%

Year	Proposed Revenue Increase
2018	2.0%
2019	2.0%

F. Automatic Wastewater Utility Rate Increases: Wastewater Utility Rates are approved to automatically increase after 2014, over the next five (5) years through 2019 as indicated below. . The indicated revenue increases would be implemented by raising the applicable wastewater base fees and volume charges by the percentages shown in Table E-1. These rate actions would be implemented January 1 of each of the indicated years, unless either Town Council or the Public Works Director indicates alternative rates should be considered during each year's budget preparation.

Table E-2: Proposed Wastewater Revenue Increases

Year	Proposed Revenue Increase
2015	5.0%
2016	5.0%
2017	5.0%
2018	5.0%
2019	3.0%

Section 2.

This ordinance shall not have any effect on existing litigation and shall not operate as an abatement of any action or proceeding now pending under or by virtue of the ordinances repealed or amended as herein provided and the same shall be construed and concluded under such prior ordinances.

Section 3.

The provisions of this ordinance are severable and the invalidity of any section, phrase, clause or portion of the ordinance as determined by a court of competent jurisdiction shall not affect the validity or effectiveness of the remainder of the ordinance.

Section 4.

This ordinance shall become effective upon the date of publication of notice of its passage in a newspaper of general circulation within the Town of Telluride.

Section 5.

A public hearing on the ordinance shall be held on the 17 day of September, 2013, in the Town Council Chambers, Rebekah Hall, 113 W. Columbia, Telluride, Colorado.

INTRODUCED, READ, and REFERRED to public hearing before the Town Council of the Town of Telluride, Colorado, on the 27 day of Aug 2013.

TOWN OF TELLURIDE

By: Stuart Fraser
Stuart Fraser, Mayor

ATTEST

Mary Jo Schillaci
Mary Jo Schillaci, Town Clerk

HEARD AND FINALLY ADOPTED by the Town Council of the Town of Telluride, Colorado, this 17 day of Sept, 2013.

TOWN OF TELLURIDE

By: Stuart Fraser
Stuart Fraser, Mayor

ATTEST

Mary Jo Schillaci
Mary Jo Schillaci, Town Clerk

APPROVED AS TO FORM:

Kevin J. Geiger, Town Attorney

STATE OF COLORADO)
)
COUNTY OF SAN MIGUEL) ss.
)
TOWN OF TELLURIDE)

I, Mary Jo Schillaci, the Town Clerk of the Town of Telluride, Colorado (the "Town"), do hereby certify:

- The foregoing pages are a true and correct copy of an ordinance (the "Ordinance") passed and adopted by the Town Council (the "Council") of the Town at a regular meeting of the Council held on 9/17/13.
- The Ordinance was duly moved and seconded and the Ordinance was adopted at the Town Council meeting of 9/17/13, by an affirmative vote of the members of the Council as follows:

Name	"Yes"	"No"	Absent	Abstain
Stuart Fraser, Mayor	✓			
Bob Saunders, Mayor Pro-Tem	✓			
Ann Brady	✓			
Thom Carnevale	✓			
Chris Myers	✓			
Kristen Permakoff	✓			
Brian Werner	✓			

- The Ordinance was approved and authenticated by the signature of the Mayor, sealed with the Town seal, attested by the Town Clerk and recorded in the minutes of the Council.
- There are no bylaws, rules or regulations of the Council that might prohibit the adoption of said Ordinance.
- The members of the Council were present at the meeting and voted on the passage of such Ordinance as set forth above.

(SEAL)

Mary Jo Kilcoyne

Town Clerk

APPENDIX 2 Telluride Municipal Code Section 13 Article 5 Water Conservation Code

Sec. 13-4-30. Violations and penalties.

(a) If at any time the Town Manager determines that an immediate health hazard, or the serious threat of an imminent health hazard, exists, he or she immediately may terminate water service to the building, structure or premises without prior notice to the owner or authorized agent of the owner. The owner shall be responsible for all costs associated with such termination of service. The Town Manager shall then notify the owner or authorized agent of the owner of the building, structure or premises of the violation. If the owner fails to correct the violation in the specified time, the Town Manager shall order that the connection be abandoned. The owner shall be responsible for all costs associated with termination of service and the temporary or permanent abandonment of service.

(b) It is unlawful for the owner of a building, structure or premises to maintain or permit to exist a cross-connection in violation of any of the provisions of this Article. A violation of any of the provisions of this Article shall be punishable upon conviction by a penalty as set forth in Paragraph 1-4-10(a)(2) of this Code for each separate offense. A separate offense shall be deemed committed on each day or portion thereof that the violation of any of the provisions of this Chapter occurs or continues unabated after the time limit set by the Town Manager in the notice. (Prior code 13.16.030; Ord. 1288 §1, 2008)

ARTICLE 5

Water Conservation Code

Sec. 13-5-10. Purpose and applicability.

Water being a finite and precious resource necessary for the preservation and enhancement of the public health, safety and welfare, and water waste is to be discouraged and water conservation encouraged, it is the purpose of this Article to regulate water use so as to promote the prudent and responsible utilization of the Town's water resources and water delivery system. This Article shall apply to all users of water and water services as supplied by the Town, to all new construction for which a building permit is required, and to the replacement of plumbing fixtures and water-using devices within existing structures when remodeling is to occur. Remodeling which does not involve replacement of existing plumbing fixtures or water-using devices shall be exempt from the provisions of this Article. This Article shall also apply to landscaping associated with new construction and/or the remodeling or reconstruction of existing structures for which a building permit is required. (Prior code 13.30.010)

Sec. 13-5-20. Installation of high-efficiency fixtures.

(a) No building permit shall be issued for the construction of a new residential, commercial or industrial structure, or for the indoor or outdoor remodeling of an existing commercial, residential or industrial structure, unless the design, construction or remodeling incorporates high-efficiency plumbing fixtures. In the instance of indoor or outdoor remodeling, compliance with this Section shall be limited to that portion of the structure for which a building permit is issued.

(b) High-efficiency plumbing fixtures shall be defined as those fixtures which comply with the following standards for water use:

(1) All water closets designed not to exceed a flow rate of one and six-tenths (1.6) gallons per flush.

(2) Urinals designed not to exceed one (1.0) gallon per flush. The use of automatic time flush devices for urinals shall not be permitted.

(3) Shower heads designed not to exceed a flow rate of two and one-half (2.5) gallons per minute at eighty (80) pounds per square inch. There shall be no more than two (2) shower heads per shower.

(4) Lavatory, kitchen and service faucets designed not to exceed a flow rate of two and two-tenths (2.2) gallons per minute at eighty (80) pounds per square inch.

(5) All commercial lavatories equipped with spring-loaded faucets that close when not in use or faucets that are equipped with metering valves that close automatically after delivering a maximum of twenty-five hundredths (0.25) gallon, except for required handicapped facilities, which may be equipped with faucets designed for the handicapped.

(6) Exceptions. Restaurant kitchen faucets and safety showers shall be exempted from the above flow restrictions. Additionally, the requirements as set forth in this Section shall not apply to fixtures used for sanitary or safety purposes in health care facilities, or to fixtures used for safety purposes in facilities where hazardous wastes are present and where health and safety might be adversely impacted by limited flow rates. Exemptions may also be granted where the enforcement of the requirements would impose an unusual hardship, create a health hazard, interfere with the use by the physically challenged, or for other unforeseen justifiable cause. All exemptions shall be granted in writing by the Building Official and the cause for exemption shall be noted.

(c) The manufacturer's name and model for each type of high-efficiency fixture to be installed in any building or structure shall be provided to and approved by the Building Official prior to installation. The Building Official may maintain a listing of acceptable high-efficiency fixtures that shall be updated on a regular basis so that plumbing contractors and other interested persons may be informed as to the type and kind of fixtures that may be installed in accordance with the requirements of this Article.

(d) No person shall alter or maintain any approved high-efficiency fixture so as to increase the flow of water beyond the fixture's intended design.

(e) Certification of compliance. For facilities for human use within office, commercial and industrial structures, the plumbing contractor or party responsible for the installation of said water flow control fixtures and fittings shall certify to the inspecting governmental entity that the fixtures and fittings conform with the volume and ratio of water flow to gallons per minute stipulated by this Section. In lieu of such certification, the results of tests performed by an approved independent testing laboratory or the manufacturer, using established principles of mechanics, shall be acceptable.

(f) Waiver of requirements. The Building Official may waive compliance with the requirements of this Section upon satisfactory demonstration by an applicant that the enforcement of the water conservation requirements specified in this Section would be detrimental to the public health or safety in a given case. Such waiver may also be granted if the Building Official determines that the requisite fixtures and fittings would cause a sewer hydraulic gradient insufficient to handle reduced water flows. (Prior code 13.30.020)

Sec. 13-5-30. Landscaping.

Any new lawn, garden or outside area that is to be watered, sprinkled or otherwise irrigated with water supplied through the municipal potable water delivery system shall comply with the provisions of this Section as a condition precedent to connecting any irrigation system or device to the municipal potable water supply.

(1) All grasses and plantings to be installed in any yard, garden or other outside area, excluding vegetables or other edible plants cultivated for human consumption, should be of a drought-tolerant native species that requires minimal water irrigation. The Director of Parks and Recreation shall promulgate and regularly update an advisory list of drought-tolerant native species and acceptable mixtures of such species to guide landscape

architects and other interested persons in the selection of acceptable plants and grasses. Xeriscaping shall be encouraged for all landscape plans. A failure to comply with the provisions of this Paragraph shall not constitute a punishable offense under this Code, it being the intent of this Section to encourage, but not require, compliance with the provisions hereof.

(2) All new irrigation systems to be connected to the municipal potable water supply must incorporate the most water-conserving-type equipment and devices commercially available as of the time the system is submitted for approval, and no new irrigation system shall be connected to the municipal potable water supply without having first been approved by the Building Official. At a minimum, new irrigation systems shall meet the following requirements:

a. All automatic systems shall be equipped with time-activated control clocks and shutoff valves.

b. The systems shall be equipped with sprinkler heads of a type which provide the most uniform coverage and maximum feasible droplets sized to reduce evaporation and wind disturbance of the coverage (pulsating type).

c. Where the slope gradient to be irrigated so requires, the systems shall be designed to control flow for the purpose of reducing runoff.

d. Where appropriate, drip irrigation shall be preferred.

(3) Irrigation systems connected to the municipal potable water supply prior to the enactment of this Section, and which do not meet the provisions and requirements of this Section, shall be exempt herefrom; except that, in the event a preexisting irrigation system is to be removed and reinstalled, replaced or expanded, such system shall be brought into compliance with all of the requirements of this Section.

(4) No building permit shall be granted for the construction of a new residential, commercial or industrial building or structure unless the installation of all landscaping associated with such construction and devoted to the cultivation of grass or plantings for aesthetic purposes, and not for agricultural food production, includes proper soil preparation. Proper soil preparation shall consist of the addition to existing soils of a minimum of three (3) cubic yards per one thousand (1,000) square feet of organic matter introduced by tilling, discing or other suitable method to a minimum depth of four (4) inches. Acceptable organic matter shall include compost, aged manures, aged sawdust or any combination of the above.

(5) The use of raw water for the irrigation of yards, gardens and other outside areas is preferred to irrigation using potable water and, when available, shall be required in place of potable water. (Prior code 13.30.030; Ord. 1288 §1, 2008)

Sec. 13-5-40. Water shortages and conservation.

(a) Water shortage defined. A water shortage is declared to exist if one (1) or more of the following circumstances exist:

(1) When the Town's total water treatment capacity and potable water consumption are approaching or at eighty percent (80%) for voluntary conservation and ninety percent (90%) for mandatory conservation; or the Town Manager otherwise determines that the Town's raw water supply or water treatment system is insufficient to satisfy the daily water use demands for the applicable time period. Total water treatment capacity shall be determined by the Public Works Director utilizing the total combined treated water available from

the Town's Mill Creek Plant, the Stillwell Tunnel Plant and such other potable water supply systems as may be developed by the Town.

(2) When the Town is unable to treat sufficient water to maintain its treated water storage reservoirs at Stillwell, the Falls at Telluride or any other raw or treated water storage reservoirs developed by the Town, at their maximum capacity.

(3) When an emergency condition arises, such as a mechanical breakdown or reduced treatment capacity due to high stream turbidity, insufficient raw water supply or fire flow requirements.

(4) When any or all of the above is anticipated to occur in the near future and it is determined that immediate imposition of conservation measures is necessary to ensure adequate time for public awareness and education to ensure the level of compliance required.

(5) When implementation of water conservation measures is required by reason of any water court decree or stipulation.

(b) Declaration of shortage. The Town Manager or Town Council, as the case may be, shall determine if a water shortage exists and whether to implement voluntary or mandatory conservation measures and which of the measures identified below to implement. The Town Manager shall make public announcements in the news media that voluntary or mandatory conservation measures are in effect and shall include a description of the conservation measure or measures to be implemented.

(c) Conservation measures imposed by Town Manager. The Town Manager may impose any one (1) or more of the following as mandatory or voluntary conservation measures in the event of a water shortage. The measures imposed and their duration shall be reasonably calculated to address the identified water shortage. The listing below is not in order or preference, nor is imposition of one (1) a condition precedent to imposition of any subsequently listed measure.

(1) Persons will be urged to conserve water in every possible way in their homes and businesses.

(2) Persons will be urged to avoid sprinkling their lawns and watering gardens, shrubs, trees or plants unless needed to avoid damage or loss and, at any rate, not more than every second day for not more than thirty (30) minutes per twenty-four-hour period.

(3) Washing of public or private sidewalks, streets, driveways, parking areas, tennis courts, patios or other paved areas with municipal treated water shall be prohibited.

(4) Power washing of structures with municipal treated water shall be prohibited.

(5) Filling, refilling or replacement of water in swimming pools, hot tubs or landscape water features with municipal treated water shall be prohibited; provided, however, that the Town Manager may permit filling of municipal or public pools and may allow the addition of water to public or private pools, hot tubs or water features to make up for losses through evaporation or use.

(6) Installation of new public or private landscaping shall be prohibited. In the event that landscaping is required as a condition of development approval, the requirements will toll during the period of imposition of conservation measures but eventual installation will continue to be secured by any required bonding.

(7) Service of water to restaurant patrons shall be prohibited unless requested by the patron.

(8) Noncommercial washing of privately owned cars or other motor vehicles, trailers or boats with municipal treated water shall be prohibited, except by bucket.

(9) Use of municipal treated water for commercial car washes shall be prohibited.

(10) Use of municipal treated water for irrigation for any public or private lawns, gardens, trees, shrubs, plants, municipal or school fields, golf courses or similar grass areas shall be prohibited except for a period not to exceed thirty (30) minutes, only between the hours of 9:00 p.m. to 9:00 a.m., and on days designated by the Town Manager. The Town Manager shall establish a schedule for irrigation that may be determined by any method he or she deems appropriate, including the establishment of zones within the area receiving municipal water service. These restrictions shall not apply to any person engaged in the business of growing or selling plants of any kind, with respect to water for such plants only.

(d) Conservation measures imposed by Town Council.

(1) The Town Council may, in the event of a water shortage, impose by resolution one (1) or both of the following conservation measures:

a. A prohibition against the use of any municipal treated water to sprinkle or irrigate any lawn, yard, garden, landscaping or other outside area. The prohibition shall apply to all residences, businesses and institutions, as well as all parks and public buildings. The restriction shall not apply to any person engaged in the business of growing or selling plants with respect to such plants only.

b. A prohibition against any new connections to the municipal water system; provided that applications pending on the date of the adoption of the resolution imposing this restriction shall be granted a connection. For purposes of this Section, *pending applications* means any applications for development that require new or additional water taps filed with and certified complete by either: (1) the Planning Director if approval under the Land Use Code is required prior to issuance of a building permit; or (2) the Building Official if no approval under the Land Use Code is required.

(2) Prior to and as a condition to imposition of either or both of the above, the Town Council shall have found and determined that the water shortage is of such severity or possible duration that imposition of the water conservation measures described in Subsection (c) above are inadequate and immediate imposition of one (1) or both of the water conservation measures described in this Subsection is required for the preservation of public health and safety. The facts underlying such determination shall be specified in the resolution imposing the measures.

(e) Applicability. The water conservation measures shall apply to all users and properties served by the municipal water system, whether the point of connection or of consumption of such service is located inside or outside the Town boundaries.

(f) Termination of conservation measures. Voluntary or mandatory conservation measures may be reduced or terminated upon the announcement of the Town Manager (or Town Council with respect to measures imposed by the Town Council) when the water shortage requiring such measures has abated. (Prior code 13.30.040; Ord. 1288 §1, 2008)

Sec. 13-5-50. Violations and penalties.

(a) Whenever a violation of a mandatory water conservation measure is observed, or whenever probable cause exists to believe a violation of a mandatory water conservation measure has occurred, a written notice shall be posted in a conspicuous place on the property where the violation occurs or occurred. Said notice shall describe the violation and order that it be abated, corrected or cured immediately or within such time as specified in the notice. If the order is not complied with as specified in the notice, water service to the property upon which the violation occurred or is occurring may be disconnected.

(b) Any person aggrieved by a water service disconnection may seek a hearing before the Town Council by requesting the same within five (5) days of the service disconnect. Such request shall be submitted to the office of the Town Manager in writing.

(c) Any person found to have violated any provision of this Section shall be assessed a penalty of five hundred dollars ($500.00) for the first offense and one thousand dollars ($1,000.00) for any subsequent occurrence within any twelve-month period.

(d) In addition to any other fee or penalty authorized under this Code, a fee of one hundred dollars ($100.00) shall be paid for the reconnection of any water service after disconnection pursuant to Subsection (a) above if a violation is found to have occurred.

(e) The remedies provided for herein are cumulative. In addition, any penalties or fees due and unpaid hereunder shall be a lien upon the property and are collectible as provided in Section 4-1-90 of this Code or as may otherwise be provided by law. (Prior code 13.30.040; Ord. 1288 §1, 2008)

APPENDIX 3 Statewide Water Supply Initiative Worksheets

WORKSHEET A – TABULATION OF WATER SUPPLY LIMITATIONS AND FUTURE WATER NEEDS

Limitation and/or Future Need	Yes	No	Comments on Limitation or Future Need	How is Limitation or Future Need Being Addressed
System is in a designated critical water supply shortage area		✓		
System experiences frequent water supply shortages and/or emergencies		✓	While Telluride's current water system does not experience frequent water supply shortages, it is vulnerable to drought.	The Town of Telluride is in the midst of constructing its new Pandora Water Treatment Plant (surface water), which will provide up to 1 mgd of high quality water. The water system that supplies this plant includes storage elements that will make the system more resilient to drought.
System has substantial non-revenue water	✓			Table 2.2 suggests that the Town has 37% non-revenue water. For this reason, the Town has identified better quantifying non-revenue water as an objective for the 2014 Water Efficiency Plan. Several Water Efficiency Activities were selected because they will help with achieving this objective.
Experiencing high rates of population and demand growth		✓	The Town is experiencing peak demand spikes that are sometimes difficult to meet. These spikes are associated with specific tourist-related periods and events	Town staff and elected officials are aware of the situation and are working actively to develop solutions that will solve the problem from several angles. For example, keeping a diversity of water sources available, increasing capacity by adding Pandora, voluntary and mandatory conservation measures.
Planning substantial improvements or additions	✓			The Town of Telluride is in the midst of constructing the new Pandora Water Treatment Plant (surface water), which will provide up to 1 mgd of high quality water. The Town's current water sources—Mill Creek (surface water) and Stillwell Tunnel (groundwater)—are less reliable in terms of volume and quality; although, they will remain in operation.
Increases to wastewater system capacity anticipated		✓		If needed, the Pandora WTP's capacity can be increased to 2 MGD.
Need additional drought reserves	✓			The Pandora Water System, which supplies water from the Bridal Veil Basin, includes reservoir storage. Current water sources have no storage component.
Drinking water quality issues		✓	The Town's water supply meets drinking water standards.	
Aging infrastructure in need of repair	✓		Telluride's *2012 Water/Wastewater Capital Asset Maintenance Plan* classified the status of nearly 20 miles of water supply piping.	Capital expenditures to replace aging pipes have been incorporated into Telluride's 2013 Water Rate Study and into the Town's Capital Implementation Plan.
Issues with water pressure in portions of distribution system		✓		

WORKSHEET B – HISTORICAL AND CURRENT WATER EFFICIENCY ACTIVITIES - 2014

Historical and Current Water Efficiency Activities (1)	Period of Implementation (2)	Annual Water Savings for Past Five Years (AF or %)					Total Five-Year Water Savings (4)	Average Annual Savings (5)
		2009	2010	2011	2012	2013		
Foundational Activities (Focus on system operations and water efficiencies within Telluride government)								
Metering and demand data collection	2003	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Water efficiency oriented water rates (tap fees are not included)	2004 - present	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Subtotal								
Targeted Technical Assistance and Incentives								
No formal targeted technical assistance and incentives activities have been undertaken by the Town to date.	n/a	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0
Ordinances and Regulations								
Water Conservation Code (Title 13, Article 5)	2002 - present	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Green Building Code (Telluride Municipal Code Title 15, "Building Codes")	6/2010 - present	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Subtotal		n/a	n/a	n/a	n/a	n/a	n/a	n/a
Educational Activities								
No formal educational activities have been undertaken by the Town to date.	n/a	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0
	Total Savings							

WORKSHEET C – MODIFICATIONS TO CAPITAL IMPROVEMENT PROJECTS AND WATER ACQUISITIONS - 2014

Capital Improvement Projects and Water Acquisitions (1)	Estimated Cost (2)	Action as a Result of Reduced Demands (3)				Potential Cost Savings (5)
		Eliminated	Postponed	Downsized	Comments (4)	
Pandora Water Treatment Plant expansion by 1 mgd (for a total capacity of 2 mgd), if water demand warrants.	$1,000,000		X		Would not expand the Pandora Plant capacity by 1 mgd, if water demand is met by current system.	$1,000,000.00
2014 West Colorado Water Line Replacement Project, if grant is secured.					None.	$0.00

WORKSHEET D – IDENTIFICATION AND SCREENING OF FOUNDATIONAL ACTIVITIES - 2014

Water Efficiency Activities for Screening	State Statute Requirement (2)	Identification		Qualitative Screening (5)				Additional Pros	Carry to Evaluation (6)	Reason for Elimination (7)
		Existing/ Potential Activity (3)	Targeted Customer Category (4)	Under the Town's direct control	Very likely to measurably decrease water use	Builds on an ongoing activity	Provides positive reinforcement to conserve			
Metering (BP1)	V,VII									
Automatic meter reading installation and operations		E		-	-	-	-	All existing programs will continue.	X	
Change remaining manual read meters (~100) to autoread meters		P		X	-	X	-	Staff ID'd	X	
Submetering for large users (indoor and outdoor)		P	Large User	X	X	X	X		X	
Meter testing and replacement		P		X	-	X	X		X	
Meter upgrades		P		X	-	X	X	Parts for existing meters are hard to obtain.	X	
Identify unmetered/unbilled treated water uses on all Town-owned facilities		P	Town	X	-	X	X		X	
Data Collection – Monitoring and Verification (BP2)										
Frequency of meter reading - investigate the requirements of moving to monthly billing		E		-	-	-	-	All existing programs will continue.	X	
Tracking water use by customer type		E		-	-	-	-	All existing programs will continue.	X	
Modify existing billing system to track use by sufficient customer types		E		-	-	-	-	All existing programs will continue.	X	
Tracking water use for large customers		P	Large User	X	-	X	-	Provides information about where to focus activities for potential largest efficiency gains.	X	
Area of irrigated lands in service area (e.g., acres)		P		X	-	-	-			Having these data does not assist with targeting specific large irrigators. Overall, most lots have no or very little landscaped acreage.
Create a "new " category under the billing program for Town-owned facilities to track		P	Town	X	X	X	X	Will help to understand water usage at each town-owned facility.	X	
Investigate the potential range of inaccuracy of existing "typical" meters used throughout the water system to refine quantification of non-revenue water.		P		X	X	X	-		X	
Investigate cost and administrative challenges of changing all meters to a new system		P		X	X	-	-		X	
Water Use Efficiency Oriented Rates and Tap Fees (BP1)	VII,VIII									
Volumetric bill		E		X	-	-	-	All existing programs will continue.	X	
Water rate adjustments		E		X	-	-	-	All existing programs will continue.	X	
Frequency of billing – Bi-monthly		E		X	-	-	-	All existing programs will continue.	X	
Inclining/tiered rates		E		X	-	-	-	All existing programs will continue.	X	
Investigate lowering the 4000 gallon per month cap for base rate to 3000 gallons per month		P		X	-	X	-	Town Council ID'd	X	
Water Budgets		P		-	-	-	-			At this time, it is unclear what benefits would be provided by creating water budgets for customers or for the system.
Tap fees with water use efficiency incentives		P		X	-	-	X	Staff ID'd	X	
System Water Loss Management and Control (BP3)	VI									
Control of apparent losses (with Metering)		E		X	X	X	-	All existing programs will continue.	X	
Leak detection and repair		E		X	X	X	-	All existing programs will continue.	X	
Water line replacement program		E		X	X	X	-	All existing programs will continue.	X	2014 West Colorado Water Line Replacement Project, if grant is secured.
System wide water audits		P		X	-		-			At this time, it is unclear what benefits a formal system wide water audit would provide.
Improve water production metering at Mill Creek WTP and Stillwell WTP		P		X	-	X	-	Staff ID'd		Staff determined that this activity had already been completed last year and so was no longer necessary.
Planning (BP2)										
Master plans/water supply plans		E		X	-	-	-	All existing programs will continue.	X	
Capital improvement plans		E		X	-	-	-	All existing programs will continue.	X	
Integrated water resources plans		E			-	-	-	All existing programs will continue.	X	Note: This applies to the Comprehensive Settlement Agreement with Idarado Mining Company (January 2013)
Feasibility studies		P		X	-	-	-			There is no need for a Feasibility study as no new projects are envisioned or slated at this time.
Staff (BP4)										
Water Conservation Coordinator		P		X	-	-	X			There is no staff available to undertake the responsibilities this would entail and there is no funding for a new staff position dedicated to do this work. This would seem to be too much for such a small water system.

WORKSHEET E – IDENTIFICATION AND SCREENING OF TARGETED TECHNICAL ASSISTANCE INCENTIVES - 2014

Water Efficiency Activities for Screening	State Statute Requirement (2)	Identification					Qualitative Screening (6)				Additional Pros	Carry to Evaluation (7)	Reason for Elimination (8)
		Existing/ Potential Activity (3)	SWSI Framework Levels (4)			Targeted Customer Category (5)							
			Level 1 Municipal Uses	Level 2 Customers with the Largest Water Use	Level 3 Customer Type(s) in Service Area		Under the Town's direct control	Very likely to measurably decrease water use	Builds on an ongoing activity	Provides positive reinforcement to			
Installation of Water Efficient Fixtures and Appliances	I												
Free indoor water audits		P	X	X	X						Ecology Commission IDd. Could piggy back on energy audit program. Could train high school students to perform the audits for Community Service Program.	X	
Toilet retrofits – Shandoka Affordable Rental Housing		P		X		Large User	X	X	X	X	Staff ID'd	X	
Urinal retrofits		P	X				-	-	-	X			Apparent high cost to benefit ratio at this time.
Showerhead retrofits		P	X				-	-	-	X			Apparent high cost to benefit ratio at this time.
Faucet retrofits (e.g., aerator installation)		P	X				-	-	-	X			Apparent high cost to benefit ratio at this time.
Water efficient washing machines		P	X				-	-	-	X			Apparent high cost to benefit ratio at this time.
Water efficient dishwashers		P	X				-	-	-	X			Apparent high cost to benefit ratio at this time.
Efficient air conditioning use		P	X				-	-	-	X			Apparent high cost to benefit ratio at this time.
Low Water Use Landscapes Incentives	II												
Drought resistant/native vegetation		P			X		-	-	X	X			Apparent high cost to benefit ratio at this time. Already regulated by Ordinance.
Irrigation scheduling/timing		P			X		-	-	X	X			Apparent high cost to benefit ratio at this time. Already regulated by Ordinance.
Work with the cemetery on irrigation system		P		X		Large User	-	X	-	X	All ID'd	X	
Work with the Telluride HS/MS on irrigation system		P		X		Large User	-	X	-	X	All ID'd	X	
Removal of phreatophytes		n/a					-	-	-	X			This is not applicable in the Town of Telluride service area.
Irrigation efficiency evaluations/outdoor water audits		P	X	X			-	X	-	X		X	
Outdoor irrigation controllers		P			X		-	-	-	X			Apparent high cost to benefit ratio at this time.
Rain sensors		P			X		-	-	-	X			Apparent high cost to benefit ratio at this time.
Residential outdoor meter installations		P			X		-	-	-	X			Increasing the number of meters to read would require significant additional staffing to install and read the meters and sort through the additional data for billing and water use.
Xeriscape		P			X		-	-	-	X			Apparent high cost to benefit ratio at this time.
Irrigation equipment retrofits		P			X		-	-	-	X			Apparent high cost to benefit ratio at this time.
Water Efficient Industrial and Commercial Water-Using Processes Incentives	III												
Commercial Indoor Fixture and Appliance Rebates/Retrofits		P		X			-	-	-	X			Apparent high cost to benefit ratio at this time.
Assess potable water usage at the Telluride Regional Wastewater Treatment Plant		P	X			Town	X	X	X	X	Staff ID'd	X	
Specialized nonresidential surveys, audits and equipment efficiency Improvements		P		X			-	-	-	X			Apparent high cost to benefit ratio at this time.
Cooling equipment efficiency		P		X			-	-	-	X			Apparent high cost to benefit ratio at this time.
Restaurant equipment		P		X			-	-	-	X			Apparent high cost to benefit ratio at this time.
Rebates	X												
Water Efficient Washing Machine Rebates		E		X	X		-	-	X	X	Currently available through SMPA and SourceGas for energy efficiency purposes.	X	
Water Efficient Dishwasher Rebates		E		X	X		-	-	X	X	Currently available through SMPA and SourceGas for energy efficiency purposes.	X	
Water conservation rebate for full-time residents		P			X		X	-	-	X	Town Council ID'd	X	
Toilet Rebates		P			X		-	-	X	X			Apparent high cost to benefit ratio at this time.
Urinal Rebates		P			X		-	-	X	X			Apparent high cost to benefit ratio at this time.
Showerhead Rebates		P			X		-	-	X	X			Apparent high cost to benefit ratio at this time.
Water Efficient Faucet or Aerator Rebates		P			X		-	-	X	X			Apparent high cost to benefit ratio at this time.
Efficient Irrigation Equipment Rebates		P		X	X		-	-	X	X			Apparent high cost to benefit ratio at this time.
Landscape Water Budgets Information and Customer Feedback		P		X	X		-	-	-	X			There are a limited number of customers in Telluride that would benefit from this because most lots are quite small with limited landscape area. The likelihood of greatly reducing water use would be small.
Turf Replacement Programs/xeriscape Incentives		P		X	X		-	-	-	X	Town Council ID'd		There are a limited number of customers in Telluride that would benefit from this because most lots are quite small with limited landscape area. The likelihood of greatly reducing water use would be small.
Give-aways		P			X		-	-	-	X			No room to store the "give-aways". No assurance that "give-away" is actually used locally.

WORKSHEET F – IDENTIFICATION AND SCREENING OF ORDINANCES AND REGULATIONS - 2014

Water Efficiency Activities for Screening	State Statute Requirement (2)	Identification					Qualitative Screening (6)				Additional Pros	Carry to Evaluation (7)	Reason for Elimination (8)
		Existing/ Potential Activity (3)	SWSI Framework Levels (4)			Targeted Customer Category (5)							
			Level 1 All Customers within the Existing Service Area	Level 2 New Development	Level 3 Point of Sales on Existing Building Stock		Under the Town's direct control	Very likely to measurably decrease water use	Builds on an ongoing activity	Provides positive reinforcement to conserve			
General Water Use Regulations	IX												
Water conservation ordinance		E	X				X	X	X	-	All existing programs will continue.	X	
Time of Day Watering Restriction change to 8 pm – 8 am all season		E	X				X	X	X	-	All existing programs will continue. All ID'd this for expansion.	X	
With each building permit, require a service line audit from the main to the meter to ensure functionality.		P	X				X	-	X	-	Ecology Commission ID'd	X	
Day of week watering restriction		P	X				X	-	X	-			Consensus that it is too complex for the public to remember which day of the week. Easier to remember you can only water at night no matter what day.
Water Waste Ordinance (BP5)		P	X				X	-	-	-			Consensus that enforcement is difficult to impossible without additional staff. No political will to penalize community in such a way.
Water Overspray Limitations		P	X				X	-	-	-			Consensus that enforcement is difficult to impossible without additional staff. No political will to penalize community in such a way.
Landscape Design/Installation Rules and Regulations	IX												
Rules and regulations for landscape design/installation (BP9)		E	X	X			-	-	X	-	All existing programs will continue. Town Council ID'd (more enforcement)	X	
Irrigation equipment requirements		E	X	X			-	-	X	-	All existing programs will continue.	X	
Soil amendment requirements (BP9)		E	X	X			-	-		-	All existing programs will continue.	X	
Restrictions of acreage of irrigation or % of property irrigated		P		X			-	-	-	-	Ecology Commission ID'd	X	
Landscaper training and certification (BP8)		P	X				-	-	-	-			New regulations are not politically palatable. There is a problem of enforcement. Questionable noticeable/measurable efficiencies in water use.
Irrigation system installer training and certification (BP 8)		P	X				-	-	-	-			New regulations are not politically palatable. There is a problem of enforcement. Questionable noticeable/measurable efficiencies in water use.
Turf Restrictions (BP 9)		P		X			-	-	-	-			Given the very small lot sizes within the Town limits, such limitations are somewhat superfluous. Larger lot sizes are in the County and therefore outside of the ability of the Town to insist on limits. Irrigation water pricing is a likely alternative way to move this forward.
Outdoor water audits/irrigation efficiency regulation (BP 10)		P		X			-	-	-	-			New regulations are not politically palatable. There is a problem of enforcement. Questionable noticeable/measurable efficiencies in water use.
Outdoor green building construction (BP 8, 9)		P		X			-	-	-	-			
Indoor and Commercial Regulation	IX												
Indoor plumbing requirements (BP 12)		E	X	X			X	-	-	-	All existing programs will continue.	X	
Green building construction (BP 12)		E	X	X			X	-	-	-	All existing programs will continue.	X	
Town facility requirements (BP 12)		P				Town	X	-	-	X	Will serve as an example to the broader community.	X	
Low efficiency fixture and appliance replacement (BP 12)		P	X				-	-	-	-			New regulations are not politically palatable. There is a problem of enforcement. Questionable noticeable/measurable efficiencies in water use.
Commercial cooling and process water requirements (BP 14)		P	X			Commercial	-	-	-	-			New regulations are not politically palatable. There is a problem of enforcement. Questionable noticeable/measurable efficiencies in water use.
Required indoor residential audits (BP 13)		P	X				-	-	-	-			New regulations are not politically palatable. There is a problem of enforcement. Questionable noticeable/measurable efficiencies in water use.
Required indoor commercial audits (BP 14)		P	X				-	-	-	-			New regulations are not politically palatable. There is a problem of enforcement. Questionable noticeable/measurable efficiencies in water use.
Commercial Water Wise use regulations (car washes, restaurants, etc.		P	X			Commercial	-	-	-	-			New regulations are not politically palatable. There is a problem of enforcement. Questionable noticeable/measurable efficiencies in water use.

WORKSHEET G – IDENTIFICATION AND SCREENING OF EDUCATION ACTIVITIES - 2014

Water Efficiency Activities for Screening	State Statute Requirement (2)	Identification					Qualitative Screening (6)				Additional Pros	Carry to Evaluation (7)	Reason for elimination (8)
		Existing/ Potential Activity (3)	SWSI Framework Levels (4)			Targeted Customer Category (5)	Under the Town's direct control	Very likely to measurably decrease water use	Builds on an ongoing activity	Provides positive reinforcement to			
			Level 1 One-Way	Level 2 One-Way with Feedback	Level 3Two-way Education (Interactive)								
Customer Education (BP6)	VI												
1 KOTO Radio Access discussion per year about wise use of water		P			X		X	-	X	X	Ecology Commission ID'd	X	
PSA newspaper water wise advertisements		P	X		X		X	-	X	X	Staff ID'd	X	
Water bill insert one time each year		P	X		X		X	-	X	X	All ID'd	X	
Newsletter		P	X				X	-	-	X			Staff time and resources expected to be excessive for little anticipated return.
Newspaper articles		P	X				X	-	-	X	Staff ID'd	X	
Mass mailings		P	X				X	-	-	X			Staff time and resources expected to be excessive for little anticipated return.
Web pages		P	X				X	-	-	X	Staff ID'd. Could use existing Town web site spotlight for getting info out.	X	
Water fairs		P			X		-	-	-	X	Ecology Commission ID'd. Of interest to parents/teachers on ECOMM.	X	
K-12 Teacher and Classroom Education Programs		P			X		-	-	-	X	Ecology Commission ID'd. Of interest to parents/teachers on ECOMM.	X	
Interactive Websites		P			X		X	-	-	X			Staff time and resources expected to be excessive for little anticipated return.
Water savings competition between Telluride and another Mountain Town		P			X		-	-	-	X	Ecology Commission ID'd		Staff time and resources expected to be excessive for little anticipated return.
Social Networking (e.g., Facebook)		P			X		X	-	-	X			Would require additional staff. Apparent high cost to benefit ratio at this time.
Customer Surveys		P		X			X	-	-	X			Would require additional staff. Apparent high cost to benefit ratio at this time.
Focus Groups		P		X			X	-	-	X			Difficulty filling currently available seats on boards and commissions.
Citizen Advisory Boards		P			X		X	-	-	X			Difficulty filling currently available seats on boards and commissions.
Technical Assistance	VI												
Native plant/xeriscape demonstration garden		E	X				X	-	X	X	All existing programs will continue.	X	Should talk this up more so public knows it is there.
Customer water use workshops		P			X		X	-	-	X			Very low turnout (5 – 10 people) at work shops in Town is typical. Apparent high cost to benefit ratio at this time.
Landscape design and maintenance Workshops		P			X		X	-	-	X			Very low turnout (5 – 10 people) at work shops in Town is typical. Apparent high cost to benefit ratio at this time.
Water conservation expert available		P			X		X	-	-	X			Apparent high cost to benefit ratio at this time.

WORKSHEET H – EVALUATION AND SELECTION OF WATER EFFICIENCY ACTIVITIES - 2014

Water Efficiency Activities for Evaluation (1)	Existing/ Potential Activity (2)	Targeted Customer Category (3)	Evaluative Screening: Evaluative Goals (4)				Evaluation: Projected Water Savings (5)		Projected Implementation Costs ($) to Town (6)	Qualitative Goals/Objectives (7)					Final Selection (8)	
			Can be accomplished with current staffing	Technically feasible	Relatively low cost ($)	Can be completed within 5-yr WEP window	Total Water Savings over 5-year Planning Window (gallons)	Average Annual Water Savings (gallons)		Decrease outdoor irrigation	Reduce wastewater discharges by reducing indoor water use	Reduce peak day summer demand	Better quantify non-revenue water	Notes on Additional Pros/cons to consider	Activities Selected for Imple-menta-tion (new have #s)	General notes and if eliminated, reason why.
FOUNDATIONAL ACTIVITIES																
Metering (BP1)																
Automatic meter reading installation and operations	E	All	X	X	X	X	unknown	unknown		-	-	-	X	Existing programs continue.	X	
Change remaining manual read meters (~100) to autoread meters	P	All	X	X	-	X	unknown	unknown	$0.00	-	-	X	X		1	
Sub-metering for large users (indoor and outdoor)	P	Large User	X	X	X	X	0	0		-	-	-	-			Question whether this will provide improved information. Timing is wrong. Too preliminary. Large water users are identified and prioritized.
Meter testing and replacement	P	All	-	X	-	-	0	0		-	-	-	X			Across the board meter testing and replacement does not meet many evaluative or qualitative criteria.
Meter upgrades - Investigate cost and administrative challenges of changing all meters to a new system	P	All	-	X	-	-	0	0		-	-	-	X			This requires a complete change of existing meters, requiring significant costs to customers and staff time to implement. The cost-benefit is questionable at this time.
Identify unmetered/unbilled treated water uses on all Town-owned facilities	P	Town	X	X	X	X	0	0	$10,000 – $53,000	-	X	-	X		2	
Data Collection – Monitoring and Verification (BP2)																
Frequency of meter reading - investigate the requirements of moving to monthly billing	E	All	X	X	X	X	0	0		X	X	-	X	Existing programs continue.	X	
Tracking water use by customer type	E	All	X	X	X	X	0	0		X	X	X	-	Existing programs continue.	X	
Modify existing billing system to track use by sufficient customer types	E	All	X	X	X	X	0	0		X	X	X	-	Existing programs continue.	X	
Tracking water use for large customers	P	Large User	X	X	X	X	0	0		X	X	X	-		3	
Create a "new " category under the billing program for Town-owned buildings to track	P	Town	X	X	X	X	0	0		X	X	-	X		4	
Investigate the potential range of inaccuracy of existing "typical" meters used throughout the water system to refine quantification of non-revenue water.	P	n/a	X	X	X	X	0	0		-	-	-	X			While eliminated because it did not meet any of the qualitative criteria, this easy to complete activity may be implemented to improve understanding of how well the existing meters are actually working.
Water Use Efficiency Oriented Rates and Tap Fees (BP1)																
Volumetric bill	E	All	X	X	X	X	unknown	unknown		X	X	X	X	Existing programs continue.	X	
Water rate adjustments	E	All	X	X	X	X	unknown	unknown		X	X	X	-	Existing programs continue.	X	
Frequency of billing – Bi-monthly	E	All	X	X	X	X	unknown	unknown					-	Existing programs continue.	X	
Inclining/tiered rates	E	All	X	X	X	X	unknown	unknown		X	X	X	-	Existing programs continue.	X	
Investigate lowering the 4000 gallon per month cap for base rate to 3000 gallons per month	P	All	X	X	X	-	unknown	unknown		X	X	X	-		5	This activity will occur as part of the next Water Services Rate Study in 2019.
Tap fees with water use efficiency incentives	P	New	X	X	X	X	0	0		X	X	X	-			Staff feels strongly that tap fees are designed capture the cost of the existing infrastructure and that the cost benefits of implementing water efficient fixtures will be more appropriately achieved through the inclining block rate structure.
System Water Loss Management and Control (BP3)																
Control of apparent losses (with metering)	E	n/a	X	X	X	X	unknown	unknown		-	-	X	X	Existing programs continue.	X	
Leak detection and repair	E	n/a	X	X	X	X	unknown	unknown		-	-	X	X	Existing programs continue.	X	
Water line replacement program	E	n/a	X	X	X	X	unknown	unknown		-	-	X	X	Existing programs continue.	X	2014 West Colorado Water Line Replacement Project, if grant is secured.
Planning (BP2)																
Master plans/water supply plans	E	n/a					0	0						Existing programs continue.	X	A Water Master Plan is in place. It will likely be updated in 2020.
Capital improvement plans	E	n/a					unknown	unknown						Existing programs continue.	X	A Capital Improvement Plan for the water system is in place through 2020. It will be updated annually.
Integrated water resources plans	E	n/a	X	X		X	0	0						Existing programs continue.	X	Telluride and Idarado Mining Company are implementing the Comprehensive Settlement Agreement (January 2013).
TARGETED TECHNICAL ASSISTANCE INCENTIVES																
Installation of Water Efficient Fixtures and Appliances																
Free indoor water audits	P	All	-	X	-	X	0	0		-	X	X	-			Staff will look for opportunities to piggy back a water audit program onto the existing energy audit program in the Town via EcoAction Partners, if the opportunity arises.

Water Efficiency Activities for Evaluation (1)	Existing/ Potential Activity (2)	Targeted Customer Category (3)	Evaluative Screening: Evaluative Goals (4)				Evaluation: Projected Water Savings (5)		Projected Implementation Costs ($) to Town (6)	Qualitative Goals/Objectives (7)					Final Selection (8)	
			Can be accomplished with current staffing	Technically feasible	Relatively low cost ($)	Can be completed within 5-yr WEP window	Total Water Savings over 5-year Planning Window (gallons)	Average Annual Water Savings (gallons)		Decrease outdoor irrigation	Reduce wastewater discharges by reducing indoor water use	Reduce peak day summer demand	Better quantify non-revenue water	Notes on Additional Pros/cons to consider	Activities Selected for Imple-menta-tion (new have #s)	General notes and if eliminated, reason why.
Toilet retrofits – Shandoka Affordable Rental Housing	P	Town	X	X	-	X	9,580,000	1,916,000	$300 per toilet	-	X	X	-		6	Will need to locate a grant! Costs assume $100 for toilet and $200 for installation per toilet.
Low Water Use Landscapes Incentives																
Work with the cemetery on irrigation system	P	Large User	X	X	-	X	583,000	116,600	?$10,000	X	-	X	X	Public perception of waste.	7	
Work with the Telluride HS/MS on irrigation system	P	Large User	X	X	X	X	1,006,750	201,350	?$10,000	X	-	X	-	Public perception of waste.	8	
Irrigation efficiency evaluations/outdoor water audits	P	All	-	X	-	X	0	0	$5,000	X	-	X	-			Apparent high cost to benefit ratio at this time. No timely or specific benefits.
Water Efficient Industrial and Commercial Water-Using Processes Incentives																
Assess potable water usage at the Telluride Regional Wastewater Treatment Plant	P	Town	X	X	X	X	unknown	unknown	$0.00 - $2,000	-	X	X	-		9	
Rebates																
Water Efficient Washing Machine Rebates	E	All	X	X	X	X	1,155,000 – 2,390,000	231,000 – 478,000	$0	-	X	X	-	Existing programs continue.	X	Incidental as residents use SMPA and SourceGas rebates when replacing older appliances for newer, energy efficient models.
Water Efficient Dishwasher Rebates	E	All	X	X	X	X	308,000 – 617,000	77,000 – 154,000	$0	-	X	X	-	Existing programs continue.	X	Incidental as residents use SMPA and SourceGas rebates when replacing older appliances for newer, energy efficient models.
Water conservation rebate for full-time residents	P	All	X	X	X	X	0	0	?$3,000	-	X	X	-			While this may be a nice incentive for some customers, it would require a lot of staff time for little water savings.
ORDINANCES AND REGULATIONS																
General Water Use Regulations																
Water conservation ordinance	E	All	X	X	X	X	Cannot be quantified	Cannot be quantified	$0	X	X	X	-	Existing programs continue.	X	
Time of day watering restriction change to 8 pm – 8 am all season	E	All	X	X	X	X	unknown	unknown	$0	X	X	X	-	Existing programs continue.	X	
With each building permit, require a service line audit from the main to the meter to ensure functionality.	P	New	X	X	X	X	Cannot be quantified	Cannot be quantified	$0	X	X	X	-		10	
Landscape Design/Installation Rules and Regulations																
Rules and regulations for landscape design/installation (BP9)	E	New	X	X	X	X	0	0	$0	X	-	X	-	Existing programs continue.	X	
Irrigation equipment requirements	E	New	X	X	X	X	0	0	$0	X	-	X	-	Existing programs continue.	X	
Soil amendment requirements (BP9)	E	New	X	X	X	X	0	0	$0	X	-	X	-	Existing programs continue.	X	
Restrictions of acreage of irrigation or % of property irrigated	P	All	X	-	-	X	0	0	$0	X	-	X	-			Apparent high cost to benefit ratio at this time. Small size of most lots (100'X25') effectively limits irrigation acreage throughout Town. Would be difficult to enforce.
Indoor and Commercial Regulation																
Indoor plumbing requirements (BP 12)	E	New	X	X	X	X	unknown	unknown	$0	-	X	X	-	Existing programs continue.	X	
Green building construction (BP 12)	E	New	X	X	X	X	unknown	unknown	$0	-	X	X	-	Existing programs continue.	X	
Town facility requirements (BP 12)	P	Town	X	X	X	X	unknown	unknown	$0	-	X	X	-			This can be accomplished through managerial policy and without a regulation or ordinance.
EDUCATION																
Customer Education (BP6)																
1 KOTO Radio Access per year about wise use of water	P	All	X	X	X	X	0	0	$0	X	X	X	-		11	
PSA newspaper water wise advertisements	P	All	X	X	X	X	0	0	$150 each	X	X	X	-		12	
Water bill insert one time each year	P	All	X	X	X	X	0	0	$200	X	X	X	-		13	
Newspaper articles	P	All	X	X	X	X	0	0	$0	X	X	X	-		14	
Web pages	P	All	-	X	X	X	0	0	$0	X	X	X	-	Spotlight and new on existing Town web page.	15	
Water fairs	P	Kids	-	X	-	X	0	0	$1,000	X	X	X	-			Implementation would have to be accomplished through coordination between the Ecology Commission and the schools.
K-12 Teacher and Classroom Education Programs	P	Kids	-	X	-	X	0	0	$3,500	X	X	X	-			Implementation would have to be accomplished through coordination between the Ecology Commission and the schools.
Technical Assistance																
Native plant/xeriscape demonstration garden	E	All					0	0	$0	X	-	X	-	Existing programs continue.	X	

WORKSHEET I – SELECTED WATER EFFICIENCY ACTIVITIES AND ESTIMATED WATER SAVINGS - 2014

Selected Water Efficiency Activities (1)	Implementation Period of Historical Activities (2)	Historical Total Water Savings (% or AF) (3)	Implementation Period of New Activities (4)	Projected Water Savings for Planning Period (5)
FOUNDATIONAL ACTIVITIES				
Automatic meter reading installation and operations	~2000 - present	0	n/a	n/a
Change remaining manual read meters (~100) to autoread meters	n/a	n/a	2015 - 2019	Estimated as 169,000 (0.1%)
Identify unmetered/unbilled treated water uses on all Town-owned facilities	n/a	n/a	2014-2015	0
Frequency of meter reading - investigate the requirements of moving to monthly billing	n/a	0	2015	n/a
Tracking water use by customer type	~2000 - present	0	n/a	n/a
Modify existing billing system to track use by sufficient customer types	~2000-2013; 2013 added 2 categories	0	n/a	n/a
Tracking water use for large customers	n/a	n/a	2014-2019	Estimated as 8,450,000 (5%)
Create a "new " category under the billing program for Town-owned buildings to track	n/a	n/a	2014	0
Volumetric bill	~2000 - present	1%?	n/a	n/a
Water rate adjustments	2000, 2004, 2014-2019	unknown	n/a	n/a
Frequency of billing – Bi-monthly	~2000 - present	unknown	n/a	n/a
Inclining/tiered rates	2004 – present; adjusted January 2014	unknown	n/a	n/a
Investigate lowering the 4000 gallon per month cap for base rate to 3000 gallons per month	n/a	n/a	2019	0
Control of apparent losses (with metering)	Mid-1970s; 1980s; 1990s - present	unknown	n/a	n/a
Leak detection and repair	Mid-1970s – present	unknown	n/a	n/a
Water line replacement program & 2014 West Colorado Water Line Replacement Project	2000 - present	unknown	n/a	Estimated as 169,000 (0.1%)
Master plans/water supply plans	1977, 1993, 2002, 2010	0	n/a	n/a
Capital improvement plans	2000 – present	Estimated at 10%	n/a	n/a
Integrated water resources plans	2013 – present	0	n/a	n/a
TARGETED TECHNICAL ASSISTANCE AND INCENTIVES				
Toilet retrofits – Shandoka Affordable Rental Housing	n/a	n/a	2015	9,580,000 (5.7%)
Work with the cemetery on irrigation system	n/a	n/a	2014-2019	116,600 gallons per year (0.07% of treated water volume). NOTE: manual read meter installed in 2013.
Work with the Telluride HS/MS on irrigation system	n/a	n/a	2014-2019	201,350 gallons per year (.12% of treated water volume)
Water Efficient Washing Machine Rebates	~2010 – present	0	n/a	n/a
Water Efficient Dishwasher Rebates	~2010 – present	0	n/a	n/a
ORDINANCES AND REGULATIONS				
Water conservation ordinance	2004 – present	Up to 4% (6,537,400 gallons) when emergency measures implemented (based on 2012 versus 2011 usage)	n/a	n/a
Time of day watering restriction, emergency - change to 8 pm – 8 am all season	n/a	n/a	2014	Average summer usage is 150,000,000 gallons more than in winter. As evaporation at night is less than at midday, we will assume 5% of total water will be saved using this technique or 7,500,000 gallons annually (0.04%).
With each building permit, require a service line audit from the main to the meter to ensure functionality.	n/a	n/a	2015 - future	Estimated as 169,000 (0.1%)
Rules and regulations for landscape design/installation (BP9)	~2000 – present	0	n/a	n/a
Irrigation equipment requirements	~2000 – present	2%?	n/a	n/a
Soil amendment requirements (BP9)	~2000 – present	0	n/a	n/a
Indoor plumbing requirements (BP 12)	~2000 – present	10%?	n/a	n/a
Green building construction (BP 12)	2006 – present	5%?	n/a	n/a
EDUCATION				
1 KOTO Radio Access per year about wise use of water	n/a		2015 – future	n/a
PSA newspaper water wise advertisements	n/a		2015 – future	n/a
Water bill insert one time each year	n/a		2015 – future	n/a
Newspaper articles	n/a		2015 – future	n/a
Web pages	n/a		2015 – future	n/a
Native plant/xeriscape demonstration garden	2008 - present	0	n/a	n/a
			TOTAL	26,355,000 (15%)

WORKSHEET J – IMPLEMENTATION PLAN - 2014

Selected Water Efficiency Activities	Period of Implementation	Implementation Actions	Milestone Deadlines	Budget	Entity/Staff Responsible for Implementation	Coordination and Public Involvement	Additional Comments
FOUNDATIONAL ACTIVITIES							
Automatic meter reading installation and operations	~1995 - present	1. Water-Wastewater Operator to read meters one time every 2 months. 2. Provide data to Finance Department for processing. 3. Finance staff to move data into billing system.	One time every 2 months. Ongoing.	$25,000	Water-Wastewater Division, PW Finance Department	None.	Assumes a WW staff loaded rate of $35 per hour and task takes 4 hours every 2 months and a Finance staff loaded rate of $35 per hour for 28 hours every 2 months. Plus 1480 bills at $.50 every 2 months.
Change remaining manual read meters (~100) to autoread meters	2014 - 2019	1. Develop list of manual read meters and their specifications. 2. Estimate cost to change out each meter and total cost. 3. Develop pro-con list of proceeding with activity 4. Meet with Town Manager to determine how to proceed with notifications and change over.	1. December 2014 2. 3. February 2015 4. February 2015 5. March 2015	$0.00	Public Works Department (DLoyd) Water-Wastewater Division, PW Town Manager	Notifications to and possible meetings with entities with manual read meters.	None.
Identify unmetered/unbilled treated water uses on all Town-owned facilities	2014-2015	1. Develop a list of all Town-owned facilities. 2. Obtain detail meter reading list. 3. Compare lists to ID unmetered buildings. 4. Determine cost of project for 2015 budget request 5. Arrange installation of new meters where needed. 6. Add the new meters to the meter reading list.	1. July 30, 2014 2. July 30, 2014 3. August 15, 2014 4. August 30, 2014 5. April 1, 2015 6. April 1, 2015	$10,000 – $53,000	Public Works Department (KGuglielmone) Finance Department	None.	A 1 inch water meter costs $208.00 to purchase. If the existing building had a meter previously, it is a simple 5 minute change out. If not, the cost to install is about $250.00. The MXU cost is $140.00. A 2-inch water meter costs $2150.00 to purchase plus installation. If a new meter is being installed and there is no backflow prevention device the job costs double.
Frequency of meter reading - investigate the requirements of moving to monthly billing	~1995 - present	1. Estimate increased funding needed to double meter reading and billing cycles for a given year. 2. Estimate increased staff time needed and determine whether such time is available. 3. Develop a pro-con list for moving to monthly meter reading and billing. 4. Meet with Town Manager to discuss findings and determine direction.	December 2015	$11,250	Water-Wastewater Division, PW Finance Department	None.	Assumes a WW staff loaded rate of $35 per hour and task takes 4 hours every 2 months and a Finance staff loaded rate of $35 per hour for 28 hours every 2 months. Plus 1480 bills at $.50 every 2 months.
Frequency of billing – Bi-monthly	~1995 - present	See previous.	See previous.	See previous.	See previous.	See previous.	See previous.
Tracking water use by customer type	~1996 - present	1. Finance looks over water use by customer for anomalies to identify potential problems. 2. Contacts property owner if there is a potential problem. 3. Finance to provide detailed list of customer use information each billing period to Env-Eng Division 4. Env-Eng Division to maintain records to review annually	One time every 2 months. Ongoing.	$0.00	1. Finance Department 2. Public Works Department (KGuglielmone)	When anomalies are found, coordination between the Public Works Department, the Finance Department, and the property owner is required.	None.
Modify existing billing system to track use by sufficient customer types	~2000-2013; 2014 - 2019	The relevance of categories will be re-assessed for the 2019 Water Services Rate Study update.	January 2019	$0.00	Finance Department Public Works Department	None.	In 2013, added 2 categories.
Tracking water use for large customers	2014-2019	1. Finance provides detailed customer use data to Public Works 2. Public Works analyzes data	Annually	$0.00	Finance Department Public Works Department (KGuglielmone)	None.	None.
Create a "new " category under the billing program for Town-owned facilities to track	2014	1. Finance to re-categorize town-owned facilities in billing/tracking system.	September 30, 2014	$0.00	Public Works Department (KGuglielmone) Finance Department	Discuss and coordinate with Town Managers and Finance Department	None.
Volumetric bill	~2000 - present	None needed.	n/a	$0.00	Finance Department	None.	None.
Water rate adjustments	2000, 2004, 2014-2019	Automatic water rate adjustments are approved by Town Council through 2019	n/a	$0.00	Finance Department	None.	Implement water rate adjustments determined by 2013 Water Services Rate Study and
Inclining/tiered rates	2004 – present; adjusted January 2014	None needed.	n/a	$0.00	Finance Department	None.	None.
Investigate lowering the 4000 gallon per month cap for base rate to 3000 gallons per month	2019	Conduct as part of the next Water Services Rate Study, which is scheduled for 2019.	Begin January 2019; complete October 2019	$0.00	Finance Department Public Works Department (KGuglielmone)	A public process is required through the Town Council.	None.
Control of apparent losses (with metering)	Mid-1970s; 1980s; 1990s - present	None needed. Ongoing program.	Ongoing.	$25,000 - $30,000	Water-Wastewater Division, PW Streets & Utilities Division, PW	Data taken from lines 5 and 6 in Table 3-4 Water Services Rate Study (2013).	None.
Leak detection and repair	Mid-1970s – present	None needed. Ongoing program.	Ongoing.	$30,200 – $41,800	Streets & Utilities Division, PW	Data taken from lines 15 and 22 in Table 3-4 Water Services Rate Study (2013)	None.
Water line replacement program & 2014 West Colorado Water Line Replacement Project	2000 – present; 2014 West Colorado Project	1. Secure DOLA Grant. 2. Issue a request for bid for construction contract 3. Secure construction contract 4. Start construction 5. Substantial completion 6. End contract	May 1, 2014 May 14, 2014 June 15, 2014 September 15, 2014 October 20, 2014 November 30, 2014	~$1,600,000 West Colorado Project. After 2014, ~$150,000 each year through 2022	Env-Eng Division, PW Streets & Utilities Division, PW	It will be necessary to coordinate with abutting property owners and the general public regarding traffic detours, safe alternative accesses, and possibly upgrading service lines to individual properties.	None.
Master plans/water supply plans	1977, 1993, 2002, 2010	1. Confirm when the master plan / water supply plan will be updated (likely 2018).	December 2014	$0.00	Town Manager Public Works Director	Coordination among staff, Town Council and the public (in a public process at Town	None.

Selected Water Efficiency Activities	Period of Implementation	Implementation Actions	Milestone Deadlines	Budget	Entity/Staff Responsible for Implementation	Coordination and Public Involvement	Additional Comments
		2. Contract for update 3. Conduct update with coordinated public meetings			Town Attorney	Council meetings).	
Capital improvement plans	2000 – present; 2014 - 2022	Re-assess annually during budget request cycle	Annually August-October	$1,000,000	Public Works Department	None anticipated. When CIP project impact specific neighborhoods, those property owners and business owners are contacted directly.	None.
Integrated water resources plans	2013 – present	Work with Idarado Mining Company and CWCB to ensure that all goals for water use are complied with.	Ongoing	n/a	Town Attorney (KGeiger) Public Works Director (PRuud)	Coordination among stakeholders (Idarado Mining Company, CWCB, State Engineer's office)	None.
TARGETED TECHNICAL ASSISTANCE AND INCENTIVES							
Toilet retrofits – Shandoka Affordable Rental Housing	2015	1. Define scope of the toilet replacement. 2. Secure grant for replacement project 3. Issue request for bids 4. Select contractor and secure contract for work 5. Begin toilet replacement project 6. Substantial completion 7. Contract closed out	1. July 2014 2. December 2014 3. January 2015 4. February 2015 5. April 6, 2015 6. May 1, 2015 7. May 15, 2015	$81,000 (1 time project cost	Shandoka Housing Manager (DJohnson) Public Works Department (KGuglielmone)	Must coordinate with renters in the apartments.	None.
Work with the cemetery on irrigation system	2014-2019	1. Start a dialogue with the Cemetery Board. 2. Agree on a scope and work plan 3. TBD based on agreed upon scope and work plan	1. May 2014 2. June 2014 3. TBD	TBD	Town Manager (GClifton) Town Attorney (KGeiger) Public Works Department (KGuglielmone)	Must coordinate closely with the Cemetery Board.	None.
Work with the Telluride HS/MS on irrigation system	2014-2019	1. Start a dialogue with the Cemetery Board. 2. Agree on a scope and work plan 3. TBD based on agreed upon scope and work plan	1. July 2014 2. September 2014 3. TBD	TBD	Town Manager (GClifton) Town Attorney (KGeiger) Public Works Department (KGuglielmone)	Must coordinate closely with the Kurt Shugars, HS/MS Building Manager and School Board, possibly.	None.
Water Efficient Washing Machine Rebates	~2010 – present	None needed. Currently implemented by SMPA and SourceGas.	Ongoing.	Unknown.	San Miguel Power Association and SourceGas	Information about all rebates is available in newsletters and on the company website.	None.
Water Efficient Dishwasher Rebates	~2010 – present	None needed. Currently implemented by SMPA and SourceGas.	Ongoing.	Unknown.	San Miguel Power Association and SourceGas	Information about all rebates is available in newsletters and on the company website.	None.
ORDINANCES AND REGULATIONS							
Water conservation ordinance	2004 – present	Management plans to review the ordinance to ensure that it remains relevant, particularly when Pandora WTP comes online. 1. Review existing water conservation ordinance. 2. Make recommendations for changes to Town Council. 3. First Reading 4. Second Reading	1. May 2014 2. June 3, 2014 (Work Session) 3. June 28, 2014 (1st Reading) 4. July 15, 2014 (2nd Reading)	$0.00	Town Manager (GClifton) Town Attorney (KGeiger) Public Works Department (PRuud, BGoldsworthy)	All Town Council meetings are public meetings. Changes to ordinances generally require three public meetings: a work session; first reading of the proposed new ordinance; and a second reading of the proposed new ordinance.	It is unknown at this time (i.e., prior to the analysis) whether any changes will be necessary to the existing ordinance.
Time of day watering restriction, emergency - change to 8 pm – 8 am all season	2004 – present	See water conservation ordinance, above.	See water conservation ordinance, above.	$0.00	Town Manager (GClifton) Town Attorney (KGeiger)	See water conservation ordinance, above.	None.
With each building permit, require a service line audit from the main to the meter to ensure functionality.	2016	Assess need and ability to implement with existing staff and resources.	January 2016	$0.00	Public Works Department (DLloyd) Planning and Building Department (MHaynes, SSamuelson)	Must develop a short work plan that includes public discussion and input.	None.
Rules and regulations for landscape design/installation (BP9)	~2000 – present	None needed.	Ongoing.	$0.00	Planning and Building Department	None.	None.
Irrigation equipment requirements	~2000 – present	None needed.	Ongoing.	$0.00	Planning and Building Department	None.	None.
Soil amendment requirements (BP9)	~2000 – present	None needed.	Ongoing.	$0.00	Planning and Building Department	None.	None.
Indoor plumbing requirements (BP 12)	~2000 – present	None needed.	Ongoing.	$0.00	Planning and Building Department	None.	None.
Green building construction (BP 12)	2006 – present	None needed.	Ongoing.	$0.00	Planning and Building Department	None.	None.
EDUCATION							
1 KOTO Radio Access per year about wise use of water	2014 – 2019	Each year, schedule with KOTO radio an Access to discuss water efficiency	1st week of June each year	$0.00	Public Works Department (KGuglielmone)	Need to schedule the talk spot with KOTO radio	None.
PSA newspaper water wise advertisements	2014 – 2019	Develop content for a "water wise" advertisement for the newspaper. Secure one advertisement each quarter	Complete January 30, 2015	$0.00	Public Works Department (KGuglielmone)	Work with DGesmundo in Clerks Department	None.
Water bill insert one time each year	2014 – 2019	Develop content and layout for a "water wise" insert for the utility bill that is mailed closest to the summer festival season.	May 2015 Billing (and each year thereafter)	$0.00	Public Works Department (KGuglielmone)	Coordinate with Finance Director, Lynne Beck for the Utility Bill insert	None.
Newspaper articles	2014 – 2019	Write an article for the newspapers regarding water efficiency and water wise use. One for each season.	December/January 2015	$0.00	Public Works Department (KGuglielmone)		None.
Web pages	2014 – 2019	Place the "water wise" insert for the water bill onto the Town's website under the Spotlight.	January 30, 2015	$0.00	Public Works Department (KGuglielmone)	Work with CDickenson in Parks and Recreation Department	None.

Selected Water Efficiency Activities	Period of Implementation	Implementation Actions	Milestone Deadlines	Budget	Entity/Staff Responsible for Implementation	Coordination and Public Involvement	Additional Comments
Native plant/xeriscape demonstration garden	2008 - present	None needed.	Ongoing.	$0.00	Installed and signed by the County Cooperative Extension Office out of Norwood. The Parks and Recreation Department has taken over day to day maintenance.	None.	None.

WORKSHEET K – SELECTION OF MONITORING DEMAND DATA FOR MONITORING PLAN - 2014

Monitoring Data	HB 10-1051 Reporting Requirement				Selection				Entity/Staff Responsible for Data Collection and Evaluation	Schedule Timing of Monitoring	Comments
	Annual	Monthly	Bi-monthly	Daily	Annual	Monthly	Bi-monthly	Daily			
Total Water Use											
Total treated water produced (metered at WTP discharge)						✓			Town of Telluride/Water-Wastewater Superintendent (Bill Goldsworthy)/Env & Eng Division (KGuglielmone)	December/January	
Total treated water delivered (sum of customer meters)	✓						✓		Town of Telluride/Finance Director (Lynne Beck)/Env & Eng Division (KGuglielmone)	December/January	
Raw non-potable deliveries					✓				Town of Telluride/Parks Department (Cathy Dickinson)/Env & Eng Division (KGuglielmone)	December/January	Town Park Wells #1 and #2
Reclaimed water produced (metered at WWTP discharge)											
Reclaimed water delivered (sum of customer meters)											
Per capita water use					✓				Town of Telluride/Water-Wastewater Superintendent (Bill Goldsworthy)/Env & Eng Division (KGuglielmone)	December/January	Need BOD data from WWTP from BGoldsworthy for service population estimates
Indoor and outdoor treated water deliveries											
Treated water peak day produced						✓			Town of Telluride/Water-Wastewater Superintendent (Bill Goldsworthy)	December/January	
Reclaimed water peak day produced											
Raw water peak day produced/delivered											
Non-revenue water	✓				✓				Town of Telluride/Parks Department (Cathy Dickinson)/Env & Eng Division (KGuglielmone)	December/January	
Water Use by Customer Type											
Treated water delivered (sum of customer meters by type)		✓					✓		Env & Eng Division (KGuglielmone)	December/January	Will use billing register data provided by Finance Department for each billing period (bi-monthly)
Raw non-potable deliveries					✓				Env & Eng Division (KGuglielmone)	December/January	Will use billing register data provided by Finance Department for each billing period (bi-monthly)
Reclaimed water delivered											
Residential per capita water use											
Unit water use (e.g., AF/account or AF/irrigated acre)											
Indoor and outdoor treated water deliveries											
Large users							✓		Env & Eng Division (KGuglielmone)	December/January	Will use billing register data provided by Finance Department for each billing period (bi-monthly)
Other Demand Related Data											
Irrigated landscape (e.g., AF/acre or number of irrigated acres)					✓				Env & Eng Division (KGuglielmone)	December/January	
Precipitation											
Temperature											
Evapotranspiration											
Drought index information											
Economic conditions											
Population					✓				Env & Eng Division (KGuglielmone)	December/January	Need BOD data from WWTP from BGoldsworthy for service population estimates
New taps					✓				Env & Eng Division (KGuglielmone)	December/January	Need data provided by Helen Schumack at Building Department

WORKSHEET L – MONITORING PLAN - 2014

Selected Water Efficiency Activities	Customer Category Impacted	Demand Monitoring Data										Other Monitoring Data								Entity/Staff Responsible for Data Collection and Evaluation	Schedule or Timing of Monitoring	Comments
		Total treated water produced	Total treated water delivered	Raw non-potable deliveries	Per capita water use	Treat water peak day produced	Treated water delivered (by customer type or to each customer)	Large Users	# Irrigated acres	Population	New taps	Annual costs	Lessons Learned	Water saving estimates	Administration Data	Relevant public feedback	Records of significant changes	# & locations of meters or facilities replaced	# & locations of leaks detected & repaired			
FOUNDATIONAL ACTIVITIES																						
Automatic meter reading installation and operations	n/a											X			X					Water-Wastewater Division, PW	Ongoing	
Change remaining manual read meters (~100) to autoread meters	Varies																	X		Water-Wastewater Division, PW	Ongoing	
Identify unmetered/unbilled treated water uses on all Town-owned facilities	Town																	X		Public Works Department (KGuglielmone)	2015	
Frequency of meter reading - investigate the requirements of moving to monthly billing	All														X					Water-Wastewater Division, PW Finance Department	2015	
Frequency of billing – Bi-monthly	n/a														X					Water-Wastewater Division, PW Finance Department	Ongoing	
Tracking water use by customer type	All						X													Public Works Department (KGuglielmone)	Annually (Dec/Jan)	
Modify existing billing system to track use by sufficient customer types	n/a														X					Finance Department Public Works Department (KGuglielmone)	2019	
Tracking water use for large customers	Varies							X												Public Works Department (KGuglielmone)	Annually (Dec/Jan)	
Create a "new " category under the billing program for Town-owned facilities to track	Town														X					Finance Department	2014	
Volumetric bill	All														X					Finance Department	Ongoing	
Water rate adjustments	All														X					Finance Department	Annually	
Inclining/tiered rates	All														X					Finance Department	n/a	
Investigate lowering the 4000 gallon per month cap for base rate to 3000 gallons per month	Residential											X			X					Public Works Department (KGuglielmone)	2019	
Control of apparent losses (with metering)	All	X	X															X		Water-Wastewater Division, PW Streets & Utilities Division, PW	Ongoing	
Leak detection and repair	All																		X	Streets & Utilities Division, PW (REstes)	Ongoing	
Water line replacement program & 2014 West Colorado Water Line Replacement Project	n/a													X			X			Public Works Department (DLloyd)	2014/2015	Linear feet of water main line replaced. Condition of line and connections.
Master plans/water supply plans	n/a																X			Public Works Department (KGuglielmone)	2018	
Capital improvement plans	n/a																X			Public Works Department (KGuglielmone)	Annually	
Integrated water resources plans	n/a																X			Public Works Department (KGuglielmone)	Ongoing	
TARGETED TECHNICAL ASSISTANCE AND INCENTIVES																						
Toilet retrofits – Shandoka Affordable Rental Housing	Large User						X							X				X		Shandoka Housing Manager (DJohnson) Public Works Department (KGuglielmone)	2015/2016	
Work with the cemetery on irrigation system	Large User						X						X				X			Public Works Department (KGuglielmone)	2015/2016	
Work with the Telluride HS/MS on irrigation system	Large User						X						X				X			Public Works Department (KGuglielmone)	2015/2016	
Water Efficient Washing Machine Rebates	All																	X		Public Works Department (KGuglielmone)	Ongoing	
Water Efficient Dishwasher Rebates	All																	X		Public Works Department (KGuglielmone)	Ongoing	
ORDINANCES AND REGULATIONS																						
Water conservation ordinance	All																X			Public Works Department (KGuglielmone)	2014	
Time of day watering restriction, emergency - change to 8 pm – 8 am all season	All																X			Public Works Department (KGuglielmone)	2014	
With each building permit, require a service line audit from the main to the meter to ensure functionality.	All																		X	Public Works Department (KGuglielmone)	Ongoing	
Rules and regulations for landscape design/installation (BP9)	All									X										Public Works Department (KGuglielmone)	Ongoing	
Irrigation equipment requirements	All									X										Public Works Department (KGuglielmone)	Ongoing	
Soil amendment requirements (BP9)	All									X										Public Works Department (KGuglielmone)	Ongoing	
Indoor plumbing requirements (BP 12)	All										X									Public Works Department (KGuglielmone)	Ongoing	

Selected Water Efficiency Activities	Customer Category Impacted	Demand Monitoring Data										Other Monitoring Data								Entity/Staff Responsible for Data Collection and Evaluation	Schedule or Timing of Monitoring	Comments
		Total treated water produced	Total treated water delivered	Raw non-potable deliveries	Per capita water use	Treat water peak day produced	Treated water delivered (by customer type or to each customer)	Large Users	# Irrigated acres	Population	New taps	Annual costs	Lessons Learned	Water saving estimates	Administration Data	Relevant public feedback	Records of significant changes	# & locations of meters or facilities replaced	# & locations of leaks detected & repaired			
Green building construction (BP 12)	All										X									Public Works Department (KGuglielmone)	Ongoing	
EDUCATION																						
1 KOTO Radio Access per year about wise use of water	All															X				Public Works Department (KGuglielmone)	Annually (June)	
PSA newspaper water wise advertisements	All															X				Public Works Department (KGuglielmone)	Annually (June)	
Water bill insert one time each year	All															X				Public Works Department (KGuglielmone)	Annually (June)	
Newspaper articles	All															X				Public Works Department (KGuglielmone)	Annually (June)	
Web pages	All															X				Public Works Department (KGuglielmone)	Annually (June)	
Native plant/xeriscape demonstration garden	All															X				Public Works Department (KGuglielmone)	Ongoing	