

City of Trinidad, Colorado



WATER CONSERVATION PLAN



June 2012

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EXECUTIVE SUMMARY

Throughout Colorado the competition, expense, and demand for water supplies is increasing while the availability of water is limited. The City of Trinidad (Trinidad) is among many communities in the Front Range that anticipate growth and increased water supply needs.

An effective method to reduce new water supply demand and be a steward of the State's valuable resource is to conserve water. As the expense of water rises, the economic benefits associated with conservation increases. Conservation will become an important component of Trinidad's water management strategy.

This Water Conservation Plan (Plan) provides guidance for effective water conservation while controlling implementation costs. This Plan provides information on Trinidad's water demands and supplies, defines goals specific to the conservation program, and presents an evaluation and selection of conservation measures/programs for implementation. The Plan also focuses on conservation measures and programs that are compatible with Trinidad's water supply system, water resources management strategy, and community values.

Conservation Goals

The development of attainable and realistic water conservation goals is key to the success of a conservation program. Goals, containing a specific set of standards, can be used to gage the effectiveness of a program and clearly define the expectations for the program. The goals listed below were developed with the objectives of maintaining current water conservation practices, implementing new practices, and providing the ability to monitor the results of the conservation program on an annual basis. The goals are as follows:

1. Maintain the currently low average annual per capita water usage of 110 gallons/person/day through 2019.
2. Continue the current level of 300 to 400 acre-feet/year of reclaimed (reused treated effluent) water use through 2019 for the Cougar Canyon Golf Course Irrigation.
3. Reduce water use by 5 percent on all existing city irrigated parks and landscaping by 2019 and optimize irrigation efficiency on any new city irrigated parks and landscaping.
4. Implement conservation measures and programs that are compatible with the community.



5. Establish a monitoring system that collects a sufficient amount of data to effectively measure the success of conservation programs on an annual basis.

Selection of Conservation Measures and Programs

A variety of water conservation measures and programs were evaluated to identify their compatibility with Trinidad's objectives and water supply system and Trinidad's ability to achieve the target water conservation savings. Following evaluation, a set of measures/programs were selected for implementation. These measures/programs meet the following criteria:

- Conservation measures or programs that could contribute to meeting the conservation goals
- Conservation measures/programs that are compatible with Trinidad's policies and community
- Conservation measures/programs that would be effective throughout the community

Implementation Plan

An effective monitoring and evaluation process will play a key role in the success of Trinidad's conservation program. As Trinidad begins to acquire more data and develop trends associated with supply demands and from conservation measures, models may be established for improving the ability to assess the effectiveness of the conservation measures and programs. Successful measures and areas where improvements may be made will be identified, further improving the overall conservation program.

The public will play a key role in the effectiveness of the Plan. The success of conservation measures and programs depends on public response. The more engaged the community is in altering their behavior to conserve water and participate in the conservation programs, the more effective the conservation measures and programs will be. Annual monitoring results on the effectiveness of the conservation programs and measures will be conveyed to the public. Public feedback and staff input will be incorporated into an action plan for the following year.

Trinidad intends to revise this Plan by June 2019. The modified Plan will incorporate findings of the annual monitoring data and public feedback. The public will have an opportunity to review the modified Plan.



SECTION 1 – INTRODUCTION

Throughout Colorado the competition and expense for developing new water supplies is increasing. One way to help reduce these expenses is to conserve water. The conservation of water can reduce expenses associated with acquisition of the water, conveyance, and treatment of both potable and waste water. Conservation also promotes the stewardship of natural resources and the environment by not only reducing water demands, but also decreasing the amount of energy needed to pump, treat, and heat water.

Conservation is a component of Trinidad’s water management strategy. As the cost of water rises, the economic benefits associated with conservation will increase. The Plan is a useful tool in developing a conservation program that effectively conserves water while reducing associated costs.

1.1 Purpose

The purpose of this Plan is to provide Trinidad guidance toward implementing a conservation program that will provide water conservation savings and is compatible with their water supply system, water resources management strategy, and community values.

1.2 Participants

Trinidad contracted with RJH Consultants, Inc. (RJH) to develop the Plan. Trinidad provided RJH with available requested data and coordinated the public review process. RJH developed the Plan in accordance with §37-60-126(7) C.R.S. and consulted CWCB's Water Conservation Plan Development Guidance Document for general guidance. Contact information for Trinidad and RJH is provided below.

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Utilities Superintendent
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Trinidad, CO 81082

Robert J. Huzjak, P.E., President
RJH Consultants, Inc.
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Englewood, CO 80112

1.3 Overview and Organization

This Plan evaluates Trinidad's historical and projected water demands and supplies. This information was used to develop a set of water conservation goals. Subsequently, a



variety of water conservation measures and programs were evaluated and ultimately a portfolio of conservation measures and programs were selected for implementation. An implementation plan and a monitoring plan to assess the effectiveness of each measure/program, is included.

The Plan is organized into the following sections:

- Executive Summary
- Section 1 – Introduction
- Section 2 – Profile of Existing Water System
- Section 3 –Water Use and Forecast Demand
- Section 4 – Proposed Facilities
- Section 5 – Conservation Goals
- Section 6 – Conservation Measures and Programs
- Section 7 – Evaluation and Selection of Conservation Measures and Programs
- Section 8 – Integrate Resources and Modify Forecasts
- Section 9 – Implementation Plan
- Appendix A – Public Review Process
- Appendix B – Adoption of Trinidad's Water Conservation Plan
- Appendix C – 30-Day Public Review Process Resolution
- Appendix D – Public Comments
- Appendix E – References



SECTION 2 – PROFILE OF EXISTING WATER SYSTEM

This section provides information on the physical characteristics of Trinidad's existing water supply system, identifies water sources and system limitations, describes current policies and planning initiatives, and summarizes current water conservation activities.

2.1 Physical Characteristics of the Existing Water Supply System

Trinidad's water supply consists of direct stream flow diversions from the North Fork of the Purgatoire River and a number of upper basin creeks of the Purgatoire River Basin that are stored in North Lake and Monument Lake Reservoirs. Water is delivered via an underground pipeline to the Water Treatment Plant located a few miles downstream of North Lake. The raw water is high quality and requires only minimal treatment to make it potable.

2.1.1 *Trinidad Service Area*

Trinidad is located on the southern Front Range/I-25 corridor of Las Animas County. Trinidad currently provides water and wastewater services to over 3,250 urban homes within the city limits and to many rural areas from the upper Purgatoire River Basin and easterly to central Las Animas County. In addition, these services are provided to a broad range of commercial users, some of the larger users include a 500-inmate prison, a junior college with a 2,000 student enrollment, and a large Army base training facility with several thousand troops deployed on site at differing times. Figure 2.1 is a map that shows the approximate limits of the Trinidad water service area. Appendix E contains a larger format water service area map.

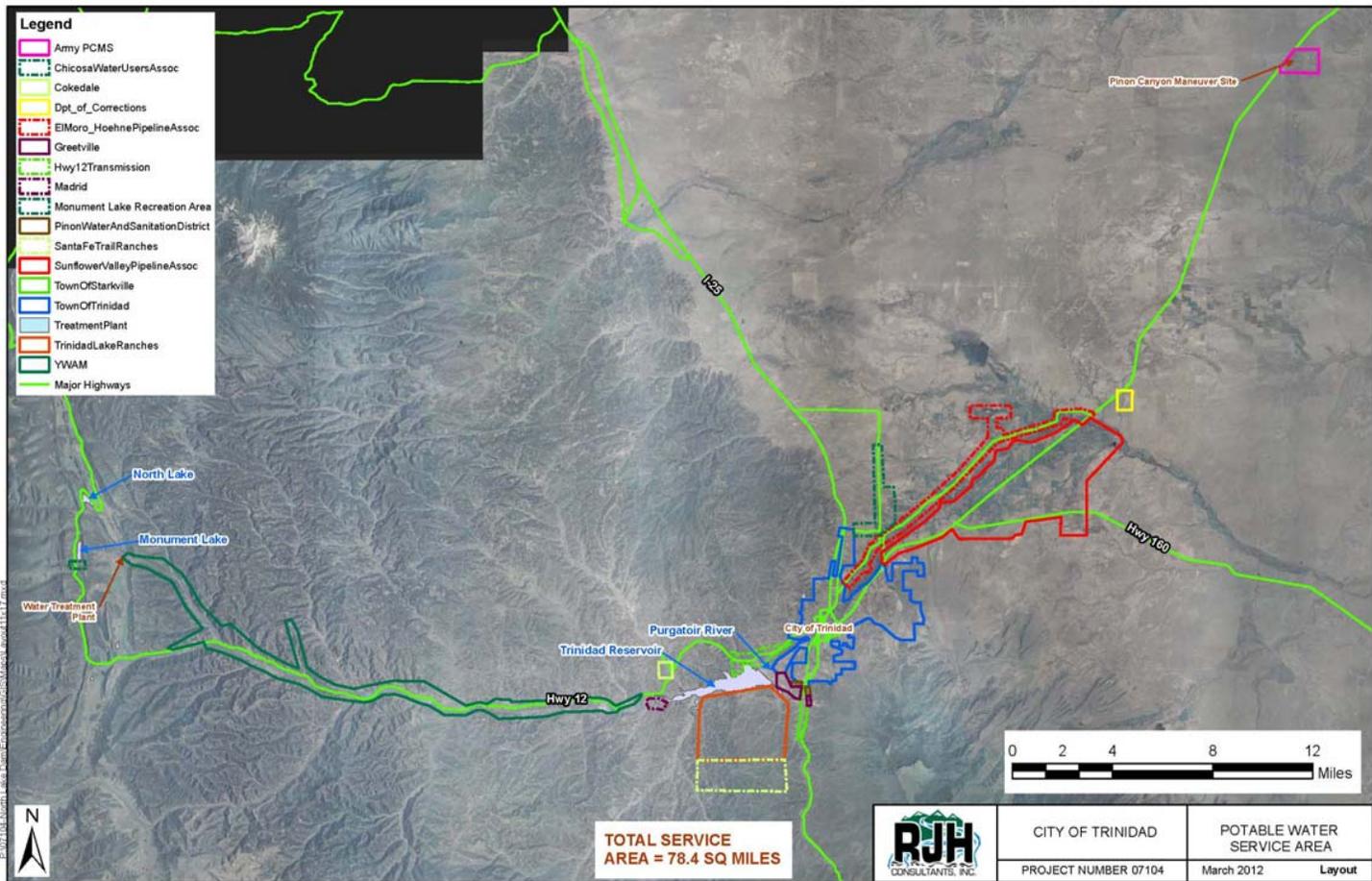


Figure 2.1 Trinidad Water Service Area

Trinidad completed an update of its Comprehensive Plan in December 2008 and is currently in the process of updating this plan. This Comprehensive Plan provides goals, guiding principles, and policies concerning future development.

2.1.2 Population

Over the past 10 years, Trinidad’s population has remained nearly constant. Trinidad serves a current population of approximately 15,000, which includes approximately 9,000 in Trinidad and 6,000 in the rural service area. This population is projected to remain constant or very slowly increase for the planning period.

This estimate is based on projections provided in Trinidad’s Comprehensive Plan, which provides the most up-to-date population projections.

Figure 2.2 Population



Since 2000, Trinidad's population has increased and stabilized, growing at 3.87 percent between 2000 and 2006.

Population Trend: 2000 - 2006

| 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|-------|-------|-------|-------|-------|-------|-------|
| 9,078 | 9,254 | 9,418 | 9,481 | 9,344 | 9,327 | 9,429 |

Source: Colorado State Demography Office

Trinidad has a relatively diverse mix of housing choices at a variety of price points, offering single family homes, duplexes, apartments and manufactured housing.

Type of Housing Stock

| | |
|----------------------------------|-----|
| Single Family Detached | 72% |
| Single Family Attached/Two Units | 8% |
| Multi-Family | 15% |
| Mobile Homes | 5% |

Source: U.S. Bureau of Census; Plan Tools, LLC

According to the Colorado Department of Local Affairs, vacancy rates average approximately 10 percent. However, City staff dispute these estimates, who believe the vacancy rate is significantly lower than 10 percent due to the high demand for housing in Trinidad that is driven by oil and gas industry workers. The 2010 Census should resolve the issue.

Vacancy Rate

| | Housing Units | % Vacant |
|------|---------------|----------|
| 2000 | 4,126 | 10.30% |
| 2001 | 4,156 | 9.14% |
| 2002 | 4,195 | 8.32% |
| 2003 | 4,234 | 8.53% |
| 2004 | 4,267 | 10.59% |
| 2005 | 4,276 | 10.94% |
| 2006 | 4,297 | 10.40% |

Source: Colorado Department of Local Affairs

An additional concern is the age of Trinidad's residential housing, with the majority of the housing stock over 50 years old.



Source: Trinidad Comprehensive Plan 2008

CITY OF TRINIDAD, COLORADO



Current population and population projections for 2012 through 2019 were estimated using the following information and assumptions:

- Current developments within Trinidad’s service area
- Assumed 3.3 people per unit for residential development
- Assumed future development will correspond with the 2008 Comprehensive Plan
- Growth is assumed to be from 0 to 1 percent per year through 2019

2.1.3 Existing Water Treatment Facilities

Trinidad’s water treatment facility is located at the intersection of County Road 13 and County Road 21.6, Lat N 37-12’-40, Long W 105-0’-40”. The water treatment facility is located about 2 miles downstream of North and Monument Lakes and is at approximately Elevation (El.) 8000. This facility has a capacity of 8.4 million gallons per day (mgd). Potable water is piped via an underground transmission line from the water treatment facility to four potable water storage tanks having a combined storage capacity of 8.4 million gallons; and from the tanks through a distribution system to customers. A schematic of Trinidad’s potable water supply system is shown on Figure 2.4.

2.2 Sources of Water

Trinidad’s water supply portfolio consists of a variety of surface water supplies. This supply, which provides a firm yield of approximately 7,700 acre-feet (ac-ft), is sufficient for approximately double the existing service population of 15,000 based on current usage.

1. Diversions from the North Fork of the Purgatoire River, which are stored in North Lake and Monument Lake Reservoirs.
2. Diversions from Whiskey Creek, Cherry Creek, and Brown’s Creek, which are stored in North Lake and Monument Reservoirs.
3. Diversions from the Purgatoire River via the Johns Flood and Model Irrigation Ditches, which are stored in Trinidad Reservoir.

Monument and North Lakes are located in western Las Animas County near the decreed surface water rights points of diversion and Trinidad Reservoir is located a few miles west of Trinidad.

Figure 2.3 Trinidad’s Existing Water Rights

Source: City of Trinidad Preliminary Treated Water System Report, March 2001, Black & Veatch

2.4. Water Rights and Raw Water Requirements

The City of Trinidad’s raw water supply includes two systems:

- Mountain Water Supply
- Lower Purgatoire Supply

The mountain supply consists of water produced from direct flow rights in the North Fork stream. These rights allow the storage of mountain water in the North Lake (4,316 AF), the City’s primary storage lake, and into Monument Lake (1,430 AF), a secondary storage lake. Pipelines connect both lakes to the existing water treatment plant.

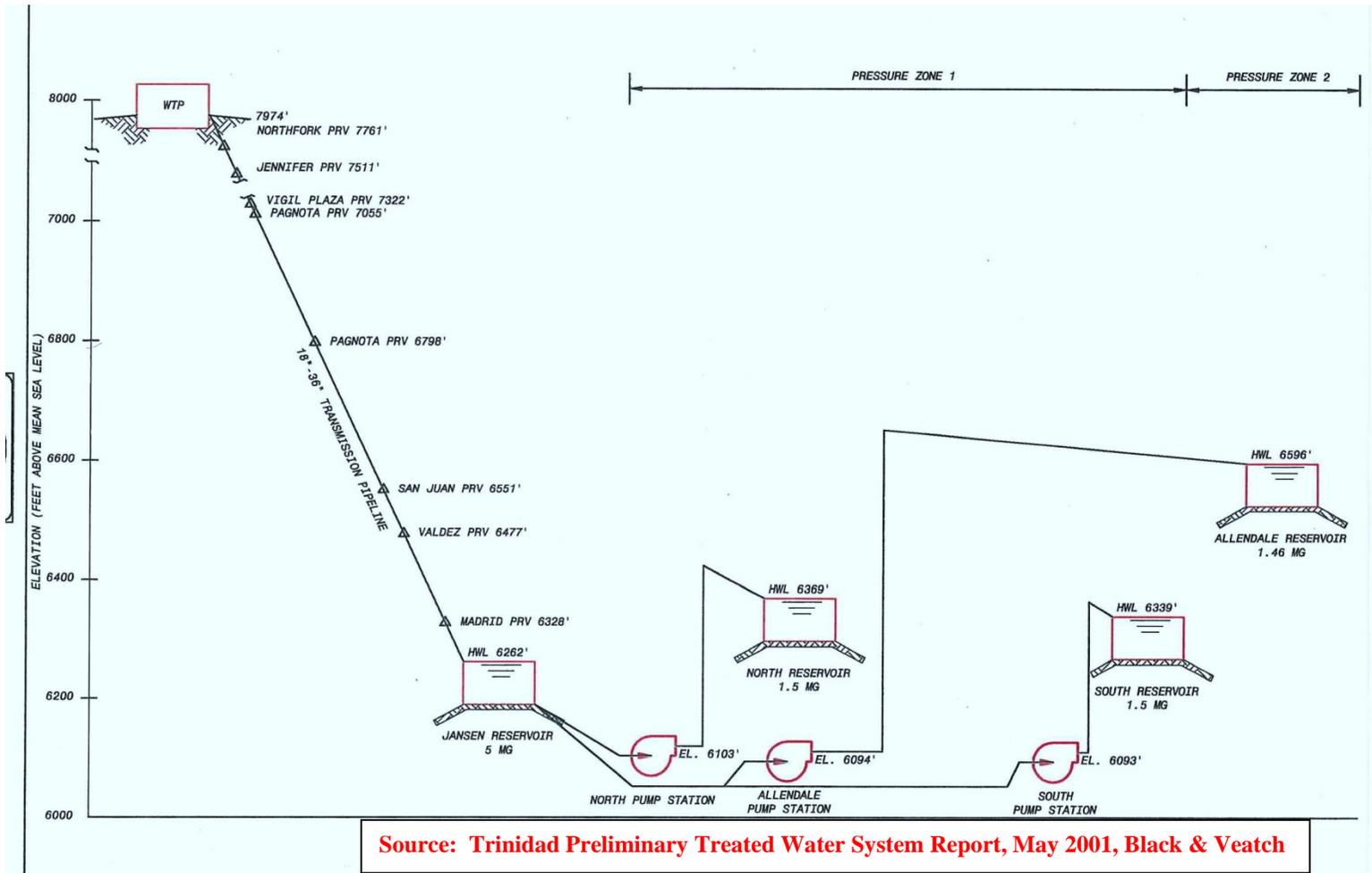
The Lower Purgatoire raw water supply consists of water stored in the Trinidad Reservoir, the water source is from the City’s water rights obtained for the John’s Flood Ditch and Model Irrigation Ditch. This source may provide a firm dry yield of up to 2,000 AF per year or 1.79 mgd based on information provided by the City’s water resources engineer.

As shown in Figure 2.3, Trinidad’s existing mountain supply water rights provide a firm yield of approximately 5,746 ac-ft/year in an average year and did provide 4,543 ac-ft during the drought of 2001-2002. The Lower Purgatoire Water Supply provides a firm yield of 2,000 ac-ft/year. Use of the Lower Purgatoire supply for potable use would require either construction of a new treatment plant below Trinidad Reservoir or exchange of the Lower Purgatoire Supply water back up river to either North Lake or Monument Lake.

2.3 System Limitations

The Purgatoire River Basin provides an average of 49,000 ac-ft of water on an annual basis, of this amount Trinidad’s water rights entitle Trinidad to store up to approximately 10,000 ac-ft on an annual basis depending upon water availability.

Figure 2.4 Schematic of Trinidad’s Potable Water Supply System



2.4 Water Costs and Pricing

2.4.1 Water Billing

Trinidad's customers are billed on a monthly basis for water utility services. Water meters are read and bills are sent to customers on a staggered basis at four differing times of every month. The utility bill consists of the following components:

- Wastewater fee – A base monthly service charge of \$24 plus a volume charge based on the customer's monthly water usage.
- Water use fee – A fixed monthly charge for usage up to 750 gallons, based on tap size plus a volume charge of \$1.50/750 gallons based on the customer's metered water usage of the current month.

Trinidad has not experienced any significant revenue or billing issues. Customers are currently categorized as urban residential and small commercial, urban large residential and commercial, rural residential and small commercial, rural large commercial, and military and government facilities.

2.4.2 Water Rates

Trinidad's water rates are variable and depend on the customer classification and tap size. Figure 2.5 shows the water use rates of all customer categories and tap sizes. A conservation oriented rate structure has not been adopted or evaluated. Commission of a rate study to evaluate the viability of adopting a conservation oriented rate structure could provide additional water savings. The impact of the wastewater volume charge as a function of year-round monthly water usage could also be evaluated in the rate study. This somewhat unique approach to wastewater charges certainly encourages water conservation because each customer is charged a base fee plus a volume charge based on the metered water usage, even during periods of outdoor irrigation.

Figure 2.5 Water Rates from Trinidad Ordinances

Section 12-74. Water service rates - Schedule.²⁹

(1) A proportion of the revenues generated by the following established Water Service Rate Schedule in the amount of three dollars (\$3.00) per month per customer shall be set aside in a restricted water fund to provide for payment of bonded indebtedness retirement, loan repayment, and capital improvements as provided for in the annual budgets of the Water Department: (Ord. 1699, eff., 8-30-02)

(a) W-1 Urban Residential and Small Commercial.

(I) Applicability. Applicable for water service within the corporate limits of the City to all services with a smaller than one and one half inch (1-1/2") meter. (Ord. 1699, eff., 8-30-02)

(II) All water usage shall be billed at a rate of one dollar and fifty cents (\$1.50) per 100 cubic feet (750 gallons) beyond the minimum amount. (Ord. 1226, 5-4-82; Ord 1699, eff., 8-30-02)

²⁹ Chapter 12, Section 74-1 is repealed and reenacted. (Ord. 1699, eff., 8-30-02)



12-74

(III) Minimum charge per month:

Meter smaller than 1-1/2"
(\$15.00)
(Ord. 1699, eff., 8-30-02)

12-74

Water Amount:

1,000 cubic feet
(7,500 gallons)

(b) W-2 Urban Large Commercial and Large Residential.

(I) Applicability. Applicable for water service within the corporate limits of the City to all services with a one and one half-inch (1-1/2") meter or larger. (Ord. 1699, eff., 8-30-02)

(II) All water usage shall be billed at a rate of one dollar and fifty cents (\$1.50) per 100 cubic feet (750 gallons) beyond the minimum amount. (Ord. 1226, 5-4-82; Ord 1699, eff., 8-30-02)

(III) Minimum charge per month: Water Amount:

| | | | |
|--------|-------|----------|----------------------------------|
| 1-1/2" | meter | \$26.25 | 1,750 cu. ft. (13,125 gallons) |
| 2" | meter | \$52.50 | 3,500 cu. ft. (26,250 gallons) |
| 3" | meter | \$105.00 | 7,000 cu. ft. (52,500 gallons) |
| 4" | meter | \$187.50 | 12,500 cu. ft. (93,750 gallons) |
| 6" | meter | \$420.00 | 28,000 cu. ft. (210,000 gallons) |
| 8" | meter | \$750.00 | 50,000 cu. ft. (375,000 gallons) |

(Ord. 1699, eff., 8-30-02)

(c) W-3 Rural Residential and Small Commercial.

(I) Applicability. Applicable for water service outside the corporate limits of the City to all services with a smaller than one and one half inch (1-1/2") meter. (Ord. 1699, eff., 8-30-02)

(II) All water usage shall be billed at the rate of two dollars and fifty cents (\$2.50) per 100 cubic feet (750 gallons) beyond the minimum amount. (Ord. 1226, 5-4-82; Ord 1699, eff., 8-30-02)

(III) Minimum charge per month: Water Amount:

| | | |
|----------------------------|---------|-------------------------------------|
| Meter smaller than 1-1/2": | \$25.00 | 1,000 cubic feet (7,500 gallons) |
|----------------------------|---------|-------------------------------------|

(Ord 1699, eff., 8-30-02)

(d) W-4 Rural Large Commercial, Industrial and Associations.

(I) Applicability. Applicable for water service outside the corporate limits of the City to all services with a one and one-half inch (1-1/2") meter or larger. (Ord. 1699, eff., 8-30-02)

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| | |
|---|--------------------------------------|
| (II) All water usage shall be billed at a rate of Three Dollars (\$3.00) per 100 cubic feet (750 gallons) beyond the minimum amount. (Ord. 1226, 5-4-82. Ord. 1583, eff., 4-18-98; Ord 1699, eff., 8-30-02) | |
| (III) Minimum charge per month: | Water Amount: |
| 1-1/2" meter \$ 52.50 | 1,750 cu. Ft. (13,125 gallons) |
| 2" meter \$105.00 | 3,500 cu. Ft. (26,250 gallons) |
| 3" meter \$210.00 | 7,000 cu. Ft. (52,500 gallons) |
| 4" meter \$375.00 | 12,500 cu. Ft. (93,750 gallons) |
| 6" meter \$840.00 | 28,000 cu. Ft. (210,000 gallons) |
| 8" meter \$1,500.00 | 50,000 cu. Ft. (375,000 gallons) |
| (Ord. 1699, eff., 8-30-02) | |
| (e) W-5 Military and Government Facilities | |
| (I) Applicability. Applicable for water service outside the corporate limits of the City of Trinidad to Military Facilities and other government facilities. (Ord. 1699, eff., 8-30-02) | |
| (II) All water usage above the minimum listed above shall be charged at the rate of Three Dollars (\$3.00) per each 100 cubic feet (750 gallons) of water. (Ord 1699, eff., 8-30-02) | |
| (III) Minimum charge per month: | Water Amount: |
| 8" meter \$1,500.00 | 50,000 cu. Ft. (375,0000 gallons) |
| (Ord. 1266, 5-7-85; Ord 1699, eff., 8-30-02) | |

Source: Trinidad Code of Ordinances, Chapter 12

2.5 Current Policies and Planning Initiatives

Trinidad has implemented a demand management program in 2005 and has been involved in a variety of planning initiatives to address future water needs, supplies, and facilities. A summary of the key items in this program are provided in the following sections.



2.5.1 Water Restrictions

The demand management program established in 2005 consists of three levels of watering restrictions designed to limit water usage. Level III calls for the highest amount of water savings and would only be required in times of emergencies; whereas Levels I and II encourage conservation and enforce water savings during a drought. Figure 2.6 summarizes the water restriction levels.

Trinidad has established the following criteria to determine which level of watering restrictions is appropriate for a given period:

- Current reservoir storage.
- Mountain snow pack and corresponding water content.
- Potable water demand – projected water demands taking into consideration weather patterns.
- Potable water production – water treatment capability.
- Potable water storage status – amount of potable water available in Trinidad’s storage tanks and distribution system.

Figure 2.6 Water Restriction Levels

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TRINIDAD, COLORADO, that:

The City Council hereby imposes the following restrictions on water usage to continue to ensure water conservation:

1. The transition to increase or decrease the severity of water restrictions from level 1 to level 2 or level 3 shall be determined by the Water Superintendent with approval of City Council. This determination shall be based upon the current status of reservoir storage, mountain snow-pack and water level content and the daily flow demand at the water treatment plant. Levels of restrictions shall be as follows:
 - A. **LEVEL 1:**
Customers may water any day of the week, but no watering shall take place between the hours of 10:00 a.m. and 4:00 p.m.



B. LEVEL 2:

Watering of lawns and other vegetation is restricted as follows: House numbers ending in an even number are allowed to water on Sunday, Tuesday, Wednesday and Friday, except during the hours of 10:00 a.m. to 4:00 p.m. House numbers ending in an odd number are allowed to water on Sunday, Tuesday, Thursday and Saturday. No watering is allowed on Mondays.

C. LEVEL 3:

Watering of lawns and other vegetation is restricted as follows: House numbers ending in an even number are allowed to water between 6:00-10:00 a.m. and 4:00-8:00 p.m. on Sunday, Tuesday, Wednesday, and Friday. House numbers ending in an odd number are allowed to water between 6:00-10:00 a.m. and 4:00-8:00 p.m. Sunday, Tuesday, Thursday, and Saturday. No watering shall take place between 10:00 A.M. and 4:00 P.M. on any day. No watering is allowed on Mondays.

Source: Trinidad Resolution 1269 Adopted April 3, 2007

Water restriction levels are posted on Trinidad's website and in water bills. Generally, Trinidad has operated under a voluntary Level I program where customers are encouraged to conserve water. If mandatory Level II or III water restrictions are warranted, customers will be required to limit irrigation to 4 alternating days per week.

If mandatory Level II and Level III restrictions are in effect, Trinidad's code enforcement officer is responsible for enforcement of the restrictions. Violations would be subject to the following penalties:

- First violation – written notice.
- Second violation within a 12-month period – written notice and a \$50 fine plus \$15 court costs.
- Third violation with a 12-month period – written notice and a \$100 fine plus \$15 court costs.

All fines are assessed by the City Court.

2.5.2 Planning Initiatives

Trinidad expects to acquire additional water rights to meet future needs. Trinidad has recently completed a treated water system report and is planning to initiate a study of the potable water distribution system in the near future. These plans will be used to develop additional facilities as needed and enhance the existing water infrastructure.

2.6 Current Water Conservation Activities

The Colorado Water Conservation Board's 2010 Statewide Water Supply Initiative defines five levels of conservation practices. Level 1 represents a minimal level of conservation (including passive conservation measures such as plumbing and fixture ordinances of the National Energy Policy Act); Level 5 requires significant effort of the water provider to establish intensive conservation measures/programs. This may include the elimination of all customer leakage and high water use landscapes. Trinidad's conservation program is most representative of a Level 2-3 rating, which is typical of many communities along the Front Range.

Trinidad's conservation program includes metering of all potable water supplied to each customer and a rate structure that ties water usage directly to sewer charges even during those portions of the year when outdoor irrigation is being employed, demonstration projects, and other measures to encourage water savings.

Water savings from the majority of conservation activities are difficult to quantify. This is attributed to a variety of factors. For instance, water savings through education is highly variable and depends on a variety of factors including the number of participants and regional climatic factors. Customers are much more willing to respond to education if there is an existing water shortage.

2.6.1 Water Wasting Ordinance

In 2005, Trinidad adopted a water wasting ordinance to prohibit wasting of water. The ordinance identifies three levels of increasing restrictions upon water usage. The restriction level is determined by the water superintendent with concurrence by City Council.

Written notice of an infraction is delivered to the water user by the Trinidad Code Enforcement Officer. If the water user does not appropriately address the water wasting,



the user may be subject to a fine of up to \$100 plus court costs in any given month or their water services may be terminated.

2.6.2 Irrigation Audit Program

Trinidad does not currently have an irrigation audit program. Less than 10 percent of the water users in the service area currently employ sprinkler and irrigation systems which would limit the benefit of an irrigation audit program.

2.6.3 Remote Reader Service

Trinidad offers a remote reader service under contract with a private company, Utilities Detection Services, to all customers who contact the town concerned that their water bill is abnormally high. The remote reader records the amount of water being used and can detect leaks. This service is used only after the Water Department personnel have been unable to locate a leak source.

2.6.4 Public Education Program

Trinidad has an ongoing program to educate customers on water supply, water rates, and the importance of water conservation via public notices published in the newspaper and on Trinidad's website. These include:

- Informative and Understandable Water Bill – Trinidad bills its customers based on the volume of water used. The water bill shows customers the amount of water used per month. This enables customers to compare their water usage on a monthly basis. The water bill also provides a phone number for customers to call for questions concerning their bill.
- Website – Trinidad's website provides a variety of information regarding water.
- Elementary School Education – Trinidad currently participates in a 1-day Water Festival which focuses on education for water conservation..

2.6.5 Parks Department Conservation Efforts

Trinidad's Parks Department has gradually adopted a variety of practices that have improved irrigation efficiency on existing parks. This includes the following:

- Improving soil preparation for plantings and grass establishment
- Using a cycle soak method to irrigate turf improving irrigation effectiveness and efficiency



- Planting native vegetation and drought tolerant plants where appropriate
- Irrigating parks in the evenings and at night when evaporation is low

Trinidad's Parks Department does not currently meter its irrigation use but is considering adding meters to the larger irrigated turf areas.

2.6.6 Use of Reclaimed Water for Irrigation

Trinidad's non-potable water supply consists of raw water used to irrigate the Cougar Canyon Golf Course. The raw water for golf course irrigation is taken directly from the Purgatoire River and is offset by treated sewer return flows from the upstream City Sewer Plant. The most significant benefit from a water conservation perspective is use of reclaimed water. Use of reclaimed water reduces the amount of first-use water needed to meet irrigation needs. Colorado water law does allow that certain types of water rights may be recaptured and reused.

2.6.7 Distribution System

Trinidad is responsible for the maintenance and repair of all pipelines within the distribution system that are not on private property. Trinidad does not currently have a formal program for updating the distribution system but plans to initiate a study that will identify priorities for system upgrades and replacements. Trinidad also flushes hydrants and waterlines as routine maintenance procedures.

Trinidad's leakage detection program consists of both visual inspections of valve boxes as well as sonic leakage detection. Any water observed in valve boxes or found at the ground surface is tested for chlorine to determine if the ponded water is the result of a leak. Trinidad uses sonic technology to inspect for leaks on all water distribution pipelines underlying roads that are scheduled for pavement overlay.

Trinidad meters the majority of its service connections. Unmetered water has historically consisted of water used for fire fighting, street cleaning, sewer cleaning, City Park irrigation, and flushing of water lines. Trinidad also monitors the quality and quantity of water treated at its water treatment plant.

SECTION 3 – WATER USE AND FORECASTED DEMANDS

This section describes Trinidad's annual water demands, water use by customer type, potable and non-potable uses, and forecasted annual water demands through 2019.

3.1 Current Water Use

Water use within a community is affected by a variety of factors including population, land use, climate conditions, drought awareness, and conservation efforts.

3.1.1 Historical Annual Water Use

Figure 3.1 shows Trinidad's total annual water use for 2011. Total water use consists of potable and raw water. The annual water usage for 2011 is typical for the time period from 2000 through 2011.

Figure 3.1 Annual Water Use

| City of Trinidad Water System Profile - 2011 | | | | |
|---|----------------------|--|-------------------------------------|---------------------------------------|
| Consumption History | | | | |
| Customer Category | No. Customers | Annual Consumption (cubic feet) | Annual Consumption (gallons) | Annual Consumption (acre feet) |
| Urban Residential | 3,250 | 44,327,819 | 332,458,643 | 1,017.63 |
| Rural Residential | 469 | 5,311,219 | 39,834,143 | 121.93 |
| Urban Commercial | 542 | 24,037,378 | 180,280,335 | 551.82 |
| Rural Commercial | 70 | 14,050,941 | 105,382,058 | 322.57 |
| Re-sale | 2 | 1,169,126 | 8,768,445 | 26.84 |
| Fire Hydrants | 15 | 0 | 0 | 0.00 |
| U.S. Army | 1 | 428,413 | 3,213,098 | 9.84 |
| Dept. of Corrections | 1 | 6,801,587 | 51,011,903 | 156.14 |
| | ===== | ===== | ===== | ===== |
| | 4,350 | 96,126,483 | 720,948,623 | 2,207 |

Source: City of Trinidad

Historical water use generally remained constant from 2000 to 2011, corresponding to a stable population during this period.

3.1.2 Historical Water Use and Customer

Figure 3.1 shows the average percentage of water use by sector for 2011, which is representative for the period 2000 - 2011. The data documents that urban residential households comprised the largest water user group at 46 percent of Trinidad's total water consumption. Urban Commercial follows at 25 percent, Rural Commercial at 15 percent, Department of Corrections at 7 percent, and Rural Residential at 5 percent.

3.1.3 Historical Per Capita Water Use

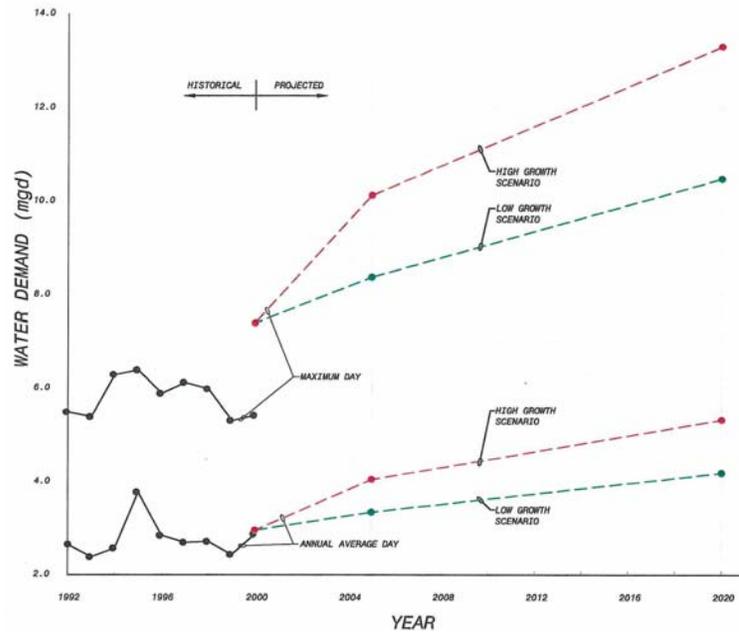
The historical per capita water usage for the period 2000 - 2011 has remained relatively constant and is computed at approximately 130 gallon/person/day for the service area population of 15,200. Approximately 15 percent of the usage within the service area is comprised of transient populations which are not included in the population census. These include the Department of Corrections, U.S. Army, and Trinidad State Junior College. If this transient population is considered, the actual per capita usage for permanent population is computed to be approximately 110 gallons/person/day.

3.2 Demand Forecast

Figure 3.2 shows projected water demands from 2000 to 2020 in lieu of any additional conservation programs or measures. Demands, as projected by a 2001 Black & Veatch study, are anticipated to increase to 4,700 ac-ft/year in 2020. There was very little increase in demand for the time period from 2000 through 2010 and, based on the usage during this period, we do not expect to see demand increase significantly above the current level of 2,200 ac-ft/year for the planning period 2012 - 2019. Unless an unexpected rapid growth scenario develops at some point in the future, Trinidad's water supply will not equal demand for the next 50 years.

Figure 3.3 displays Trinidad's water accounting balance sheet for 2011 that tabulates the total unaccounted water for this year at approximately 20 percent. A review of past accounting records indicate that unaccounted water is in the range of 15 to 20 percent for the time period from 2000 to 2010. We estimate the system loss value to be approximately 5 percent of the accounted water quantity. Future implementation of planned additional metering and monitoring will allow a more accurate determination of the actual loss value.

**Figure 3.2 Total Projected Demands
(Includes Potable, Raw, and Reclaimed Water)**



**TABLE 2-10
PROJECTED WATER DEMANDS (mgd)
HIGH GROWTH SCENARIO**

| Year | Service Area Projected Population | Average Day | Maximum Day ¹ | Maximum Hour ² |
|-------------------------------|-----------------------------------|-------------|--------------------------|---------------------------|
| 2000 | 10,400 | 2.96 | 7.40 | 11.10 |
| 2005 | 15,000 | 4.05 | 10.13 | 15.20 |
| 2020 | 20,700 | 5.32 | 13.30 | 19.95 |
| Buildout of 2020 Service Area | 29,700 | 7.12 | 17.80 | 26.70 |

¹ Maximum Day to Average Day Ratio = 2.5
² Maximum Hour to Maximum Day Ratio = 1.5

**TABLE 2-11
PROJECTED WATER DEMANDS (mgd)
LOW GROWTH SCENARIO**

| Year | Service Area Projected Population | Average Day | Maximum Day ¹ | Maximum Hour ² |
|------|-----------------------------------|-------------|--------------------------|---------------------------|
| 2000 | 10,400 | 2.96 | 7.40 | 11.10 |
| 2005 | 12,400 | 3.35 | 8.38 | 12.57 |
| 2020 | 15,500 | 4.19 | 10.48 | 15.72 |

¹ Maximum Day to Average Day Ratio = 2.5
² Maximum Hour to Maximum Day Ratio = 1.5



Figure 3.3 2011 Water System Accounting

| City of Trinidad Water System Profile - 2011 | | | | |
|---|-------------------|----------------|------------------|-------------------|
| Raw/Finished Water | | | | |
| Raw Water Supply | Cubic Feet | Gallons | Acre Feet | Percentage |
| North Lake | 163,711,333 | 1,227,835,000 | 3,768.34 | |
| North Lake Peak Flow (MGD) | | 6.420 | 19.70 | |
| North Lake Low Flow (MGD) | | 1.720 | 5.28 | |
| Finished Water Supply | | | | |
| Water Filtration Plant | 120,682,933 | 905,122,000 | 2,777.91 | |
| Average WTP (MGD) | | 2.480 | 7.61 | |
| Peak Flow (MGD) | | 4.727 | 14.51 | |
| Low Flow (MGD) | | 1.266 | 3.89 | |
| End Use | | | | |
| Consolidated Billing | 96,126,483 | 720,948,623 | 2,212.66 | 80% |
| Non-Account Uses (L. & U.) | 24,556,450 | 184,173,378 | 565.25 | 20% |
| | ===== | ===== | ===== | ===== |
| | 120,682,933 | 905,122,001 | 2,777.91 | 100% |



SECTION 4 – PROPOSED FACILITIES

Trinidad is anticipating relatively slow growth within the next few decades. The town is planning to acquire additional water supplies as they become available and plans to expand existing facilities and develop new facilities to accommodate growth as needed.

For purposes of assessing proposed facilities and conservation efforts in this Plan, a 7-year planning period was chosen for the following reasons:

- Seven years provides a suitable time period to assess the effects of facility modifications/additions and conservation efforts.
- Trinidad will be experiencing projected slow growth within the next decade. Facility modifications coupled with growth patterns and water demands cannot be predicted with a high degree of certainty beyond 7 years.
- The Colorado Water Conservation Board (CWCB) requires that Conservation Plans be updated at least every 7 years. The update of this Plan will be able to capture more information on the costs of surface water supplies and conservation savings, given that there will be more conservation and water savings data available.

Trinidad has recently completed major upgrades to their water and wastewater treatment facilities. The water treatment plant has a current capacity of 8.4 mgd and the wastewater treatment plant has a capacity of 2.0 mgd. The plant capacities are projected to be more than adequate for the 7-year planning period. The next area of focus for planned facilities upgrade by Trinidad is that of the potable water distribution system. Trinidad plans to initiate a study of the entire distribution system so that a priorities improvement list, with associated cost estimates for the systems upgrades, can be developed. By knowing the needs and costs, funding sources for improvements can be identified and developed.

SECTION 5 – CONSERVATION GOALS

This section presents the water conservation goals for this Plan and explains how the goals were developed.

5.1 Water Conservation Goals

The development of attainable water conservation goals is a key component to the success of a conservation program. Goals provide a specific set of standards that can be used to gage the effectiveness of a program and clearly define the intention of the program. The goals listed below were developed with the objective of targeting a specific amount of water conservation savings, while also facilitating the ability to easily monitor the success of the conservation program on an annual basis. The goals are as follows:

- 1 Maintain the already low average annual per capita water usage of 110 gpcd through 2019.
- 2 Continue to use approximately 250 to 400 ac-ft/year of reclaimed water to irrigate the Cougar Canyon Golf Course.
- 3 Reduce water use by 15 percent on all existing city irrigated parks and landscaping by 2019 and optimize irrigation efficiency on all new city irrigated parks and landscaping.
- 4 Implement conservation measures and programs that are compatible with the community.
- 5 Continue to participate in the Purgatoire River Water Conservation District Tamarisk removal and conservation programs.

5.2 Goal Development Process

The water conservation goals were developed using Trinidad's historical per capita demand, projected populations, water demands, and conservation efforts. Because Trinidad has sufficient water supply and treatment capability for the planning period, there is not a need to implement more costly measures during the next 7 years. A large reduction in the quantity of potable water sales during the planning period will only serve to reduce revenue to Trinidad without significantly reducing fixed operating costs.



SECTION 6 – CONSERVATION MEASURES AND PROGRAMS

This section provides a description of potential conservation measures and programs considered for potential implementation in Trinidad. A preliminary screening process was applied to eliminate conservation measures/programs that did not meet Trinidad's conservation goals.

6.1 Identification of Conservation Measures and Programs

Conservation measures and programs that were considered during the development of this Plan include measures and programs identified in CWCB's Water Conservation Plan Development Guidance Document.

6.2 Criteria Used in Screening Conservation Measures and Programs

A set of screening criteria was developed to eliminate certain conservation measures and programs from further consideration. These criteria were developed by assessing the effectiveness and applicability to Trinidad for each of the measures/programs in meeting the conservation goals specified in Section 5. The screening criteria include:

- **Criterion 1:** The measure/program is not applicable to Trinidad's water supply system or community.
- **Criterion 2:** The measure/program is being evaluated or implemented by Trinidad separately from this Plan.
- **Criterion 3:** The measure/program would provide negligible water savings for Trinidad.
- **Criterion 4:** The measure/program is a supply option not applicable to reducing Trinidad's water use.
- **Criterion 5:** Trinidad prefers to focus on other measures/programs that more directly or efficiently address its conservation goals.

SECTION 7 – EVALUATION AND SELECTION OF CONSERVATION MEASURES AND PROGRAMS

This section provides a discussion of the evaluated and the selected conservation measures/programs. A qualitative assessment of each conservation measure/program is provided.

7.1 Combinations of Measures and Programs

Conservation measures/programs are often used in conjunction with one another. In order to facilitate a more integrated assessment, the conservation measures/programs selected for evaluation were categorized by type of measure/program and targeted end users.

7.2 Qualitative Assessment

The following discussion provides a qualitative assessment of each of the measures/programs selected for evaluation.

7.2.1 *Landscape and Irrigation Efficiency for Parks*

Trinidad's Parks Department has implemented a variety of conservation measures to conserve irrigation water. These include the following:

- Improving soil preparation for plantings and grass establishment
- Using a cycle soak method to irrigate turf improving irrigation effectiveness and efficiency
- Planting native vegetation and drought tolerant plants where appropriate
- Scheduling irrigation during early mornings and at night when evaporation is not as high

These measures have gradually been implemented from 2000 to present and have proven to be effective in reducing irrigation water use. Trinidad plans on implementing additional measures to conserve irrigation water. This includes the installation of meters on all parks irrigation supply lines and moisture sensors. The moisture sensors will be installed in all Trinidad owned parks, shutting off the irrigation system if it is raining. Trinidad, in conjunction with Trinidad State Junior College and the Purgatoire River Water Conservation District, has installed a demonstration evapotranspiration (ET)



controller at Trinidad City Park. Irrigation at the park is currently being monitored and evaluated. If the ET controller is proven to be effective, Trinidad will consider the installation of ET controllers in additional parks. The installation of water meters will allow for better water system accounting and accurate quantification of water savings due to the installation of moisture sensors and ET controllers.

7.2.2 Water Efficient Appliances and Fixtures

7.2.2.1 Fixture Rebate Program

Trinidad could offer a rebate incentive to encourage customers to replace their older fixtures with ones that are more water efficient. Customers could receive a rebate from Trinidad for the purchase and installation of low-flow toilets, urinals, showerheads, and faucets. This has proven to be effective in older communities where the replacement of high water using appliances and fixtures can provide significant water savings. An identified source of funding for the program and the overall budget impact on fixed operating costs would be required prior to implementation.

Trinidad plans to focus its near-term conservation efforts on measures/programs that will provide water savings throughout the entire community. As infrastructure begins to age, the modern water appliances and fixtures will likely be less water efficient when compared to newer more efficient technology. Trinidad may re-evaluate the effectiveness of a fixture rebate program when the replacement of aging fixtures with newer more efficient fixtures could yield savings throughout a large portion of the community.

7.2.2.2 Appliance Rebate Program

The replacement of an older washing machine with a front load machine can save approximately 20 gallons of water per load. In contrast to the fixture rebate program, washing machines are not necessarily correlated with the age of a home. Residents often move their washing machines from home to home and new washing machines are often purchased for use in older homes. An identified source of funding for the program and the overall budget impact on fixed operating costs would be required prior to implementation.



7.2.2.3 Regulations/Ordinances Addressing Fixtures and Appliances

Trinidad could establish regulations that would mandate the use of water efficient fixtures and appliances. For instance, standards stipulating the installation of specific low water using appliances and fixtures could be enforced for all new developments. Regulations could also require the replacement of high water using fixtures with efficient fixtures prior to the sale of a home.

Although these regulations could provide some water savings, additional regulations could deter developers' interest in Trinidad, especially if neighboring towns do not impose the same regulations. Regulations requiring time of sale upgrades could increase the price of the homes, deterring new home buyers. Trinidad currently prefers to focus its efforts on conservation measures and programs that could be implemented on a voluntary basis.

7.2.3 Use of Reclaimed Water

Currently the Cougar Canyon Golf Course is irrigated with reclaimed water. Wastewater return flows are released from the upstream treatment plant to the Purgatoire River and then diverted downstream into the golf course irrigation system. Approximately 250 to 400 ac-ft/year of reclaimed water is used for this purpose.

7.2.4 Metering and Billing Metering of Source Water

Trinidad currently meters water treatment production and records water diversions and reservoir storage. This data provides valuable information for detecting system water losses and potential measures to mitigate those losses. Trinidad currently monitors and performs a detailed accounting of all water diversions, storage, treatment, and deliveries. Unaccounted system water volumes have been approximately 15 to 20 percent since 2000. Metering of city parks irrigation supply, water used for hydrant and line flushing, and the development and implementation of a formal system loss control program will significantly reduce this quantity.

7.2.4.1 Meter Service Connections and Volume Billing

Trinidad meters and bills customers based on the amount of water they use. They also bill for wastewater treatment based on the amount of water that is used on a monthly basis, even during months of outside irrigation. This somewhat unique wastewater billing practice provides a financial disincentive to using large quantities of water and has

proven to be effective in increasing customers' awareness of water consumption and encourages water conservation. High water and wastewater bills serve as a means to help deter wasteful water use and in some cases may be indicative of a leak. Trinidad plans to continue billing wastewater to its customers on a monthly basis based on the volume of potable water used.

7.2.4.2 Replacement of Meters

Trinidad plans to replace meters over 15 year old. This improves metering reliability and helps to ensure that customers are accurately billed for the volume of water consumed. This also improves Trinidad's ability to evaluate system water losses by tightening the water budget. System losses are usually estimated by using a water budget approach (the difference between water treatment production at the water treatment plant and metered usage by the end user is calculated). Replacing old meters can help improve the accuracy of this estimation.

7.2.4.3 Analysis of Unmetered Water

Trinidad's unmetered water has historically consisted of water used for fire fighting, street cleaning, sewer cleaning, system losses, City-owned parks irrigation, and water line flushing. This unmetered water accounts for approximately 15 to 20 percent of total annual water use. Similar to the replacement of meters, improving the metering of unaccounted for water would help tighten Trinidad's water budget and subsequently improve Trinidad's ability to estimate system water losses. Trinidad plans to begin metering hydrant flushing during the summer of 2012 and begin meter installation on city parks irrigation supply lines. This will reduce the amount of unaccounted for water and subsequently improve Trinidad's ability to estimate distribution system water losses.

7.2.4.4 Water Accounting

Trinidad's current billing system consists of five categories: urban residential, urban commercial, rural residential, rural commercial, and resale. Trinidad's service area extends from the water treatment plant located just downstream of North Lake, eastward almost 100 miles to the U.S. Army Pinion Canyon Maneuver Site. Only the area bounded and within Trinidad limits is considered to be urban. Trinidad currently accounts and tracks usage for each different billing category, the total treated water quantity, potable water storage, and raw water diversions.

**TABLE 7.1
WATER BILLING AND REVENUE CATEGORIES**

| City of Trinidad Water System Profile - 2011 | | | |
|---|----------------------|---|------------------------------------|
| Revenue History | | | |
| Customer Category | No. Customers | Billed Revenue (Customer Category) | Revenue (Customer/Year) |
| Urban Residential | 3,250 | \$867,831.22 | \$267.02 |
| Rural Residential | 469 | \$195,182.95 | \$416.17 |
| Urban Commercial | 542 | \$422,127.05 | \$778.83 |
| Rural Commercial | 70 | \$385,527.45 | \$5,507.54 |
| Re-sale | 2 | \$84,993.50 | \$42,496.75 |
| Fire Hydrants | 15 | \$1,683.00 | \$112.20 |
| U.S. Army | 1 | \$21,962.46 | \$21,962.46 |
| Dept. of Corrections | 1 | \$204,047.61 | \$204,047.61 |
| | ===== | ===== | ===== |
| | 4,350 | \$2,183,355 | |

Source: City of Trinidad

7.2.5 Distribution/Treatment System Efficiency Leak Repair

Trinidad is responsible for the maintenance and repair of all pipelines within its distribution system that are not located on private property. Residents may report water leaks by calling the Trinidad Water Superintendent. This informal program has proven effective in addressing water leaks within a reasonable period of time, reducing the amount of water that is wasted.

7.2.5.1 Leak Detection Program

Trinidad has an ongoing leak detection program. This program has been useful in detecting leaks and repair of these leaks has reduced system losses. Trinidad plans to continue this program. A formal leak detection and loss control program developed and implemented in accordance with AWWA standards would further reduce the system waste due to loss.



7.2.6 Public Education Informative and Understandable Water Bill

Trinidad's water bill provides each customer with information on how much water they used per monthly billing cycle. This information enables customers to compare and regulate water usage on a monthly basis.

7.2.6.1 Distribution of Conservation Information

Trinidad plans to expand water conservation information distribution by conveying information through the town's website, newspaper, bill inserts, and pamphlets.

- Newspaper/bill insert – Trinidad plans to include a conservation article in its newspaper or bill insert on an annual basis. This will provide another means for customers to be educated on how they may conserve water.
- Water conservation pamphlets – Trinidad plans to provide a pamphlet on water conservation landscaping maintenance guidelines and xeriscaping.

7.2.6.2 School Programs

Trinidad plans to continue a 1-day water education program which includes participation by public schools, conservation groups, and State, local, and federal government agencies. The stated objectives of the 1-day water education festival are:

1. To provide an opportunity to learn about our water supply, the importance of water conservation, and watershed protection through creative and interactive displays, presentations, and activities.
2. To provide students with environmental knowledge and the opportunity to share what they have learned with the community in creative ways.

7.2.6.3 Water Service Leak Detection

Trinidad offers a leak detection service to all customers who contact Trinidad concerned that their water bill is abnormally high. A subcontractor to the Trinidad Water Department, Utilities Technical Services, uses the latest technology for locating potential water leaks. This has proven to be effective in assisting customers in locating water leaks and consequently saving water. This service is used only after Water Department personnel have been unable to locate a leak source.

7.2.7 Additional Regulations/Ordinances - Water Wasting Ordinance

Trinidad has a water wasting ordinance that prohibits the waste of water. This measure has proven to be effective in clearly defining Trinidad's position on the negligent wasting of water. It also provides Trinidad the authority to penalize customers for wasting water. Trinidad plans to continue to enforce this ordinance.

7.2.7.1 Water Restrictions

Trinidad has used a three-tiered water restrictions program since 2005. Generally the water restrictions have been implemented on a voluntary basis and many customers observe the voluntary restrictions. This helps to regulate peak day irrigation demands during the irrigation season.

Trinidad plans to continue to implement the three-tiered water restrictions program. This program provides flexibility to customers recommending an irrigation schedule on a volunteer basis, yet when the water supply system is stressed, it provides Trinidad the ability to regulate irrigation.

7.3 Estimated Water Savings

The current cumulative water savings goal for the selected conservation measures is 100 ac-ft/year. It is difficult to individually estimate, quantify, and track the savings for each measure. The current water accounting system in use by Trinidad and proposed system upgrades will allow for the total system savings due to the implemented measures.

7.4 Selection of Conservation Measures and Programs

Each of the conservation measures/programs selected for implementation meet one or more of the following criteria:

- Conservation measures/programs that are currently implemented by Trinidad and have proven to be successful and worth continuing implementation.
- Conservation measures/programs that could contribute to meeting the conservation goals.
- Conservation measures/programs that are compatible with Trinidad's policies and community.
- Conservation measures/programs that would be effective throughout the whole community.

Following is list of conservation measures/programs either currently in use or selected for future implementation.

Currently Implemented Water Conservation Measures

1. Volume metering and billing
2. Informal Leak detection and repair program
3. Mass balance water accounting including non-account water
4. Use of reclaimed water for Cougar Canyon Golf Course irrigation
5. Wastewater volume billing as a function of metered potable water use, even during times of outside water use and irrigation.
6. Water restriction/water wasting ordinance
7. Phreatophyte removal on the main stem of the Purgatoire River

It is estimated that current and past water savings from these programs is approximately 20 percent of the volume usage. This amounts to 440 acre-feet of savings at the current consumption level.

Water Conservation Measures Selected for Future Implementation During the Plan Period

Measures will be implemented as funding sources for each program are identified and funds become available for measure.

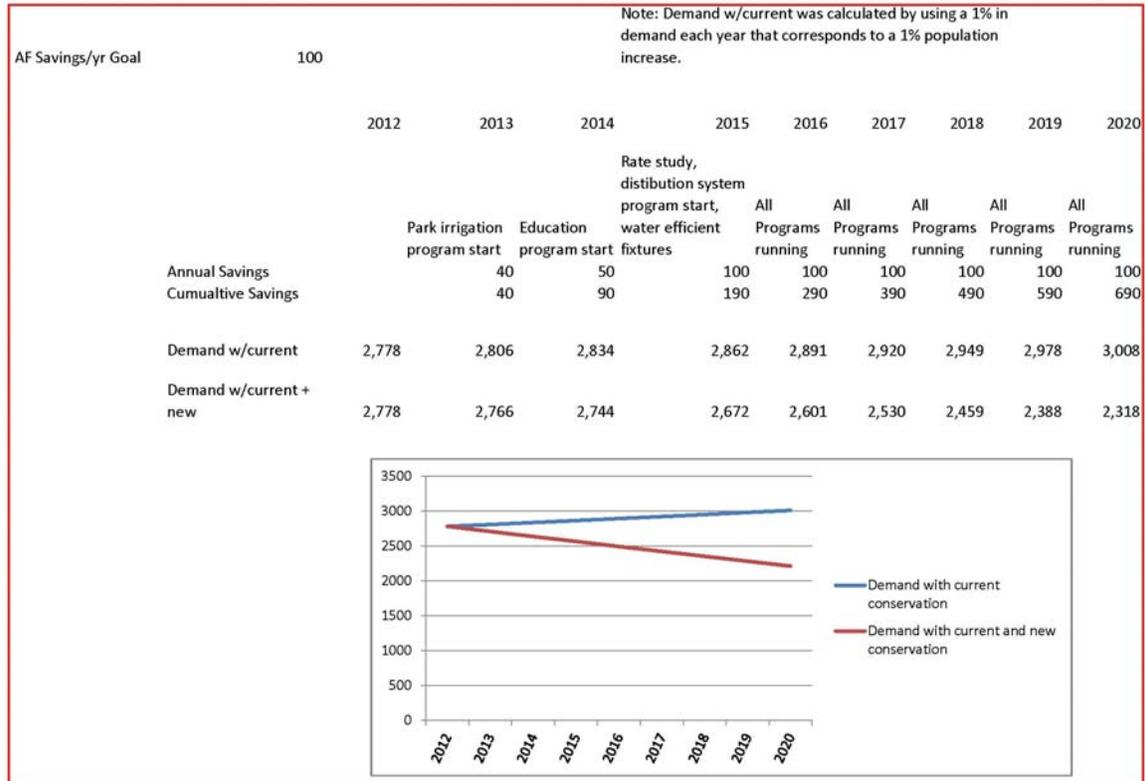
1. Irrigation efficiency for City owned parks to include:
 - a) Moisture sensors
 - b) ET controllers
 - c) Metering of all parks applied irrigation water
 - d) Soil preparation and nighttime watering schedules
2. Commercial and residential rebate program for water efficient fixtures
 - a) Toilets
 - b) Urinals
 - c) Shower heads
 - d) Faucets
 - e) Washing machines
 - f) Irrigation moisture sensors and ET controllers



3. Public Education
 - a) Distribution of information via water bill inserts, Trinidad’s website, and the Trinidad newspaper
 - b) School programs
 - c) Water conservation brochure
4. Distribution System Leak Detection and Water Distribution System Evaluation Study
 - a) Develop a formalized leak detection program
 - b) Perform annual distribution system inspections
 - c) Perform annual system loss control audits in accordance with AWWA Standards
 - d) Monitor metered distribution system pressure zones and storage tank levels
 - e) Commission a study to evaluate the overall condition of the aging water distribution system which will identify and prioritize necessary system component repairs, updates and replacements and the projected costs.
5. Rate Structure Study
 - a) Commission a study to evaluate the impact an implemented conservation oriented rate structure would have on water savings and water department revenue.
 - b) If a water conservation oriented rate structure is determined to be viable, develop and adopt a new rate structure in accordance with the study.



Projected Future Water Savings From The Selected Conservation Measures



SECTION 8 – INTEGRATE RESOURCES AND MODIFY FORECASTS

This section summarizes the projected water conservation savings for the proposed conservation measures/programs.

8.1 Water Conservation Savings Estimates and Conservation Goals

The water conservation measures and programs selected for implementation are estimated to total approximately 100 ac-ft/year of quantifiable water savings. This may be achievable with the selected measures and programs. However, actual total water savings could be higher or lower than the estimated 100 ac-ft/year pending on the accuracy of the estimates and actual water savings of the measure/programs that could not be quantified. There is a degree of uncertainty in the assumptions used to calculate the available water savings estimates.

8.2 Summary of Demand Forecast

If the water conservation savings goals are achieved, first-use water demand could be reduced by 100 ac-ft/year through demand management. Following is an estimate of waters that will be realized through the proposed conservation measures:

| | |
|--|----------|
| City Parks Irrigation Metering, Installation of Moisture Sensors, ET Controllers | 30 ac-ft |
| Water Efficient Fixtures and Irrigation Improvements Rebate Program | 50 ac-ft |
| Water Conservation Public Education | 10 ac-ft |
| Implementation of Formal Leak Detection and System Upgrade Program | 10 ac-ft |

8.3 Identification of Project-Specific Savings

Generally speaking, successful conservation practices can reduce water demands and consequently eliminate, downsize, or delay the need for water supply capital projects. Conservation can also reduce the amount of water rights requiring future acquisition to meet customer needs. This can provide significant cost savings. These savings can be considered in light of implementation costs for the conservation measures and programs.

Trinidad does not anticipate downsizing or eliminating capital projects as a result of water conservation within this planning period. Similarly, the acquisition of water rights will not be reduced. As previously discussed, Trinidad is anticipating a slow population growth and there is a high degree of uncertainty regarding future water conservation

savings. Although conservation may slow the increase in water supply demands, water demands will continue to increase in response to a growing population. Trinidad will monitor conservation savings and if appropriate, future capital projects and water acquisitions could be postponed.

8.4 Conservation and Potential Revenue Effects

Conservation has the potential to affect water utility revenues. While revenues are largely driven by the amount of water used by its customers, Trinidad has significant fixed costs that are unaffected by water usage. To make up for the loss of revenue associated with conservation, Trinidad may need to raise water rates. Trinidad may also save money through the reduction of water treatment and pumping costs associated with the reduction in demand.

It is highly unlikely that water use reductions resulting from conservation measures/programs alone would be cause for a rate increase. Trinidad plans to monitor cost expenditures for conservation measures/programs. If a measure/program does not appear to be cost-effective in the long term and could potentially contribute to a need to increase water rates, this measure/program may be considered for elimination. Trinidad annually reviews capital and operation expenditures and projected revenues. Water rates would only be raised if necessary to meet future expenses.



SECTION 9 – IMPLEMENTATION PLAN

This section provides a preliminary schedule for implementation of the selected conservation plans and measures and proposed public participation and monitoring processes.

9.1 Implementation Schedule

This section provides an implementation schedule for the selected conservation measures and programs. A project timeframe to implement future programs is provided. Existing programs will be continued and maintained.

- | | |
|---|-----------|
| 1. Irrigation Efficiency for City Owned Parks | July 2013 |
| 2. Public Education and Participation | July 2014 |
| 3. Rebate Program for Water Efficient Fixtures | July 2015 |
| 4. Implement a Formal Leak Detection and Water System Upgrade Program | July 2015 |

9.2 Plan for Public Participation in Implementation

The public will play a key role in the effectiveness of Trinidad's conservation program. The success of conservation measures and programs depends on how the public responds to the measures/programs. The more engaged the community is in altering their behavior to conserve water, the more effective the conservation measures and programs will be. Trinidad will continue to implement a public education program educating the public on why and how they may conserve water.

It is also important to establish a means where feedback from the public on the conservation measures and programs may be received. The public will have the opportunity to provide input at the Culebra Range Community Coalition Water Festival on May 17, 2012 through e-mail and mail correspondence. Information on Trinidad's monitoring of the conservation program will be conveyed to the public on an annual basis at which time the public will have an opportunity to provide feedback. Public input will help Trinidad incorporate community values when making important water management decisions.



9.3 Plan for Monitoring and Evaluating Processes

One of the conservation goals of this Plan is to establish an effective monitoring and evaluation process. Data limitations were a challenge in estimating water conservation savings associated with existing conservation measures/programs. This was mainly attributed to the relatively recent implementation of existing conservation measures/programs and the planned implementation of new ones. As Trinidad begins to acquire more data, trends between demand and conservation measures/programs may be established, improving the ability to assess the effectiveness of individual conservation measures/programs.

The collection and organization of data is instrumental in the success of this monitoring plan. Data will be collected on the following:

- Daily measured and recorded water system distribution and storage data.
- Daily wastewater and water treatment production.
- Monthly potable metered demands.
- Monthly non-potable water use (raw and reclaimed).
- Annual costs of each conservation measure/program.
- Annual data on development within the service area. This includes the number of new homes built, commercial properties developed, and acres of new irrigated lands (with corresponding types of vegetation, e.g., native vegetation, Kentucky bluegrass, etc.).
- Annual record of efforts by the Parks Department to conserve water. This may include changes to the irrigation schedule, ET controller installation, acreage of new xeriscaping, acreage of new irrigated landscaping, etc.
- Feedback from the public. These may include comments at open houses concerning conservation, e-mail/mail correspondence, etc. that provides valuable information on the public's perception of the conservation measures/programs.
- Additional information that may provide valuable insight for the modification of the conservation program.
- Annual and monthly per capita demands – Trends in total per capita demands on a monthly and annual basis will be evaluated. These per capita demands will be compared to Water Conservation Goal 1 targeting a per capita water usage of 100 ac-ft/year by 2019 to evaluate how well the conservation program is meeting its total water savings goal.

- Evaluate total conservation water savings – Annual metered demands will be compared to projected demands of the respective year to estimate conservation water savings. These conservation savings will be compared to the water conservation goal targeting a water savings of 100 ac-ft/year by 2019 to evaluate how well the conservation program is meeting its total water savings goal. Other factors besides conservation (e.g., weather patterns and changes to surface water supply) will also be considered when evaluating water savings.
- Accounting of potable water distribution system – Treated water production and metered water usage will be compared to evaluate conveyance system losses and unaccounted for water on an annual basis.
- Annual and monthly metered water usage – Changes in monthly water use trends over the duration of the planning period will be identified. For example, conservation measures targeting outdoor use may reduce per capita monthly demands during the summer.
- Metered water usage by billing category – Total water usage by parks, commercial users, and residential customers will be evaluated on an annual basis. Trends in monthly water usage by customer type will be evaluated as well as residential per capita water usage.

These data will be organized and consolidated into a standardized filing system. Billing data will be downloaded on an annual basis and stored electronically. These data will also be analyzed on an annual basis to assess the effectiveness of conservation measures/programs.

Conclusions from the annual evaluation described above will be developed. Successes and areas where improvements may be made will be identified. This information will be conveyed to the public on an annual basis. Public feedback regarding the evaluation and staff input will be incorporated into the final conclusions. An action plan addressing concerns will be developed for the following year.

9.4 Plan for Updating and Revising the Conservation Plan

Colorado's Water Conservation Statute requires that each covered entity revise their conservation plan at least every 7 years. Trinidad intends to revise this Plan by June 2019. Data gathered during the interim will be collected and analyzed on an annual basis. If monitoring results and/or changes in the water supply system warrant a revised conservation plan prior to the 7-year time period, Trinidad will modify the Plan accordingly.

The modified Plan will incorporate findings of the annual data collection and analyses performed during the Plan period. Historical water use, water savings, and conservation costs will be assessed to evaluate the performance of existing conservation measures/programs and identify where changes can be made. Additional conservation measures/programs will also be evaluated and considered for inclusion into the new Plan.

9.5 Plan Adoption Date, Plan Completed Data, Approved Date

Trinidad's Conservation Plan will be adopted by on July [redacted], 2012. Appendix B provides the formal documentation approving the Plan and amendment.

Summary of Public Review Process

Trinidad will adopt the Water Conservation Plan on July [redacted], 2012 at a public Board meeting. A copy of the approval document is provided in Appendix B. Prior to approval, the public had an opportunity to review and provide comments on the Plan. This public outreach is outlined below.

- 30-day Public Review Resolution - On June [redacted], 2012, Trinidad will adopt a resolution on the public review process for adopting water conservation and other water plans. This resolution stipulates that a minimum of a 30-day public review process is required before a conservation or water plan may be approved by Trinidad. The public has the opportunity to provide comments and feedback that shall be considered for incorporation into plans. A copy of this resolution is provided in Appendix C.
- Public Meeting - A public meeting will be held on June [redacted], 2012. This meeting presented information on the Water Conservation Plan. Information on the existing conservation program, water supply and demand data, conservation goals, evaluation of the conservation measures and programs, as well as the selected conservation measures and programs will be presented.
- Public Review Period – A public review period was held from June [redacted], 2012 to July [redacted], 2–012. The public will be notified via the Trinidad website and the local newspaper of the opportunity to review and provide comments on the Plan. The Plan will be available on Trinidad’s website and hard copies will be available at the City Administration Building. A copy of the public comments as well as responses is provided in Appendix D.



APPENDIX A

PUBLIC REVIEW PROCESS

ADOPTION OF TRINIDAD'S WATER CONSERVATION PLAN

30-DAY PUBLIC REVIEW PROCESS RESOLUTION

APPENDIX D

PUBLIC COMMENTS

APPENDIX E

REFERENCES