CITY OF MONTE VISTA

2011 WATER CONSERVATION PLAN

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EXECUTIVE SUMMARY

The City of Monte Vista ("City" or "Monte Vista") is located northwest of Alamosa in the San Luis Valley in Rio Grande County, Colorado. The City provides water services to a population of approximately 4,300 residents. Monte Vista obtains all of their drinking (potable) water from groundwater with no surface water sources. Monte Vista is committed to optimizing its water supplies and system through practical water conservation practices. Implementing water conservation within its service area will maximize its available water, which will benefit the City in meeting future demands and during times of drought.

Monte Vista has developed a Water Conservation Plan in accordance with the Water Conservation Act of 2004 and to meet the provisions of Colorado Revised Statute section 37-60-126. As part of CRS 37-60-126, a State-approved Plan will qualify Monte Vista for funding from the Colorado Water Conservation Board (CWCB) and the Colorado Water Resources and Power Development Authority for water supply and delivery projects.

In 2009, Monte Vista's water customers used approximately 754 acre-feet (AF) or 246 million gallons (MG). By 2020, which is the end of the planning horizon for this Plan, it is projected that Monte Vista will need to provide approximately 802 AF (261 MG) annually. Water savings from this water conservation planning effort is estimated to save the City 146 AF (48 MG) per year and 1,895 AF (617 MG) over the planning period of 2011 to 2020. For some of the selected water conservation measures and programs, estimated savings over planning period is calculated by compounding the estimated annual water savings per the total number of annual participants. The savings from this planning effort will make a considerable contribution toward the water supplies needed to serve the 2020 demand.

This report documents Monte Vista's water system, past and future water use, planned capital improvement projects, and the water conservation planning process used in accordance with CWCB's Water Conservation Plan guidelines and policies.

Water Conservation Goals

Monte Vista has considered water conservation in its planning for many years and has developed a number of measures to promote efficient water use. The City has implemented the following water conservation measures and programs:

- Updated billing system software was purchased in 2005
- Recently installed water meters for customers

Additionally, Monte Vista has established water saving ordinances as set forth in the City's municipal code and has a drought mitigation plan in place. It is uncertain the exact reduction in water use the City has seen because of these efforts. Over the ten-year planning period (2011 to 2020), tracking efforts will be increased to quantify water savings and costs of the Plan.

Water savings goals were established for this Water Conservation Plan by completing the following steps:

- Establishing an initial water savings goal estimate
- Selecting water conservation measures or programs to meet those goals
- Comparing the expected water savings to the original goals

The goal for this Water Conservation Plan is to reduce the overall water use by 20 percent or 1,895 AF (617 MG) over a ten-year planning period. This savings will come from water use categories that were identified through the planning process for potential water savings:

- Residential
- Residential - Multi-Family
- Commercial
- Public Authority
- Zero Billing
- Unaccounted-For Losses

The City's water conservation goals are shown in **Table ES-1**.

Table ES-1 – Water Conservation Goals

Water Use Categories:	Total Projected Water Use (2011 to 2020)	Savings Goals Resulting from Selected Conservation Programs	Total Water Savings from Selected Programs	Adjusted Projected Water Use (2011 to 2020) after Savings from Selected Programs
	(AF)	(%)	(AF)	(AF)
Residential	5,421	9%	495	4,926
Residential - Multi-Family	1,232	17%	206	1,027
Commercial	641	5%	34	607
Public Authority	261	72%	187	74
Zero Billing	265	13%	35	230
Unaccounted-for Losses (20%)	1,564	12%	938	626
Total Water Production:	9,384			7,489
Total Demand Reduction:			1,895	
Total Percent Reduction:		20%		

Evaluation and Selection of Conservation Measures and Programs

In order to select water conservation measures and programs to meet the water savings goals, a universal list of measures and programs was subject to an initial screening, cost-benefit analysis and final screening. This process pared the universal list down to the final selection of measures/programs that Monte Vista will implement. The screening criteria used consisted of the following:

1. Political ramifications
2. Financial implications
3. The City's priority ranking of measures (i.e. education is a high priority)

Implementation Plan

All of the proposed water conservation measures and programs chosen will require staff and financial resources for implementation. This will require some strategy in implementing the most beneficial measures first. For illustration purposes, a three year schedule has been proposed and should be interpreted that Year 1 is the City's first priority of projects followed by Year 2 and then Year 3. The City will implement these programs as funds become available and it may not be within three years exactly. The proposed implementation of this Water Conservation Plan will occur over a three-year period, provided the necessary resources are available.

Monte Vista is committed to implementing the selected water conservation programs and will budget money and pursue CWCB water-efficiency grant money to accomplish this goal. **Table ES-2** shows the implementation schedule of the selected measures/programs, the cost to implement and maintain each one, the percent each measure/program contributes to the overall water savings, and those that have been identified for grant money.

Monitoring of the Plan will be completed on an annual basis and a formal update is required by CWCB within seven years. Public feedback is an integral part of this Plan and comments were solicited and incorporated into the final Plan.

Table ES-2 – Implementation Plan for Monte Vista's Water Conservation Plan

Measure/Program	Cost to Implement (includes 1st year annual cost)	Annual On-going Costs (programs in 2nd or 3rd year of implementation)	Total Annual Cost without Lost Revenue	% of Total Water Savings	Implementation Considerations	Grant Request Possible?
Year 1						
Utility Maintenance Programs						
Leak Detection & Repair Program	$8,200	0	8200	24.8%	Staff time, Funding and Consultant time	Yes
AMI FlexNet	$400,000	0	0	24.8%	Funding	Yes
Regulatory Standards Program (Phase 1)						
Evaluation of Policies to Encourage Water Savings	$2,000	0	$0	0.1%	Staff Time and Governmental Actions	No
Turf & Landscape Standards	$1,000	0	$500	0.3%		
Irrigation System Standards for New Development	$1,000	0	$500.00	0.3%		
Education Programs (Phase 1)						
Water Conservation Website Upgrades	$5,500	0	$500	4.0%	Staff and Funding	Yes
Rebate and Incentive Programs (Phase 1)						
Water Conservation Upgrades at City Facilities - Indoor	$7,752	0	0	1.1%	Staff, Funding and Procurement of Materials	Yes
Water Conservation Upgrades at City Facilities - Outdoor	$10,000	0	0	0.7%		
Total Year 1 Cost	**$435,452**	**$0**	**$9,700**			
Year 2						
Regulatory Standards Program (Phase 1 & Phase 2)						
Water Rate Structure Changes	$50,000	0	$0	8.0%	Staff time, Funding and Governmental Actions	Yes
Turf & Landscape Standards	0	$500.00	0	see Year 1	Phase 1	see Year 1
Irrigation System Standards for New Development	0	$500.00	0			
Education Programs (Phase 1 & Phase 2)						
Children's Water Festival	$10,000	0	$3,000	1.8%	Staff time, Funding, and Coordination with Local Schools	Yes
School Education Program (K-12)	$44,300	0	$1,300	1.8%		
Water Conservation Website Upgrades	0	$500	0	see Year 1	Phase 1	see Year 1
Rebate and Incentive Programs (Phase 2)						
Toilet Retrofit Program	$2,993	0	$250	2.6%	Staff, Funding and Procurement of Materials	Yes
Low Income Retrofit	$7,909	0	$6,909	4.4%		
Audit Program (Phase 1)						
Residential Water Audit Kits	$3,297	0	$1,100	4.7%	Staff, Funding and Materials	Yes
Total Year 2 Cost	**$118,499**	**$1,500**	**$12,559**			
Year 3						
Utility Maintenance Programs						
Leak Detection & Repair	0	$8,200		see above	Program runs every other year	see above
Regulatory Standards Program (Phase 1 & Phase 2)						
Turf & Landscape Standards	0	$500		see Year 1	Phase 1	see Year 1
Irrigation System Standards for New Development	0	$500				
Education Programs (Phase 1, Phase 2 & Phase 3)						
Xeriscape Demonstration Garden	$5,900	0	$900	0.5%	Staff, Funding and Procurement of Materials	Yes
Xeriscape Education Programs	$4,750	0	$2,750	0.1%		
Children's Water Festival	0	$3,000		see Year 2	Phase 2	see Year 2
School Education Program (K-12)	0	$1,300				
Water Conservation Website Upgrades	0	$500		see Year 1	Phase 1	see Year 1

Table ES-2 cont.

Measure/Program	Cost to Implement (includes 1st year annual cost)	Annual On-going Costs (programs in 2nd or 3rd year of implementation)	Total Annual Cost without Lost Revenue	% of Total Water Savings	Implementation Considerations	Grant Request Possible?
Rebate and Incentive Program (Phase 2 & Phase 3)						
Residential Rebate for Low-Flow Toilets	$3,450	0	$3,250	7.0%	Staff and Funding	Yes
Rebate for High Efficiency Clothes Washer	$2,325	0	$2,125	0.7%		
Low Flow Faucet Rebate	$650	0	$550	3.4%		
Low Flow Showerhead Rebate	$650	0	$550	0.8%		
Irrigation System Efficiency Device Rebates	$1,650	0	$1,250	0.7%		
Xeriscape Incentives	$14,890	0	$12,890	3.3%		
Toilet Retrofit Program	0	$250		see Year 2	Phase 2	see Year 2
Low Income Retrofit	0	$6,909				
Audit Program (Phase 1 continued)						
Residential Water Audit Kits	0	$1,100		see Year 2	Phase 1	see Year 2
Total Year 3 Cost	**$34,265**	**$22,259**	**$24,265**			
Total Combined 3-Year Cost (implementation and annual costs)	**$611,975**					
Total Implementation Costs	**$588,215**					
Estimated Annual Costs (for measures shown)	**$46,524**					

CHAPTER 1 – INTRODUCTION

The City of Monte Vista ("City" or "Monte Vista") is located northwest of Alamosa in the San Luis Valley in Rio Grande County, Colorado. Spanish for "Mountain Views," Monte Vista is named for the beautiful surrounding mountain vistas. The City was founded in 1886 on the prosperity the early pioneers found in the water, the abundant crops and livestock.

Currently, Monte Vista serves approximately 1,989 customer taps, which includes approximately 200 taps outside the City limits. The City has an estimated population of 4,300 people with a projected population of 6,250 at full build out.

Monte Vista obtains all of their drinking (potable) water from groundwater without any surface water sources. They have five wells located in the confined portion of the Rio Grande aquifer. These wells range from 300 to 800 feet deep and discharge directly into the distribution system. The City also has three irrigation wells that are used for outdoor irrigation use. All water demands are met through the pumping of the wells with no water storage within the system. The current water distribution system was constructed beginning in 1950 and has had many recent additions to improve and expand delivery.

Monte Vista has determined that implementing water conservation within its service area will maximize its available water, which will benefit the City in meeting future demands and during times of drought. A thorough and feasible Water Conservation Plan can assist this community to manage its water resources and plan appropriately for the expected growth. Monte Vista has chosen a ten-year planning horizon from 2011 to 2020.

The City has previously completed several water planning studies. Information from the following studies was relied upon for this planning effort:

- Bikis Water Consultants, LLC in April 2010, prepared an Augmentation Water Rights Acquisition Feasibility Study for the City of Monte Vista. The purpose of this report was to determine the augmentation demand and various alternatives of water right acquisition and storage that would be needed to meet those demands.

- Integra Engineering completed a Master Infrastructure Plan Update in 2008. This plan addresses needed capital improvement projects with a prioritized implementation schedule. It allows the City to meet current and future regulatory requirements and improve system deficiencies.

- In 2009, a Comprehensive Plan was prepared for the City of Monte Vista which is a guidance document for the City as it grows. Previously, the City was included in Joint Master Plan between Rio Grande County and Town of Del Norte.

The purpose of this Water Conservation Plan is to guide Monte Vista in water conservation planning and implementation. Water conservation planning will help the City to optimize water supplies and systems through practical water conservation practices. Other benefits may include delaying infrastructure upgrades and reducing wastewater flows and treatment.

CHAPTER 2 – PROFILE EXISTING WATER SYSTEM

Characteristics of City of Monte Vista Water Supply System

Population and Service Area

The City is located northwest of Alamosa in the San Luis Valley in Rio Grande County, Colorado (**Figure 2.1**). The City limits encompass approximately 1,600 acres. Monte Vista also serves approximately 200 customer taps outside the City limits. The City's population grew starting in 1985 and continued until approximately 2005 when growth started to decrease. The City's 2008 Master Infrastructure Plan projected a growth rate ranging from 1.0 to 1.6 percent per year until 2030, with a specific growth rate of 0.57 percent from 2006 to 2011. This data was developed in part by analyzing the State Demography Office data, which shows an average growth rate for Rio Grande County of one percent from 2010 to 2015 and 1.4 percent for 2015 to 2020. For this study, the City projects future growth at approximately 0.57 percent from 2010 until 2019 as shown on Table 2.1.

Table 2.1 – City of Monte Vista Population

Year	Population	Growth Rate
2003	4,670	-
2004	4,722	1.10%
2005	4,639	-1.80%
2006	4,520	-2.60%
2007	4,391	-2.90%
2008	4,357	-0.80%
2009	4,309	-1.10%
2010	4,334	0.57%
2011	4,359	0.57%
2012	4,384	0.57%
2013	4,409	0.57%
2014	4,434	0.57%
2015	4,459	0.57%
2016	4,484	0.57%
2017	4,510	0.57%
2018	4,536	0.57%
2019	4,562	0.57%
…	…	…
2035	6,250	1.25%

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Figure 2.1
City of Monte Vista
Location Map

Date:	8-4-2010
Drawn By:	MLH
Scale:	1 inch = 3,500 feet
Job No:	09-420

Water Distribution System

Monte Vista obtains its potable water supply from five wells completed in the confined Rio Grande aquifer. These wells range in depth from 300 to 800 feet. The distribution system includes 30 miles of pipelines that range in size from four to 12 inches in diameter. The City has three shallow wells that it uses directly for irrigation of Chapman Park and the high school football field. The other City parks and the golf course are served by the potable well supply. **Table 2.2** shows the pipe sizes and lengths for the water distribution system.

Table 2.2 – Miles of City of Monte Vista Distribution System Pipeline

Diameter (in)	Total Length (miles)
4	1.9
6	15.4
8	8.3
10	2.8
12	2.1
Total	**30.5**

Monte Vista's water distribution system has three primary service areas. The major service area is the central core of the City, which is a typical looped grid system. This area is bounded to the north by Prospect Avenue, to the south by 6th Avenue, to the east by Henderson Road and to the west by Country Club Drive. The other primary service areas are the Veterans Center to the east and the Meadows Lane area to the northwest. Service to these areas has developed as branched system with minimal looping. Both branched areas are connected to the central core area at only one point.

The current water distribution system was constructed beginning in 1950 and has had many recent additions to improve and expand delivery. The City's water distribution system does not include any treated water storage. The City is currently updating their pump stations to include the ability to disinfect groundwater at each pump station to meet Colorado drinking water standards.

Service Connections and Water Demand

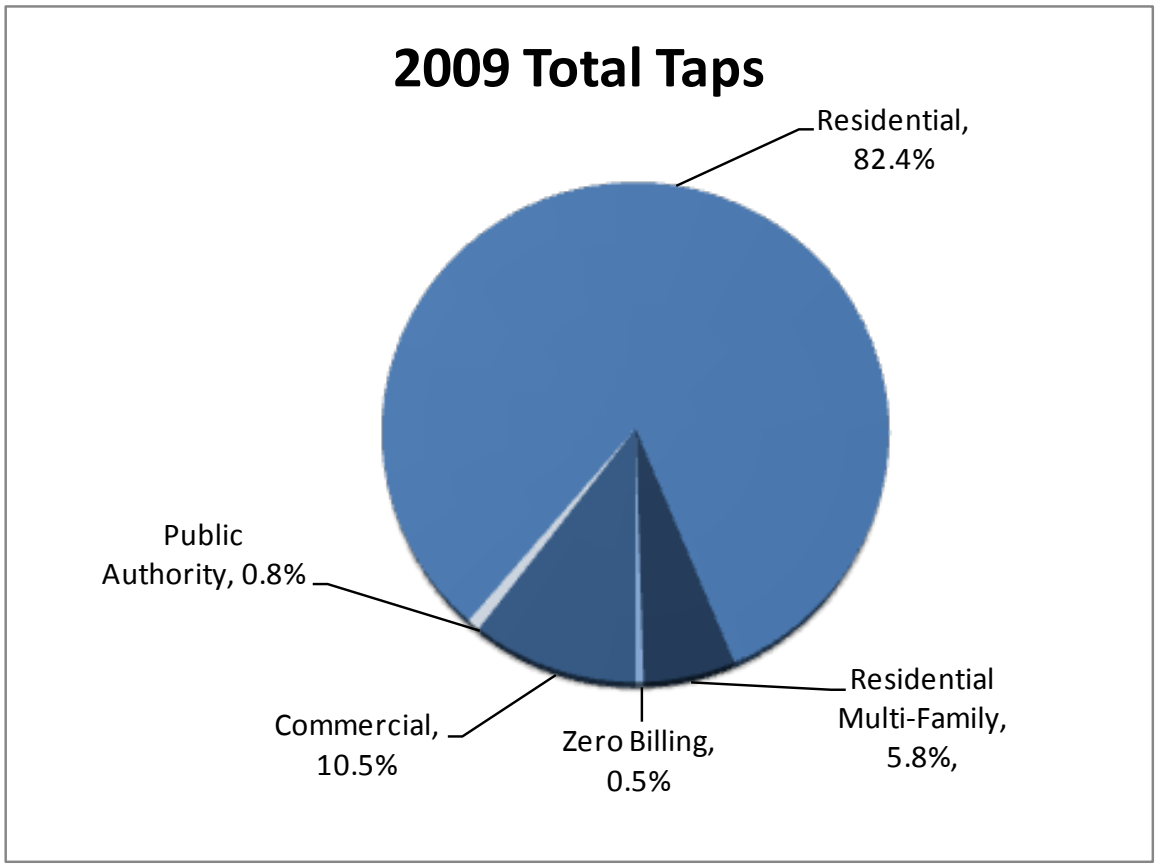
By the end of 2009, Monte Vista was serving 1,989 taps. The number of taps can be broken into the following categories with the corresponding number of taps:

- Residential – 1,640 taps
- Residential Multi-Family – 115 taps
- Public Authority (government assisted single family homes) – 16 taps

- Commercial – 208 taps
- Zero Billing (golf course, City parks, City buildings, etc.) – 10 taps

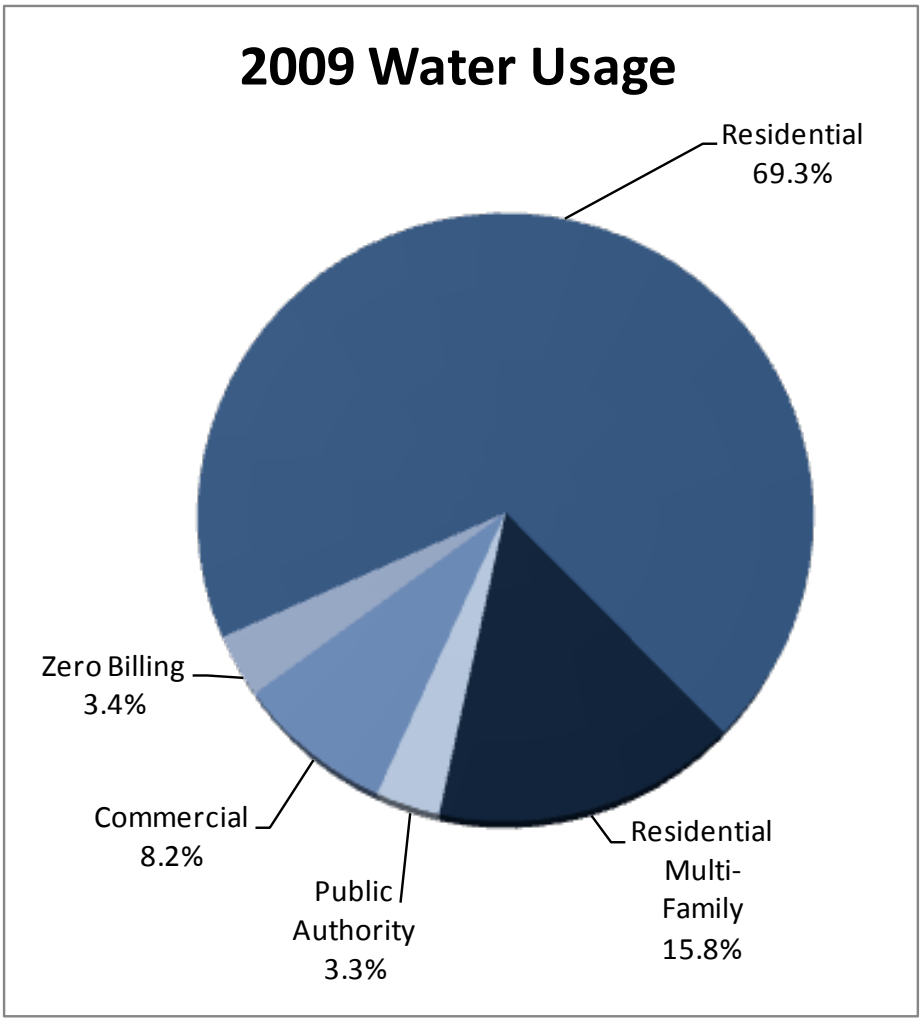
Each of the customer categories are shown in **Figure 2.2** below with the coinciding percentage of total taps.

Figure 2.2 – Percentage of Taps per Category



The tap distribution for the same customer categories looks a little different than the water use distribution as shown in **Figure 2.3**. While Residential water users consist of 82.4 percent of the taps, they only contribute 69.3 percent of the water use. Conversely, while the Zero Billing category only consists of 0.5 percent of the taps, they contribute 3.4 percent of the water use. This is due to the amount of water that is used from the taps associated with the different categories. For example, the golf course is served under the Zero Billing category and has a much higher use than a Residential tap. This information is helpful to consider when selecting conservation measures to target certain categories.

Figure 2.3 – Percentage of Water Use per Category



Sources of Water Supply

As mentioned previously, the City's main source and currently only source of potable water supply is from its five wells completed in the confined Rio Grande aquifer. They also have three other shallow wells that are completed in the unconfined aquifer and used for irrigation. The City also owns several other agricultural water rights that are currently being leased back to farmers for irrigation.

The water supplies owned by the City are shown in **Table 2.3** with a brief description of each source following the table.

Table 2.3 – City of Monte Vista Water Rights

Table 2.3 – Water Sources

Well Name	Adjudicated Water Rights (gpm)	Amount (cfs)	Amount (AF/yr)
City Supply Sources- Confined Aquifer			
Batterson Well #1	1,100	2.45	1,774
Jackson Well #2	1,800	4.01	2,903
Broadway Well #3	1,200	2.67	1,936
Sherman Well #4	2,300	5.12	3,710
Prospect Well #8*	1,800	4.45	3,226
Subtotal	6,400	14.25	10,323
Raw Water Sources- Unconfined Shallow Aquifer			
Chapman Park- Well #5	600		968
High School FB - Well #6	190		306
Golf Course- Well #7	1,900		3,065
Subtotal	2,690	0	4,339

NOTE: Well #8 is decreed as an Alternate Point of Diversion for Wells 1-4 (Case No. 88
Therefore, Well #8 flow rate is not counted towards the total from the wells.
gpm = gallons per minute cfs = cubic feet per second
AF/year = acre-feet per year

Augmentation Supply Sources	
Ditch	**Est. Historical Consumptive Use (ac-ft)**
McDonald Ditch	94.2
Anderson Ditch	276.8
Rio Grande Lariat Ditch	77.9
Ben Ogle Ditch	19.4
TOTAL (ac-ft/yr)	**468.3**

Well Supplies

The City's five confined aquifer wells were decreed as alternate points of diversion for each other in Case No. 88CW013. Their adjudicated flow rates range from 1,100 to 2,300 gallons per minute (gpm). Together these five wells cannot pump more than their decreed flow rate of 6,400 gpm or 10,323 acre-feet (AF) per year. In a typical year, three of these wells will pump at 900 gpm with the fourth well occasionally turning on to meet an increase in demand and the fifth well not being used at all. During the 2002

drought, the three wells ran constantly at 900 gpm with the fourth well frequently pumping and the fifth well was occasionally tapped into to produce adequate supply.

The City uses two of its shallow, unconfined wells for irrigation of the High School football field and Chapman Park. This reduces the demand on the potable wells. The third shallow well is currently not functional but could possibly be repaired and used for irrigation of the golf course. This would be beneficial by reducing the amount of potable water that is supplied to the golf course.

The City must augment its well depletions per the "Confined Aquifer New Use Rules" for Division 3 that were released in June 2004 to comply with SB 04-222. These rules address depletions from the confined aquifer as well as the unconfined aquifer, which includes all the City's wells. The State Engineer's Office (SEO) has developed a Rio Grande Decision Support System (RGDSS) groundwater model that covers the entire San Luis Valley and simulates both confined and unconfined aquifers. Based on RGDSS modeling from the SEO and an engineering report by Davis Engineering summarizing information for Monte Vista's augmentation plan (completed in 2006), current depletions are 528 AF/yr with estimated build-out depletions of 599 AF/yr. This data was obtained from the Bikis April 2010 report, which addresses the augmentation needs for the City.

Native Water Supplies

Monte Vista owns water rights in four different ditch companies: the Anderson Ditch, McDonald Ditch, Rio Grande Lariat Ditch and the Ben Ogle Ditch. These ditches range in seniority and have an estimated yield of approximately 468 AF for the shares Monte Vista owns (Bikis 2010). These water rights are currently being leased back to farmers for irrigation, but they will eventually undergo a change of use in Water Court to include augmentation before they can cover the City's well depletions.

Water Costs and Pricing

Water Fund

The water fund for Monte Vista is used to finance the cost of service for current and future water delivery. It is made up of water development fees and monthly water sales. Monthly water sales cover the City's cost of water service. Fees and water rates are evaluated yearly to ensure that water supply and cost of service is not jeopardized.

Table 2.4 shows the water development fee that covers costs associated with connection to the City's system. The water development fee for a ¾" to 1" Residential tap is $2,500 if inside the City limits and $5,000 for taps established outside the City limits. The other tap fees range from $3,200 (1" Commercial tap) to $9,700 (4" tap). These fees are doubled if outside the City.

Table 2.4 – City of Monte Vista Water Tap Fees

Tap Size	Inside City Limits			Outside City Limits		
Water Tap Rates	Allocation of Tap Fee for Acquisition of Water Rights	Basic Tap Fee	Total Tap Fee	Allocation of Tap Fee for Acquisition of Water Rights	Basic Tap Fee	Total Tap Fee
3/4 - 1 in Residential	$1,700	$800	$2,500	$3,400	$1,600	$5,000
1-in Commercial	$1,700	$1,500	$3,200	$3,400	$3,000	$6,400
1 1/2- in	$2,400	$2,000	$4,400	$4,800	$4,000	$8,800
2-in	$3,200	$2,500	$5,700	$6,400	$5,000	$11,400
3-in	$4,200	$3,400	$7,600	$8,400	$6,800	$15,200
4-in	$5,400	$4,300	$9,700	$10,800	$8,600	$19,400

Charges for Water Service

All water users are charged a monthly base rate, which reflects the fixed costs associated with providing water services and include a certain amount of water. **Table 2.5** shows the base fee and current rates for each size of meter. The base fee ranges from $20.20 for smaller taps within the City to $406.80 for a six-inch Commercial tap outside the City. The base fee includes a certain amount of water: 5,000 gallons from mid-March to mid-December and 15,000 gallons from mid-December to mid-March. Once a water user exceeds the 5,000 gallons or 15,000 gallons, they pay $1.46 per 1,000 gallons. The reason the City has separated the usage into seasons is because they have developed a “drip policy” that allows water users to drip their water lines to prevent freezing during the winter due to the cold temperatures in Monte Vista.

Table 2.5 – City of Monte Vista Water Rates

Resolution No. 9-2009 (Amending No. 14-2003)

Metered Customers	Base Fee - Inside City	Base Fee - Outside City	Gallons included in Base Fee from Mar 15 to Dec 20	Gallons included in Base Fee from Dec 21 to Mar 14	Excess Water Volume Charged per 1000 gallons
3/4" meter	$20.20	$40.40	5,000	15,000	$1.46
1" residential meter	$20.20	$40.40	5,000	15,000	$1.46
1" commercial meter	$23.90	$47.80	5,000	15,000	$1.46
1.5" meter	$41.00	$82.00	5,000	15,000	$1.46
2" meter	$53.70	$107.40	5,000	15,000	$1.46
3" meter	$84.80	$169.60	5,000	15,000	$1.46
4" meter	$151.30	$302.60	5,000	15,000	$1.46
6" meter	$203.40	$406.80	5,000	15,000	$1.46

NOTE: Base Fee includes a certain amount of water with it depending on the season. Excess volume charge occurs after the water allocation with the base fee has been met. A "drip policy" was created to allow users to drip water to prevent their service lines from freezing in the winter.

Billing and Collections

Monte Vista water customers are billed for their water usage on a monthly basis. The water bills are mailed out by the 6th day of each month and payments are due on the 25th day of each month. Accounts that are in arrears are charged a penalty of two percent per month of the arrears amount. Service may be discontinued on accountings 30 days in arrears. All delinquent accounts constitute a perpetual lien upon the premises. Per Resolution No. 15-2000, it costs $25 to close or reopen a City service valve due to non-payment. Insufficient funds are charged a $20 fee per check.

Water charges reflected on monthly utility bills are a combination of a base service delivery charge and a metered consumption usage charge if the base use is surpassed. Potable water sales in 2009 were estimated at approximately $376,204 (**Table 2.6**).

Table 2.6 – City of Monte Vista Water Revenue

Water Use Category	2006	2007	2008	2009
Residential	$260,027.50	$264,875.08	$281,129.30	$264,095.66
Multi-Family	$100,279.72	$72,496.17	$81,411.96	$69,565.45
Public Authority	$4,919.40	$13,619.93	$13,160.22	$12,348.05
Commercial	$31,186.65	$32,186.69	$33,863.14	$30,194.43
Total	**$396,413.27**	**$383,177.87**	**$409,564.62**	**$376,203.59**

System Limitations

Along with areas of high water use, system limitations can provide insight into how and where to set water conservation goals. The following sections include both current and potential system limitations. Ideally, conservation can help mitigate a portion of the limitations and improve the reliability and efficiency of the system.

Growth and Augmentation Demand

The location of Monte Vista is somewhat isolated, which makes growth slower than other areas in Colorado. Due to the City's water supply being groundwater, the City would like to protect this precious resource as much as possible. Conserving water benefits the City by reducing the amount of water it needs to augment and thereby reducing costs for the City.

The estimated historical consumptive use for the native water supplies is 468 AF/yr, which is 131 AF short of demands. The City is currently acquiring more water rights to address this shortfall. They would like to consider water conservation as another tool to help them meet this shortfall.

Future Water Supply

The Rio Grande Basin is an over-appropriated basin with significant demands on water for agricultural, municipal and other uses as well as compact obligations. The Rio Grande Water Conservation District has been working on forming sub-districts that would protect the aquifer by reducing groundwater usage. Monte Vista will not be part of a sub-district, as they are developing their own augmentation plan.

The City needs storage to be able to fully utilize its agricultural water rights for augmentation. The City has completed negotiations with the Rio Grande Reservoir Company for storage that will allow the City to make year-round releases for augmentation. The City also has opportunities to lease transbasin water from the

Navajo Development Corporation which owns water rights in the Williams Creek Squaw Pass Diversion. This would add another dimension to Monte Vista's overall water rights portfolio. The Navajo Development Corporation diverts water from the Upper Pine River Basin (San Juan River Basin) into Squaw Creek and Rio Grande Reservoir.

Change of Use

Conversion of native water rights from agricultural to municipal use requires detailed engineering analyses and applications to Water Court. The engineering analyses required involve the change of use of agricultural water, which quantifies the historical consumptive use of the crops grown with the water right and return flows resulting from irrigation of those crops. Additional applications will likely be necessary for any future native water acquired by Monte Vista.

Water Treatment

The City's potable wells require minimal treatment due to the high quality of the groundwater. A small amount of chlorine is added to the distribution system to meet minimal disinfection standards. The City is currently updating their pump stations to include the ability to disinfect groundwater at each pump station to meet Colorado drinking water standards. The City would need a water treatment plant to treat raw water supplies such as agricultural water rights.

Unaccounted-for Water Use

There are two types of water losses that occur in cities, apparent losses and real losses. Apparent losses are paper losses that can be caused by customer meter inaccuracies, billing system data errors or unauthorized consumptions. Real losses are those that are physically lost within the distribution system, including the water treatment process.

Monte Vista's system losses have averaged 16-20 percent for the last few years, which is quite a bit higher than the seven to ten percent that is considered good by industry standards. The City recognizes this is an area for great improvement and would like to actively pursue leak detection in this Water Conservation Plan to reduce losses. The City also has sections of irrigation pipe that are considerably older and might need replacement.

Statewide Water Supply Initiative

In 2003, the Colorado General Assembly authorized the Colorado Water Conservation Board (CWCB) to implement the Statewide Water Supply Initiative (SWSI) as a result of growing pressure on water supplies in Colorado and the 2002 drought. This study was recently updated in 2010. The study identified current and future water demands, available water supplies, and existing and planned water supply projects in eight major river basins in the State.

Monte Vista is located in the Rio Grande Basin where SWSI identified a small gap between water needs and water supplies in the Basin projected to occur by 2025. Water conservation is one method the SWSI report identified for meeting this gap.

Policies and Planning Initiatives Affecting Water Use

Municipal Code

The City currently has water conservation policy incorporated into the municipal code. Monte Vista has developed a no water waste ordinance and an ordinance that prohibits the growth of Box Elder, female Cottonwood, Siberian Elm and Chinese Elm trees. These trees are very invasive in this area and consume large amounts of water. No lawn watering restrictions have been incorporated into the municipal code.

Current Water Conservation Activities

Monte Vista has considered water conservation in its planning and has developed a number of measures to promote efficient water use. The following is a list of water conservation measures and programs already developed:

- No Water Waste Ordinance
- Drought Mitigation Plan
- Ordinance for removal of invasive tree species
- Updated billing system software that was purchased in 2005
- Installed water meters for all customers between 2000 and 2005

The City began an effort in 2000 to install meters on all of the system's taps. From 1994 to 2005, an average of 2,462.9 AF/yr of water was used. After all meters were installed and operable in 2005, water use decreased to 1,211.8 AF/yr. This represents a 51 percent decrease in demand attributable to metering per Davis Engineering (2006).

Use by Customer Category

In 2009, Monte Vista's billed water demand per customer category totaled 754 AF (245 million gallons or MG) as shown in **Table 3.1**. The water use shown below does not include fire hydrant or construction water use. These uses constitute very small portions of the overall water use and will not be included in the calculations presented in this plan.

Table 3.1 – 2009 Water Use by Customer Category

Water Use Category	2009 Billed Water Demand (AF)	Percent of Total
Residential	522	69%
Multi-Family	119	16%
Public Authority	25	3%
Commercial	62	8%
Zero Billing	26	3%
Total	**754**	**100%**

Residential Water Use

Residential water use, which includes both indoor and outdoor uses, constitutes the largest water use in Monte Vista at 69 percent of the total water use. In 2009, this equates to 522 AF per year of water consumption.

Residential Multi-Family Water Use

Total Multi-Family water use is 119 AF per year, which is the second largest water use for the City. This water use makes up approximately 16 percent of total water use.

Public Authority Water Use

Public Authority is also a residential water use specifically for low-income housing and comprises three percent of the overall water use or 25 AF per year.

Commercial Water Use

Commercial water users in the City include office buildings, hotels, retail stores, restaurants, car washes, and other similar businesses. Water use for this category is 62 AF per year or eight percent of the total water use.

The largest Commercial water users in the City include the Country Trailer Court, Valley Grande Housing Partners (low income housing), Legacy Assisted Living, Mountain Meadows (Nursing Home), and the Veterans Center.

Zero Billing Water Use

This category includes buildings, parks, the golf course and areas owned and operated by the City that are not billed. Zero Billing water use totals 26 AF or three percent of the total water use in 2009.

Taps and Water Use Summary

The total number of taps per customer category is shown in **Table 3.2**. Historical data on the number of taps per customer category is unavailable prior to 2009. Due to slow growth in the area, it is assumed that the number of taps per customer category has not changed significantly since 2005. **Table 3.3** shows the water use for each customer category from 2005 through 2009.

Table 3.2 – City of Monte Vista Taps by Customer Category

Category	2009 Taps
Residential	1,640
Multi-Family	115
Public Authority	16
Commercial	208
Zero Billing Location	10
Total	**1989**

Table 3.3 – City of Monte Vista Water Use

Year	Residential AF	Multi-Family AF	Public Authority AF	Commercial AF	Zero Billing Locations AF	**Total** AF
2005	543	137	28	68	72	**848**
2006	563	168	32	73	81.7	**918**
2007	531	122	28	67	86.8	**834**
2008	557	139	27	70	94	**886**
2009	522	119	25	62	25.5	**754**

The water use per tap is shown in **Table 3.4**. The average Residential use is 0.33 AF per tap. The Multi-Family is quite a bit higher at 1.19 AF per tap. The Commercial use averaged 0.33 AF per tap for customers and Zero Billing averages 7.2 AF per tap, which is likely due to high irrigation demand through a smaller number of taps, such as for the golf course. Public Authority use average 1.73 AF per tap.

Table 3.4– City of Monte Vista Historic Water Use per Tap (AF/tap)

Year	Commercial	Public Authority	Residential	Multi-Family	Zero Billing Location	**Total**
2005	0.33	1.73	0.33	1.19	7.2	10.79
2006	0.35	1.98	0.34	1.46	8.17	12.31
2007	0.32	1.73	0.32	1.06	8.68	12.12
2008	0.34	1.66	0.34	1.21	9.4	12.94
2009	0.3	1.57	0.32	1.03	2.55	5.77
Average	**0.33**	**1.73**	**0.33**	**1.19**	**7.2**	**10.79**

NOTE: Red numbers were calculated using the number of taps from 2009 for estimates for 2005-2008.

Per Capita Water Use

Per capita water use, both system-wide and residential only, is a commonly used way to gage an entity's water use habits. System-wide per capita use can vary significantly between entities depending on the type of non-residential customers within the system.

From 2005 to 2009, Monte Vista averaged 170 gallons per capita per day (gpcd) system-wide with 142 gpcd for residential uses as shown in **Table 3.5**. The residential gpcd includes other categories such as Multi-Family and Public Authority.

Table 3.5 – City of Monte Vista per Capita Water Use

Year	Total Water Use (AF)	Residential Water Use (AF)	Population	System Wide GPCD	Residential GPCD
2005	848	708	4,639	163	136
2006	918	763	4,520	181	151
2007	834	681	4,391	170	138
2008	886	722	4,357	181	148
2009	754	666	4,309	156	138
Avg	848	708	4,443	170	142

NOTE: GPCD = Gallons per Capita per Day

Indoor vs. Outdoor Use

In Colorado, a significant portion of water use typically occurs outdoors for irrigation. To determine Monte Vista's average outdoor use, we examined the average water use during the winter months (November to April) and the average use during the summer months (May to October), between 2006 and 2009. Approximately 37 percent of total water use for Residential, Multi-Family, and Public Authority customers is estimated as outdoor water use.

Demand Forecast

Using a projected population growth rate of 0.57 percent, we calculated projected demands for Monte Vista as shown in **Table 3.6**. The total annual water use for 2009 is 754 AF with a projected increase to 825 AF by 2025. The total projected demand was split between each customer category based on the percentage of total water use presented in **Table 3.1.**

Table 3.6 – City of Monte Vista Demand Projections

Year	TOTAL Water Use MG	TOTAL Water Use AF	Residential 69% AF	Residential Multi 16% AF	Commercial 8% AF	Public Authority 3% AF	Zero Billed 3% AF
2009	246	754	522	119	62	25	26
2010	247	758	525	119	62	25	26
2011	248	762	528	120	62	25	26
2012	250	767	531	121	63	26	26
2013	251	771	534	121	63	26	26
2014	253	775	537	122	64	26	26
2015	254	780	540	123	64	26	26
2016	256	784	544	124	64	26	27
2017	257	789	547	124	65	26	27
2018	258	793	550	125	65	26	27
2019	260	798	553	126	65	27	27
2020	261	802	556	126	66	27	27
2021	263	807	559	127	66	27	27
2022	264	811	562	128	67	27	28
2023	266	816	566	129	67	27	28
2024	267	821	569	129	67	27	28
2025	269	825	572	130	68	28	28

As shown in **Table 3.7**, we calculated the volume of water needed to meet the demand considering the average system loss from the last several years (20 percent). For 2009, 904 AF was pumped to meet the demand, and we estimate 990 AF will need to be pumped in 2025.

Table 3.7 – Total Projected Pumped Water Volumes

Year	Total Projected Potable Water Use AF	System Losses 20% AF	Total Potable Demand AF	Total Potable Demand MG
2009	754	151	904	295
2010	758	152	909	296
2011	762	152	915	298
2012	767	153	920	300
2013	771	154	925	301
2014	775	155	930	303
2015	780	156	936	305
2016	784	157	941	307
2017	789	158	946	308
2018	793	159	952	310
2019	798	160	957	312
2020	802	160	963	314
2021	807	161	968	315
2022	811	162	974	317
2023	816	163	979	319
2024	821	164	985	321
2025	825	165	990	323

CHAPTER 4 - PROPOSED FACILITIES

Supply Forecasting

As discussed in previous chapters, the City's main water supply is obtained through groundwater sources and per Colorado law; the amount consumed must be augmented.

Monte Vista's total native water supply available for augmentation is 468 AF per year. The City needs 131 AF per year of additional augmentation water to replace depletions. The City has recently acquired storage in the Rio Grande Reservoir. The Williams Creek Squaw Pass Diversion water rights are not for sale. The City will enter into a long-term lease agreement with Navajo Development Company at a cost of $8,100 per year (or approximately $50 per AF).

Proposed Facilities

Potential Facility Needs

Table 4.1 outlines the recommended Capital Improvement Projects pertaining to the water system from the 2008 Master Infrastructure Plan. These recommendations were proposed for the next one to five years and include two new pump stations to meet the City's fire flow needs along with new pipe to accommodate growth and improvements for fire flow. **Table 4.2** provides a summary of costs under these two categories of fire flow and growth improvements.

Table 4.1 – Summary of Capital Improvement Expansions

Improvement	Quantity	Unit
Fire Flow Improvements		
East End of City		
New East Pumping Station	1	ea
8" PVC Pipe	1,820	l.f.
West End of City		
New West Pumping Station	1	ea
10" PVC Pipe	1,500	l.f.
12" PVC Pipe	5,720	l.f.
16" PVC Pipe	630	l.f.
Growth Improvements		
Estimated Sun Peaks Growth		
8" PVC Pipe	7,600	l.f.
12" PVC Pipe	3,160	l.f.
Estimated Trosper Ranch Growth		
8" PVC Pipe	10,400	l.f.
12" PVC Pipe	5,520	l.f.

Table 4.2 – Summary of Capital Improvement Costs

Improvement	5-year Recommendation Cost
Fire Flow Improvements	$1,705,000
Growth Improvements	$2,257,000

CHAPTER 5 - WATER CONSERVATION GOALS

Goal Development Process

The development of water-savings goals for Monte Vista was a collaborative process involving Clear Water Solutions and City staff. Information was gathered from billing records and existing planning documents to properly characterize the system, resources and water use. Development of this data showed the City's largest water use customer categories, seasonal usage, system limitations and losses, and outlined the City's existing conservation efforts and their estimated effectiveness.

Once the water use for each customer category was identified, we met with staff to discuss water-savings goals and the potential methods to reach those goals. Initial reduction percentages were established and a universal list of measures and programs were compiled for consideration. The goals focused on the water use areas that could be successfully impacted considering factors such as water savings potential, costs, staff time, and public acceptance.

Water Conservation Goals

Establishing water conservation goals is an iterative process that begins with quantifying the future demand for water based on current water-use habits and identifying areas water use can feasibly and effectively be reduced. Reduction of future water demand through water conservation can potentially delay planned water supply acquisition and the need for infrastructure improvements.

Discussions with City staff focused on their desire to decrease their system losses and develop water conservation standards for new construction as well as develop general community outreach and education.

In setting initial water savings goals for the City, we looked at the current water use per customer category and the limitations of the water supply system. **Table 5.1** shows initial goals established for each customer category.

Table 5.1 – Monte Vista's Water Conservation Goals

Water Use Categories:	Total Projected Water Use (2011 to 2020)	Reduction Goals for Planning Horizon	
	(AF)	(%)	(AF)
Residential	5,421	10.0%	542
Residential - Multi-Family	1,232	10.0%	123
Commercial	641	5.0%	32
Public Authority	261	8.0%	21
Zero Billing	265	5.0%	13
Unaccounted-for Losses (currently 20%)	1,564	2.5%	196
Total Water Production:	9,384		
Total Demand Reduction:			927
Total Percent Reduction:			10%

Residential/ Multi-Family/ Public Authority Conservation Goals

The per-capita Residential use is on target for typical residential water users. The Multi-Family use in Monte Vista is definitely higher than average and a good area to target for savings. Public Authority also has a higher than average water use and should be targeted for potential savings. The reduction goal was set at ten percent for Residential, ten percent for Multi-Family and eight percent for Public Authority.

Commercial Conservation Goals

The Commercial category includes but is not limited to hospitality, restaurants, retail, healthcare, mobile home parks, and grocery stores. Little is known about the water use habits of these customers and until results from conservation measures have been monitored, the actual savings are difficult to predict. The City will set a savings goal of five percent for this customer category.

Zero Billing

Monte Vista tracks indoor and outdoor water use at city-owned properties. The City believes that a five percent savings can be achieved through water conservation measures targeting this category.

Unaccounted-for Losses

This category is where Monte Vista may achieve the largest water savings. The average loss in the system due to leaks, record keeping errors or lack of proper measurement is approximately 20 percent of the water production. The goal for the City

is to reduce the system losses by 2.5 percent, reducing the total system losses from 20 percent to 17.5 percent.

CHAPTER 6 – CONSERVATION MEASURES AND PROGRAMS

Water Conservation Measures and Programs

We developed a universal list of conservation measures and programs. The measures and programs were placed into five major categories: Utility Maintenance Programs, Regulatory Controls and Standards, Educational Programs, Rebates and Incentive Programs, and Audit Programs. The universal list is shown in **Table 6.1** with existing measures highlighted in green.

Screening Criteria

The following screening criteria were compiled based on discussions with staff. The criteria were chosen as a general screening to pare down the universal list to a list of measures and programs to evaluate further, including reviewing costs to implement, expected water savings, and loss of revenue from the water savings. Each measure and program in **Table 6.1** was screened with the following criteria.

- Financial implications
- Staff availability
- Staff and Council approval

Screening of Conservation Measures and Programs

The purpose of the initial screening was to create a list of measures and programs that would be evaluated further in the planning process via a cost-benefit analysis. A meeting was held with City staff to discuss each measure/program on the universal list and eliminate ones that were not feasible using the established screening criteria.

The list of measures was also evaluated to determine if the CWCB Minimum Required Water Conservation Plan Elements were addressed. The required elements that CWCB wants to see evaluated include:

- Water-efficient fixtures and appliances, including toilets, showerheads, and faucets
- Low water use landscapes, drought resistant vegetation, removal of phreatophytes (a deep-rooted plant that obtains water from the water table or the layer of soil just above it. Includes cottonwoods, tamarisk, etc.), and efficient irrigation
- Water-efficient industrial and commercial water use processes
- Water reuse systems
- Distribution system leak identification and repair

- Dissemination of information regarding water use efficiency measures, including by public education, customer water use audits, and water-saving demonstrations
- Water rate structures and billing systems designed to encourage water use efficiency in a fiscally responsible manner
- Regulatory measures designed to encourage water conservation
- Incentives to implement water conservation techniques, including rebates to customers

The screening was completed on July 1, 2010. The resulting decisions are noted on **Table 6.1.**

Table 6.1 – Universal List of Conservation Measures and Programs

Conservation Measure or Program		Existing	Further Evaluation	Comment
Supply side measures & programs	**Utility Maintenance Programs**			
	Billing Software Upgrades	Yes	No	Monte Vista has recently updated their billing software.
	Water Reuse System	No	No	Potential sources of reuse will be utilized City's Plan for Augmentation. Effluent will be used to offset augmentation requirements
	Leak Detection & Repair Program	No	Yes	Currently, problems are fixed on an as needed basis. The City is interested in developing a program to find leaks before they become a problem.
	Installing Meters in the Distribution System to Pinpoint Leak Areas	No	No	An Advanced Metering Infrastructure (AMI) system (below) will be evaluated instead.
	Installation of Advance Metering Infrastructure (AMI)	No	Yes	AMI, such as Sensus FlexNet, provides data and information that the City can share with their customers, giving them the tools they need to conserve.
	Sub-Meter Mobile Home Parks	No	No	Sub-metering and Leak Detection are the responsibility of the mobile home park/master meter owner.
	Leak Detection for Master Meter Communities	No	No	
	Leak Detection in Mobile Home Parks	No	No	
	Meter Testing and Replacement Program	No	No	Monte Vista installed new meters for all water customers in 2005. The City may evaluate this measure in future planning efforts.

Conservation Measure or Program		Existing	Further Evaluation	Comment
Demand side measures & programs	**Regulatory Controls and Standards**			
	Water Waste Ordinance	Yes	Yes	Briefly included in municipal code. Continue as is.
	Removal of Phreatophytes e.g. Cottonwoods	Yes	Yes	The removal of Chinese Elm is included in municipal code. Continue as is.
	Drought Mitigation Plan	Yes	No	May re-evaluate with future planning efforts.
	Water Restrictions-Hours/Days	No	No	Re-evaluate with future planning efforts.
	General Evaluation of Policies that Encourage Water Savings	No	Yes	City Staff would like to evaluate further.
	Water Rate Structure Changes	No	Yes	A rate study may be conducted to determine a fair structure that will help maximize water savings.
	New Car Wash Standards (New Construction)	No	No	The City does not anticipate new car wash construction. This measure will not be evaluated at this time.
	High Efficiency Appliance Requirements/Standards for New Construction	No	No	Already extensively covered in State and National Plumbing standards and codes.
	Decorative Water Feature Requirements and Standards on New Construction	No	No	This measure is not needed at this time.
	Turf and Landscape Restrictions/Standards for New Construction	No	Yes	Includes Xeriscape. Combined with Irrigation System Requirements/Standards for New Construction measure .
	Irrigation System Requirements/Standards for New Construction	No	Yes	City Staff would like to evaluate further.
	Laundry and Laundromat Requirements/Standards for New Construction	No	No	Re-evaluate with future planning efforts.
	Low Water Use and Appliance Codes	No	No	Already extensively covered in State and National Plumbing standards and codes.
	Soil Amendment Ordinance for New Landscapes	No	Yes	The City would like to evaluate this measure further.
	New Landscape/Lawn Permits	No	No	Already included under the Turf & Landscape and Irrigation System Standards
	Requiring Wind and/or Rain Sensors for Commercial and Open Space Irrigation	No	No	Re-evaluate with future planning efforts.

Conservation Measure or Program		Existing	Further Evaluation	Comment
Demand side measures & programs	**Regulatory Controls and Standards, continued**			
	Restrict High Water-Use Turf on Medians or 6:1 Slopes	No	No	Re-evaluate with future planning efforts.
	Restrictive Covenants Ordinance	No	No	Re-evaluate with future planning efforts.
	Educational Programs			
	Billing Statements that Encourage Water Savings	No	No	Billing statements are sent on small postcards and are therefore are not conducive to providing a lot of information. Re-evaluate with future planning efforts.
	Children's Water Festival	No	Yes	The City will explore opportunities for implementation of this program.
	Water Education Wagon	No	Yes	The City would like to evaluate the construction of a portable water education display.
	Xeriscape Garden Demonstration	No	Yes	The City would like to implement a Xeriscape demonstration program.
	Designated Water Conservation Officer	No	No	Re-evaluate with future planning efforts.
	Xeriscape Gardening Classes	No	Yes	The City would like to evaluate further.
	Xeriscape Program for Commercial	No	No	Re-evaluate with future planning efforts.
	Xeriscape Program for Open Space (HOAs)	No	No	Currently there are very few Open Space (HOAs) areas. Re-evaluate with future planning efforts.
	Promote Hospitality BMPs	No	No	Re-evaluate with future planning efforts.
	School Education Program (K-12 Education)	No	Yes	The City would like to evaluate further.
	Website Water Use Calculator	No	Yes	This measure will be combined with other website related measures into the Water Conservation Website Upgrades
	Educational Kits	No	Yes	This effort will be combined with residential audit kits (see below).
	Post Commercial, Industrial, and Public BMPs on Website or as Bill Stuffers	No	No	Re-evaluate with future planning efforts.
	Property Manager/HOA Education and Training	No	No	Re-evaluate with future planning efforts.

Conservation Measure or Program		Existing	Further Evaluation	Comment
Demand side measures & programs	**Educational Programs, continued**			
	Public Education - Newsletter & Website	No	Yes	This measure will be combined with other website related measures into the Water Conservation Website Upgrades
	Send ET Irrigation Scheduling in Water Bill	No	Yes	Instead of sending bill stuffers, this measure will be combined with other website related measures into the Water Conservation Website Upgrades
	Rebates and Incentive Programs			
	Commercial Toilet and Waterless Urinal Rebates	No	Yes	The City would like to evaluate further.
	Distribute Toilet Retrofit Devices	No	Yes	The City would like to evaluate further.
	Distribute Pre-rinse Spray Heads to Restaurants & Institutions	No	Yes	The City would like to evaluate further.
	Rebate Programs for Toilets, Clothes Washers, Dishwashers, Faucets and Showerheads	No	Yes	The City would like to evaluate rebates.
	Rebates for ET (SMART) Sprinkler System Controllers	No	Yes	This effort will be combined with Irrigation System Efficiency Device Rebates (see below).
	Turf Replacement Incentives	No	No	Due to the smaller population, this program will not be evaluated at this time.
	Zero Interest Loans for Washers	No	Yes	The City would like to evaluate further.
	Water Conservation Upgrades for City Facilities-Outdoor	No	Yes	This program would include installing Wind/Rain Sensor and ET controllers on City systems.
	Water Conservation Upgrades for City Facilities-Indoor	No	Yes	This program would include retrofitting toilets, showerheads, and faucet aerators within the City facilities
	Xeriscape Incentives for all customer categories	No	Yes	The City would like to evaluate further.
	Irrigation System Efficiency Device Rebates	No	Yes	The City would like to evaluate further.
	Wind and/or Rain Sensor Rebates for Residential or Commercial	No	Yes	This effort will be combined with Irrigation System Efficiency Device Rebates (see above).
	Low Income Retrofit Program	No	Yes	This effort will be combined with Irrigation System Efficiency Device Rebates (see above).

Conservation Measure or Program		Existing	Further Evaluation	Comment
Demand side measures & programs	**Audit Programs**			
	Commercial Water Audits	No	Yes	The City would like to evaluate further.
	Residential Audit Kit	No	Yes	Will make this a joint effort between education kits and audit kits.
	Sprinkler System Audit Kit and Instructions	No	Yes	Included with Residential Audit Kit.
	Irrigation Audit of City Parks and Properties	No	No	Re-evaluate with future planning efforts.

* Shaded cells represent existing measures.

CHAPTER 7 – EVALUATION AND SELECTION

The initial screening of the measures and programs with City staff resulted in eliminating 27 measures and selecting 33 measures for further evaluation. Eliminated measures will be evaluated with future planning efforts. Some of the selected measures have been combined as noted in **Table 6.1** (resulting in 29 measures selected for evaluation). The benefits and costs of the selected measures and programs are shown in **Table 7.1**. The grouping of the measures enabled us to consider like measures and avoid double counting savings. Details about the cost-benefit evaluation and information about each measure can be found in the following section with additional details available in **Appendix A**.

Utility Maintenance Programs

- Leak Detection and Repair Program
  This measure would include leak detection and repair for the City's water delivery system. Currently the City has estimated its leakage rate to be 20 percent for the last four years. They know leaks are a problem in their system as some of the areas have older irrigation pipe and want to make this measure a high priority. They would perform a system wide water audit to determine real and apparent system loss and then hire a consultant with sounding equipment to pinpoint the physical leaks for repair.

- Advanced Metering Infrastructure Program
  Advanced Metering Infrastructure (AMI) refers to systems that measure, collect and analyze water or energy usage, and interact with water meters, through various communication media either on-demand or on pre-defined schedules. AMI technology can help water utilities automate water systems, detect leaks earlier, give customers tools to monitor water use, provide more accurate rates and reduce demand.

Regulatory Controls

- Water Waste Ordinance
  The City currently has an ordinance prohibiting the waste of water and will continue to keep this regulatory control in place.

- Removal of Phreatophytes
  The City has an existing ordinance (Sec. 9-3-20) that prohibits the growth of female Box Elder trees, female Cottonwood trees, Siberian Elm trees and Chinese Elm trees. These trees are very invasive in this area and consume large amounts of water.

- General Evaluation of Policies
  The City may evaluate their existing policies and City ordinances that involve water conservation measures and expand or create policies and ordinance that encourage water conservation.

- Water Rate Structure Changes
  The City currently uses a flat rate water structure. A tiered rate structure would encourage water conservation and efficient water use. Evaluation of water rate structures, including a rate study, may ensure maximum water conservation savings.

- Turf and Landscape Standards for New Construction
  Many municipalities require certain turf and landscape standards for new construction. These standards are usually enforced in the Land Use Codes for municipalities. They can include the use of Xeriscape principles such as incorporation of low water-use plants, efficient irrigation systems, and grouping of similar water-use plants in irrigation zones. The turf and landscape standards may require a certain percentage of new landscapes to be low water use. certificates of occupancy for new construction are given only after review of the turf and landscape standards that shows compliance with the standards.

- Irrigation System Standards for New Construction
  Municipalities often require new construction standards for residential and commercial irrigation systems. These standards are usually enforced in the Land Use Codes for municipalities. Minimum standards for irrigation systems can be set as part of the building permit review process and certificates of occupancy for new construction are given only after review that the irrigation standards have been met.

- Soil Amendment Standards for New Landscapes
  The City can make soil amendments a requirement for the building permit process. Soil amendments include the addition of organic and inorganic matter to soil to improve it texture nutrient load, moisture-holding capacity and infiltration rate.

Educational Programs

- Children's Water Festival
  Several Front Range entities have developed a Children's Water Festival to encourage water education at a young age. The festival typically would span across two school years, such as third and fourth graders. The students would participate in different activities that are geared towards water conservation that they also take home to their families. The City would develop a program internally for their local schools and service area. There are many programs across the state from which Monte Vista could model their program. Some

examples include .utewater.org/festival.html and .fcgov.com/utilities/edu-kd-wtr_festival.php

- School Education
  This program includes time for Project WET (Water Education and Training) to work with local educators to develop water conservation education programs within the school systems. Project WET has dedicated itself to the mission of reaching children, parents, teachers and community members of the world with water education. Project WET has helped many schools along the Front Range.

  This program also incorporates the building of a mobile water wagon. The mobile water wagon provides hands-on demonstrations to educate kids, parents and teachers about water conservation. Providing education regarding where the water comes from would be included.

- Xeriscape Garden Demonstration
  This program would include design and construction of a Xeriscape Garden that would be open to the public to learn about the Xeriscape process. Guided and self-guided tours are offered with a specifically designed pamphlet covering plant types, mulches and sprinkler system fine-tuning.

- Xeriscape Gardening Classes
  The City has access to a local extension service and/or local master gardeners that offer small gardening classes. This could be done a couple times a year at no cost on a first come first served basis.

- Water Conservation Upgrades to Website
  Currently, the City has a very user-friendly interactive website. A water conservation link could be added to provide information such as water conservation tips, lawn watering guides, residential water use calculator, promotion of the EPA Water Sense program and links to other water conservation websites. The website can also include customer surveys as well as other water conservation program information that the City is doing such as rebates and/or audits.

  The City sends out a quarterly newsletter that could contain water conservation information to inform the citizens about current programs the City is promoting.

Rebates and Incentives

- Commercial Toilet Rebates
  This measure entails providing rebates to commercial users to replace toilets and urinals with low-flow models. It would be a good way to target some of the higher water-use commercial accounts in the area, including a hotel and manufacturing businesses.

- Toilet Retrofit
  Toilet retrofit devices are used to reduce the amount of water need to flush high-volume toilets that use 3.5 gallons per flush (gpf). These devices include toilet bladders or displacement devices, toilet dams and early closure devices. Monte Vista may provide these low cost devices to customers or make them available for purchase. For more information on these types of devices: .amconservationgroup.com.

- Distribute Pre-Rinse Spray Heads to Restaurants and Institutions
  Pre-rinse spray heads can be found in most restaurants and institutions. Old spray heads used around 3.0 gpm as opposed to newer ones that use 1.4 gpm. New technology has gotten this water demand even lower. Monte Vista may provide these low cost devices to commercial customers or make them available for purchase.

- Rebate Program for Toilets, Clothes Washers, Faucets, and Showerheads
  This program would provide rebates to residential users who purchase low-flow or high-efficiency toilets, clothes washers, faucets, and showerheads. Surrounding entities have found the most success with these rebate programs. Rebates for the selected fixtures would be in the range of those provided by surrounding water providers.

- Irrigation System Efficiency Device Rebate for Residential and Commercial
  Rebates could be offered for residential and commercial customers to install irrigation system efficiency devices. Irrigation System Efficiency Devices may include ET (SMART) Sprinkler system controllers and/or Wind and Rain Sensors. Smart controllers for sprinkler systems use real-time weather data or a soil moisture sensor to determine an irrigation schedule. These controllers can be programmed to accommodate different zones with varying landscapes. Smart controllers are the most efficient surface irrigation technology. Wind and rain sensors cost from $25 to $45 while automatic irrigation system controllers range from $50 to $250.

- Xeriscape Incentive for All Categories
  This rebate program would apply to all customer categories and can be offered for new and existing developments. Rebates could be offered on xeric plants purchased or on square footage of conversion from high water use landscape to Xeriscape. Design of the xeric landscape is another area that could be subsidized by the City either by offering design service or a rebate. Information can be found at ://www.conservationcenter.org/for-cities.htm.

- Water Conservation Upgrades for City Facilities - Indoor
  This program would provide high efficiency fixture replacement for toilets, showerheads and faucet aerators within City Buildings. This would provide a

positive message to the citizens by showing the City would commit to saving water as well.

- Water Conservation Upgrades for City Facilities - Outdoor
  This program would include the installation of irrigation efficiency devices such as ET (SMART) sprinkler system controllers and/or Wind and Rain Sensor for areas owned by the City such as parks and lawn areas around City buildings. Again this would be a positive message to the City's citizens.

- Zero Interest Loans for Homeowners
  This program would provide loans to citizens for high-efficiency clothes washers and to replace aging water service lines to the homes. This would encourage water savings by fixing leaks as well as using a more efficient fixture. The City of Fort Collins has a similar loan programs; see their website for more details: ://www.fcgov.com/conservation/res-zilch.php

- Low Income Retrofit
  This program will provide low-income single-family and multi-family households with toilet, showerhead and faucet aerators free of charge to the customer. A grant could be obtained to acquire this hardware or the City would set aside funds to purchase this equipment.

- Commercial Water Audits
  Certain commercial customers are often the highest water users and have been an area of increasing focus for water conservation. Most commercial customers would participate in a water audit if they know it could identify ways to reduce their operating costs over the long term. Water audits can be performed by a third party consultant and is an effective way to educate businesses on how they can save water.

- Residential Audit Kits
  Self-guided residential audit kits can be designed to include items such as leak detection tablets, surveys, and sprinkler testing cones. Instructions for conducting the audit and evaluating the results can give residential customers insight and direction on how they can save water and money. The guidance offered in the instructions could lead the customer to take part in other conservation programs offered, including rebates.

Costs and Water Savings of Conservation Options

Prior to evaluating the potential cost effectiveness of the measures/programs, it is important to understand the magnitude of typical indoor and outdoor uses and the contribution of each to total demand. There is a wide range of water use related to each indoor and outdoor measure that can affect the potential water savings and cost effectiveness accordingly. The assumptions for calculating water savings used for this

analysis were based on the conservative end of the ranges found in the available water conservation research to avoid overestimating savings.

Many resources were used to estimate water savings including Amy Vickers Handbook of Water Use and Conservation, studies and papers from California and Arizona, local studies available from the American Water Resources Association, the Environmental Protection Agency, Western Resource Advocates, information from other Colorado municipalities, and the CWCB website.

Table 7.1 provides a cost-benefit analysis for all of the measures and programs previously identified to be evaluated further. A planning horizon of ten years is used to quantify the full benefit of these measures and programs. The costs and water savings over the planning period are calculated assuming the measures/programs all start in year one. This provides an equitable ranking of the measures, so they can be compared on an apples-to-apples basis. In reality, the measures and programs will be implemented according to the implementation schedule developed in Chapter 8.

The first five columns (Columns A-E) of **Table 7.1** identify the conservation measure or program and quantify the costs to the City. These costs include unit or annual costs for materials, staff time, and one-time start up costs. The table then quantifies water savings annually and for the entire ten-year planning horizon. Annual water savings and projected lost revenue are based on full implementation. This gives the City an idea of the anticipated water savings and estimated revenue impacts after full implementation.

The cost per 1,000 gallons of water saved is found by dividing the total cost by the total water savings for the entire ten-year period. The measures and programs are then ranked by cost per 1,000 gallons saved. This ranking helps to determine which measures will be more effective and to suggest a useful order of implementation.

Table 7.1 – Cost/Savings Analysis of Conservation Measures and Programs

	Conservation Measure or Program	Total Cost to Water Provider				# of Participants per Year	Gallons Saved per Unit per Year	Estimated Annual Water Savings (gallons)	Estimated Total Water Savings over Planning Period (gallons)	Annual Revenue Loss Related to Water Savings	Estimated Annual Cost	Estimated Total Cost over Planning Period including Set-up	Cost per 1000 Gallons Saved	Rank
		Rebate	One time Labor and Material Cost	Annual Labor	Annual Materials									
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)
Supply side measures & programs	**Utility Maintenance Programs**													
	Leak Detection & Repair Program	$0	$0	$8,200	$0	0	0	15,289,117	152,891,171	$0	$8,200	$41,000	$0.27	2
	AMI FlexNet	$0	$400,000	$0	$0	0	0	15,289,117	152,891,171	$0	$0	$400,000	$2.62	16
Demand side measures & programs	**Regulatory Controls and Standards**													
	Water Waste Ordinanc	$0	$0	$100	$0	0	0	1,230,906	12,309,056	$665	$765	$7,649	$0.62	3
	Removal of Phreatophytes i.e. Chinese Elm	$0	$0	$100	$0			1,230,906	12,309,056	$665	$765	$7,649	$0.62	3
	Evaluation of Policies that Encourage Water Savings	$0	$2,000	$0	$0	0	0	91,087	910,870	$133	$133	$2,133	$2.34	12
	Water Rate Structure Changes	$0	$50,000	$0	$0	0	0	4,923,622	49,236,224	$7,188	$7,188	$121,885	$2.48	13
	Turf & Landscape Standards	$0	$500	$500	$0	0	0	34,078	1,874,271	$234	$734	$7,841	$4.18	19
	Irrigation System Standards for New Development	$0	$500	$500	$0	0	0	34,078	1,874,271	$234	$734	$7,841	$4.18	20
	Soil Amendment Ordinance for New Landscapes	$0	$500	$500		0	0	34,078	1,874,271	$234	$734	$7,841	$4.18	21
	Educational Programs													
	Children's Water Festival	$0	$7,000	$2,000	$1,000	0	0	1,126,428	11,264,284	$1,645	$4,645	$53,446	$4.74	23
	School Education Program (K-12)	$0	$43,000	$800	$1,000	0	0	1,126,428	11,264,284	$1,645	$2,945	$72,446	$6.43	26
	Xeriscape Demonstration Garden	$0	$5,000	$400	$500	0	0	326,776	3,267,764	$477	$1,377	$18,771	$5.74	24
	Xeriscape Education Programs	$0	$2,000	$2,250	$500	20	0	79,573	795,728	$639	$3,389	$35,890	$45.10	29
	Water Conservation Website Upgrades	$0	$5,000	$500	$0	0	0	2,461,811	24,618,112	$3,594	$4,094	$45,942	$1.87	7
	Rebate and Incentive Programs													
	Commercial Toilet Rebate	$75	$0	$250	$0	10	9,125	91,250	5,018,750	$733	$1,733	$17,327	$3.45	17
	Toilet Retrofit Program	$50	$2,743	$250	$0	60	4,821	289,277	15,910,241	$2,323	$2,573	$28,471	$1.79	6
	Pre-Rinse Spray Heads for Restaurants & Institutions	$0	$200	$250	$375	5	49,296	246,480	13,556,400	$1,979	$2,604	$26,242	$1.94	9
	Residential Rebate for Low-Flow Toilets	$50	$200	$250	$0	60	13,114	786,834	43,275,854	$6,318	$9,568	$95,883	$2.22	10
	Rebate for High Efficiency Clothes Washer	$125	$200	$250	$0	15	5,596	83,947	4,617,089	$674	$2,799	$28,191	$6.11	25
	Low Flow Faucet Rebate	$5	$100	$250	$0	60	6,428	385,703	21,213,654	$3,097	$3,647	$36,572	$1.72	5
	Low Flow Showerhead Rebate	$5	$100	$250	$0	60	1,503	90,186	4,960,251	$724	$1,274	$12,842	$2.59	15
	Water Conservation Upgrades at City Facilities - Indoor		$0	$0	$0			709,286	7,092,863		$0	$0	$0.00	1
	Water Conservation Upgrades at City Facilities - Outdoor		$10,000	$0	$0			434,034	4,340,335		$0	$10,000	$2.30	11
	Irrigation System Efficiency Device Rebates	$25	$400	$250	$0	40	79,573	79,573	4,376,505	$639	$1,889	$12,900	$4.41	22
	Xeriscape Incentives		$2,000	$2,000	$0	10		371,470	20,430,858	$1,597	$14,487	$146,874	$7.19	27
	Zero Interest Loans for Washers/Pipeline Replacement		$1,200	$2,000	$0	20		353,005	19,415,289	$2,835	$4,835	$49,546	$2.55	14
	Low Income Retrofit		$1,000	$2,800	$4,109	25		499,428	27,468,562	$4,010	$10,920	$110,198	$4.01	18
	Audit Programs													
	Residential Water Audit Kits	$0	$2,197	$1,100	$0	30	0	529,508	29,122,933	$4,252	$5,352	$55,716	$1.91	8
	Commercial Water Audits	$0	$1,000	$700	$0	12	5,377	53,765	2,957,098	$432	$6,132	$62,317	$21.07	28

Column Explanations:

(A) Name of conservation measure or program
(B) A rebate provided upon approval of customer application
(C) One time labor and material costs involved in set up program or measure
(D) Labor involved each year for operation of measure or program
(E) Materials needed each year for each unit if listed or for the whole measure or program
(F) Number of participants expected to participate and resulting units or audits needed
(G) Gallons of water saved per unit as a result of participating in the program or measure
(H) Total water savings seen in a year from the measure or program
(I) Total water savings seen over entire ten year planning period; could be based on increasing water demand or a fixed use per account
(J) Revenue the water provider will not be paid if the water savings occur.
(K) Total annual cost to water provider plus the annual revenue loss.
(L) Total cost to implement and operate measure or program over entire planning period, including annual operation, one time set up costs and annual revenue lost due to water savings
(M) Cost per 1000 gallons saved = total cost over planning period divided by total water saved over planning period
(N) Ranks the measures and programs according to the price per 1000 gallons of water saved, lowest to highest

Comparison of Benefits and Costs

The resulting rank of measures by cost-benefit is shown in **Table 7.2** below. The cost per 1,000 gallons saved ranges from $0.27 to $45.10. The educational and audit programs and measures included higher ranked programs while the utility maintenance programs, regulatory controls and standards measures, and rebate and incentive programs have a mix of high and low rankings.

The rankings are a result of the ratio of cost, including lost revenue due to water savings. For instance, rebates for high-efficiency clothes washers save a fair amount of water. However, the costs of these programs are high, so they rank lower than one might expect. This is only a cost per water saved ranking. There are other factors to consider, which will be accomplished in a second screening.

Table 7.2 – Cost-Benefit Ranking

Rank	Conservation Measures and Programs
1	Leak Detection & Repair Program
2	Water Waste Ordinance
3	Removal of Phreatophytes i.e. Chinese Elm
4	Water Conservation Upgrades at City Facilities - Indoor
5	Low Flow Faucets
6	Toilet Retrofit Program
7	Water Conservation Website Upgrades
8	Residential Water Audit Kits
9	Pre-Rinse Spray Heads for Restaurants & Institutions
10	Residential Rebate for Low-Flow Toilets
11	Water Conservation Upgrades at City Facilities - Outdoor
12	Evaluation of Policies that Encourage Water Savings
13	Water Rate Structure Changes
14	Zero Interest Loans for Washers/Pipeline Replacement
15	Low Flow Showerhead
16	AMI FlexNet
17	Commercial Toilet Rebate
18	Low Income Retrofit
19	Turf & Landscape Standards
20	Irrigation System Standards for New Development
21	Soil Amendment Ordinance for New Landscapes
22	Irrigation System Efficiency Device Rebates
23	Children's Water Festival
24	Xeriscape Demonstration Garden
25	Rebate for High Efficiency Clothes Washer
26	School Education Program (K-12)
27	Xeriscape Incentives
28	Commercial Water Audits
29	Xeriscape Education Programs

Evaluation Criteria

After each of the conservation measures and programs were ranked by *cost per 1,000 gallons saved*, as shown in **Table 7.2**, the next step was to select conservation measures and programs for implementation. The criteria used for selection are as follows:

1. Political ramifications
2. Financial implications
3. The City's priority ranking of measures (i.e. education is a high priority)

Selected Conservation Measures and Programs

The second screening was accomplished by evaluating each measure/program based on the screening criteria and Monte Vista's overall goal for this Water Conservation Plan. The following six measures were eliminated in the second screening process:

- Pre-Rinse Spray Heads for Restaurants & Institutions
- Zero Interest Loans for Washers/Pipeline Replacement
- Commercial Toilet Rebate
- Soil Amendment Ordinance for New Landscapes
- Irrigation System Efficiency Device Rebates
- Commercial Water Audits

The City will re-evaluate these measures with future planning efforts.

In Chapter 5, conservation goals were established for the customer categories:

- Residential: 10% - 542 AF (177 MG)
- Residential Multi-Family: 10% - 123 AF (40 MG)
- Commercial: 5% - 32 AF (10 MG)
- Public Authority: 8% - 21 AF (7 MG)
- Zero Billing: 5% - 13 AF (4 MG)
- Unaccounted-for Losses: 2.5% - 196 AF (64 MG)

The selected conservation measures/programs and associated water savings were arranged within the targeted customer categories to more easily compare the anticipated savings to the original goals. Some of the measures contribute savings to more than one category. **Table 7.3** shows the water savings for the selected measures/programs, sub-totaled for each category.

Table 7.3 – Combined Water Savings of Selected Conservation Measures and Programs

Conservation Measures and Programs	Estimated Annual Water Savings after full Implementation (gallons)	Estimated Total Water Savings over Planning Period (gallons)
Unaccounted for Losses		
Leak Detection & Repair Program	15,289,117	152,891,171
AMI FlexNet	15,289,117	152,891,171
Subtotal - Gallons	30,578,234	305,782,343
Acre-Feet	94	938
Residential		
Removal of Phreatophytes i.e. Chinese Elm	883,179	8,831,794
Water Waste Ordinance	883,179	8,831,794
Evaluation of Policies that Encourage Water Savings	65,355	65,355
Water Rate Structure Changes	3,532,718	35,327,177
Turf & Landscape Standards	19,893	1,094,126
Irrigation System Standards for New Development	19,893	1,094,126
Children's Water Festival	883,179	8,831,794
School Education Program (K-12)	883,179	8,831,794
Xeriscape Demonstration Garden	326,776	3,267,764
Xeriscape Education Programs	79,573	795,728
Water Conservation Website Upgrades	1,766,359	17,663,588
Toilet Retrofit Program	96,426	5,303,414
Residential Rebate for Low-Flow Toilets	262,278	14,425,285
Rebate for High Efficiency Clothes Washer	27,982	1,539,030
Low Flow Faucet Rebate	128,568	7,071,218
Low Flow Showerhead Rebate	30,062	1,653,417
Irrigation System Efficiency Device Rebates	39,786	2,188,252
Xeriscape Incentives	371,470	20,430,858
Low Income Retrofit	199,771	10,987,425
Residential Water Audit Kits	53,765	2,957,098
Subtotal - Gallons	10,553,394	161,191,037
Acre-Feet	32	495
Multi-Family		
Removal of Phreatophytes i.e. Chinese Elm	200,761	2,007,613
Water Waste Ordinance	200,761	2,007,613
Evaluation of Policies that Encourage Water Savings	14,856	14,856
Water Rate Structure Changes	803,045	8,030,451
Turf & Landscape Standards	7,174	394,549
Irrigation System Standards for New Development	7,174	394,549
Children's Water Festival	200,761	2,007,613
School Education Program (K-12)	200,761	2,007,613
Water Conservation Website Upgrades	401,523	4,015,226
Toilet Retrofit Program	96,426	5,303,414
Residential Rebate for Low-Flow Toilets	262,278	14,425,285
Rebate for High Efficiency Clothes Washer	27,982	1,539,030
Low Flow Faucet Rebate	128,568	7,071,218
Low Flow Showerhead Rebate	30,062	1,653,417

Conservation Measures and Programs	Estimated Annual Water Savings after full Implementation (gallons)	Estimated Total Water Savings over Planning Period (gallons)
Multi-Family, continued		
Low Income Retrofit	99,886	5,493,712
Residential Water Audit Kits	193,881	10,663,474
Subtotal - Gallons	2,875,899	67,029,631
Acre-Feet	9	206
Public Authority		
Removal of Phreatophytes i.e. Chinese Elm	42,488	424,877
Water Waste Ordinance	42,488	424,877
Evaluation of Policies that Encourage Water Savings	3,144	3,144
Water Rate Structure Changes	169,951	1,699,508
Turf & Landscape Standards	1,043	57,359
Irrigation System Standards for New Development	1,043	57,359
Children's Water Festival	42,488	424,877
School Education Program (K-12)	42,488	424,877
Water Conservation Website Upgrades	84,975	849,754
Toilet Retrofit Program	96,426	5,303,414
Residential Rebate for Low-Flow Toilets	262,278	14,425,285
Rebate for High Efficiency Clothes Washer	27,982	1,539,030
Low Flow Faucet Rebate	128,568	7,071,218
Low Flow Showerhead Rebate	30,062	1,653,417
Low Income Retrofit	199,771	10,987,425
Residential Water Audit Kits	281,861	15,502,361
Subtotal - Gallons	1,457,055	60,848,780
Acre-Feet	4	187
Commercial		
Removal of Phreatophytes i.e. Chinese Elm	104,477	1,044,772
Water Waste Ordinance	104,477	1,044,772
Evaluation of Policies that Encourage Water Savings	7,731	7,731
Water Rate Structure Changes	417,909	4,179,089
Turf & Landscape Standards	5,968	328,238
Irrigation System Standards for New Development	5,968	328,238
Water Conservation Website Upgrades	208,954	2,089,545
Irrigation System Efficiency Device Rebates	39,786	2,188,252
Subtotal - Gallons	895,271	11,210,638
Acre-Feet	3	34
Zero Billing		
Water Conservation Upgrades at City Facilities - Indoor	709,286	7,092,863
Water Conservation Upgrades at City Facilities - Outdoor	434,034	4,340,335
Subtotal - Gallons	1,143,320	11,433,198
Acre-Feet	3.51	35
Grand Total - (Gallons)	**47,503,174**	**617,495,626**
Acre-Feet	**146**	**1,895**

These savings were compared to the initial goals set in Chapter 5. As mentioned earlier, water conservation goal setting is an iterative process; original goals are established, conservation measures are evaluated and selected based on appropriate criteria, and the resulting water savings are compared to the original goals. **Table 7.4**

compares the anticipated water savings from the selected measures with the initial goals set in Chapter 5 and then adjusts the water saving goals for this plan.

Table 7.4 – Water Conservation Goals Comparison

		Initial Goals (Ch. 5)		Adjusted Goals			
Water Use Categories:	Total Projected Water Use (2011 to 2020)	Reduction Goals for Planning Horizon		Total Water Savings from Selected Programs	Resulting Reduction	Adjusted Reduction Goals for Planning Horizon	
	(AF)	(%)	(AF)	(AF)	(%)	(%)	(AF)
Residential	5,421	10.0%	542	495	9.1%	9%	495
Residential - Multi-Family	1,232	10.0%	123	206	16.7%	17%	206
Commercial	641	5.0%	32	34	5.4%	5%	34
Public Authority	261	8.0%	21	187	71.6%	72%	187
Zero Billing	265	5.0%	13	35	13.2%	13%	35
Unaccounted-for Losses	1,564	2.5%	196	938	12%*	12%*	938
Total Water Production:	9,384						
Total Demand Reduction:			927	1,895			1,895
Total Percent Reduction:			10%		20%	20%	

** The goal is to reduce unaccounted losses to 12%.*

Over the ten-year planning period, the selected measures/programs provide an overall estimated water savings of 1,895 AF (617 MG) with an annual savings of 146 AF (48 MG). This is higher than the initial water savings goals set in Chapter 5. It should be noted that for some of the selected water conservation measures and programs, estimated savings over planning period is calculated by compounding the estimated annual water savings per the total number of annual participants.

Goals for all categories, with the exception of the Residential and Commercial categories were adjusted higher from the initial City goals. The Residential water use category goal was adjusted lower one percent to match the estimated water savings resulting from the cost-benefit analysis. The adjusted goals reflect the goals believed to be obtainable by City staff.

After the goals were adjusted to better reflect the expected water savings, the estimated water use reduction is 20 percent. Therefore, Monte Vista will target a reduction in its water use by 20 percent over the next ten years as a result of implementation of this plan.

CHAPTER 8 – INTEGRATE RESOURCES AND MODIFY FORECASTS

Implementation Schedule

Water savings resulting from implementation of this Water Conservation Plan will occur gradually as the City has the resources to implement each selected measure and program and the water users respond to that implementation. Implementation grant availability will be crucial in the timing of implementation.

The following table proposes a schedule of implementation that splits the effort over three years and allows time to apply for and possibly obtain grant money. A three-year implementation schedule is ambitious and actual implementation of the Water Conservation Plan will likely occur over a longer period. The annual costs shown reflect the cost to implement the measure/program and maintain it. Any grant money obtained would reduce these yearly costs. The table also shows the percent of the total water saved over the planning period from each measure.

This table does not include existing measures that are already implemented and are not scheduled for expansion and improvements. Those measures include the water waste ordinance and removal of phreatophytes. The City will continue these programs as is.

Table 8.1 –City of Monte Vista Water Conservation Plan Implementation Schedule

Measure/Program	Cost to Implement (includes 1st year annual cost)	Annual On-going Costs (programs in 2nd or 3rd year of implementation)	Total Annual Cost without Lost Revenue	% of Total Water Savings	Implementation Considerations	Grant Request Possible?
Year 1						
Utility Maintenance Programs						
Leak Detection & Repair Program	$8,200	0	8200	24.8%	Staff time, Funding and Consultant time	Yes
AMI FlexNet	$400,000	0	0	24.8%	Funding	Yes
Regulatory Standards Program (Phase 1)						
Evaluation of Policies to Encourage Water Savings	$2,000	0	$0	0.1%	Staff Time and Governmental Actions	No
Turf & Landscape Standards	$1,000	0	$500	0.3%		
Irrigation System Standards for New Development	$1,000	0	$500.00	0.3%		
Education Programs (Phase 1)						
Water Conservation Website Upgrades	$5,500	0	$500	4.0%	Staff and Funding	Yes
Rebate and Incentive Programs (Phase 1)						
Water Conservation Upgrades at City Facilities - Indoor	$7,752	0	0	1.1%	Staff, Funding and Procurement of Materials	Yes
Water Conservation Upgrades at City Facilities - Outdoor	$10,000	0	0	0.7%		
Total Year 1 Cost	**$435,452**	**$0**	**$9,700**			
Year 2						
Regulatory Standards Program (Phase 1 & Phase 2)						
Water Rate Structure Changes	$50,000	0	$0	8.0%	Staff time, Funding and Governmental Actions	Yes
Turf & Landscape Standards	0	$500.00	0	see Year 1	Phase 1	see Year 1
Irrigation System Standards for New Development	0	$500.00	0			
Education Programs (Phase 1 & Phase 2)						
Children's Water Festival	$10,000	0	$3,000	1.8%	Staff time, Funding, and Coordination with Local Schools	Yes
School Education Program (K-12)	$44,300	0	$1,300	1.8%		
Water Conservation Website Upgrades	0	$500	0	see Year 1	Phase 1	see Year 1
Rebate and Incentive Programs (Phase 2)						
Toilet Retrofit Program	$2,993	0	$250	2.6%	Staff, Funding and Procurement of Materials	Yes
Low Income Retrofit	$7,909	0	$6,909	4.4%		
Audit Program (Phase 1)						
Residential Water Audit Kits	$3,297	0	$1,100	4.7%	Staff, Funding and Materials	Yes
Total Year 2 Cost	**$118,499**	**$1,500**	**$12,559**			
Year 3						
Utility Maintenance Programs						
Leak Detection & Repair	0	$8,200		see above	Program runs every other year	see above
Regulatory Standards Program (Phase 1 & Phase 2)						
Turf & Landscape Standards	0	$500		see Year 1	Phase 1	see Year 1
Irrigation System Standards for New Development	0	$500				
Education Programs (Phase 1, Phase 2 & Phase 3)						
Xeriscape Demonstration Garden	$5,900	0	$900	0.5%	Staff, Funding and Procurement of Materials	Yes
Xeriscape Education Programs	$4,750	0	$2,750	0.1%		
Children's Water Festival	0	$3,000		see Year 2	Phase 2	see Year 2
School Education Program (K-12)	0	$1,300				
Water Conservation Website Upgrades	0	$500		see Year 1	Phase 1	see Year 1
Rebate and Incentive Program (Phase 2 & Phase 3)						
Residential Rebate for Low-Flow Toilets	$3,450	0	$3,250	7.0%	Staff and Funding	Yes
Rebate for High Efficiency Clothes Washer	$2,325	0	$2,125	0.7%		
Low Flow Faucet Rebate	$650	0	$550	3.4%		
Low Flow Showerhead Rebate	$650	0	$550	0.8%		
Irrigation System Efficiency Device Rebates	$1,650	0	$1,250	0.7%		
Xeriscape Incentives	$14,890	0	$12,890	3.3%		
Toilet Retrofit Program	0	$250		see Year 2	Phase 2	see Year 2
Low Income Retrofit	0	$6,909				
Audit Program (Phase 1 continued)						
Residential Water Audit Kits	0	$1,100		see Year 2	Phase 1	see Year 2
Total Year 3 Cost	**$34,265**	**$22,259**	**$24,265**			
Total Combined 3-Year Cost (implementation and annual costs)	**$611,975**					
Total Implementation Costs	**$588,215**					
Estimated Annual Costs (for measures shown)	**$46,524**					

The total cost to implement the conservation plan is $588,215. The cost to implement the plan including the annual costs for the first three years of on-going programs is $611,975. Annual on-going costs for the measures shown in **Table 8.1** total $46,524 per year. The implementation schedule will be most affected by available funding and staff time. While this schedule is optimistic, the goal is to allow time to research and obtain grants to develop sound programs for a higher probability of success.

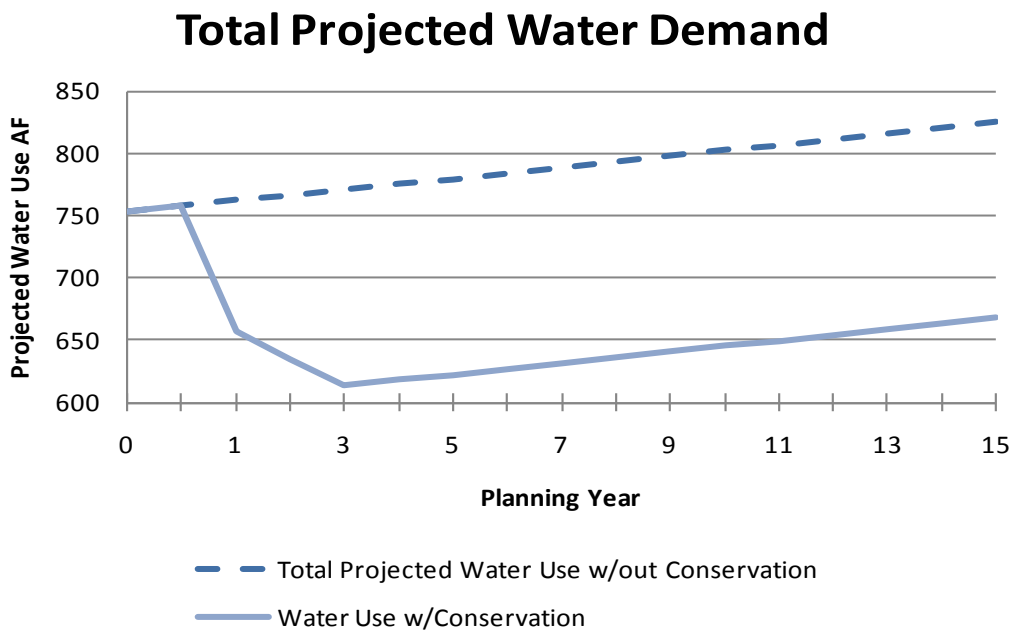
It should be noted that the implementation costs include both cost to implement the water conservation measure/program and staff time associated with the implementation and is not necessarily representative of the capital outlay requirement. Please refer to **Appendix A** for the detailed breakdown of costs for each measure/program.

Modified Demand Forecast

The total water demands for Monte Vista are shown in the following graph with and without water conservation. The anticipated water savings follow the implementation schedule. The savings are compiled according to the assumptions used in the cost-benefit analysis and are carried through the end of the planning period. Effects of implementing the water conservation measures will last well beyond the planning horizon.

The average annual savings after all of the measures/programs have been implemented is 146 AF (48 MG) per year without considering savings due to measures already in place and savings from measures with compounding annual savings due to an annual increase in participants.

Figure 8.1 – Comparison of Demand Forecast with and without Conservation



Water Supply Forecast Modification

Along with lowering the overall demand for water, there are two areas that can be directly affected by water conservation; water supply acquisition and system capacity upgrades. Efforts in these areas may be modified and/or delayed, which could provide substantial financial savings to the conserving entity. While Monte Vista has planned infrastructure upgrades (refer to Chapter 4), there are no planned capacity upgrades.

Water Supply

As discussed in Chapter 4, the City will need 131 AF per year of additional augmentation water to replace depletions at full build out. To cover the shortage, Monte Vista will enter into an agreement with Navajo Development Company for long-term lease of Williams Creek Squaw Pass Diversion water rights at a cost of $8,100/year (or approximately $50 per AF).

From the annual savings estimated through water conservation (146 AF), Monte Vista may be able to significantly reduce the lease amount required from the Williams Creek Squaw Pass Diversion water rights.

Benefits of Water Conservation

Table 8.2 shows the annual savings that will result as the plan is implemented as shown in **Table 8.1**. The cumulative water saved per year shown in **Table 8.2** includes compounding annual savings due to an annual increase in participants.

Table 8.2 – Estimated Water Savings and Water Supply Needs

Savings from Conservation	Cumulative Amount Saved per Year MG	Cumulative Amount Saved per Day MGD	Cumulative Water Saved per Year AF	Projected Increase in Demand AF	Cumulative Increase in Demand AF
Year 1	34.3	0.09	105	4	4
Year 2	42.9	0.12	132	4	9
Year 3	51.1	0.14	157	4	13

The savings are shown in MG per day (MGD) and AF, so one can compare the savings to either storage capacity or water purchases/leasing. This table illustrates that, with water conservation, water leasing could be delayed with implementation of selected water conservation measures. However, the water savings from the water conservation plan could also be stored in a reservoir for later use by Monte Vista. Decisions for water acquisition should not be based on water conservation alone but done in conjunction with water supply planning and other considerations for the City.

For example, if the estimated annual water savings of 146 AF (48 MG) after full implementation is realized and that amount of augmentation water does not need to be leased from the Williams Squaw Pass Diversion, the cost savings would equal the current market value of the water. As mentioned previously the water will cost roughly $50 per AF, annually. The value of the water savings from conservation is then $73,000 over the ten-year planning horizon ($7,300/year).

CHAPTER 9 – PLAN OF IMPLEMENTATION AND MONITORING

The schedule for implementation is presented in **Table 8.1** in Chapter 8. The process for implementing the plan and monitoring its success is outlined in this chapter.

Public Participation

One of CWCB's requirements for a State-approved Water Conservation Plan is to solicit public comments on the draft plan for not less than a 60-day period unless otherwise specified by City policy.

Through this water conservation planning process, the public was notified and given 60 days to comment. The plan was available on Monte Vista's website and at City Hall for review. No public comments were received; therefore they are not included in this plan.

Monitoring and Evaluation

Monitoring the success of this Water Conservation Plan includes measuring water use as well as money spent on the selected conservation measures and programs. Individual customer water use can be tracked for rebates, which will involve customer's water use prior to installation, verification of installation, and post installation water use. Customer class water use will be monitored for programs such as upgrading indoor and/or outdoor facilities with water efficient fixtures. **Table 9.1** presents the information that will be tracked for each measure proposed by the City. More specific monitoring information will be developed as each measure is implemented.

Many of the costs evaluated in the cost-benefit analysis include annual costs for follow up. This will allow staff to specifically set aside time to monitor and evaluate the success of the conservation measures and programs. Expenditures for conservation will be documented by staff and reported to City Council on a regular basis. This will be valuable information in evaluating the cost-benefit ratio and to validate the success of implementing the selected conservation measures and programs. Since the programs will be implemented in phases, there will be time to evaluate and establish the appropriate method to monitor success of each program and measure.

The City will prepare an annual report summarizing the monitoring efforts for the water conservation measures that have been implemented and that are on-going. This will be presented to City Council annually, so they can evaluate the success of the program.

Plan Updates and Revisions

The required schedule for updating the Water Conservation Plan is seven years. The progress towards achieving the water savings goals will be monitored on an annual basis by Monte Vista staff. The City may choose to update this plan prior to seven years if implementation and actual water savings deviate too much from these projections. This deviation may be caused by several factors including higher or lower than expected growth, less than anticipated participation and the inability to implement the plan due to lack of funding.

Plan Adoption and Approval

Following the public comment period, the comments were incorporated into the plan. The Monte Vista City Council formally adopted the plan prior to submittal to CWCB for final approval. The resolution is attached as **Appendix C**. Implementation will begin after CWCB approval is received. It is only after final CWCB approval that Monte Vista will be eligible for a water-efficiency grant through CWCB for plan implementation.

Table 9.1 – Tracking Matrix for Monitoring Water Conservation Measures

Conservation Measures and Programs	Number of Rebates/ Giveaways	Individual Customer Water use	Customer Class Water Use	Per Capita water use	Unaccounted for Water	Peak & Annual Treated & Total Water Demand
	(A)	(B)	(C)	(D)	(E)	(F)
AMI FlexNet				X	X	X
Leak Detection & Repair Program				X	X	X
Meter Testing & Replacement		X		X	X	X
Develop Ordinance & Standards for New Development			X	X		X
Water Restrictions			X	X		X
Water Rate Structure Changes			X	X		X
Billing Statements that Encourage Water Savings				X		X
Water Conservation Website Upgrades/ Public Education				X		X
Xeriscape Demonstration Garden				X		X
Xeriscape Gardening Classes				X		X
Children's Water Festivals				X		X
School Education Program				X		X
Property Manager/HOA Training & Education			X	X		X
Indoor Rebates	X	X		X		X
Irrigation System Efficiency Device Rebates	X	X		X		X
Water Conservation Upgrades at City Facilities - Indoor			X	X		X
Water Conservation Upgrades at City Facilities - Outdoor			X	X		X
Residential Water Audits			X	X		X

NOTES:

(A) The number of rebates and/or giveaways will be tracked for those installations that have been proven.

(B) Water use prior and post installation will be tracked to determine if a savings has occurred.

(C) These measures affect specific customer classes that can be tracked to determine savings.

(D) A reduction in the Gallons per Capita Water Use will show an overall savings

(E) These measures track uses that are not billed but are supply-side related.

(F) Reductions in peak and annual water use will show an overall savings

REFERENCES

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The Brendle Group, June 2006. Northern Colorado Action Plan for Industrial, Commercial, and Institutional (ICI) Water Conservation.

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City of Monte Vista Comprehensive Plan, 2009.

City of Monte Vista Master Infrastructure Plan, 2008.

City of Monte Vista Ordinance No. 754 - Restricting the Use of Water for Irrigation Purposes for the City of Monte Vista, April 2003.

City of Monte Vista Resolution No. 15-2000 - Providing rates for Opening and Closing City Service Valves and Collection of Funds for insufficient checks, Dec. 2000.

City of Monte Vista Resolution No. 11-2003 Amended - Policy regarding Water Tap Fees, June 2003.

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Rio Grande County Joint Master Plan for Rio Grande County, City of Monte Vista and Town of Del Norte, 2004.

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U.S. Environmental Protection Agency, 2007. Cases in Water Conservation: How Efficiency Programs Help Water Utilities Save Water and Avoid Costs.

Vickers, Amy, 2001. Handbook of Water Use and Conservation: Home, Landscapes, Business, Industries, Farms. WaterPlow Press, Amherst, MA.

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Western Resource Advocates, 2006. Water in the Urban Southwest.

APPENDIX A

Water Conservation Measures

Leak Detection and Repair Program

This measure would include leak detection and repair for City water delivery infrastructure.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	5

Estimated Water Savings

Annual Estimated Water Production without Savings	305,782,343	gallons/yr
Estimated Water Production over Planning Period without Savings	3,057,823,429	gallons
Annual Estimated Savings Rate	5.00%	
Estimated Annual Water Savings	**15,289,117**	gallons/yr
Estimated Savings over Planning Period	**152,891,171**	gallons

Notes:

Current system leakage/loss rate is estimated at 20%.

The estimated production (without savings) equals the projected water usage plus 20%.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	24	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$1,200.00	
Third Party Costs (Leak Detection Consult)	$6,500.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$500.00	/year
Annual Labor	**$8,200.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	0	/year
Gallons Saved per Unit per Year	0	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost	$0.00	
Third Party Costs (Mapping of System)	$0.00	
One Time Labor/Material Cost	**$0.00**	

Notes:

Third Party Costs include:
- Leak survey preformed every other year by a consultant.

Annual staff costs include coordination with consultants.

Estimated Annual Cost	**$8,200.00**	/year
Estimated Total Cost over Planning Period Including Set-up	**$41,000.00**	
	$0.27	

Advanced Metering Infrastructure Program

Advanced Metering Infrastructure (AMI) *refers to systems that measure, collect and analyze water or energy usage, and interact with water meters, through various communication media either on-demand or on pre-defined schedules. AMI technology can help water utilities automate water systems, detect problem areas earlier, give customer's tools to monitor water use, provide more accurate rates and reduce demand.*

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Water Production without Savings	305,782,343	gallons/yr
Estimated Water Production over Planning Period without Savings	3,057,823,429	gallons
Annual Estimated Savings Rate	5.00%	
Estimated Annual Water Savings	**15,289,117**	gallons/yr
Estimated Savings over Planning Period	**152,891,171**	gallons

Notes:

Current system leakage/loss rate is estimated at 20%. A portion of these losses may be attributed to faulty meters or end user infrastructure. The City of Monte Vista would like to reduce these losses by 5% over the planning period.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	0	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$0.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$0.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	0	/year
Gallons Saved per Unit per Year	0	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost and Program setup	$400,000.00	
One Time Labor/Material Cost	**$400,000.00**	

Notes:

Cost estimates only include one time materials and programs setup cost for installation of a Sensus FlexNet AMI system.

More information on Sensus FlexNet systems can be found at www.sensus.com.

Estimated Annual Cost	**$0.00**	/year
Estimated Total Cost over Planning Period Including Set-up	**$400,000.00**	
Cost per 1000 Gallons Saved	**$2.62**	

Water Waste Ordinance

The City of Monte Vista currently has an ordinance restricting water waste.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate*	0.50%

Customer Category	Average Annual Water Use (gallons/yr)	*Estimated Annual Water Savings gallons/yr*
Residential	176,635,884	883,179
Multi-Family	40,152,256	200,761
Public Authority	8,497,538	42,488
Commercial	20,895,445	104,477

Estimated Annual Water Savings	**1,230,906**	gallons/yr
Estimated Savings over Planning Period	**12,309,056**	gallons

Notes:

Estimated savings is 1/2 %. This measure will only affect Residential, Multi-Family, Public Authority and Commercial water users.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	2	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$100.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs	$0.00	/year
Annual Labor	**$100.00**	/year
Materials Costs		
Annual Materials Budget	$0	/year
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time Labor Costs	$0.00	
One Time Material Costs	$0.00	
One Time Labor/Material Cost	**$0.00**	

Notes:

Labor costs include estimated staff time for researching and developing requirements and standards and receiving approval and implementing the ordinance.

Water Waste Ordinance

Water Rates

Residential, Multi-Family and Public Authority Base Fee - *Includes the summer base usage of 5,000 gallons.*	$20.20
Commercial Base Fee - *Includes the summer base usage of 5,000 gallons. Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Annual Revenue Loss Related to Water Savings **$664.94** /year

Estimated Annual Cost	**$764.94** /year
Estimated Cost over Planning Period not including Lost Revenue	**$1,000.00**
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$7,649.35**
Cost per 1000 Gallons Saved	**$0.62**

Removal of Phreatophytes

The City of Monte Vista currently has an ordinance that requires removal of Chinese Elm trees. These trees are an invasive species in this area and have a high water use.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate*	0.50%

Customer Category	Average Annual Water Use (gallons/yr)	*Estimated Annual Water Savings gallons/yr*
Residential	176,635,884	883,179
Multi-Family	40,152,256	200,761
Public Authority	8,497,538	42,488
Commercial	20,895,445	104,477

Estimated Annual Water Savings	**1,230,906**	gallons/yr
Estimated Savings over Planning Period	**12,309,056**	gallons

Notes:

Estimated savings is 1/2 %. This measure will only affect Residential, Multi-Family, Public Authority and Commercial water users.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	2	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$100.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs	$0.00	/year
Annual Labor	**$100.00**	/year
Materials Costs		
Annual Materials Budget	$0	/year
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time Labor Costs	$0.00	
One Time Material Costs	$0.00	
One Time Labor/Material Cost	**$0.00**	

Notes:

Labor costs include estimated staff time for ordinance enforcement.

Removal of Phreatophytes

Water Rates

Residential, Multi-Family and Public Authority Base Fee - *Includes the summer base usage of 5,000 gallons.*	$20.20
Commercial Base Fee - *Includes the summer base usage of 5,000 gallons. Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Annual Revenue Loss Related to Water Savings **$664.94** /year

Estimated Annual Cost	**$764.94** /year
Estimated Cost over Planning Period not including Lost Revenue	**$1,000.00**
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$7,649.35**
Cost per 1000 Gallons Saved	**$0.62**

General Evaluation of Policies that Encourage Water Savings

The City would like to evaluate policies, City ordinances, etc. that would allow the City to encourage water savings.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	1

Estimated Water Savings

Annual Estimated Savings Rate	0.10%

Customer Category	Average Outdoor Water Use gallons	*Estimated Annual Water Savings gallons/yr*
Residential	65,355,277	65,355
Multi-Family	14,856,335	14,856
Commercial	7,731,315	7,731
Public Authority	3,144,089	3,144

Estimated Annual Water Savings	**91,087**	gallons/yr
Estimated Savings over Planning Period	**910,870**	gallons

Notes:

Most policies that encourage water savings are geared toward outdoor uses. This measure can affect the outdoor usage of customer categories shown. Assume a conservative reduction of 0.10% of projected total billed water each year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	0	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$0.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$0.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	0	/year
Gallons Saved per Unit per Year	0	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time City Staff Labor	$2,000.00	
One Time Material Costs	$0.00	
One Time Labor/Material Cost	**$2,000.00**	

Notes:

Labor costs include estimated staff time for researching and evaluation of current policy. Also time for updating and expanding on current policy.

General Evaluation of Policies that Encourage Water Savings

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes the summer base usage of 5,000 gallons.*	$20.20
Commercial Base Fee - *Includes the summer base usage of 5,000 gallons. Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Annual Revenue Loss Related to Water Savings **$132.99** /year

Estimated Annual Cost	**$132.99**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$2,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$2,132.99**	
Cost per 1000 Gallons Saved	**$2.34**	

Water Rate Structure Changes

Based on many water conservation studies, an inclining block water rate design most effectively encourages efficient water use. A rate study may be necessary to ensure maximum water conservation savings.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	2.00%

Customer Category	Average Water Use (gallons)	*Estimated Annual Water Savings gallons/yr*
Residential	176,635,884	3,532,718
Multi-Family	40,152,256	803,045
Commercial	20,895,445	417,909
Public Authority	8,497,538	169,951

Estimated Annual Water Savings	**4,923,622**	gallons/yr
Estimated Savings over Planning Period	**49,236,224**	gallons

Notes:

Assume a conservative reduction of 2% of projected total billed water. Rate change studies have shown a greater savings (Southwest Florida Water Management District study - 13%).

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	0	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$0.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$0.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	0	/year
Gallons Saved per Unit per Year	0	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time City Staff Labor	$10,000.00	
Rate Study performed by Consultants	$40,000.00	
One Time Labor/Material Cost	**$50,000.00**	

Notes:

Labor costs include estimated staff time for researching water rate options and implementing those options (~200 hours at $50/hour).

Costs also include water rate study completed by a Consultant. Before a new rate structure is adopted, a rate study would need to be completed by an outside consulting firm.

Water Rate Structure Changes

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Annual Revenue Loss Related to Water Savings **$7,188.49** /year

Estimated Annual Cost	**$7,188.49**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$50,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$121,884.89**	
Cost per 1000 Gallons Saved	**$2.48**	

Turf and Landscape Standards for New Construction

Many water providers require restrictions on turf and low water use landscape standards for new construction within their building permit review process. The turf and landscape standards may require a certain percentage of new landscapes to be low water use.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	5.00%

Customer Category	Outdoor Water Use Per Tap gallons/tap	Annual Program Participants	*Estimated Annual Water Savings gallons/yr*
Residential	39,786	10	19,893
Multi-Family	143,472	1	7,174
Commercial	39,786	3	5,968
Public Authority	208,577	0.1	1,043

Estimated Annual Water Savings	**34,078**	gallons/yr
Estimated Savings over Planning Period	**1,874,271**	gallons

Notes:

An estimated number of building permits will be obtained in any year. Estimate that approximately 37% of total customer use is outdoor use.
Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	10	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$500.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$500.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	0	/year
Gallons Saved per Unit per Year	0	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
		/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time City Staff Labor	$500.00	
Rate Study performed by Consultants	$0.00	
One Time Labor/Material Cost	**$500.00**	

Notes:

One time Labor costs include estimated staff time for researching and developing requirements and standards and receiving approval and implementing those options.

Cost for one time program development includes 10 hours of staff time at a rate of $50/hour.

Annual cost include costs for inspection (2 hours per permit). Inspections may be performed by a third party. Annual inspection costs are split between Turf & Landscape Standards, Irrigation Standards for New Construction and Soil Amendment Ordinance for New Landscapes.

Turf and Landscape Standards for New Construction

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes the summer base usage of 5,000 gallons.*	$20.20
Commercial Base Fee - *Includes the summer base usage of 5,000 gallons. Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Annual Revenue Loss Related to Water Savings **$234.10** /year

Estimated Annual Cost	**$734.10** /year
Estimated Cost over Planning Period not including Lost Revenue	**$5,500.00**
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$7,840.95**
Cost per 1000 Gallons Saved	**$4.18**

Irrigation System Standards for New Construction

Many water providers encourage or require irrigation system standards within their building permit review process. The irrigation system standards help to design irrigation systems that efficiently use water.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	5.00%

Customer Category	Outdoor Water Use Per Tap gallons/tap	Annual Program Participants	*Estimated Annual Water Savings gallons/yr*
Residential	39,786	10	19,893
Multi-Family	143,472	1	7,174
Commercial	39,786	3	5,968
Public Authority	208,577	0.1	1,043

Estimated Annual Water Savings	**34,078**	gallons/yr
Estimated Savings over Planning Period	**1,874,271**	gallons

Notes:

An estimated number of building permits will be obtained in any year. Estimate that approximately 37% of total customer use is outdoor use.
Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	10	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$500.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$500.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	0	/year
Gallons Saved per Unit per Year	0	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
		/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time City Staff Labor	$500.00	
Rate Study performed by Consultants	$0.00	
One Time Labor/Material Cost	**$500.00**	

Notes:

Labor costs include estimated staff time for researching and developing requirements and standards and receiving approval and implementing those options.

Cost for one time program development includes 10 hours of staff time at a rate of $50/hour.

Annual cost include costs for inspection (2 hours per permit). Inspections may be performed by a third party. Annual inspection costs are split between Turf & Landscape Standards, Irrigation Standards for New Construction and Soil Amendment Ordinance for New Landscapes.

Irrigation System Standards for New Construction

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes the summer base usage of 5,000 gallons.*	$20.20
Commercial Base Fee - *Includes the summer base usage of 5,000 gallons. Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Annual Revenue Loss Related to Water Savings	**$234.10**	/year

Estimated Annual Cost	**$734.10**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$5,500.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$7,840.95**	
Cost per 1000 Gallons Saved	**$4.18**	

Soil Amendment Ordinance for New Landscapes

Soil amendments include the addition of organic and inorganic materials to soil to improve its texture nutrient load, moisture-holding capacity, and infiltration rate. The City may make soil amendment a requirement in order to pass building inspection.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	5.00%

Customer Category	Outdoor Water Use Per Tap gallons/tap	Annual Program Participants	*Estimated Annual Water Savings gallons/yr*
Residential	39,786	10	19,893
Multi-Family	143,472	1	7,174
Commercial	39,786	3	5,968
Public Authority	208,577	0.1	1,043

Estimated Annual Water Savings	**34,078**	gallons/yr
Estimated Savings over Planning Period	**1,874,271**	gallons

Notes:

An estimated number of building permits will be obtained in any year. Estimate that approximately 37% of total customer use is outdoor use.
Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	10	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$500.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$500.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	0	/year
Gallons Saved per Unit per Year	0	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
		/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time City Staff Labor	$500.00	
Rate Study performed by Consultants	$0.00	
One Time Labor/Material Cost	**$500.00**	

Notes:

Labor costs include estimated staff time for researching and developing requirements and standards and receiving approval and implementing those options.

Cost for one time program development includes 10 hours of staff time at a rate of $50/hour.

Annual cost include costs for inspection (2 hours per permit). Inspections may be performed by a third party. Annual inspection costs are split between Turf & Landscape Standards, Irrigation Standards for New Construction and Soil Amendment Ordinance for New Landscapes.

Soil Amendment Ordinance for New Landscapes

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes the summer base usage of 5,000 gallons.*	$20.20
Commercial Base Fee - *Includes the summer base usage of 5,000 gallons. Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Annual Revenue Loss Related to Water Savings **$234.10** /year

Estimated Annual Cost	**$734.10**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$525.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$7,840.95**	
Cost per 1000 Gallons Saved	**$4.18**	

Children's Water Festival

Monte Vista and surrounding communities do not currently have a water festival. The City would be interested in developing a water festival program modeled after festivals held along the Front Range.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate*	0.50%

Customer Category	Average Annual Water Use	*Estimated Annual Water Savings gallons/yr*
Residential	176,635,884	883,179
Multi-Family	40,152,256	200,761
Public Authority	8,497,538	42,488

Estimated Annual Water Savings	**1,126,428**	gallons/yr
Estimated Savings over Planning Period	**11,264,284**	gallons

Notes:

This measure only affects Projected Residential water usage.

Assume 0.5% savings of projected Residential water usage.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	40	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$2,000.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs	$0.00	/year
Annual Labor	**$2,000.00**	/year
Materials Costs		
Annual Materials Budget	$1,000	/year
Annual Materials	**$1,000.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One time material cost	$5,000.00	
Water Conservation Education Program Set Up (May be completed by 3rd party)	$2,000.00	
One Time Labor/Material Cost	**$7,000.00**	

Notes:

Staff hours include time participating in Water Festivals.

Material costs may include an annual budget for education materials and venue.

Children's Water Festival

Water Rates

Rate Category	Current Rates (per 1000 gallons)
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

Average rates are shown for planning purposes only.

Estimated Revenue assumes that the current avg rates will not change over the planning period.

Estimated Annual Revenue Loss Related to Water Savings **$1,644.59** /year

Estimated Annual Cost	**$4,644.59**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$37,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$53,445.85**	
Cost per 1000 Gallons Saved	**$4.74**	

School Education Program

This includes time for educators to work with Project WET to develop water conservation education programs. This measure also includes time and materials for the City to construct a mobile Water Education Wagon that could be taken around to different events to educate kids and parents about water conservation and where their water comes from.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Water Use without Savings	225,285,677	gallons/yr
Estimated Water Use over Planning Period without Savings	2,252,856,768	gallons
Annual Estimated Savings Rate	0.50%	
Estimated Annual Water Savings	**1,126,428**	gallons/yr
Estimated Savings over Planning Period	**11,264,284**	gallons

Notes:

This measure only affects Projected Residential, Multi-Family and Public Authority water usage.

Assume 0.5% savings of projected water usage.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	16	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$800.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Website updates, etc.)	$0.00	/year
Annual Labor	**$800.00**	/year
Materials Costs		
Annual Materials Budget	$500	/year
Annual Materials	**$500.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
Project WET teacher scholarship	$3,000.00	
Mobile Water Conservation Education Program Set Up (May be completed by 3rd party)	$40,000.00	
One Time Labor/Material Cost	**$43,000.00**	

Notes:

Staff hours include time working with local schools and educators to develop a water conservation education program (16 hours).

Material costs include an annual budget for education materials costs.

One time labor and material costs include a Project WET teacher scholarship. Project WET (Water Education & Training) has dedicated itself to the mission of reaching children, parents, teachers and community members of the world with water education. *A $3000 budget would allow for training 10-15 teachers and give them continuing education credit. More information is available at www.projectwet.org.*

Also included in one time labor costs is the cost to construct a mobile water conservation education program, similar to a water wagon. Cost includes project construction.

School Education Program

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$339,165.55	/year
Estimated Average Annual Revenue with Water Savings	$337,520.97	/year
Annual Revenue Loss Related to Water Savings	**$1,644.59**	/year

Estimated Annual Cost	**$2,944.59**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$56,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$72,445.85**	
Cost per 1000 Gallons Saved	**$6.43**	

Xeriscape Demonstration Garden

Creating a Xeriscape demonstration garden is an excellent way to educate the public to the water savings evident from xericscape.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Water Use without Savings	65,355,277	gallons/yr
Estimated Water Use over Planning Period without Savings	653,552,769	gallons
Annual Estimated Savings Rate	0.5%	
Estimated Annual Water Savings	**326,776**	gallons/yr
Estimated Savings over Planning Period	**3,267,764**	gallons

Notes:

This measure affects projected water usage for Residential customers.

Estimate that approximately 37% of total customer use is outdoor use.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	8	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$400.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$400.00**	/year
Materials Costs		
Annual Materials Budget	$500	/year
Annual Materials	**$500.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time Design and Material Cost	$5,000.00	
Third Party Costs	$0.00	
One Time Labor/Material Cost	**$5,000.00**	

Notes:

Cost is for garden design (one time cost), installation, plants and planting materials and annual maintenance.

Xeriscape Demonstration Garden

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes the summer base usage of 5,000 gallons.*	$20.20
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$117,273.04	/year
Estimated Average Annual Revenue with Water Savings	$116,795.95	/year
Annual Revenue Loss Related to Water Savings	**$477.09**	/year

Estimated Annual Cost	**$1,377.09**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$14,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$18,770.94**	
Cost per 1000 Gallons Saved	**$5.74**	

Xeriscape Education Programs

The City can partner with the local extension service and/or local master gardeners to provide Xeriscape education classes.

Planning Period	2011 to 2020
	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	10.00%

Customer Category	Outdoor Water Use Per Tap gallons/tap	Annual Program Participants	*Estimated Annual Water Savings gallons/yr*
Residential	39,786	20	79,573

Estimated Annual Water Savings	**79,573**	gallons/yr
Estimated Savings over Planning Period	**795,728**	gallons

Notes:

This measure will impact the outdoor usage for the Residential category is estimated at 0.33 af/tap, which is the rate for the Residential customer category.

Estimate that approximately 37% of total customer use is outdoor use.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	40	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$2,000.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$250.00	/year
Annual Labor	**$2,250.00**	/year
Materials Costs		
Number of Participants	20	/year
Material Cost per Participant	$25	/ participant
Annual Materials Budget	$500	/year
Annual Materials	**$500.00**	/year
Rebates		
Rebate Cost	$0.00	
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time cost	$2,000.00	
Third Party Costs	$0.00	
One Time Labor/Material Cost	**$2,000.00**	

Notes:

Cost includes any costs associated with developing and implementing Xeriscape education. Additionally, costs would include educational material ($1,000).

Xeriscape Education Programs

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes the summer base usage of 5,000 gallons.*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Annual Revenue Loss Related to Water Savings - $638.97 /year

Estimated Annual Cost	**$3,388.97** /year
Estimated Cost over Planning Period not including Lost Revenue	**$29,500.00**
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$35,889.70**
Cost per 1000 Gallons Saved	**$45.10**

Water Conservation Upgrades to Website

This measure includes the creation of a water conservation website that may include customer surveys, EPA WaterSense Program Promotion, water conservation tips, lawn watering guides, and installation of a residential water use calculator on a website.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	1.00%

Customer Category	Average Water Use gallons	*Estimated Annual Water Savings gallons/yr*
Residential	176,635,884	1,766,359
Multi-Family	40,152,256	401,523
Commercial	20,895,445	208,954
Public Authority	8,497,538	84,975

Estimated Annual Water Savings	**2,461,811**	gallons/yr
Estimated Savings over Planning Period	**24,618,112**	gallons

Notes:

This measure affects projected water usage for the residential, multi-family, public authority and commercial customer categories.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	10	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$500.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Website updates, etc.)	$0.00	/year
Annual Labor	**$500.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	0	/year
Gallons Saved per Unit per Year	0	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost	$0.00	
One Time Labor Costs (website setup)	$5,000.00	
One Time Labor/Material Cost	**$5,000.00**	

Notes:

Annual staff hours include website promotion and annual maintenance.

For one time labor costs, we estimate cost to determine website content/information and estimated costs to establish website (may be completed by 3rd party).

Website content may include:
- customer survey
- EPA WaterSense program information http://www.epa.gov/WaterSense/
- General water conservation tips and information
- Lawn watering guides (ET scheduling)
- Water use calculators (example - www.H2OConserve.org)

Water Conservation Upgrades to Website

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Annual Revenue Loss Related to Water Savings **$3,594.24** /year

Estimated Annual Cost	**$4,094.24**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$10,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$45,942.44**	
Cost per 1000 Gallons Saved	**$1.87**	

Commercial Customer Category Toilet Rebate

This program would provide rebates for low flow for commercial entities.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Commercial Water Use Per Tap without Savings

Gallons Used per Commercial Tap per Year	107,531	gallons/yr
Saving Per day with a commercial low flow toilet*	25	gpd
Gallons Saved per toilet per Year	9,125	gallons/yr
Annual Number of Commercial Toilets Replaced	10	/year
Estimated Annual Water Savings	**91,250**	gallons/yr
Estimated Savings over Planning Period	**5,018,750**	gallons

**Based on "Handbook of Water Use and Conservation" by Amy Vickers - analysis of water billing records for non-residential sites in the Metropolitan Water District of Southern California*

Notes:

Estimated Water Use is based on a 0.33 AF/tap use. This is the average tap use for 2005 through 2009.

Average savings per toilet for commercial accounts is 25 gpd.*

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	5	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$250.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$250.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	10	/year
Gallons Saved per Unit per Year	9,125	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$75.00	
Number of Participants	10	/year
Annual Rebate Cost	**$750.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost	$0.00	
One Time Labor Cost	$400.00	

Notes:

Annual labor costs are split between all Rebate and Incentive programs (9 total). Estimated annual staff time is estimated at approximately 45 hours for all programs. This time includes water savings tracking.

Staff hours include time for program set up (1x cost) and annual staff hours for program implementation.

The City may offer $75.00 for each high flow toilet replaced with a low-flow toilet. Old toilets cannot be resold.

Commercial Customer Category Toilet Rebate

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$9,146.23	/year
Estimated Average Annual Revenue with Water Savings	$8,413.49	/year
Annual Revenue Loss Related to Water Savings	**$732.74**	/year

Estimated Annual Cost	**$1,732.74**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$10,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$17,327.38**	
Cost per 1000 Gallons Saved	**$3.45**	

Distribute Toilet Retrofit Devices

Toilet Retrofit devices are used to reduce the amount of water needed to flush high-volume toilets that use 3.5 gpf or more. Toilet Retrofit Devices include toilet bladders (or displacement devices), toilet dams, and early closure devices.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Residential Water Use Per Tap without Savings

Customer Category	Water Use Per Tap gallons/tap	Annual Program Participants
Residential	107,531	20
Multi-Family	387,763	20
Public Authority	563,722	20

Residential, Multi-Family & Public Authority Annual Use	1,059,016	gallons/tap/yr
Total	1,059,016	gallons/tap/yr
People per Household	2.59	
Average Flushes per Household per person*	5.1	flushes/day
Saving Per Flush with retrofit devices	1	gallons/flush
Gallons Saved per Household per Year	4,821	gallons/yr
Number of retrofit devices used each year	60	/year
Maximum retrofit devices used over planning period	600	
Estimated Annual Water Savings	**289,277**	gallons/yr
Estimated Savings over Planning Period	**15,910,241**	gallons

**Based on "Handbook of Water Use and Conservation" by Amy Vickers*

Notes:

Estimated Water Use is based on a 0.33AF/tap use for Residential taps, 1.19 AF/tap use for Multi-Family taps, and 1.73 AF/tap use for Public Authority taps. This is the average tap use for 2005 through 2009.

Retrofit Devices (except for the Early Closure Flapper) are not recommended for toilets with less than 3.5 gallons per flush.

A savings of 1 gpf is used assuming that at least one and maybe two of the devices is installed per participant.
Estimated Savings:*
Toilet Bladders: 0.5 to 1.5 gpf
Toilet Damns: 0.5 to 1.0 gpf
Early Closure Devices: 1.0 to 1.5 gpf

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of Toilet Retrofit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	5	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$250.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$250.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	60	/year
		gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	60	
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
Toilet Tummy (order of 250 at $3.69/unit)	$922.50	
Early Closure Flapper (order of 250 at $3.99/unit)	$997.50	
Toilet Dam (order of 250 at $2.49/unit)	$622.50	
One Time Labor Cost	$200.00	
One Time Labor/Material Cost	**$2,742.50**	

Notes:

Annual labor costs are split between all Rebate and Incentive programs (9 total). Estimated annual staff time is estimated at approximately 45 hours for all programs. This time includes water savings tracking.

Staff hours include time for program set up (1x cost) and annual staff hours for program implementation.

The City can save money on toilet retrofit devices by ordering them in bulk. The prices and quantities seen in the one time labor and materials costs are from the AM Conservation Group website (www.amconservationgroup.com).

Distribute Toilet Retrofit Devices

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$171,925.93	/year
Estimated Average Annual Revenue with Water Savings	$169,603.03	/year
Annual Revenue Loss Related to Water Savings	**$2,322.90**	/year

Estimated Annual Cost	**$2,572.90**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$5,242.50**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$28,471.45**	
Cost per 1000 Gallons Saved	**$1.79**	

Distribute Pre-Rinse Spray Heads to Restaurants & Institutions

Pre-rinse spray heads can be found in most restaurants and institutions. Old pre-rinse spray heads use up to 3 gpm. New spray-head technology is available that only uses 1.4 gpm.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Commercial Water Use Per Tap without Savings

Gallons Used per Commercial Tap per Year	107,531	gallons/yr
Operating Hours per Day	2	hours/day
Operating Days per Year	260	days/yr
Non-water saving pre-rinse spray head water flow rate	3	gpm
Low-Flow pre-rinse spray valves water flow rate*	1.4	gpm
Non-Water saving pre-rinse spray head water flow rate	93,600	gallons/yr
Low-Flow pre-rinse spray valves water flow rate	44,304	gallons/yr
Gallons Saved per spray head per year	49,296	gallons/yr
Annual Program Participants	5	/year
Maximum No. of Participants over Planning Period	50	
Estimated Annual Water Savings	**246,480**	gallons/yr
Estimated Savings over Planning Period	**13,556,400**	gallons

**Based on Western Regional Power Administration's Pre-Rinse Valve Fact Sheet, November 2005. http://www.wapa.gov/ES/pubs/fctsheet/PreRinseValves.pdf*

Notes:

Estimated Water Use is based on a 0.33 AF/tap use. This is the average tap use for 2005 through 2009.

Average savings per low-flow spray head is 1.4 gpm.*

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	5	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$250.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$250.00**	/year
Materials Costs		
Unit Cost	$75.00	/participant
Number of Participants	5	/year
Gallons Saved per Unit per Year	49,296	gallons
Annual Materials	**$375.00**	/year
Rebate Cost	$0.00	
Number of Participants	5	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost	$0.00	
One Time Labor Cost	$200.00	
One Time Labor/Material Cost	**$200.00**	

Notes:

Annual labor costs are split between all Rebate and Incentive programs (9 total). Estimated annual staff time is estimated at approximately 45 hours for all programs. This time includes water savings tracking.

Annual staff hours should include spray head installation for each participant to ensure proper installation. A one time cost is included for ordering spray heads and measure development.

New sprayheads costs about $75.00 per unit.

This is not a rebate program, it is a giveaway.

Distribute Pre-Rinse Spray Heads to Restaurants & Institutions

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$4,573.11	/year
Estimated Average Annual Revenue with Water Savings	$2,593.88	/year
Annual Revenue Loss Related to Water Savings	**$1,979.23**	/year

Estimated Annual Cost	**$2,604.23**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$6,450.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$26,242.34**	
Cost per 1000 Gallons Saved	**$1.94**	

Residential Low-Flow Toilet Rebate

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Residential Water Use Per Tap without Savings

Customer Category	Water Use Per Tap gallons/tap	Annual Program Participants
Residential	107,531	20
Multi-Family	387,763	20
Public Authority	563,722	20

Residential, Multi-Family & Public Authority Annual Use	1,059,016	gallons/tap/yr
Total	1,059,016	gallons/tap/yr
People per Household	2.59	
Average Flushes per Household*	5.1	flushes
Saving Per Flush with a low flow toilet (1.28 gal/flush)	2.72	gallons/flush
Gallons Saved per Household per Year	13,114	gallons/yr
Annual Program Participants	60	/year
Maximum No. of Participants over Planning Period	600	
Estimated Annual Water Savings	**786,834**	gallons/yr
Estimated Savings over Planning Period	**43,275,854**	gallons

**Based on "Handbook of Water Use and Conservation" by Amy Vickers*

Notes:

Estimated Water Use is based on the following 2005-2009 average:
Residential = 0.33 af/tap
Multi-Family = 1.19 af/tap
Public Authority = 1.73 af/tap

A rebate would be available for toilets using 1.28 gallons per flush or dual flush toilets.

*Savings based on 5.1 flushes per person per day *. Saving 2.72 gal per flush (4.0 gal ave flush rate - 1.28 gal conservation flush rate) and 2.59 people per household.*

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	5	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$250.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$250.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	60	/year
Gallons Saved per Unit per Year	13,114	gallons
		/year
Rebates		
Rebate Cost	$50.00	
Number of Participants	60	/year
Annual Rebate Cost	**$3,000.00**	
One Time Labor and Material Costs		
One Time Materials Cost	$0.00	
One Time Labor Cost	$200.00	
One Time Labor/Material Cost	**$200.00**	

Notes:

Annual labor costs are split between all Rebate and Incentive programs (9 total). Estimated annual staff time is estimated at approximately 45 hours for all programs. This time includes water savings tracking.

Residential Low-Flow Toilet Rebate

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$171,925.93	/year
Estimated Average Annual Revenue with Water Savings	$165,607.65	/year
Annual Revenue Loss Related to Water Savings	**$6,318.27**	/year

Estimated Annual Cost	**$9,568.27**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$32,700.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$95,882.75**	
Cost per 1000 Gallons Saved	**$2.22**	

High Efficiency Clothes Washer Rebate

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Residential Water Use Per Tap without Savings

Customer Category	Water Use Per Tap gallons/tap	Annual Program Participants
Residential	107,531	5
Multi-Family	387,763	5
Public Authority	563,722	5

Residential, Multi-Family & Public Authority Annual Use	1,059,016	gallons/tap/yr
Total	1,059,016	gallons/tap/yr
People per Household	2.59	
Laundry loads per person per day*	0.37	
Saving per load with a high efficiency washer	16	gallons/load
Gallons Saved per Household per Year	5,596	gallons/yr
Annual Program Participants	15	/year
Maximum No. of Participants over Planning Period	150	
Estimated Annual Water Savings	**83,947**	gallons/yr
Estimated Savings over Planning Period	**4,617,089**	gallons

**Based on "Handbook of Water Use and Conservation" by Amy Vickers*

Notes:

Estimated Water Use is based on the following 2005-2009 average:
Residential = 0.33 af/tap
Multi-Family = 1.19 af/tap
Public Authority = 1.73 af/tap

*Savings based on 0.37 loads per person per day *. Saving 16 gal per load (43 gal/load avg. rate - 27 gal/load conservation rate*) and 2.7 people per household.*

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	5	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$250.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$250.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	15	/year
Gallons Saved per Unit per Year	5,596	gallons
		/year
Rebates		
Rebate Cost	$125.00	
Number of Participants	15	/year
Annual Rebate Cost	**$1,875.00**	
One Time Labor and Material Costs		
One Time Materials Cost	$0.00	
One Time Labor Cost	$200.00	
One Time Labor/Material Cost	**$200.00**	

Notes:

Annual labor costs are split between all Rebate and Incentive programs (9 total). Estimated annual staff time is estimated at approximately 45 hours for all programs. This time includes water savings tracking.

High Efficiency Clothes Washer Rebate

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$42,981.48	/year
Estimated Average Annual Revenue with Water Savings	$42,307.39	/year
Annual Revenue Loss Related to Water Savings	**$674.10**	/year

Estimated Annual Cost	**$2,799.10**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$21,450.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$28,190.95**	
Cost per 1000 Gallons Saved	**$6.11**	

Low-Flow Faucet Rebate

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Residential Water Use Per Tap without Savings

Customer Category	Water Use Per Tap gallons/tap	Annual Program Participants
Residential	107,531	20
Multi-Family	387,763	20
Public Authority	563,722	20

Residential, Multi-Family & Public Authority Annual Use	1,059,016	gallons/tap/yr
Total	1,059,016	gallons/tap/yr
People per Household	2.59	
Estimated Water Use for a 2.75 gpm rated faucet*	14.9	gpcd
Annual residential water use for a 2.75 gpm rated faucet*	14,086	gallons/yr
Estimated Water Use for a 1.5 gpm rated faucet*	8.1	gpcd
Annual residential water use for a 1.5 gpm rated faucet*	7,657	gallons/yr
Gallons Saved per Household per Year	6,428	gallons/yr
Number of low-flow faucets used each year	60	Households/year
Maximum low-flow faucets used over planning period	600	
Estimated Annual Water Savings	**385,703**	gallons/yr
Estimated Savings over Planning Period	**21,213,654**	gallons

**Based on "Handbook of Water Use and Conservation" by Amy Vickers. Please refer to Table 2.15 on page 103.*

Notes:

Estimated Water Use is based on the following 2005-2009 average:
Residential = 0.33 af/tap
Multi-Family = 1.19 af/tap
Public Authority = 1.73 af/tap

Average water savings of 6,428 gal. per household per year for 1.5 gpm faucets (1.5gpm vs. 2.75gpm).*

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	5	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$250.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$250.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
		/year
Gallons Saved per Unit per Year	6,428	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$5.00	
Number of Units	60	/year
Annual Rebate Cost	**$300.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost	$0.00	
One Time Labor Cost	$100.00	
One Time Labor/Material Cost	**$100.00**	

Notes:

Annual labor costs are split between all Rebate and Incentive programs (9 total). Estimated annual staff time is estimated at approximately 45 hours for all programs. This time includes water savings tracking.

Low-Flow Faucet Rebate

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$171,925.93	/year
Estimated Average Annual Revenue with Water Savings	$168,828.74	/year
Annual Revenue Loss Related to Water Savings	**$3,097.19**	/year

Estimated Annual Cost	**$3,647.19**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$5,600.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$36,571.93**	
Cost per 1000 Gallons Saved	**$1.72**	

Low-Flow Showerhead Rebate

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Residential Water Use Per Tap without Savings

Customer Category	Water Use Per Tap gallons/tap	Annual Program Participants
Residential	107,531	20
Multi-Family	387,763	20
Public Authority	563,722	20

Residential, Multi-Family & Public Authority Annual Use	1,059,016	gallons/tap/yr
Total	1,059,016	gallons/tap/yr
People per Household	2.59	
Annual residential water use for a 3 gpm rated showerhead*	10,021	gallons/yr
Estimated Water Use for a 2.5 gpm rated showerhead*	9.01	gpcd
Annual residential water use for a 2.5 gpm rated faucet*	8,518	gallons/yr
Gallons Saved per Household per Year	1,503	gallons/yr
Number of showerheads replaced each year	60	/year
Maximum showerheads replaced over planning period	600	
Estimated Annual Water Savings	**90,186**	gallons/yr
Estimated Savings over Planning Period	**4,960,251**	gallons

**Based on "Handbook of Water Use and Conservation" by Amy Vickers. Please refer to Table 2.11 on page 88.*

Notes:

Estimated Water Use is based on the *following 2005-2009 average:*
Residential = 0.32 af/tap
Multi-Family = 1.19 af/tap
Public Authority = 1.73 af/tap

Average water savings of 1,602 gal. per household per year for 2.5 gpm faucets (2.5gpm vs. 3gpm).*

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	5	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$250.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$250.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	60	/year
		gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$5.00	
Number of Units	60	
Annual Rebate Cost	**$300.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost	$0.00	
One Time Labor Cost	$100.00	
One Time Labor/Material Cost	**$100.00**	

Notes:

Annual labor costs are split between all Rebate and Incentive programs (9 total). Estimated annual staff time is estimated at approximately 45 hours for all programs. This time includes water savings tracking.

The Town may provide $5.00 per showerhead replaced.

Low-Flow Showerhead Rebate

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$171,925.93	/year
Estimated Average Annual Revenue with Water Savings	$171,201.73	/year
Annual Revenue Loss Related to Water Savings	**$724.20**	/year

Estimated Annual Cost	**$1,274.20**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$5,600.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$12,841.97**	
Cost per 1000 Gallons Saved	**$2.59**	

Irrigation System Efficiency Device Rebates

Irrigation System Efficiency Devices may include ET (SMART) Sprinkler system controllers and/or Wind and Rain sensors.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	5.00%

Customer Category	Outdoor Water Use Per Tap gallons/tap	Annual Program Participants	*Estimated Annual Water Savings for all Participants (gallons/yr)*
Residential	39,786	20.0	39,786
Commercial	39,786	20.0	39,786

Estimated Annual Water Savings	**79,573**	gallons/yr
Estimated Savings over Planning Period	**4,376,505**	gallons

Notes:

This measure is only for Residential and Commercial customers. Outdoor usage for Residential and Commercial categories is estimated at 0.33 af/tap.

Wind and Rain Sensors can save an estimated 5% to 10% of water used outdoors and costs approximately $25 to $45. The amount of water that can be saved through improved programming of an irrigation system controller varies but is estimated to be at least 10% to 15%. The cost of automatic irrigation system controllers for residential use ranges from about $50 to $250, depending on the features provided. Commercial-use controllers and central controllers can cost up to several thousand dollars.*

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

**Based on "Handbook of Water Use and Conservation" by Amy Vickers*

Costs

Labor Costs		
Staff Hours	5	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$250.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$250.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	40	/year
Gallons Saved per Unit per Year	Varies	gallons
Annual Materials	**$0.00**	/year
Rebate Cost	$25.00	
Number of Participants	40	/year
Annual Rebate Cost	**$1,000.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost	$0.00	
One Time Labor Cost	$400.00	
One Time Labor/Material Cost	**$400.00**	

Notes:

Annual labor costs are split between all Rebate and Incentive programs (9 total). Estimated annual staff time is estimated at approximately 45 hours for all programs. This time includes water savings tracking.

The City may offer residents $25.00 per irrigation system device, limit 1 device per household.

Annual program participants will total approximately 127 people per year (see table above for specific participants per customer category.

Irrigation System Efficiency Device Rebates

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 5,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 5,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$16,024.39	/year
Estimated Average Annual Revenue with Water Savings	$15,385.42	/year
Annual Revenue Loss Related to Water Savings	**$638.97**	/year

Estimated Annual Cost	**$1,888.97**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$12,900.00**	
Revenue	**$19,289.70**	
Cost per 1000 Gallons Saved	**$4.41**	

Xeriscape Incentives

Turf areas can be replaced with Xeriscape landscaping for new or existing developments. The City will offer a rebate per square feet of Xeriscape installed.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Customer Category	Outdoor Water Use Per Tap gallons/tap	Annual Program Participants	*Estimated Annual Water Savings (gallons/yr)*
Residential	39,786	10	198,932

Average Turf Net Irrigation Requirement	2.28	AF/acre/yr
Acres of Turf replaced each year with Xeriscape Landscape	1	acres/yr
Water use for Turf	742,940	gallons/yr
Annual Estimated Savings Rate*	50%	
Estimated Annual Water Savings	**371,470**	gallons/yr
Estimated Savings over Planning Period	**20,430,858**	gallons

**Based on "Handbook of Water Use and Conservation" by Amy Vickers*

Notes:

*Studies have shown that implementing Xeriscape landscaping practices can achieve at least a 50 % reduction in water use**

Average Turf Net Irrigation Requirement was estimated based on similar use figures for the area.

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	40	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$2,000.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$2,000.00**	/year
Materials Costs		
Annual Materials Budget	$0	/year
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.25	/square foot
Square feet of Turf replaced each year with Xeriscape Landscape	43,560	/year
Annual Rebate Cost	**$10,890.00**	/year

One Time Materials Cost	$2,000.00
Third Party Costs	$0.00
One Time Labor/Material Cost	**$2,000.00**

Notes:

Costs include annual staff time, a rebate of $0.25/square foot of turf replaced and a one time program set up cost.

Xeriscape Incentives

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$3,904.35	/year
Estimated Average Annual Revenue with Water Savings	$2,306.92	/year
Annual Revenue Loss Related to Water Savings	**$1,597.42**	/year

Estimated Annual Cost	**$14,487.42**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$130,900.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$146,874.24**	
Cost per 1000 Gallons Saved	**$7.19**	

Water Conservation Upgrades for City Facilities - Indoor

This would provide high efficiency fixture replacement for toilets, showerheads, and faucet aerators within City Buildings.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	1

Estimated Water Savings

Annual Estimated Zero Billing Water Use Per Tap without Savings

Customer Category	Water Use Per Tap gallons/tap
Zero Billing	2,346,127

	Gallons per Day	Estimated No. of Units replaced	Estimated Gallons Saved per year
Gallons saved per day with High Effic. Toilet*	25.00	50	456,250
GPCD saved for 1.5 gpm showerhead	2.65	5	4,836
GPCD saved for 1 gpm Faucet Aerator	6.80	100	248,200

Estimated Annual Water Savings **709,286** gallons/yr

Estimated Savings over Planning Period **7,092,863** gallons

**Based on "Handbook of Water Use and Conservation" by Amy Vickers*

Notes:

Estimated Water Use is based on the following 2005-2009 average:
Zero Billing = 7.2 af/tap

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	0	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$0.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$0.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	10	/year
Gallons Saved per Unit per Year	varies	gallons
Annual Materials	$0.00	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost	$5,251.50	
One Time Labor Cost	$2,500.00	

Notes:

This is a retrofit program is not a rebate program.

Cost of Material assumes:
$100 -1.28 gpf HET Glacier Bay Toilet
$30 - 1.5 gpm showerhead
$1.50 - 0.5 gpm low flow dual-thread faucet aerator- kitchen and bathroom

Estimated Annual Cost	**$0.00**	/year
Estimated Total Cost over Planning Period Including Set-up		
Cost per 1000 Gallons Saved	**$0.00**	

Water Conservation Upgrades for City Facilities - Outdoor

This would include the installation of Irrigation System Efficiency Devices may include ET (SMART) Sprinkler system controllers and/or Wind and Rain sensors for outdoor areas irrigated by the City such as City Parks etc.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	1

Estimated Water Savings

Annual Estimated Savings Rate	5.00%

Customer Category	Outdoor Water Use Per Tap gallons/tap	No of Facilities	*Estimated Annual Water Savings for all Participants (gallons/yr)*
Zero Billing	868,067	10	434,034

Estimated Annual Water Savings	**434,034**	gallons/yr
Estimated Savings over Planning Period	**4,340,335**	gallons

Notes:

This measure is only for Zero Billing. Outdoor usage for Zero Billing categories is estimated at 7.2 af/tap.

Wind and Rain Sensors can save an estimated 5% to 10% of water used outdoors and costs approximately $25 to $45. The amount of water that can be saved through improved programming of an irrigation system controller varies but is estimated to be at least 10% to 15%. The cost of automatic irrigation system controllers for residential use ranges from about $50 to $250, depending on the features provided. Commercial-use controllers and central controllers can cost up to several thousand dollars.*

**Based on "Handbook of Water Use and Conservation" by Amy Vickers*

Labor Costs		
Staff Hours	0	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$0.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$0.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	10	/year
Gallons Saved per Unit per Year	Varies	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	0	/year
Annual Rebate Cost	**$0.00**	/year
One Time Materials Cost	$6,000.00	
One Time Labor Cost	$4,000.00	
One Time Labor/Material Cost	**$10,000.00**	

Notes:

This is not a rebate program but a retrofit program for irrigation around City buildings.

Assume City purchases 50 wind & rain sensors at $40/sensor + $4000 for central controllers.

Estimated Annual Cost	**$0.00**	/year
Estimated Total Cost over Planning Period Including Set-up	**$10,000.00**	
Cost per 1000 Gallons Saved	**$2.30**	

Zero Interest Loan for Washers & Aging Infrastructure

This program would provide loans to citizens for High Efficiency Clothes Washers and to replace aging water service lines to their homes. This would encourage water savings by fixing leaks as well as using more efficient fixtures within the house.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	5%
Total Annual Participants	20

Customer Category	Water Use Per Tap gallons/tap	*Estimated Annual Water Savings gallons/yr*
Residential	107,531	35,844
Multi-Family	387,763	129,254
Public Authority	563,722	187,907
Total Annual Use	1,059,016	353,005

Estimated Annual Water Savings	**353,005**	gallons/yr
Estimated Savings over Planning Period	**19,415,289**	gallons

Notes:

Estimated Water Use is based on the *following 2005-2009 average:*
Residential = 0.33 af/tap
Multi-Family = 1.19 af/tap
Public Authority = 1.73 af/tap

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	40	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$2,000.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$2,000.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	20	/year
Gallons Saved per Unit per Year	varies	gallons
Annual Materials	**$0.00**	/year
Rebates		
Rebate Cost	n/a	
Number of Participants	20	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost	$0.00	
One Time Labor Cost	$1,200.00	
One Time Labor/Material Cost	**$1,200.00**	

Notes:

This program is not a rebate or a retrofit program but a zero interest loan where the funds are made available by the City.

Zero Interest Loan for Washers & Aging Infrastructure

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$57,308.64	/year
Estimated Average Annual Revenue with Water Savings	$54,474.01	/year
Annual Revenue Loss Related to Water Savings	**$2,834.63**	/year

Estimated Annual Cost	**$4,834.63**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$21,200.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$49,546.32**	
Cost per 1000 Gallons Saved	**$2.55**	

Low Income Retrofit

This program will provide low income single- and multi- family households with toilet, showerhead and faucet aerators. This will be installed free of charge to customer.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Residential Water Use Per Tap without Savings

Customer Category	Water Use Per Tap gallons/tap	Annual Program Participants
Residential	107,531	10
Multi-Family	387,763	5
Public Authority	563,722	10

Total	1,059,016	gallons/tap/yr
Gallons saved per Household per Toilet	13,114	gallons/yr
Gallons saved per Household per Showerhead	1,503	gallons/yr
Gallons saved per Household per Faucet Aerator	5,360	gallons/yr
Total	19,977	gallons/yr
Annual Program Participants	25	/year
Max No. of Participants over Planning Period	250	
Estimated Annual Water Savings	**499,428**	gallons/yr
Estimated Savings over Planning Period	**27,468,562**	gallons

**Based on "Handbook of Water Use and Conservation" by Amy Vickers*

Notes:

Estimated Water Use is based on the following 2005-2009 average:
Residential = 0.33 af/tap
Multi-Family = 1.19 af/tap
Public Authority = 1.73 af/tap

Toilet savings assume 1.28 HET installation.
Showerhead savings assume 1.5 gpm showerhead installation.
Low Flow Faucet assumes 1.0 gpm faucet installation.

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

This program could save a household up to $40 per year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	50	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$2,500.00	
Evaluation and Follow up Costs	$300.00	/year
Annual Labor	**$2,800.00**	/year
Materials Costs		
Unit Cost	$132.00	/participant
Number of Participants	25	/year
Gallons Saved per Unit per Year	499,428	gallons
Annual Materials	**$4,109.38**	/year
Rebate Cost	$0.00	
Number of Participants	25	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost	$0.00	
One Time Labor Cost	$1,000.00	
One Time Labor/Material Cost	**$1,000.00**	

Notes:

This is a retrofit program not a rebate program. Assumes one toilet, one showerhead and one faucet aerator will be replaced per household.

Cost of Material assumes One of Each:
$100 -1.28 gpf HET Glacier Bay Toilet
$30 - 1.5 gpm showerhead
$1.5 - 0.5 gpm low flow dual-thread faucet aerator- kitchen and bathroom

Low Income Retrofit

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$70,240.29	/year
Estimated Average Annual Revenue with Water Savings	$66,229.88	/year
Annual Revenue Loss Related to Water Savings	**$4,010.41**	/year

Estimated Annual Cost	**$10,919.79**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$70,093.75**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$110,197.85**	
Cost per 1000 Gallons Saved	**$4.01**	

Commercial Water Audits

Commercial customers are often the highest water users and have been an area of increasing focus for water conservation. Commercial customers who participate in a water audit could identify ways to reduce their operating costs over the long term. Water audits can be performed by a third party consultant and is an effective way to educate businesses on how they can save water.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	5.00%

Customer Category	Water Use Per Tap gallons/tap	Annual Program Participants	*Estimated Annual Water Savings gallons/yr*
Commercial	107,531	10.0	53,765

Estimated Annual Water Savings	**53,765**	gallons/yr
Estimated Savings over Planning Period	**2,957,098**	gallons

Notes:

Estimated Water Use is based on a 0.33 AF/tap use for Commercial taps. This is the average tap use for 2005 through 2009.

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year. For example, in the first year of the program, there are 20 participants. In the second year of the program, there are water savings from the 20 participants from last year's program, and new participants thereby compounding the savings.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	8	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$400.00	
Evaluation and Follow up Costs	$300.00	/year
Annual Labor	**$700.00**	/year
Materials Costs		
Unit Cost	$500.00	/participant
Number of Participants	10	/year
Gallons Saved per Unit per Year	5,377	gallons
Annual Materials	**$5,000.00**	/year
Rebates		
Rebate Cost	$0.00	
Number of Participants	10.0	/year
		/year
One Time Labor and Material Costs		
One Time Labor Cost (program setup assistance through 3rd party)	$1,000.00	
One Time Labor/Material Cost	**$1,000.00**	

Notes:

Staff hours include time for coordination with third party consultants.

Consultants may be hired to perform audits at an estimated cost of approximately $500.00 per audit.

Commercial Water Audits

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$9,146.23	/year
Estimated Average Annual Revenue with Water Savings	$8,714.49	/year
Annual Revenue Loss Related to Water Savings	**$431.74**	/year

Estimated Annual Cost	**$6,131.74**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$58,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$62,317.36**	
Cost per 1000 Gallons Saved	**$21.07**	

Residential Audit Kit

Self-guided residential audit kits can be designed to include items such as leak detection tablets, surveys, and sprinkler testing cones. Instructions for conducting the audit and evaluating the results can give residential customers insight and direction on how they can save water and money. The guidance offered in the instructions could lead the customer to take part in other conservation programs offered, including rebates.

Planning Period	2011 to 2020
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Residential Water Use Per Tap without Savings

	Water Use (gallons/tap)	Estimated Annual Water Savings (gallons/yr)
Residential	107,531	53,765
Multi-Family	387,763	193,881
Public Authority	563,722	281,861
Total	1,059,016	529,508

Annual Estimated Savings Rate	5.00%	
Annual Program Participants	30	/year
Maximum No. of Participants over Planning Period	300	

Annual Estimated Residential Water Use Per Tap with Savings

Estimated Annual Water Savings	**529,508**	gallons/yr
Estimated Savings over Planning Period	**29,122,933**	gallons

Notes:

Estimated Water Use is based on the *following 2005-2009 average:*
Residential = 0.33 af/tap
Multi-Family = 1.19 af/tap
Public Authority = 1.73 af/tap

Estimate that by 2018, 20% of residential accounts will have participated (approx. 2,500). Assume annual participation of 50 and 3% savings of average household use.

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours (Website updates, etc.)	16	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$800.00	
Evaluation and Follow up Costs	$300.00	/year
Annual Labor	**$1,100.00**	/year
Materials Costs		
Unit Cost	$0.00	/participant
Number of Participants	0	/year
Gallons Saved per Unit per Year	0	gallons
Annual Materials	**$0.00**	/year
Rebate Cost	$0.00	
Number of Participants	30	/year
Annual Rebate Cost	**$0.00**	/year
One Time Labor and Material Costs		
One Time Materials Cost (Bulk Purchase of 2500 Audit Kits)	$1,797.00	
Water Audit Website Set Up	$400.00	
One Time Labor/Material Cost	**$2,197.00**	

Notes:

Online instruction can be set up on City Website.

Residential audit kits are available at wholesalers like AM Conservation Group, Inc. for $5.99 per unit for a bulk purchase of 1800 to 3000 units. Kits can be customized to include the City of Monte Vista's logo.

Residential Audit Kit

Water Rates

Rate Category	Current Rates/Fees
Residential, Multi-Family and Public Authority Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter).*	$20.20
Commercial Base Fee - *Includes an average of 10,000 gallons (5,000 in summer & 15,000 in winter). Assume a 1" commercial meter fee.*	$23.90
Excess Water Volume Charged per 1,000 gallons for all customer categories	$1.46

Notes:

The annual revenue loss was estimated based on: Residential rates for 3/4" & 1" meters and 1" commercial meter rates.

Revenue losses do not include outside City revenues lost.

Estimated Revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$85,962.96	/year
Estimated Average Annual Revenue with Water Savings	$81,711.02	/year
Annual Revenue Loss Related to Water Savings	**$4,251.95**	/year

Estimated Annual Cost	**$5,351.95**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$13,197.00**	
Revenue	**$55,716.48**	
Cost per 1000 Gallons Saved	**$1.91**	

APPENDIX B

Public-Review Process

Valley Courier

Alamosa Newspapers Inc.
P.O. Box 1099, 2205 State Ave.
Alamosa, CO 81101

PROOF OF PUBLICATION

STATE OF COLORADO)
) SS.
COUNTY OF ALAMOSA)

Jennifer Martinez being duly sworn, desposes and says:

1. That she is the Bookkeeper of the Valley Courier, a daily newspaper printed and published in the City of Alamosa, County of Alamosa and State of Colorado, and is competent to certify to the facts herein stated.

2. That the said Valley Courier is printed and published daily, except Sundays and legal holidays and Mondays, or is printed and published on each of any 5 days in every week exception legal holidays; and that it has a general circulation in the County of Alamosa, and in the State of Colorado and elsewhere.

3. That the said the Valley Courier was established, and has been printed and published in said County, uninterruptedly and continuously, during a period of at least six months next prior to the first issue thereof.

containing that certain legal notice entitled_____

Legal# 5310 in re: _____

Notice _____ a copy of which is hereunto attached.

4. That the said the Valley Courier is a public daily newspaper of general circulation, and that the said daily newspaper is printed and published in whole or in part in the said County of Alamosa, in which said document is required by law to be published.

5. That the said the Valley Courier is a daily newspaper within the meaning of the laws and statutes of the State of Colorado and within the meaning of Colorado Revised Statutes 1953, Chapter 109, as amended to date; and that said publication has been admitted to the United States mails as periodicals matter under the provisions of the act of March 3, 1879, or any amendments thereof.

6. That the said annexed document was published in the regular and entire editions of the Valley Courier, a duly qualified daily newspaper for that purpose, within the terms of the above named Acts.

7. That the said annexed document is a full, true, and correct copy of the original which was regularly published in each of the regular and entire issues of said daily newspaper, a legally qualified paper for that purpose, once each week, on the same day of each week, for successive

weeks by 1 insertions and

that the first publication thereof was in the issue dated

February 9 2011 and that the last

publication was in the issue dated

February 9 2011

Bookkeeper Jennifer Martinez

Subscribed and sworn to before me this 2nd day

of March 2011

Shasta Quintana Notary Public

My Commission Expires November 26, 2011

Seal

SHASTA QUINTANA NOTARY PUBLIC STATE OF COLORADO

PUBLIC NOTICE

The City of Monte Vista has com
pleted a Draft Water
Conservation Plan. The goal of th
plan is to develop
Programs for efficient and sustain
able water use. Before finalizin
the Water Conservation Plan
Monte
Vista welcomes input from its cus
tomers and will conduct a 60-da
public review period from Februar
7 through April 8, 2011. A complet
copy of the draft will available fo
review at City Hall located at
Chico
Camino and posted on the websit
at www.cityofmontevista.com.
All written comments are due a
the front desk, prior to April 11
2011 and can be dropped off o
mailed to 4 Chico Camino, Mont
Vista, CO 81144 - ATTN: Don Va
Wormer.
NO. 5310
PUBLISHED BY THE VALLE
COURIER FEBRUARY 9, 2011

INVOICE

Valley Publishing
P.O. Box 607
Monte Vista, CO 81144

2/10/2011

City of Monte Vista
4 Chico Camino
Monte Vista, CO 81144

Customer #755

2/9/2011	Legal #2519- draft water conser. plan	$16.00

Total: $16.00

Please remit copy with payment.
Thank You.

THE Monte Vista JOURNAL

Monte Vista, CO 81144
Proof of Publication

STATE OF COLORADO
COUNTY OF RIO GRANDE

I, Mary Cerny, do solemnly swear that I am a representative of the Monte Vista Journal; that the same is a weekly newspaper printed, in whole or in part, and published in the County of Rio Grande, State of Colorado, and has a general circulation therein; that said newspaper has been published continuously and uninterruptedly in said County of Rio Grande for a period of more than fifty-two consecutive weeks prior to the first publication of annexed legal notice or advertisement, that said newspaper has been admitted to the United States mails as second-class matter under the provisions of the Act of March 3, 1879, or any amendments thereof, and that said newspaper is a weekly newspaper duly qualified for publishing legal notices and advertisements within the meaning of the laws of the State of Colorado. 2519

That the annexed legal notice or advertisement was published in the regular and entire issue of every number of said weekly newspaper for the period of (1 one) consecutive insertions; and that the first publication of said notice was in the issue of said newspaper dated February 9, 2011 and that the last publication of said notice was in the issue of said newspaper dated February 9, 2011.

Mary E Cerny Subscribed and sworn before me a notary in

and for the State of Colorado this 10 day of Feb. A.D. 20 11.

Jennifer F. Alonzo
Notary Public

My Commission expires 4-24-13

JENNIFER F. ALONZO NOTARY PUBLIC STATE OF COLORADO

PUBLIC NOTICE

The City of Monte Vista has completed a Draft Water Conservation Plan. The goal of the plan is to develop programs for efficient and sustainable water use. Before finalizing the Water Conservation Plan, Monte Vista welcomes input from its customers and will conduct a 60-day public review period from February 7 through April 8, 2011. A complete copy of the draft will available for review at City Hall located at 4 Chico Camino and posted on the website at www.cityofmontevista.com.

All written comments are due at the front desk prior to April 8, 2011 and can be dropped off or mailed to 4 Chico Camino Monte Vista, CO 81144 - Attn: Don Van Wormer.

NO. 2519 Published in the Monte Vista Journal on Wednesday, February 9, 2011.

APPENDIX C

Monte Vista City Council Adoption

RESOLUTION 5-2011

A RESOLUTION ADOPTING A WATER CONSERVATION PLAN

WHEREAS, the city of Monte Vista recognizes the need to reduce water consumption, and

WHEREAS, the city of Monte Vista recognizes water conservation will help ensure the long-term availability of water to the citizens of Monte Vista, and

WHEREAS, water conservation will reduce the amount of water the city of Monte Vista may be required to purchase, and

WHEREAS, water conservation is beneficial to the long-term environmental health of the San Luis Valley, and

WHEREAS, a Water Conservation Plan is a valuable tool to implement water conservation measures.

NOW, THEREFORE BE IT HEREBY RESOLVED BY THE MONTE VISTA CITY COUNCIL THAT THE WATER CONSERVATION PLAN DEVELOPED BY CLEARWATER SOLUTIONS FOR USE BY THE CITY BE ADOPTED AND UTILIZED AS THE PRIMARY RESOURCE FOR WATER CONSERVATION IN THE CITY OF MONTE VISTA.

Read, adopted and signed this 21st day of April, 2011.

SIGNED

Jose "Art" Medina, Mayor

Attest:

Rhonda Valdez, City Clerk