Water Conservation Plan for
The St. Charles Mesa Water District

Draft Date: October 19, 2009
Revised February 8, 2010

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Meter Information

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Executive Summary

In April, 2008, St. Charles Mesa Water District (SCMWD) made an application to the Colorado Water Conservation Board (CWCB) Office of Water Conservation and Drought Planning, for a grant in the amount of $15,700. This also included an "In-Kind" contribution from SCMWD valued at $5,450. The grant was approved in June of the same year.

The purpose of the grant was to offset the cost of preparing a Water Conservation Plan for the District. In June, 2008, Young Technology Group began preliminary data collection related to same.

The Plan has been prepared, utilizing the CWCB's "Nine-Step" Planning Template. They are:

1. Profile the Existing Water System
2. Characterize Water Use and Forecast Demand
3. Profile Proposed Facilities
4. Identify Conservation Goals
5. Identify Conservation Measures and Programs
6. Evaluate and Select Conservation Measures and Programs
7. Integrate Resources and Modify Forecasts
8. Develop Implementation Plan
9. Monitor, Evaluate and Revise Conservation Activities and the Conservation Plan

During this process, several planning sessions have taken place between the District's personnel and YTG, related to identifying the conservation goals. Through this process, it was determined that the main conservation goals are:

1. Reduce the "Non-Revenue" water (water which is treated but does not show up in the accounting, mainly due to meter inaccuracies).
2. Increase efficient irrigation practices by customers.
3. Reduce overall use per customer, over time, without adversely impacting the District, financially.

The replacement of the existing meters is part of the Long Range Capital Improvement Plan (CIP). This program entails replacement of all existing meters over a 10 year span. This will benefit the district, and the individual customer(s) in the following manner:

1. The new meters shall provide a more accurate accounting of the individual customer usage. This will allow the district to better determine the amount of water which is being lost through leaks.
2. The new meters shall be radio-read, which will save the district time and money, related to the actual reading of the meters.
3. The new meters shall allow the district a more accurate accounting of the effects of the various conservation measures and programs, which the district implements.
4. The new meters come with a meter monitor, which is a remote receiver and display, which allows customers to monitor their individual water use. The unit also comes with a leak detection alert.

In order to accomplish these tasks, a series of 10 conservation measures and programs have been analyzed for implementation. Some of the individual programs are combined for this narrative. In general, they are as follows:

1. Replacement of all individual meters, over a 10 year period, commencing in 2010, and complete in 2020 (Approximately 400 meter annually).
2. Leak Detection and Replacement of leaking mains.
3. Low Water Use Landscapes
4. Efficient Irrigation Practices
5. Customer installation of Low Flow Plumbing Fixtures and Appliances. This includes a rebate program by the District to the customer.

The Conservation Plan contains an interactive spreadsheet, which calculates the results of the implementation of the measures and programs mentioned above. It is meant to be used as a guide, in order to determine the effectiveness of the various programs and measures.

The proposed programs and measures are diverse in nature and initially limited in scope. The purpose is to identify those programs and measures which are most effective, and consider wider application, if appropriate. Also, to identify any programs and measures which are not effective and either eliminate or modify them.

Initially, the Conservation Plan shall be monitored annually, immediately following the District's annual accounting audit. This should provide enough information to determine the effectiveness of the various programs and measures.

One of the main goals is to reduce per unit consumption, without adversely effecting District revenues. This will require initial, minimal implementation, to avoid a negative impact on the District.

Currently, the model predicts a minor reduction in overall water consumption, assuming that the conservation measures and programs are effective. Assuming a growth rate of 1%, the loss in revenue, due to a drop in per capita use, will be offset by growth and collection of tap fees. Also, the per capita reduction in use will allow the postponement of some of the system upgrades which are related to supply capacity. This will allow the District additional time to accumulate capital reserves prior to performing some of the supply capacity upgrades.

Water Saving Tips:

1. When brushing your teeth, or shaving, don't let the water run continuously. Use a glass of water when brushing teeth, and only run water when cleaning razor.
2. Bathe in the tub when possible, filling tub with just a few inches of water. Showers should be as brief as possible. Turn off water while lathering up and then back on to rinse.
3. Keep a large plant watering container near the faucet. While waiting for hot water, simply capture the cold water in the watering container, until hot water is available. The captured water should be used to water plants.
4. When doing laundry or using dish washer, always run full loads. If you can't wait, make sure the water level setting is correct.

5. Always repair leaks in faucets, toilet tanks, control valves and sprinklers. A small leak can waste up to 6,000 gallons per year.
6. Run your evaporative cooler only when necessary. An evaporative cooler can use 10 to 30 gallons per day. Run your cooler vent as much as possible until the temperature in your home requires you to cool.
7. Water only in the early morning or late evening, to reduce evaporation. Keep sprinklers adjusted so they are not spraying sidewalks and driveways. If you have a dry spot, water by hand. Mow your lawn at no lower than 3 inches, to help it keep the moisture in the soil.
8. Water trees and shrubs by hand. Don't let water run unattended.
9. Don't wash your patios or sidewalks. Sweep them off.
10. Washing your car should be done using a bucket or a hose with a control valve. Don't let the hose run, even on your lawn.
11. One inch of water a week, is generally recommended, to maintain a viable landscape, including vegetables, turf, trees and flowers.
12. One inch of water:

    Over 1,000 square feet = 624 gallons. Over 1-acre = 27,200 gallons.

    At a rate of 10 gallons per minute, it will require approximately 1 hour to add 1 inch of water, to a 1,000 square foot lawn.

    One Gallon = 15,100 drops, 16 cups, 8 pints, 4 quarts, 128 fluid ounces, 8.34 pounds.

    One Cubic foot of water contains 7.48 gallons of water.

    1-acre•foot of water = 12" (one foot) deep, over 1-acre (43,560 square feet) = 325,851 gallons.

All of the above information is available on the **District's Web Site**

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1.0 Name and Contact Information

St. Charles Mesa Water District : District Office 1397 Aspen Road Pueblo, CO 81006
Regular Office hours: 10:00 a.m. – 12:00 p.m., 1:00 p.m. – 4:30 p.m. Monday-Friday
Office Telephone: (719) 542-4380 Fax: (719) 542-4862 Emergency: (719) 542-4380

Key Personnel:
David K. Simpson, District Manager
Donald R. Williams, Operations Manager
Susann F. Long, Administrative Assistant & Bookkeeper
Michael M. Cid, Treatment Plant Operator, Class A Water

1.01 Organizations and Individuals assisting with Plan Development

St. Charles Mesa Water District: David K. Simpson, District Manager

Southeastern Colorado Water Conservancy District: Jean Van Pelt, Conservation Outreach Coordinator

Young Technology Group: Ken Young, P.E., Owner

1.1 Physical Characteristics of the Existing Water Supply System

The St. Charles Mesa is a geographic region located just east, and adjacent to the City of Pueblo, Colorado. The area is characterized as a "Table top mesa" which is bounded by the Arkansas River on the north, and is bisected by the St. Charles River, which is tributary to the Arkansas River.

The St. Charles River is essentially the delineator between the higher density residential and business developments located to the west, and the more urban, agricultural area located to the east of the river.

The St. Charles Mesa Water District (SCMWD) was formed in 1963 as a water association, by a group of residents and land owners who were committed to creating a not for profit water utility to provide potable water to the residents and businesses on the St. Charles Mesa. In 1988, the association's members voted to convert to a Water District.

The District encompasses approximately 65 square miles. The majority of the system is located in Zone 1, which was the original district boundary. In 1999, the District absorbed the Huerfano Water District into its service area (Zone 2) and includes 152 taps. Zone 2 is currently under a moratorium for new taps.

The District currently serves a population of 10,921. As of May, 2009 there are 3,853 residential taps and 185 commercial (non residential) taps and eight (8) Institutional (School District No. 70) taps. The current average daily use for residential taps is 350 gallons per day, and 1,400 gallons per day for commercial (non residential) taps and 26,000 gallons per day for Institutional (School District No. 70) taps. The largest use is irrigation of lawns by Institutional (School District No. 70) customers. The customers with the highest irrigation usage are Pueblo County High School and South Mesa Elementary School. The largest commercial, non-irrigation user is Mission Foods.

The main components of the overall water system are the 5 MGD treatment facility, 1,800 Acre-Foot Raw Water Storage Reservoir, raw water delivery pipeline from the Bessemer Ditch and 185 miles of distribution piping. There are also four auxiliary wells.

1.2 Water Sources

The following is a summary of the raw water sources which the District utilizes:

1. The Arkansas River Pump Station, which is located approximately 1 mile west of the westerly district boundary, which diverts water from the Arkansas River and pumps the raw water to the raw water storage reservoir (5.5 miles to the east) via a 14" diameter pipeline. A booster pump station is located midway along the transmission line. This is available from November through March.
2. Bessemer Ditch Diversion Number 1 is located at 21st Lane and South Road, and is pumped to the 90 acre-foot raw water reservoir via a 12" diameter pipeline.
3. Bessemer Ditch Diversion Number 2 is located approximately 1 mile west of the 1,800 acre-foot raw water reservoir and is delivered via a 30" diameter gravity pipeline. Both of the Bessemer Ditch Diversions are used during the irrigating season (March 15 – November 15).
4. Cottonwood Creek is a primary source which is utilized between April and October.
5. Zoeller Ditch is a primary source which can be utilized year round.
6. Velasquez Creek is a supplemental source which can be utilized from November 15 through March 15, and has a winter storage priority.
7. Wells #1, #6, #8 and #10 are utilized mainly from March through November.
8. The District also attempts to maintain an annual storage of approximately 2,000 acre-feet of project water in Pueblo Reservoir.

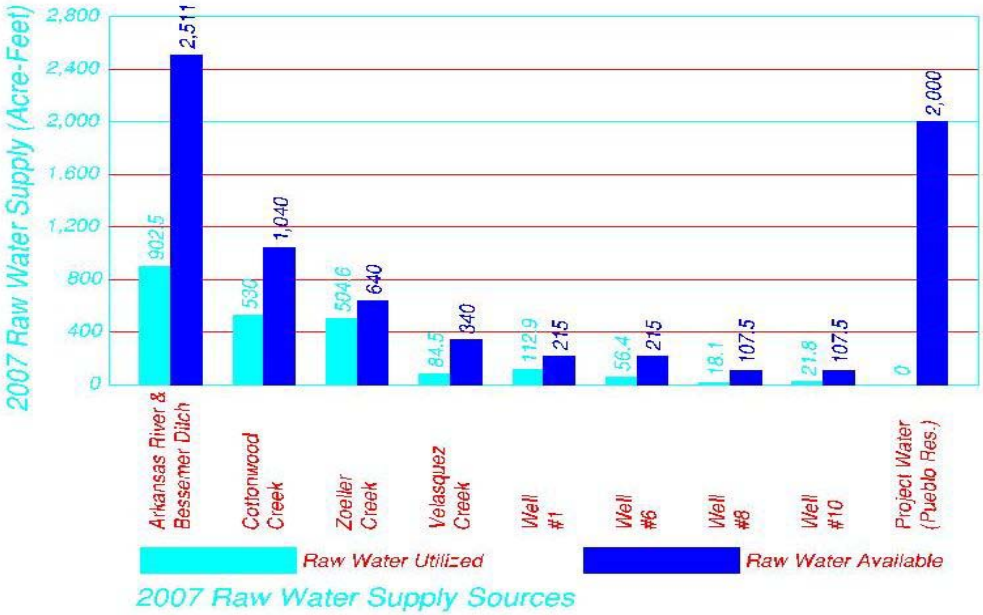

Figure 1.2 – St. Charles Mesa Water District Raw Water Supply Sources

All of the surface water sources, except Bessemer Ditch Diversion #1, are piped to Raw Water Reservoir #2, which has a storage capacity of 1,800 acre-feet. The wells are piped to a central chlorination facility at 21st Lane, Raw Water Reservoir #1, which has a storage capacity of 90 acre-feet, receives water from Bessemer Ditch diversion #1 at 21st Lane.

1.3 System Limitations

The St. Charles Mesa Water District is not located within a designated critical water supply area, nor does the system experience frequent water supply shortages. In fact, the District has never had to institute mandatory water restrictions. During the summer of 2002, in the midst of a region-wide drought, the District did institute voluntary lawn watering restrictions for the first time since its inception. This was done in order to protect the stored raw water reserve, in the event of a protracted drought. The result was almost 100% compliance by the users.

1.4 Water Costs and Pricing

From its inception, the District has made every effort to minimize cost to the user, while maintaining a viable system. In order to promote responsible use, the District has always utilized an inclining block rate. In 2006, the District retained the services of Integrated Utilities, Inc. to perform a rate and tap fee study. The result was a tiered rate structure and various tap fees based on location. The purpose of the tiered rate structure was to encourage high-end users to irrigate more efficiently.

The tap fees were divided into two main categories. The first for users located west of the St. Charles River, where the density is highest and the tap fee low, and the second for users located east of the St. Charles River, where the density is very low.

The following is a summary of the current Tap Fees:

Table 1.4a – St. Charles Mesa Water District Tap Fee Structure

ST. CHARLES MESA WATER DISTRICT							
2007 WATER TAP FEES / MAY 11, 2006 / REVISION OF ARTICLE XI, SECTION 19.01							
Base on Integrated Utilities Plant Investment Fee Study and Financial Plan Prepared for St. Charles Mesa Water District and adopted by the Board of Directors December 13, 2006							
Bessemer Irrigation Ditch Company shares must be provided by applicant at no charge to the District or purchased from the water bank prior to recordation of Final Plat of Subdivision or prior to request for connection to District's water system, whichever occurs first.							
Article XI, Section 19.01 - Revised and Adopted May 10, 2008							
WEST OF THE ST. CHARLES RIVER							
Size	**Maximum Flow Rate**	**Bessemer Ditch Shares Req. per tap**	**Meter Equiv. ratio**	**Reimbursement fee**	**Improvement fee**	**Installation cost**	**Water Tap Total cost**
5/8"x3/4"	20	1	1	$2,075.00	$3,635.00	$1,000.00	$6,710.00
1"	50	2	1.7	$3,527.50	$6,179.50	$1,500.00	$11,207.00
1-1/2"	120	7	3.3	$6,847.50	$11,995.50	$3,000.00	$21,843.00
No water tap larger than 1-1/2 inch can be installed west of the St. Charles River without being evaluated by the District's hydraulic model and approved by the Board of Directors							
2"	160	10	5.3	$10,997.50	$19,265.50	$5,000.00	$35,263.00
3"	320	25	10.7	$22,202.50	$38,894.50	$10,000.00	$71,097.00
4"	500	40	16.7	$34,652.50	$60,704.50	$25,000.00	$120,357.00

EAST OF THE ST. CHARLES RIVER							
Size	**Maximum Flow Rate**	**Besseme r Ditch Shares Req. per tap**	**Meter Equiv. ratio**	**Reimbursement fee**	**Improvement fee**	**Installation cost**	**Water Tap Total cost**
5/8"x3/4"	20	1	1	$2,075.00	$9,946.00	$1,000.00	$13,021.00
1"	50	2	1.7	$3,527.50	$16,908.20	$1,500.00	$21,935.70
No water tap larger than 1 inch can be installed east of the St. Charles River without being evaluated by the District's hydraulic model and approved by the Board of Directors							
1-1/2"	120	7	3.3	$6,847.50	$32,821.80	$3,000.00	$42,669.30
2"	160	10	5.3	$10,997.50	$52,713.80	$5,000.00	$68,711.30
3"	320	25	10.7	$22,202.50	$106,422.20	$10,000.00	$138,624.70
4"	500	40	16.7	$34,652.50	$166,098.20	$25,000.00	$225,750.70

The following is a summary of the District's current water rates, based on tap size, with a tiered rate structure, based on the Integrated Utilities Study.

Table 1.4b – St. Charles Mesa Water District Water Rate Structure

St. Charles Mesa Water District

2009 WATER RATES

							Cost Per
Rate Code 1	Meter 5/8 X 3/4 Residential				Cumulative		1,000 Gal.
First	0	Gallons			**$17.50**	Minimum	17.50
Next	5,000	Gallons	$0.92	5,000	$22.10		4.4200
Next	30,000	Gallons	$1.60	35,000	$70.10		2.0029
All Over	35,000	Gallons	$2.36	70,000	$152.70		2.1814
Rate Code 2	HWD 5/8X3/4"Meter Residential				Cumulative		1,000 Gal.
First	0	Gallons			**$17.50**	Minimum	17.50
Next	5,000	Gallons	$1.08	5,000	$22.90		4.5800
Next	25,000	Gallons	$1.96	30,000	$71.90		2.3967
All Over	30,000	Gallons	$2.90	60,000	$158.90		2.6483

Rate Code 3	HWD 5/8X3/4"Meter Residential				Cumulative		1,000 Gal.
First	0	Gallons			**$29.75**	Minimum	29.75
Next	5,000	Gallons	$1.08	5,000	$35.15		7.0300
Next	25,000	Gallons	$1.96	30,000	$84.15		2.8050
All Over	30,000	Gallons	$2.90	60,000	$171.15		2.8525
Rate Code 4	5/8 X 3/4 COMMERCIAL				Cumulative		1,000 Gal.
First	0	Gallons			**$17.50**	Minimum	17.50
Next	12,000	Gallons	$1.31	12,000	$33.22		2.7683
Next	70,000	Gallons	$1.90	82,000	$166.22		2.0271
All Over	82,000	Gallons	$3.77	164,000	$475.36		2.8985
Rate Code 5	1'" Meter COMMERCIAL				Cumulative		1,000 Gal.
First	0	Gallons			**$29.75**	Minimum	29.75
Next	5,000	Gallons	$0.92	5,000	$34.35		6.8700
Next	30,000	Gallons	$1.60	35,000	$82.35		2.3529
All Over	35,000	Gallons	$2.36	70,000	$164.95		2.3564
Rate Code 6	1" Meter COMMERCIAL				Cumulative		1,000 Gal.
First		Gallons			**$29.75**	Minimum	29.75
Next	20,000	Gallons	$1.31	20,000	$55.95		2.7975
Next	260,000	Gallons	$1.90	280,000	$549.95		1.9641
All Over	280,000	Gallons	$3.77	560,000	$1,605.55		2.8671
Rate Code 7	11/2" Meter COMMERCIAL				Cumulative		1,000 Gal.
First	0	Gallons			**$57.75**	Minimum	57.75
Next	40,000	Gallons	$1.31	40,000	$110.15		2.7538
Next	560,000	Gallons	$1.90	600,000	$1,174.15		1.9569
All Over	600,000	Gallons	$3.77	1,200,000	$3,436.15		2.8635
Rate Code 8	1 1/2" LANDFILL				Cumulative		Cost Per 1,000 Gal.
First	0	Gallons			**$57.75**	Minimum	57.750
Next	75,000	Gallons	$2.23	75,000	$225.00		3.0000

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Next	300,000	Gallons	$3.59	375,000	$1,302.00		3.4720
All Over	375,000	Gallons	$5.34	750,000	$3,304.50		4.4060
Rate Code							
9	2" Meter COMMERCIAL				Cumulative		1,000 Gal.
First	0	Gallons			**$92.75**	Minimum	92.75
Next	64,000	Gallons	$1.31	64,000	$176.59		2.7592
Next	800,000	Gallons	$1.90	864,000	$1,696.59		1.9636
All Over	864,000	Gallons	$3.77	1,728,000	$4,953.87		2.8668
Rate Code							
10	3" METER COMMERCIAL				Cumulative		1,000 Gal.
First	0	Gallons			**$187.25**	Minimum	187.25
Next	128,000	Gallons	$1.31	128,000	$354.93		2.7729
Next	1,200,000	Gallons	$1.90	1,328,000	$2,634.93		1.9841
All Over	1,328,000	Gallons	$3.77	2,656,000	$7,641.49		2.8771
Rate Code							
11	4" METER COMMERCIAL				Cumulative		1,000 Gal.
First	0	Gallons			**$292.25**	Minimum	292.25
Next	200,000	Gallons	$1.31	200,000	$554.25		2.7713
Next	2,000,000	Gallons	$1.90	2,200,000	$4,354.25		1.9792
All Over	2,200,000	Gallons	$3.77	4,400,000	$12,648.25		2.8746

1.5

1.6 Current Policies and Planning Initiatives

In 2000, the District promoted alternate landscape practices for all customers, especially large irrigators. This program has had some success, and continued implementation is planned. In 2002, lawn watering information was provided to all customers. This has resulted in lower overall usage. The largest decline was seen in 2004, after the drought. This can be seen in Table 1.6, Table 2.1 and Figure 2.1.

In 2005, a Long Range Plan for Capital Improvements was prepared by the District. The majority of the projects are listed in Worksheet 3-1. The following is a brief summary of the Long Range Capital Improvement Plan:

Table 1.5 – St. Charles Mesa Water District Long Range Plan for Capital Improvements

Long Range Plan for Capital Improvements	
Year	**Project Name(Description)**
2006	Upgrade Office Computer System
2006	Distribution System Maps (Phase 1)
2006	3,600 GPM Aerator (RWRes. #2)
2007	Distribution System Maps (Phase 2)
2007	50 HP Tractor & Mower
2007	8-Inch Main Hillside Rd. to Hwy. 50
-	8, 6, 4&2 Inch Mains 30th $ Everett
2008	Distribution System Maps (Phase 3)
2008	8-Inch Main Everett Rd. (30th-Baxter)
2008	Recoating interior 2.5MG Storage Tank
2009	2.5 Ton Cap. Side Shift Forklift
2009	8-Inch Main 35th Lane (South Rd.-Jersey Rd.)
2010	12-Inch Main 21st Lane (Gale Rd-S. of Hwy. 50)
2010	8-Inch Main 35th Lane (Jersey Rd.-Hwy. 50)
2011	2.5 MG Tank - LaSalle Road Site
2011	12-Inch Main 21st Lane (Iris Rd.-Ex. 12-Inch)
2012	2MGD Microfloc Filter 29850 South Rd.
2013	6-Inch Main Baxter Rd. (Daniel Rd.-Everett)
2013	8-Inch Main Hwy. 50 (on Gale Rd. to 35th Lane)
2014	6-Inch Main Hwy. 50 (35th Lane-36th Lane)
2015	12-Inch Main Gale Rd. (21st Lane-25th Lane)
2016	12-Inch Main Gale Rd. (25th Lane-27th Lane)
2016	4-Inch Main Cortner Rd. (John Gage-South Rd.)
2016	6-Inch Main Hwy. 50 (41st Lane-42nd Lane)
2017	8-Inch Main Hwy. 50 (Baxter Rd. to SC Bridge)
2018	12-Inch Main Gale Rd. (27th Lane-29th Lane)
2019	4-Inch Main 23rd Lane (Everett Rd.-Goodman)
2019	12-Inch Main 25th Lane (South Rd.-County Farm Rd.)
2020	1MGD Microfloc Filter 1440 21st Lane
2020	Chemical Treatment Equip. 1440 21st Lane
2021	8-Inch Main Hwy. 50 (SC Bridge-32nd Lane)
2022	8-Inch Main Hwy. 50 (32nd Lane-35th Lane)

2023	Change Water Meters to Radio Read
2024	Change Water Meters to Radio Read
2024	6-Inch Main 39th Lane (South Rd.-Jersey rd.)
2025	Change Water Meters to Radio Read

1.7 Current Water Conservation Activities

At present, the District does not have any mandatory conservation policies in place. The combination of the inclining block rates, voluntary alternate landscape practices, voluntary irrigation guidelines and voluntary irrigation restrictions (when implemented) have resulted in a net drop in overall use, from 2000 to 2004, and again from 2005 to 2007. The drop in use is even more profound when comparing the increase in taps versus total use.

Table 1.6 – St. Charles Mesa Water District Total Use per Tap

Year	# Taps	Growth	Usage	Use/Tap
		%	Ac.-Ft.	Ac.-Ft./Tap
2000	3,771	-	2,011	0.53
2001	3,806	0.93%	1,971	0.52
2002	3,850	1.16%	1,908	0.50
2003	3,900	1.30%	1,823	0.47
2004	3,926	0.67%	1,701	0.43
2005	3,961	0.89%	1,910	0.48
2006	3,991	0.76%	1,917	0.48
2007	4,021	0.75%	1,793	0.45

Step 2 – Characterize Water Use and Forecast Demand

2.1 Current Water Use

The following is a summary of water use by customer class. There are three distinct classes. 1-Residential, 2-Commercial and 3-Institutional (Schools).

Table 2.1a – St. Charles Mesa Water District Total Use per Customer Class

Year	# Taps Residential	Growth %	Usage Ac.-Ft.	Use/Tap Ac.-Ft./Tap
2000	3,606	-	1,684	0.47
2001	3,639	0.92%	1,609	0.44
2002	3,681	1.15%	1,611	0.44
2003	3,729	1.30%	1,487	0.40
2004	3,753	0.64%	1,383	0.37
2005	3,786	0.88%	1,549	0.41
2006	3,810	0.63%	1,559	0.41
2007	3,835	0.66%	1,499	0.39

Year	# Taps Commercial	Growth %	Usage Ac.-Ft.	Use/Tap Ac.-Ft./Tap
2000	161	-	327	2.03
2001	163	1.24%	267	1.64
2002	165	1.23%	209	1.27
2003	167	1.21%	250	1.50
2004	169	1.20%	208	1.23
2005	171	1.18%	259	1.51
2006	177	3.51%	242	1.37
2007	182	2.82%	177	0.97

Year	# Taps Institutional	Growth %	Usage Ac.-Ft.	Use/Tap Ac.-Ft./Tap
2001	8	-	95	11.84
2002	8	0.00%	88	11.03
2003	8	0.00%	86	10.78
2004	8	0.00%	110	13.80
2005	8	0.00%	102	12.79
2006	8	0.00%	116	14.45
2007	8	0.00%	115	14.40

From the above data, it can be seen that the majority of the Residential customers have shown a steady decrease in irrigation use. There is a small increase beginning again in 2005, but subsequent years (2006, 2007) have indicated a slow decrease. It is belief that the summer after the drought (2004) a slight increase occurred since residences were no longer under voluntary lawn watering restrictions. The Commercial customers reflect a similar pattern between 2001 and 2007. The Institutional customers have shown an overall increase in lawn irrigation between 2004 and 2007. This is partially due to the fact that some of the facilities have added new areas which need to be irrigated.

In order to quantify the in-house use vs. irrigation usage, the total use during the winter months (December – March) was used as a baseline to determine average monthly in-house water usage. The following table illustrates the "winter usage" for all use categories.

Table 2.1b – St. Charles Mesa Water District Average Winter Water Usage

Year	Dec. Usage Ac.-Ft.	Jan. Usage Ac.-Ft.	Feb. Usage Ac.-Ft.	Mar. Usage Ac.-Ft.	Avg. Usage Ac.-Ft.
2000	74.8	85.2	78.5	78.9	79.4
2001	75.0	78.2	79.8	67.8	75.2
2002	67.9	80.2	75.7	73.6	74.4
2003	71.3	72.9	70.6	64.8	69.9
2004	69.7	83.9	67.1	61.6	70.6
2005	76.2	72.1	64.7	68.3	70.3
2006	69.7	80.7	65.3	75.1	72.7
2007	73.4	69.8	67.4	69.8	70.1
Avg.	72.3	77.9	71.1	70.0	72.8

The above Table 2.1b is calculated for all use sectors.

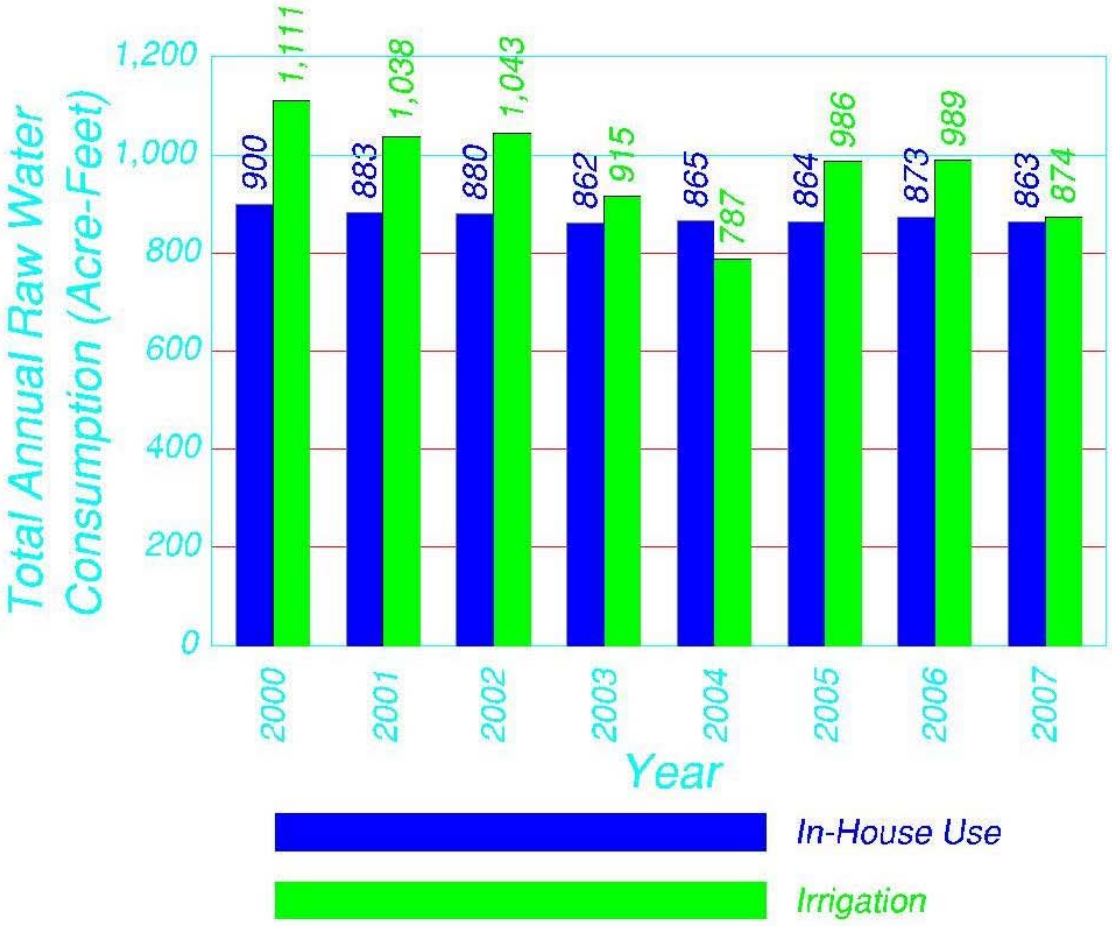
The irrigation use is calculated as the difference of the total use during April through November less the average use between December through March, and yields the following:

Table 2.1c – St. Charles Mesa Water District Average Irrigation Usage

Year	April Usage Ac.-Ft.	May Usage Ac.-Ft.	June Usage Ac.-Ft.	July Usage Ac.-Ft.	Aug. Usage Ac.-Ft.	Sep. Usage Ac.-Ft.	Oct. Usage Ac.-Ft.	Nov. Usage Ac.-Ft.	Avg. Usage Ac.-Ft.	Cumulative Usage Ac.-Ft.
										Irrigation
2000	99.4	175.7	278.6	304.5	257.6	292.7	179.2	105.9	211.7	1,111.2
2001	104.5	175.6	232.3	292.8	242.1	260.4	169.1	143.7	202.6	1,038.1
2002	129.1	231.1	275.3	303.0	285.3	214.4	105.1	82.2	203.2	1,043.1
2003	89.4	157.5	195.2	247.9	299.6	215.8	172.6	118.9	187.1	914.5
2004	118.8	136.6	256.5	206.5	197.8	190.4	157.7	104.7	171.1	786.6
2005	89.9	147.5	243.6	305.8	282.9	245.2	161.2	92.6	196.1	986.3
2006	131.3	202.7	287.9	278.7	262.0	198.2	138.3	72.6	196.5	989.3
2007	113.4	115.9	182.2	274.7	245.1	224.4	188.2	112.0	182.0	873.5
Avg.	109.5	167.8	244.0	276.7	259.1	230.2	158.9	104.1		
Avg. Winter	72.8	72.8	72.8	72.8	72.8	72.8	72.8	72.8		
Avg. Irrigation	36.7	95.0	171.2	203.9	186.3	157.4	86.1	31.3		967.8

The average irrigation water use from 2000 to 2007 is 52.7% of the total annual water consumption. The overall use trend is downward, from 2003 during the extended drought. The irrigation use has continued to lag behind pre-drought years, immediately preceding this period. The following graph explains the total, annual, in-house use and total irrigation use, by calendar year.

Figure 2.1 – St. Charles Mesa Water District Total Annual Raw Water Consumption



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http://www.stcharlesmesawaterdistrict.org/

The following is a list of the 6 customers with the highest usage, from the period of May, 2008 to April, 2009:

Table 2.1d – St. Charles Mesa Water District – Largest Water Use by Customer

	County High School		S. Mesa Elementary		Mission Foods	
Month	**Use**	**Cost**	**Use**	**Cost**	**Use**	**Cost**
	(1,000 Gallons)	**($)**	**(1,000 Gallons)**	**($)**	**(1,000 Gallons)**	**($)**
January	178	$525.43	32	$134.67	665	$1,375.23
February	293	$730.95	16	$113.71	606	$1,263.13
March	695	$1,494.75	37	$141.22	721	$1,481.63
April	1,008	$2,089.45	144	$328.59	856	$1,738.13
May	3,080	$7,610.25	1,308	$3,344.31	742	$1,506.69
June	2,150	$4,216.25	1,580	$4,364.31	820	$1,653.33
July	2,376	$4,970.25	1,791	$5,155.56	833	$1,677.77
August	2,524	$5,525.25	1,578	$4,356.81	957	$1,910.89
September	1,765	$3,492.45	1,584	$4,379.31	864	$1,736.05
October	1,986	$3,907.93	1,229	$3,048.06	771	$1,561.21
November	605	$1,311.65	218	$464.83	563	$1,170.17
December	229	$604.77	28	$128.87	573	$1,188.97
TOTALS	**16,889**	**$36,479.38**	**9,545**	**$25,960.25**	**8,971**	**$18,263.20**

	PV Middle School		Vineland Elementary		Cesar Dairy	
Month	**Use**	**Cost**	**Use**	**Cost**	**Use**	**Cost**
	(1,000 Gallons)	**($)**	**(1,000 Gallons)**	**($)**	**(1,000 Gallons)**	**($)**
January	15	$112.40	43	$115.85	158	$318.15
February	38	$142.53	74	$174.75	42	$97.75
March	44	$150.39	74	$174.75	39	$92.05
April	92	$229.79	194	$402.75	36	$86.35
May	1,031	$2,305.56	852	$2,107.15	474	$1,271.85
June	1,044	$2,354.31	773	$1,810.90	491	$1,335.60
July	1,103	$2,575.56	816	$1,972.15	507	$1,395.60
August	1,040	$2,339.31	1,060	$2,887.15	542	$1,526.85
September	912	$1,859.31	908	$2,317.15	485	$1,313.10
October	911	$1,855.56	494	$962.87	178	$352.59
November	205	$440.39	31	$97.74	34	$81.87
December	30	$131.45	32	$99.03	24	$63.07
TOTALS	**6,465**	**$14,496.56**	**5,351**	**$13,122.24**	**3,010**	**$7,934.83**

Irrigation of large areas of lawn is the reason for the increased usage during the irrigating season, for the four Institutional (public schools) customers listed above. The exceptions are Mission Foods, whose usage is more directly related to its business operation, and Cesar Dairy, which uses some of its water for cattle watering. The District has provided resources related to efficient irrigation methods to all of these customers, particularly to School District No. 70. During 2002 this information was disseminated as an information packet in the monthly water bills. The following is a summary of the resource information:

- When brushing your teeth, or shaving, don't let the water run continuously. Use a glass of water when brushing teeth, and only run water when cleaning razor.
- Bath in the tub when possible, filling tub with just a few inches of water. Showers should be as brief as possible. Turn off water when lathering up, and then back on to rinse.
- Keep a large plant watering container near the faucet. While waiting for hot water, simply capture the cold water in the watering container, until hot water is available The capture water should be use to water plants.
- When doing laundry, or using the dishwasher, always run full loads. If you can't wait, make sure the water level setting is correct.
- Always repair leaks in faucets, toilet tanks, control valves and sprinklers. A small leak can waste up to 6,000 gallons per year.
- Run your evaporative cooler only when necessary. An evaporative cooler can use 10 to 30 gallons per day. Run you cooler vent as much as possible until the temperature in your home requires you to cool.
- Water lawns only in there early morning or late evening, to reduce evaporation. Keep sprinklers adjusted so they are not spraying sidewalks or driveways. If you have a dry spot, water by hand. Mow you lawn at no more than 3 inches tall, to help it keep the moisture in the soil.
- Water trees and shrubs by hand. Don't let water run unattended.
- Don't wash your patios or sidewalks. Sweep them off.
- Washing your car should be done using a bucket, or a hose with a control valve. Don't let the hose run, even on your lawn.
- One inch of water per week, is generally recommended, to maintain a viable landscape, including vegetables, turf, trees and flowers.
- One inch of water: Over 1,000 square feet equals 624 gallons. Over 1 acre = 27,200 gallons. At a rate of 10 gallons per minute, it will require approximately 1 hour to add 1 inch of water, to a 1,000 square foot lawn. One Gallon = 15, 100 drops, 16 cups, 8 pints, 4 quarts, 128 fluid ounces, 8.34 pounds. One cubic foot of water contains 7.48 gallons of water. 1 acre-foot of water is 1-foot deep, over 1-acre = 325,851 gallons.
- All of the above information is available at the District's web site: stcharlesmesawaterdistrict.org

Additionally, Mr. David Simpson had individually contacted the Institutional customers during that same period. This limited program met with some success, which can be seen in Table 2.1a, on sheet 8. During 2002, there was a substantial drop in use, from the previous year.

2.2 Forecasting Method

The forecast demand is projected in Worksheet 2-1, by the number of taps, and also by population. The forecast is based on a growth rate of 1%.

2.3 Demand Forecast

The demand forecast shown below is for all users, regardless of type. This does not include any water conservation, other than the voluntary programs which are in currently in place

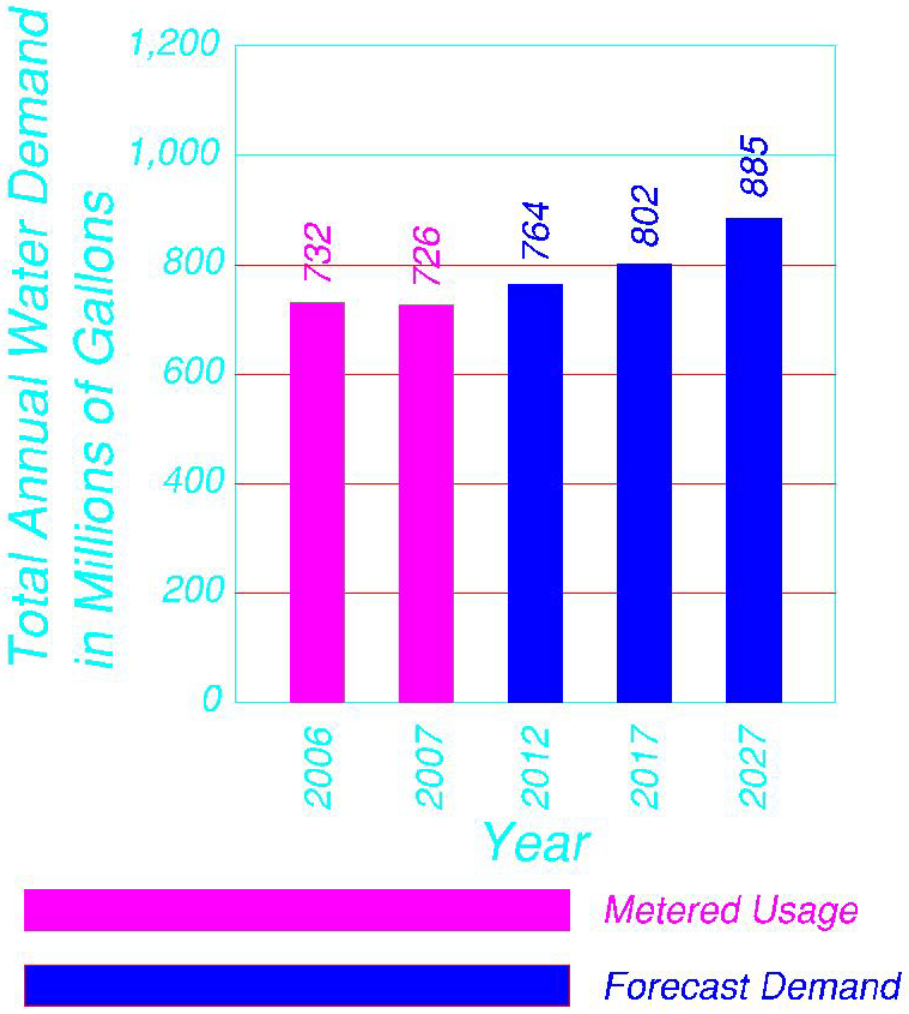


Figure 2.3 – St. Charles Mesa Water District Forecast Demand without Conservation

Step 3 – Profile Proposed Facilities

3.1 Facility Needs

In 2005, the St. Charles Mesa Water District developed a Long Range Capital Improvement Plan, and it is attached in the folder at the end of this report. The proposed improvements contained therein are a comprehensive needs list, and not all of the items are directly related to water use, or conservation. However, the majority of the costs associated are directly relevant to providing additional raw, or treated water, increased storage and distribution capacity. In addition, one of the main areas of concern is non-revenue water. That is, treated water, which is utilized by the customer, but which is not being properly metered, and therefore, not being paid for, by the customer. It is believed that this is due to inaccurate metering due to deterioration in the individual meters themselves. Many of the original water meters, which were installed in the early 1970's, are still in use today. Recently, a sample of these meters were replaced with radio read meters. The old meters were tested by the District, yielding the following results:

Table 3.1 – St. Charles Mesa Water District Meter Testing Data

METER TESTS						
TYPE	**Flow rate**	**1/4 GPM**		**2 GPM**		**15 GPM**
NEPTUNE	Accuracy	0%		90%		97.30%
SENSUS		85.50%		80%		98.40%
HERSEY		0%		20%		83.50%
SENSUS		3%		95%		95.40%
SENSUS		90.20%		100%		99.80%
TRIDENT		70.20%		100%		99.50%
SENSUS		74%		100.50%		99.20%
HERSEY		0%		90%		94.20%
HERSEY		80.10%		100%		98.50%
AVG.		**45%**		**86%**		**96.20%**

As can be seen from the test results, some of the low flows do not even register on 3 of the old meters. The moderate flows are off by an average of 14% (low), while the high flows are still relatively accurate.

Currently, and for the foreseeable future, the District has an abundance of raw water, in the form of senior surface water rights, wells, raw water storage and project water. However, the existing well sources will be taken out of service at some point in the future. This is particularly true if the majority of the shares in the Bessemer Ditch are sold. This is due to the fact that the seepage from the unlined irrigation ditch is tributary to the existing wells, and the wells are only utilized when the ditch is flowing.

The District intends to add 2 Million Gallons per Day (MGD) capacity to its main treatment plant, in 2012. In addition, they intend to add 1 MGD capacity to their secondary plant in the year 2020. This will give a total treatment capacity of 8 MGD in 2020, an increase of 3.0 MDG.

Additional upgrades in pumping and distribution are planned through the year 2025, which are intended to provide additional capacity and higher system pressure.

At present, there are three small sanitation districts which provide sanitary sewer service to customers in the St. Charles Mesa Water District. They are:

1. St. Charles Mesa Sanitation District
2. Salt Creek Sanitation District
3. Blende Sanitation District

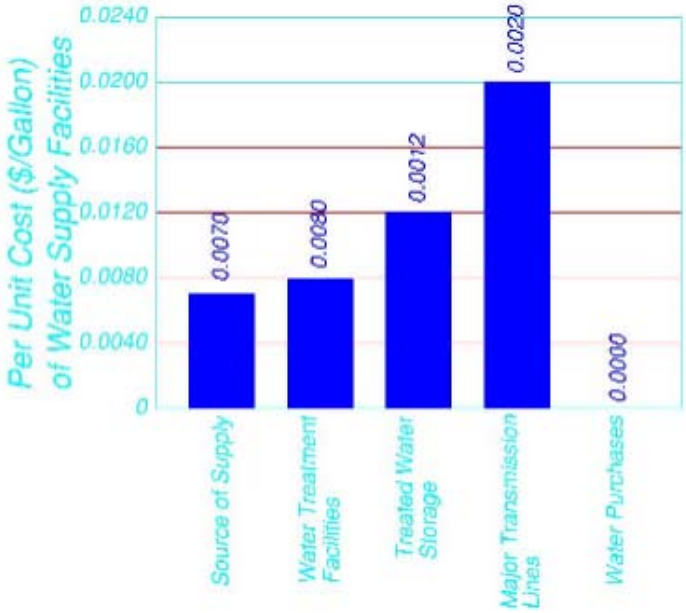
In total, the 3 districts presently serve 430 customers. No additional service is anticipated by any of these entities.

The vast majority of the residences and businesses located in the District's service boundary are presently utilizing Individual Sewage Disposal Systems (ISDS) consisting of a septic tank and leach field. The fact that no further sanitary sewer service is anticipated has tended to limit dense development, particularly for the future, as the minimum lot size required for ISDS systems has increased to 30,000 square feet minimum.

3.2 Incremental Cost Analysis

The following is a summary of the per unit costs ($/Gallon) associated with the various planned supply-side capacity improvements:

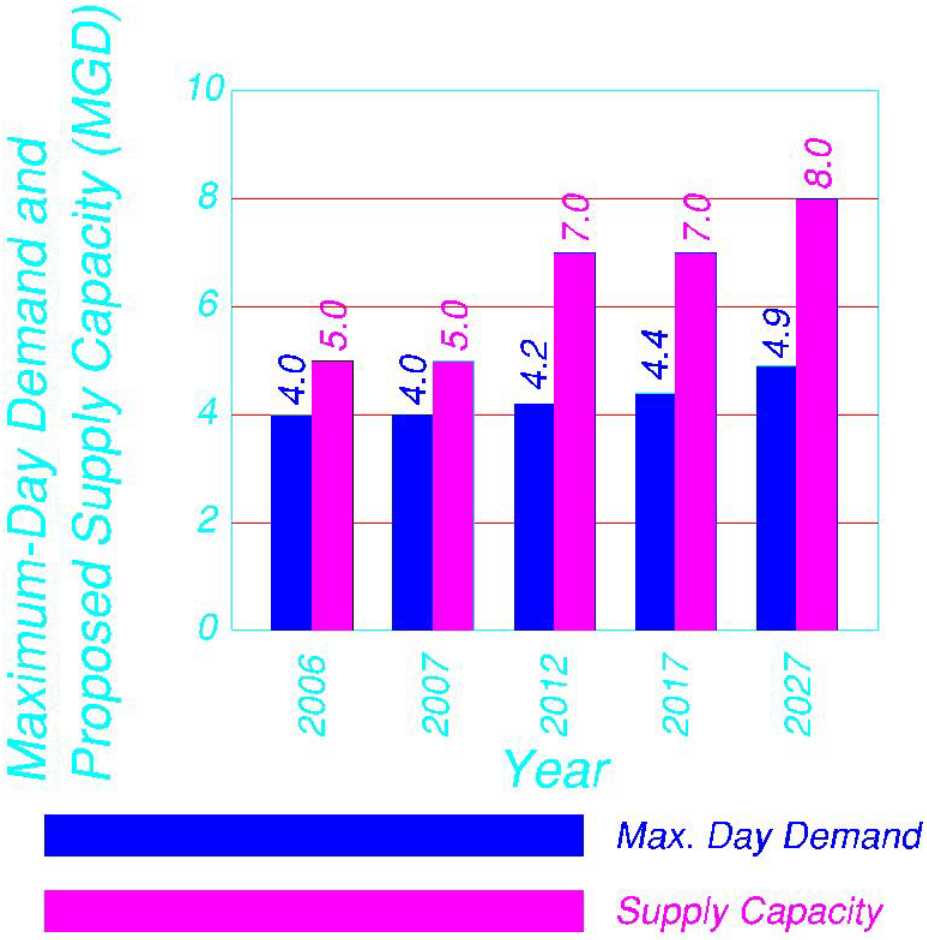
Figure 3.2 – St. Charles Mesa Water District per Unit Cost of Water Supply Facilities



3.3 Preliminary Capacity and Costs Forecasts

It is projected, in Worksheet 2-1, that the Maximum-Day demand in the year 2017, shall be 4.4 Million Gallons per Day (MGD); and in the year 2027 the Maximum-Day demand shall be 4.9 MGD. Accordingly, the District intends to upgrade its overall treatment capacity by 2 MGD in the year 2012, and an additional 1 MGD in 2020. The following is a summary of the projected Maximum-Day demand and the proposed total treatment capacity:

Figure 3.3 – St. Charles Mesa Water District Maximum-Day Demand and Proposed Supply Capacity (Without Conservation)



Step 4 – Identifying Conservation Goals

4.1 Water Conservation Goals

The District, currently, has the following conservation measures in place:

Supply Side Measures:

1. Inclining block rate for water usage. This tiered rate structure encourages efficient water usage (particularly as it applies to lawn irrigation) by increasing the per gallon charge as monthly usage increases. This was the first attempt, by the District, of encouraging conservation, and was implemented during the first year of its existence (1963) and shall remain in place.
2. Revised rates and tap fees. This was implemented in 2006, and was the result of a Study performed by Integrated Utilities. There were some adjustments made to the original tiered rate structure, however, the most dramatic revision was the increase in tap fees for users located east of the St. Charles River, in the more rural area of Zone 1. This was due to the increased cost of water delivery infrastructure in the less urbanized area of the district. These policies have been approved by the District Board, and shall remain in place.

Demand Side Measures:

1. Alternate Landscape Practices. The District began encouraging larger users (mainly the Institutional Users) to implement water saving measures related to watering of large areas of lawn. This began as somewhat of an informal process of contacting the Institutional users and suggesting conservation measures which would decrease irrigation usage and reduce the user's water bills. When this program was implemented (2000), most of the users were not very receptive. However, after the drought of 2003, some Institutional users did modify their irrigating practices. Currently, Water Returns has participated with Pueblo County High School in a water audit. The full implementation of all recommendations made by Water Returns has not been completed, due to the costs associated with upgrading the irrigation system, and due to decreased School District budgets. The intent is to have Water Returns perform 1 audit per year on each of the 8 Institutional taps.
2. Lawn water information provided to all customers. This information was originally disseminated via mailers with the monthly water bills. It is also available on the District's web site. The intent is to provide the customer with the most effective water application rates, which minimizes total usage related to lawn irrigation. The effect of this program can be seen in Figure 2.1, when in 2003 and 2004, lawn irrigation usage showed a dramatic drop off. This was mostly due to the drought of 2003, even though mandatory watering restrictions were not implemented. This program is ongoing.

The main conservation goals of the District are to reduce usage through a carefully thought out and implemented series of Capital Improvements, along with promotion of efficient irrigation practices, low water use landscaping and incentive programs for low-flow plumbing fixtures. The current savings goal is 0.4% overall use reduction per year.

The first priority shall be the reduction of non-revenue water. This is the difference between the total, treated finished water which is delivered from the treatment plants, and the sum of the individual meters at the customer's location. At present, the District loses 19% of the treated finished water. It is believed that the vast majority of this is due to the inaccuracies in the older existing water meters. The reasons for this item being given top priority are, firstly, this will, increase the overall water accounting efficiency by reducing the quantity of treated water which is put into the distribution system, but not registered by the individual customer meters. Secondly, it will encourage water conservation by requiring the customers to pay for the amount of water that they are actually utilizing. One of the nine meters tested was not registering 80% of the use at a moderate flow rate, and 16.5% of the use at a high flow rate. Thirdly, this program shall, eventually, decrease treatment costs as water accounting becomes more accurate and increased efficiency on the part of the customers. The Automated Meter Reading (AMR) units offer the option of an individual Water Meter Monitor (WMM), which the individual customer can use to track water usage. The WMM unit also comes with a Leak Detection Alarm. We feel that the WMM will help individual customers conserve water, and that it offers the only method by which the customer can track their water usage, other than their monthly bill. Lastly, the automatic read feature will also reduce the cost of reading the meters and of billing.

Upon full implementation, almost all of the "non-revenue" water shall be accounted for. This will be tracked by comparing the monthly meter reading at the treatment plant, versus the sum of the individual meters. We expect the percentage of unaccounted for water to drop from approximately 19% to approximately 4%, upon full implementation, a savings of 15%.

The second priority shall be the promotion of efficient irrigation. This process shall be two-fold. The first step shall be to identify the largest irrigation users, and provide information and incentives to reduce consumption due to inefficient irrigation practices. The second step shall be to encourage all residential and non-residential users to systematically implement efficient irrigation practices, along with incentives to replace a portion of their lawns with Low Water Use Landscaping. The perfect balance would be a reduction in irrigation use which is slightly more than new use from growth. This will allow for a reduction in overall usage, while not negatively impacted the District financially.

The impact of efficient irrigation can be seen in Figure 2.1 – St. Charles Mesa District Total Annual Raw Water Consumption. The vast reduction in irrigation use during the year 2003, was due to the institution of voluntary lawn water restrictions which were implemented in June of that year. The voluntary restrictions were lifted in April, 2004, but the non-potable use for the calendar year of 2004 was actually less than the previous (drought) year. This is partially due to a very wet spring, but also, most likely due to the fact that the customers realized that they could save money by irrigating the lawns less frequently, but more efficiently. This is borne out by the fact that, although the district has added approximately 150 new taps since 2002, the irrigation use has remained well below the rate from the year 2002.

Additional Demand Side measures shall include the installation of Low Flow Plumbing Fixtures and Efficient Appliances. These measures shall be promoted to customers through the use of rebates from the District. The District shall pursue grant money to fund the rebates.

4.2 Goal Development Process

The main resource in this process has been the interaction between Young Technology Group (YTG) and the staff of the St. Charles Mesa Water District (SCMWD). This process has been ongoing since April, 2008, when the District made application to the State for a grant to offset the cost of the Conservation Plan. In June, 2008 Mr. Ken Young of YTG and Mr. David Simpson, District Manager for SCMWD, both attended the Water Conservation Plan Development Workshop, which was presented by Great Western Institute.

Since that time, there have been numerous discussions between SCMWD staff and YTG, concerning the type of goals which the District wishes to achieve through the implementation of the plan. A good deal of the observations related to the goal setting process came from the day to day operation of the water system.

In addition, the District solicited a presentation from "Water Returns" of Colorado Springs, in September, 2008, which detailed some of the goals and programs related to efficient irrigation and also low-flow plumbing devices.

Data was collected from the District's Water Revenues and Service records for fiscal years 2000 through 2007, Overall Water Usage Records for fiscal years 1994 through 2007 and Individual billing records.

This data was utilized, along with recommendations from the District Staff, to identify the most crucial conservation goals, those being the reduction of "non-revenue" water by the replacement of individual meters, and targeting irrigation use through promotion of efficient irrigation and low water use landscapes. In addition, several demand-side measures are to be implemented on a small scale, to determine which are most effective.

Step 5 – Identifying Conservation Measures and Programs

Supply Side Measures

1. Target reduction of "Non-Revenue" water through the implementation of a program to replace all of the existing meters over a ten year period, commencing in the year 2010. The District intends to target the customers which have new radio-read meters installed, with the other demand side measures and programs. This is due to the uncertainty involved with the majority of the existing meters. Targeting the customers with new meters will provide more accurate tracking of the demand side conservation measures proposed.

2. Leak Detection and Repair– SCMWD intends to enact a leak detections system. This procedure shall be performed annually, in the month of April. Each year the District shall identify older portions of the distribution system, or any suspect areas. The Leak Detection Company shall then perform a limited evaluation of that particular portion of the system which has been previously identified by the District. Upon detection of a major leak, the District shall revise the Long Range CIP, in order to affect repair of the leak. Approximately 1% of the District's 185 miles of water distribution main (1.85 miles) will be evaluated annually.
   Analysis of this program (Worksheet 6-1 Leak Detection) indicates that any leaks discovered, should be repaired immediately. Most of these mains are already targeted for replacement in the Long Range CIP. Based on the results of the Leak Detection Program, the Long Range CIP may be modified to expedite repairs and replacement of problems which are identified by the Leak Detection Company.

3. Water Revenue Systems – The District has had an inclining block rate since its inception. It was later refined in the mid 1970's. This was done to help promote efficient irrigation and landscaping and to offset the cost of securing future water sources. In 2006, the District retained the services of Integrated Utilities Group, Inc. (IUG) to perform a study on the water rates and tap fees. The recommendations contained in the report suggested the following:

   a. Firstly, as it applies to the Plant Investment Fee (PIF) and Tap Fees, the District would be split into two areas and categories. The first being that portion of the District which is located to the west of the St. Charles River, and the second being the remainder of the District located east of the St. Charles River. The tap fees are detailed in Table 1.4a.
   b. Secondly, IUG recommended a revised set of water rates which are shown on Table 1.4b.

Demand Side Measures

1. Efficient Irrigation – The District shall implement a rebate program for the first 20 customers, annually, who install rain sensors for automated irrigation systems. In addition, Individual audits shall be performed on each of the Institutional Users. The audit program was implemented at Pueblo County High School, in the summer of 2009, by "Water Returns", a private auditing company. The results of that audit were not available at the time of this report.

2. Low Water Use Landscapes and Drought Resistant Vegetation– A program for replacement of existing lawn with xeriscaping and low water use plants has been analyzed. A cost analysis was performed for

the installation and water savings, based on a 1,000 square foot area (Worksheet 6-1 LWU Landscapes). As a result, the District intends to offer a rebate of $1.00/square foot of lawn area which is replaced with Low Water Use Landscapes and Drought Resistant Vegetation. Currently, there is no mechanism which requires a Landscape Plan for new developments in Pueblo County.

3. Low Flow Plumbing Fixtures and Water Efficient Appliances – This includes the installation, by individual customers, of Low Flush Toilets and Urinals, Low Flow Showerheads and Faucets, and Water Efficient Washing Machines. The District shall offer rebates, on a limited annual basis, to customers who install these devices. This program shall be targeted at the customers with new meters in order to provide accurate tracking of water savings, but will be available to all interested customers. This program shall also be contingent upon the availability of grant monies.
4. Education – The District will coordinate with the Southeastern Colorado Water Conservation District (SECWCD), to offer classes in outdoor irrigation practices and conservation landscapes. The SECWCD is currently preparing a conservation plan for the Arkansas Valley Conduit. The St. Charles Mesa Water District (SCMWD) is a strong supporter of the conduit, and support the conservation plan being prepared, and will provide information on training that will be provided. The SCMWD has participated in funding for the SECWCD xeriscape garden, and has the link to the SECWCD web site, on their web site. The SCMWD also provides information to customers of the District on lawn watering guides prepared by the SECWCD.
5. Institutional Irrigation Audits – Commencing this in the spring of 2009, Water Returns (a non-profit water conservation group) commenced a comprehensive Irrigation Audit at Pueblo County High School. The audit includes analysis of the existing irrigation system, soil analysis, materials for consumer communication, informal training of grounds crews and a status report and outline of long range planning considerations. As of this date, the following low/no cost recommendations have been implemented:
    a. Adjust sprinkler head alignment and height.
    b. Increase fertilization and aeration to at least 3 times per year
    c. Significantly reduce watering in accordance with recommended irrigation schedule

The goal of the audit is to reduce irrigation use by 30% to 50% once all recommendations are implemented.

Table 5.1 – St. Charles Mesa Water District Water Conservation Measures and Programs

	Conservation Measure or Program	Date of Implementation	Comments
Supply Side Measures and Programs	Target reduction of "non-revenue" water	April, 2010	Commencing in 2010, the District shall replace approximately 10% of the existing customer meters, annually, to be completed by 2019. In addition, the District shall provide rebates to customers who wish to purchase a Flow Monitor. This device tracks water consumption and also provides leak detection. The rebates shall be based on grant availability.
	Leak Detection and Repair	April, 2010	This process had previously been performed on an as-needed basis, based on customer complaints, pressure losses and visual inspection. The new program shall target the oldest portions of the distribution system and other suspect areas.
	Water Revenue System (Inclining Block Rates and Tap fees)	1963	The District has continuously had an Inclining Block Rate since its inception. This has been revised based on the IUG study, which was adopted in 2006. The study also recommended revisions to the tap fees, based upon the plant investment fee, location of service and water rights.
Demand Side Measures and Programs	Efficient Irrigation	2002	The District began providing literature related to efficient irrigation practices to its largest irrigators via the customer's monthly bill. This information was later added to the Districts web-site, along with links related to efficient irrigation. A new program shall be implemented which provides rebates to customers who install a rain sensor on their irrigation controllers. The rebates shall be subject to grant availability, and will commence, on a limited basis, in the year 2010.
	Low Water Use Landscapes and Drought Resistant Vegetation	2000	The District has disseminated information regarding xeriscaping and drought resistant vegetation, since the year 2000. This was added to the web site in 2003. A pilot program has been evaluated to provide limited annual rebates to customers who replace existing lawn with low water use landscapes. This program shall commence in 2010 on a limited basis, and shall be subject to grant availability.

	Low Flow Pluming Fixtures and Water Efficient Appliances	2010	The District shall provide rebates to a limited number of customers, annually, who install low flush toilets and urinals, low flow showerheads and faucets, and water efficient clothes washers. These programs are to be implemented on a limited basis, and targeted at the customers who receive new water meters, so as to provide accurate tracking of water savings.

5.2 Screening Criteria for Conservation Measures and Programs

Table 5.2 – St. Charles Mesa Water District Screening Criteria for Proposed Water Conservation Measures and Programs

	Measure or Program	Screening Criteria for Conservation Measures and Programs	Yes	Not Sure	No
Supply Side Measures	Target Reduction of "Non-Revenue" Water	Does the proposed Measure or Program have a positive economic impact on the District?	X		
		Are Federal, State or Local Grants available for implementation or rebates?		X	
		Does the proposed Measure or Program provide enough water savings to justify its economic viability?	X		
		Is the proposed Measure or Program sustainable?	X		
		Is the proposed Measure or Program acceptable to the Customers?		X	
		Does the Measure or Program comply with District By Laws?	X		
	TOTAL		4	2	0
	Measure or Program	**Screening Criteria for Conservation Measures and Programs**	**Yes**	**Not Sure**	**No**
	Leak Detection and Repair	Does the proposed Measure or Program have a positive economic impact on the District?		X	
		Are Federal, State or Local Grants available for implementation or rebates?		X	
		Does the proposed Measure or Program provide enough water savings to justify its economic viability?		X	
		Is the proposed Measure or Program sustainable?	X		
		Is the proposed Measure or Program acceptable to the Customers?		X	

		Does the Measure or Program comply with District By Laws?	X		
	TOTAL		2	4	0
	Measure or Program	**Screening Criteria for Conservation Measures and Programs**	**Yes**	**Not Sure**	**No**
	Water Revenue Systems	Does the proposed Measure or Program have a positive economic impact on the District?	X		
		Are Federal, State or Local Grants available for implementation or rebates?		X	
		Does the proposed Measure or Program provide enough water savings to justify its economic viability?	X		
		Is the proposed Measure or Program sustainable?	X		
		Is the proposed Measure or Program acceptable to the Customers?		X	
		Does the Measure or Program comply with District By Laws?	X		
	TOTAL		4	2	0
Demand Side Measures	**Measure or Program**	**Screening Criteria for Conservation Measures and Programs**	**Yes**	**Not Sure**	**No**
	Efficient Irrigation	Does the proposed Measure or Program have a positive economic impact on the District?			X
		Are Federal, State or Local Grants available for implementation or rebates?		X	
		Does the proposed Measure or Program provide enough water savings to justify its economic viability?		X	
		Is the proposed Measure or Program sustainable?	X		
		Is the proposed Measure or Program acceptable to the Customers?	X		
		Does the Measure or Program comply with District By Laws?	X		
	TOTAL		3	2	1
	Measure or Program	**Screening Criteria for Conservation Measures and Programs**	**Yes**	**Not Sure**	**No**
	Low Water use Landscapes	Does the proposed Measure or Program have a positive economic impact on the District?			X
		Are Federal, State or Local Grants available for implementation or rebates?		X	

		Does the proposed Measure or Program provide enough water savings to justify its economic viability?	X		
		Is the proposed Measure or Program sustainable?	X		
		Is the proposed Measure or Program acceptable to the Customers?	X		
		Does the Measure or Program comply with District By Laws?	X		
	TOTAL		4	1	1
	Measure or Program	**Screening Criteria for Conservation Measures and Programs**	**Yes**	**Not Sure**	**No**
	Low Flow Plumbing Fixtures and Water Efficient Appliances	Does the proposed Measure or Program have a positive economic impact on the District?			X
		Are Federal, State or Local Grants available for implementation or rebates?	X		
		Does the proposed Measure or Program provide enough water savings to justify its economic viability?		X	
		Is the proposed Measure or Program sustainable?	X		
		Is the proposed Measure or Program acceptable to the Customers?	X		
		Does the Measure or Program comply with District By Laws?	X		
	TOTAL		4	1	1

5.3 Application of Screening Criteria

For each of the "yes" answers from Table 5.2, 2 points will be allotted. For each "don't know" answer 1 point will be allotted. For each "no" answer, 0 points will be allotted. The following Table 5.3 tallies the screening evaluation for each measure and program:

	Measure or Program	Score
Supply Side Measures	Target Reduction of Non-Revenue Water	10
	Leak Detection and Repair	8
	Water Revenue Systems	10
Demand Side	Efficient Irrigation	8
	Low Water Use Landscapes	9
	Low Flow Plumbing Fixtures and Water Efficient Appliances	9

The Average Score, based on 2-"yes", 2-"don't know", and 2-"no" answers is 6. From Tables 5.2 and 5.3, all of the proposed measures and programs listed shall merit evaluation in the Design Worksheets.

Step 6 – Evaluate and Select Conservation Measures and Programs

The savings goals, for the three use categories (Residential, Commercial and Institutional) are to reduce the use by 0.40%, per year. Table 6.1 illustrates the savings goals:

Table 6.1 – St. Charles Mesa Water District Water Conservation Savings Goals

Year	Res. Usage Ac.-Ft.	Residential Water Savings Goal Ac.-Ft.	Comm. Usage Ac.-Ft.	Commercial Water Savings Goal Ac.-Ft.	Inst. Usage Ac.-Ft.	Institutional Water Savings Goal Ac.-Ft.
2010	1,767	7.1	266	1.1	118	0.5
2011	1,847	14.5	278	2.2	124	1.0
2012	1,926	22.2	290	3.3	129	1.5
2013	1,945	29.9	293	4.5	139	2.0
2014	1,964	37.8	295	5.7	131	2.6
2015	1,984	45.7	298	6.9	133	3.1
2016	2,004	53.7	301	8.1	134	3.6
2017	2,022	61.8	304	9.3	135	4.2
2018	2,043	70.0	307	10.5	137	4.7
2019	2,064	78.3	310	11.8	138	5.3
2020	2,085	86.6	314	13.0	139	5.8
2021	2,106	95.0	317	14.3	141	6.4
2022	2,127	103.5	320	15.6	142	7.0
2023	2,147	112.1	323	16.9	144	7.5
2024	2,169	120.8	326	18.2	145	8.1
2025	2,189	129.6	329	19.5	146	8.7
2026	2,210	138.4	332	20.8	148	9.3
2027	2,231	147.3	336	22.2	149	9.9
2028	2,252	156.3	339	23.5	151	10.5
2029	2,273	165.4	342	24.9	152	11.1
2030	2,294	174.6	346	26.3	153	11.7

6.1 Create Combinations of Measures and Programs

In order to offset the potential loss of revenue caused by initial implementation of demand side measures, the replacement of the existing individual meters shall be top priority. This will allow the coincidental implementation of some of the demand side measures. For the fiscal years 2010through 2020 the replacement of all of the older individual meters shall take place. This will coincide with the customer water audits, pilot programs and efficient irrigation and landscaping programs.

Commencing in the year 2010, the customers who are targeted for meter replacement shall receive written notification regarding the timing of the meter replacement. Each customer shall be given the option of receiving a Water Meter Monitor, with the new meter installation. This device is approximately the same size as a television remote controller, and allows the customer to track water usage. The Monitor has several features, including a leak detection alarm, which is outlined in detail on page 9 of the Design Manual.

In addition to the Water Meter Monitor, the customers who receive new meters shall be encouraged to participate in any or all of the Demand Side Programs and Measures. These customers who receive new meters shall be targeted for the other Demand Side Measures, so that the District can keep an accurate accounting of potential water savings.

6.2 Costs and Water Savings of Conservation Options

The following Table 6.2 is from Worksheet 6-2: Comparison of Benefits and Costs of the Conservation Measures and Programs

Table 6.2 St. Charles Mesa Water District Comparison of Benefits and Costs of the Conservation Measures and Programs

Line	Conservation measure/program [a]	Total cost for the measure/ program [b]	Anticipated annual water savings in gallons [c]	Cost of water saved by the measure ($/gallon)[d]	Net benefit of implementing the measure/ program [e]
1	Installation of 10 LF Toilets/Year	-$12,000.00	11,695	-$0.0051	$23,160.72
2	Installation of 10 LF Urinals/Year	-$12,000.00	3,600	-$0.0167	$15,435.54
3	Installation of 20 LF	-$6,000.00	13,140	-$0.0011	$31,079.42
4	Installation of 20 LF Kitchen	-$6,000.00	7,300	-$0.0021	$19,933.01
5	Installation of 20 LF Bathroom	-$6,000.00	3,650	-$0.0002	$145,330.09
6	Install 10 efficient washing	-$22,000.00	8,500	-$0.0129	$30,111.68
7	Replace all Res. Meters w/Radio Read	-	4,000,000	-$0.0024	$8,645,894.1
8	Low Water Use Landscapes	-	25,000	-$0.0210	$257,715.78
9	Installation of 20 Rain Sensors/Year	-$6,000.00	100,000	-$0.0002	$196,863.14
10	Leak Detection and Replacement of	-	1,500,000	-$0.0300	$1,043,147.3
11					
12	Total Demand Side Measures		172,885		$719,629
13					
14	Total Supply Side Measures		5,500,000		$9,689,042

Table 6.3 – St. Charles Mesa Water District "Out of Pocket" Costs of Conservation Measures and Programs

Conservation Measure / Program	Rebate	Admin.	# / Year	Total Cost (Annual)	Program Life (Years)	Total Program Cost
Low Flush Toilets	$50.00	$10.00	10	$600.00	20	$12,000.00
Low Flush Urinals	$50.00	$10.00	10	$600.00	20	$12,000.00
Low Flow Showerheads	$10.00	$5.00	20	$300.00	20	$6,000.00
Low Flow Kitchen Faucets	$10.00	$5.00	20	$300.00	20	$6,000.00
Low Flow Bathroom Faucets	$10.00	$5.00	20	$300.00	20	$6,000.00
Efficient Washing Machines	$100.00	$10.00	10	$1,100.00	20	$22,000.00
Low Water Use Landscaping	$0.10	$0.05	10,000	$1,500.00	20	$30,000.00
Rain Sensors	$10.00	$5.00	20	$300.00	20	$6,000.00
TOTAL				**$5,000.00**		**$100,000.00**

6.3 Benefits and Costs of Conservation Options

The following Table 6.4 is from Worksheet 6-3: Selection of Conservation Measures/Programs and Estimate of Water Savings:

Table 6.4 – St. Charles Mesa Water District Selection of Conservation Measures and Programs and Estimate of Water Savings

		Primary criteria for selecting or rejecting the conservation measure/program for implementation	Estimated reduction in demand for selected measures/programs (gallons per day) [a]	
Line	Measure/Program		Average-day demand	Maximum-day demand
1	LF Toilets		320	641
2	LF Urinals		99	197
3	LF Showerheads		720	1,440
4	LF Kitchen Faucets		400	800
5	LF Bathroom Faucets		4,000	8,000
6	Washing Machines		233	466
7	Radio Read Residential Meters		109,589	219,178
8	Low Water use Landscapes		1,370	2,740
9	Rain Sensors		5,479	10,959
10	Leak Detection		4,110	8,219
11				
12				

Total			126,320	252,640

6.4 Define Evaluation Criteria

As stated in section 5.3, the main evaluation criteria is the financial impact on the Water District. District revenues fluctuate annually, and monthly, based mainly on weather and seasonal fluctuations. Periodic budget shortfalls occur during "wet" periods, which are unpredictable. In the past, the District has managed to overcome these shortfalls by retaining some capital reserves and by offsets during dry periods. However, due to an increase in the drainage infrastructure projects, which are performed in areas where the District has a CIP project, these capital reserves have been reduced.

Any measure or program, which would reduce District revenues, particularly during a period when revenues are already down, could result in serious economic consequences.

Therefore, the top priority for implementation shall be the elimination of non-revenue water. All other measures and programs shall be done in conjunction with, but supplementally, to demand side measures.

6.5 Select Conservation Measures and Programs

The following Conservation Measures and Programs have been selected for implementation:

Supply Side Conservation Measures and Programs

1. Radio Read Meters: The District shall be replacing all of the outdated or inefficient meters. This process shall take place over a 10-year period, commencing in 2010. It is estimated that approximately 15%-19% of all treated water is not being accounted for. A significant reduction shall decrease production costs and improve efficiency. In addition, this measure should encourage customers to conserve, as they will have to pay for all water consumed.
2. Leak Detection and Replacement of Mains: The District shall contract the services of a leak detection contractor, annually. The oldest mains in the system shall be targeted for leak detection and repair. This had previously been performed on a complaint basis.

The above listed Water Conservation Measures and Programs shall be implemented on a varied, but limited scale. The 5 highest Institutional users shall be targeted for all measures and programs, because they are the largest water consumers. The Commercial and Residential users shall be targeted based on the installation of new radio read water meters.

Water Reuse or Recycling was not considered as part of this plan. This is due to the fact that the majority of the District's raw water supply is subject to the State of Colorado Water Law. Therefore, any raw water diverted in Priority, may only be used once and must be released so that the next user, in priority, can utilize the water.

The St. Charles Mesa Water District has penalties for customers who irrigate during periods of mandatory outdoor watering restrictions. Fortunately, the District has never had to implement mandatory restrictions. On the one occasion when voluntary restrictions were enacted, the customers complied with such a degree, that mandatory restrictions were not enacted.

The Tap Fees (Table 1.4a) and Water Rates (Table 1.4b) are a result of an Analysis performed by Integrated Utilities Group, Inc. (IUG), in 2005-2006. The Tap Fees and Water Rates were determined based on the evaluation of the Plant Investment Fee (PIF), the value of the existing utility, and the cost of the Capital Improvement Plan (CIP). The value of the existing infrastructure was analyzed by the Original Cost (OC), Net Book Value (NBV), Replacement Cost Less Depreciation (RCLD) and Full Replacement Cost (RCN). The full Analysis is on file at the District Office.

Demand Side Conservation Measures and Programs

1. Low Flush Toilets: The District will provide a $50.00 rebate for the first 10 customers, annually, who wish to install a Low Flush Toilet which meets the 1.28 gallon per flush requirement (WaterSense specified fixtures). This program shall be restricted to those customers who are served by one of the three sanitation districts.
2. Low Flow Urinals: The District will provide a $50.00 rebate for the first 10 customers, annually, who installs a Low Flow Urinal which meets the 0.5 gallons per flush requirement (WaterSense specified fixtures). This Measure is targeted at commercial customers (mainly public facilities and food service establishments).
3. Low Flow Showerheads: The District shall provide a $10.00 rebate for the first 20 customers, annually, who purchase and install low flow showerheads which meet the 1.75 gallon per minute flow rate (WaterSense specified fixtures).
4. Low Flow Kitchen Faucets: The District shall provide a $10.00 rebate for the first 20 customers, annually, who purchase and install low flow kitchen faucets which meet the 1.5 gallon per minute flow rate (WaterSense specified fixtures).
5. Low Flow Bathroom Faucets: The District shall provide a $10.00 rebate for the first 20 customers, annually, who purchase and install low flow bathroom faucets which meet the 1.5 gallon per minute flow rate (WaterSense specified fixtures).
6. Efficient Washing Machines: The District shall provide a $100.00 rebate for the first 10 customers, annually, who purchase and install efficient clothes washing machines which have a water factor of 6 or less. The water factor is the amount of gallons per cubic foot per load.
7. Low Water Use Landscapes: The District shall provide a $1.00 per square foot rebate, up to 10,000 square feet, annually, to customers who wish to replace all or a portion of their existing lawns with Low Water Use Landscaping.

Table 6.5 – St. Charles Mesa Water District Approximate Annual Cost to Irrigate 1,000 square feet of lawn.

Month	Frequency	Volume (Gallons)	Cost
March	3	336	$1.01
April	6	672	$2.02
May	8	896	$2.69
June	10	1,120	$3.36
July	12	1,344	$4.03
August	10	1,120	$3.36
September	8	896	$2.69
October	6	672	$2.02
November	2	224	$0.67
Totals	65	7,280	$21.84

Table 6-5 assumes that 1-inch of water shall be applied, per watering; the cost of the water is 0.003 cent per gallon and a 25% loss due to evaporation and runoff. A landscape which requires no water at all, shall see a savings of $21.84 per 1,000 square feet of area, annually. A low water use landscape, which requires some watering, will see between 50% and 70% reduction in the above savings

8. Rain Sensors: The District shall provide a $10 rebate to the first 20 customers, annually, who purchase and install a rain sensor on their automated irrigation systems.

   The following Table 6.6 is a summary of the projected savings from the installation of 1 rain sensor applied to a 1-acre lawn:

Table 6.6 – St. Charles Mesa Water District Rain Sensor

Month	Frequency	Depth (1"/App.) ft.	Volume (Gallons)	Cost	Rainfall in.	Rainfall ft.	Depth (1"/App.) ft.	Volume (Gallons)
March	3	0.25	101,822	$305.46	0.97	0.08	0.17	68,899
April	6	0.50	203,643	$610.93	1.25	0.10	0.40	161,217
May	8	0.67	271,524	$814.57	1.49	0.12	0.54	220,953
June	10	0.83	339,405	$1,018.22	1.33	0.11	0.72	294,264
July	12	1.00	407,286	$1,221.86	2.04	0.17	0.83	338,047
Aug.	10	0.83	339,405	$1,018.22	2.27	0.19	0.64	262,360
Sep.	8	0.67	271,524	$814.57	0.84	0.07	0.60	243,014
Oct.	6	0.50	203,643	$610.93	0.64	0.05	0.45	181,921
Nov.	2	0.17	67,881	$203.64	0.58	0.05	0.12	48,196
TOTAL		5.42	2,206,133	$6,618.40	11.41	0.95	4.47	1,818,871
TOTAL	For a 1 acre lot with rain sensor savings in gallons							387,261
TOTAL	For a 1 acre lot with rain sensor savings in dollars							$1,162

The above Table 6.6 is based on the following Table 6.7:

Table 6.7 – St. Charles Mesa Water District Average Rainfall for Pueblo, CO

Month	Precip.	Precip.
	in.	ft.
January	0.33	0.03
February	0.26	0.02
March	0.97	0.08
April	1.25	0.10
May	1.49	0.12
June	1.33	0.11
July	2.04	0.17
Aug.	2.27	0.19
Sep.	0.84	0.07
Oct.	0.64	0.05
Nov.	0.58	0.05
Dec.	0.39	0.03
TOTAL	12.39	1.03

Step 7 – Integrate Resources and Modify Forecasts

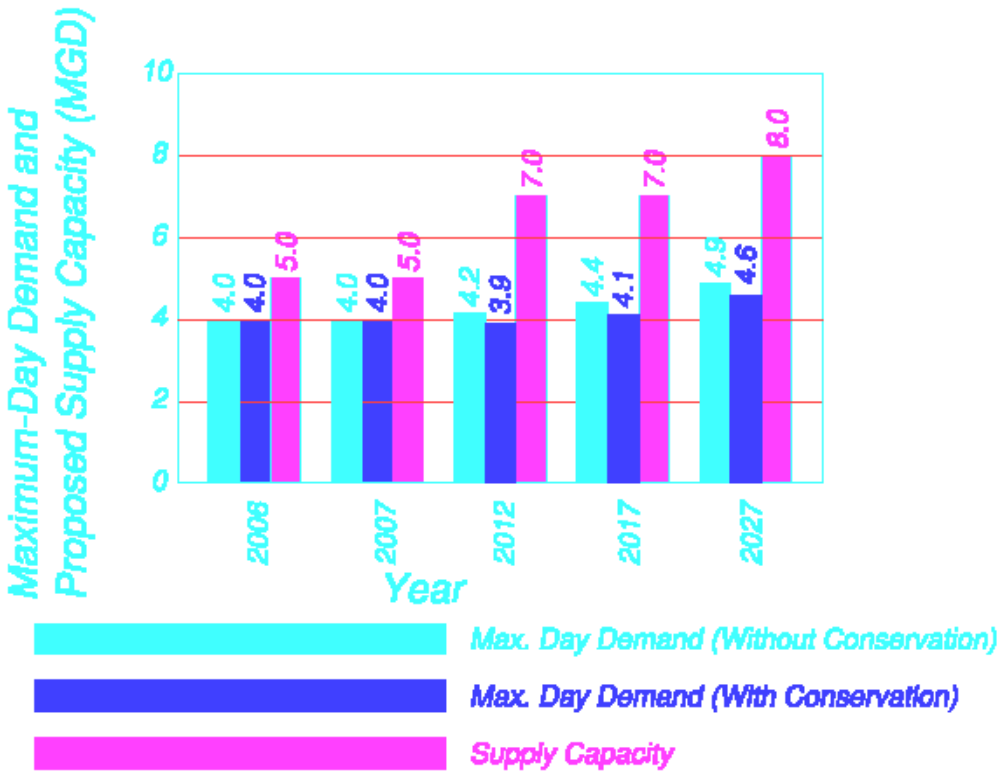
7.1 Revise Demand Forecast

Table 7.1a – St. Charles Mesa Water District Modified Demand Forecast

Worksheet 7-1: Modified Demand Forecast

Line	Item	Current Year	Year 5	Year 10	Year 20
1	Average-day demand before conservation [a]	1,988,678	2,091,774	2,197,192	2,424,242
2	Average-day demand after conservation [b]		1,961,424	2,066,841	2,293,891
3	Reduction in Average-day demand (line 1 less line 2)		130,350	130,350	130,350
4	Maximum-day demand before conservation [a]	4,000,000	4,207,367	4,419,401	4,876,086
5	Maximum-day demand after conservation [b]		3,946,666	4,158,701	4,615,386
6	Reduction in Maximum-day demand (line 4 less line 5)		260,700	260,700	260,700
7	Ration maximum-day to average-day demand before conservation (line 4 divided by line 1)	2.01	2.01	2.01	2.01
8	Ration maximum-day to average-day demand after conservation (line 5 divided by line 2)		1.89	1.89	1.90

Figure 7.1b – St. Charles Mesa Water District Maximum-Day Demand and Proposed Supply Capacity (With and Without Conservation)



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7.1 Identify Project Specific Savings

The following Table 7.2 is from Worksheet 7-2, which details the savings from postponing the installation of a 2 MGD filter, for 10 years

Table 7.2 – St. Charles Mesa Water District Project Specific Savings **

Worksheet 7-2: Project-Specific Savings				
DESCRIPTION OF PROJECT [a] Installation of an additional 2MGD filter				
Describe the project: The installation of a 2MGD filter unit at the main treatment plant located at 29850 South Road, in the year 2012. This may be postponed until 2022.				
Project was scheduled to begin: May, 2012				
Purpose of the project: Additional Supply Capacity	[X] Improvement	[ ] Addition		
The project is designed to meet:	[ ] Avg.-day	[X] Max.-day		
Type of project:	[ ] Source of supply			
	[X] Water treatment facilities			
	[ ] Treated water storage			
	[ ] Major transmission lines			
	[ ] Purchased water			
	[ ] Wastewater facility			
	[ ] Other			

Line	Item	Project Capacity (Daily)	Project Costs	
			Total capital costs ($)	Annual operating costs ($)
A	**CAPITAL PROJECT IS ELIMINATED**			
1	Original Project			
2	Savings from elimination (Equals line 1)			
B	**CAPITAL PROJECT IS DOWNSIZED**			
3	Original project			
4	Downsized project			
5	Savings from downsizing (line 3 less line 4)			
C	**CAPITAL PROJECT IS POSTPONED**			
6	Present value of original project		$538,032.46	$35,000.00
7	Present value of postponed project		$655,858.57	$426,648.05
8	Savings from postponement (line 6 less line 7)		$117,826.11	$544,474.15

D	**NEED FOR PURCHASED WATER IS REDUCED**			
9	Original estimate of purchases			
10	Revised estimate of purchases (can be "0")			
11	Savings from reduced purchases (line 9 less line 10)			

7.2 Revise Supply-Capacity Forecast

At present, there are no CIP's, associated with the distribution system, which are intended to be removed or delayed by the conservation measures mentioned above. This is mainly due to the fact that the areas which have been targeted for replacement, in the CIP, are comprised of the oldest, most undersized portion of the distribution system. The improvements outlined in the CIP are also intended to increase the efficiency of the distribution system, and help eliminate potential leaks.

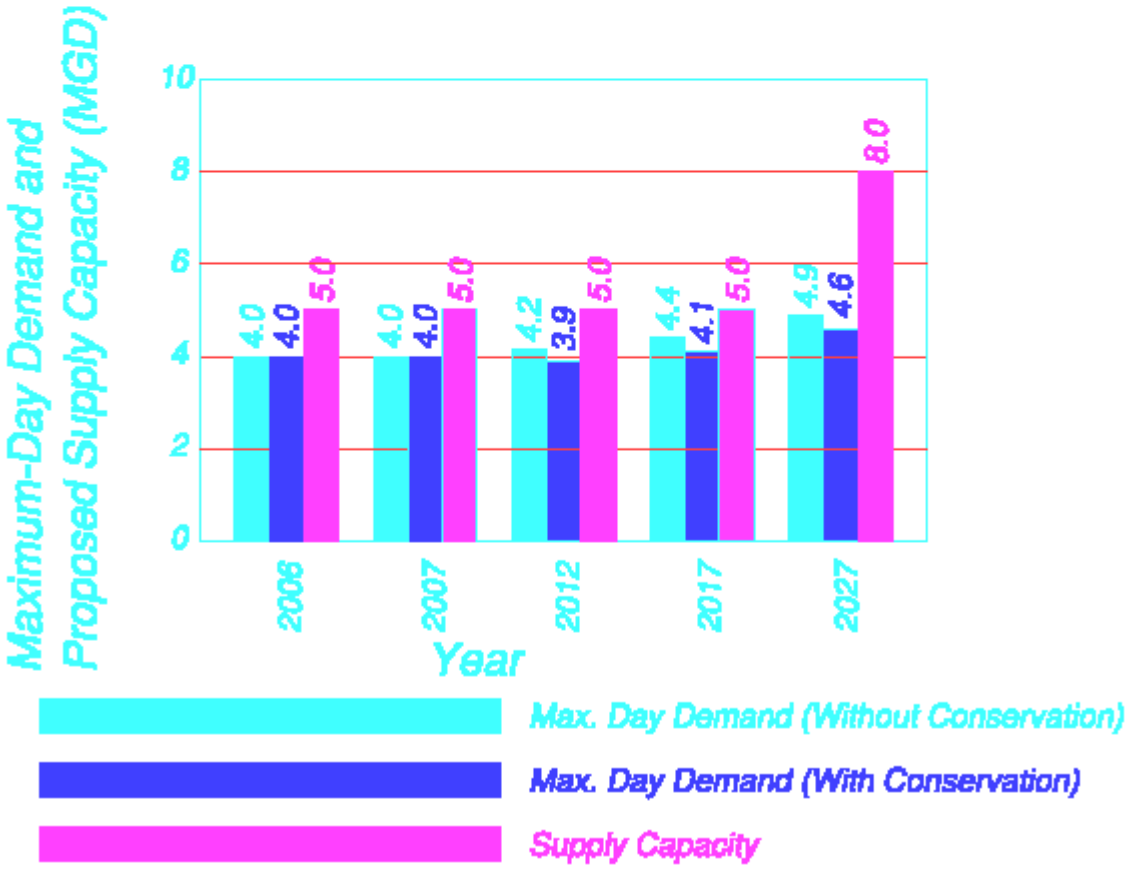
Table 7.3 – St. Charles Mesa Water District Modified Supply Forecast

Worksheet 7-3: Modified Supply Forecast and Estimated Total Savings

MODIFIED SUPPLY FORECAST					
Line	Item	Current Year	Year 5	Year 10	Year 20
A	**Forecast Supply Capacity (Daily)**				
1	Supply capacity before conservation program [a]	3,429,770	6,039,648	6,039,648	6,039,648
2	Planned reduction in supply capacity [b]		0	0	0
3	Supply capacity after conservation (line 1 less line 2)		6,039,648	6,039,648	6,039,648
B	**Capacity Reserve**				
4	Supply capacity less demand (line 3 less line 2 on worksheet 7-1)		1,961,424	2,066,841	2,293,891

The following bar graph represents the Maximum-Day Demand with and without conservation, and the total supply capacity, assuming that the proposed 2MGD upgrade, originally scheduled for 2012, being postponed until 2022.

Figure 7.2 – St. Charles Mesa Water District Maximum-Day Demand and Revised Supply Capacity (With and Without Conservation)



It appears that the 2MGD upgrade in 2012, can be postponed by at least 10 years, and in fact, the 1 MGD upgrade scheduled for 2020 may be sufficient on its own, as a supply capacity of 6.0MGD will be sufficient to meet the demand, particularly if the conservation measures and programs are successful.

7.3 Consider Revenue Effects

Table 7.4 – St. Charles Mesa Water District Revenue Effects from Conservation

Year	# Taps Residential	Growth %	Res. Usage Ac.-Ft.	Projected Savings Ac.-Ft.	Revised Usage Forecast Ac.-Ft.	Tap Fees Revenue $	Water Sales Revenue $
2000	3,606	-	1,684	-	-	-	-
2001	3,639	0.92%	1,609	-	-	-	-
2002	3,681	1.15%	1,611	-	-	-	-
2003	3,729	1.30%	1,487	-	-	-	-
2004	3,753	0.64%	1,383	-	-	-	-
2005	3,786	0.88%	1,549	-	-	-	-
2006	3,810	0.63%	1,559	-	-	-	-
2007	3,835	0.66%	1,499	-	-	242,086.00	1,377,021.00
2008	3,873	1.00%	1,608	-	-	207,851.80	1,387,277.00
2009	3,912	1.00%	1,687	-	-	207,729.68	1,470,821.00
2010	3,951	1.00%	1,767	13.5	1,753	261,690.00	1,550,796.38
2011	3,991	1.00%	1,847	27.0	1,820	268,400.00	1,609,591.66
2012	4,031	1.00%	1,926	40.5	1,885	268,400.00	1,667,511.38
2013	4,071	1.00%	1,945	54.1	1,891	268,400.00	1,672,366.77
2014	4,112	1.00%	1,964	67.6	1,896	275,110.00	1,677,222.16
2015	4,153	1.00%	1,984	81.1	1,903	275,110.00	1,682,953.10
2016	4,194	1.00%	2,004	94.6	1,909	275,110.00	1,688,692.90
2017	4,236	1.00%	2,022	108.1	1,914	281,820.00	1,692,663.88
2018	4,279	1.00%	2,043	121.6	1,921	288,530.00	1,699,279.23
2019	4,321	1.00%	2,064	135.1	1,929	281,820.00	1,705,903.43
2020	4,363	1.00%	2,085	139.4	1,946	281,820.00	1,720,743.76
2021	4,406	1.00%	2,106	143.6	1,962	288,530.00	1,735,575.24
2022	4,450	1.00%	2,127	147.8	1,979	295,240.00	1,750,406.72
2023	4,495	1.00%	2,147	152.0	1,995	301,950.00	1,764,362.64
2024	4,540	1.00%	2,169	156.3	2,013	301,950.00	1,780,078.53
2025	4,585	1.00%	2,189	160.5	2,029	301,950.00	1,794,034.45
2026	4,631	1.00%	2,210	164.7	2,045	308,660.00	1,808,865.93
2027	4,677	1.00%	2,231	168.9	2,062	308,660.00	1,823,706.26

Year	# Taps Commercial	Growth %	Comm. Usage Ac.-Ft.	Projected Savings Ac.-Ft.	Revised Usage Forecast Ac.-Ft.	Tap Fees Revenue $	Water Sales Revenue $
2000	161	-	362	-	-	-	-
2001	163	1.24%	267	-	-	-	-
2002	165	1.23%	209	-	-	-	-
2003	167	1.21%	250	-	-	-	-
2004	169	1.20%	208	-	-	-	-
2005	171	1.18%	259	-	-	-	-
2006	177	3.51%	242	-	-	-	-
2007	182	2.82%	177	-	-	33,550.00	207,210.00
2008	184	1.00%	247	-	-	13,420.00	208,669.00
2009	186	1.00%	265	-	-	13,420.00	221,190.00
2010	188	1.00%	282	2.0	280	13,420.00	247,607.04
2011	190	1.00%	299	4.1	295	13,420.00	260,837.74
2012	192	1.00%	317	6.1	311	13,420.00	274,961.70
2013	194	1.00%	321	8.1	313	13,420.00	276,703.98
2014	196	1.00%	325	10.2	315	13,420.00	278,446.26
2015	198	1.00%	329	12.2	317	13,420.00	280,179.69
2016	200	1.00%	333	14.2	319	13,420.00	281,921.97
2017	202	1.00%	337	16.3	321	13,420.00	283,664.25
2018	204	1.00%	342	18.3	324	13,420.00	286,290.94
2019	206	1.00%	346	20.3	326	13,420.00	288,024.37
2020	208	1.00%	351	21.0	330	13,420.00	291,889.22
2021	210	1.00%	355	21.6	333	13,420.00	294,860.83
2022	212	1.00%	360	22.2	338	13,420.00	298,725.68
2023	214	1.00%	365	22.9	342	13,420.00	302,581.69
2024	216	1.00%	369	23.5	346	13,420.00	305,562.13
2025	218	1.00%	374	24.1	350	13,420.00	309,418.14
2026	220	1.00%	378	24.8	353	13,420.00	312,398.59
2027	222	1.00%	383	25.4	358	13,420.00	316,254.60

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Year	# Taps Institutional	Growth %	Inst. Usage Ac.-Ft.	Projected Savings Ac.-Ft.	Revised Usage Forecast Ac.-Ft.	Tap Fees Revenue $	Water Sales Revenue $
2001	8	-	95	-	-	-	-
2002	8	0.00%	88	-	-	-	-
2003	8	0.00%	86	-	-	-	-
2004	8	0.00%	110	-	-	-	-
2005	8	0.00%	102	-	-	-	-
2006	8	0.00%	116	-	-	-	-
2007	8	0.00%	115	-	-	0.00	92,123.00
2008	8	0.00%	102	-	-	0.00	92,809.00
2009	8	0.00%	102	-	-	0.00	98,378.00
2010	8	0.00%	102	0.9	101	0.00	89,412.84
2011	8	0.00%	102	1.8	100	0.00	88,608.04
2012	8	0.00%	102	2.7	99	0.00	87,812.08
2013	8	0.00%	102	3.6	98	0.00	87,016.12
2014	8	0.00%	102	4.5	97	0.00	86,211.31
2015	8	0.00%	102	5.4	97	0.00	85,415.35
2016	8	0.00%	102	6.3	96	0.00	84,619.39
2017	8	0.00%	102	7.2	95	0.00	83,814.59
2018	8	0.00%	102	8.1	94	0.00	83,018.63
2019	8	0.00%	102	9.0	93	0.00	82,222.67
2020	8	0.00%	102	9.3	93	0.00	81,975.04
2021	8	0.00%	102	9.6	92	0.00	81,718.56
2022	8	0.00%	102	9.9	92	0.00	81,470.93
2023	8	0.00%	102	10.2	92	0.00	81,223.30
2024	8	0.00%	102	10.4	92	0.00	80,975.66
2025	8	0.00%	102	10.7	91	0.00	80,719.19
2026	8	0.00%	102	11.0	91	0.00	80,471.56
2027	8	0.00%	102	11.3	91	0.00	80,223.92

From Table 7-4, it appears that the increased revenue from growth will outpace the loss of revenue from the Conservation Measures and Programs, if implemented according to the plan. The only loss in revenue is in the Institutional Sector. This is because there are no new schools anticipated within the planning time frame.

Step 8 – Develop Implementation Plan

8.1 Develop Implementation Schedule

The first measure to be implemented shall be the replacement of the old system meters with new, radio read meters. This will be done in conjunction with all of the other conservation measures and programs. Each program, besides the Radio Read Meters, and the Long Range CIP, are somewhat limited in scope. However, there are 10 programs and measures which were analyzed and are to be implemented. This will allow the District to determine which programs are effective and which are not (if any).

Table 8.1 – St. Charles Mesa Water District Implementation Schedule for Measures and Programs

Worksheet 8-1: Implementation Schedule for Measures and Programs

Line	Measure/Program	Required Action	Beginning Date	Completion Date	Notes
1	Low Flush Toilets $50 rebate for first 10 participants (annually)	District notify customers via mailing & Website	1/1/2010	1/1/2029	Evaluate Annually
2	Low Flush Urinals $50 rebate for first 10 participants (annually)	District notify customers via mailing & Website	1/1/2010	1/1/2029	Evaluate Annually
3	Low Flow Showerheads $10 rebate for first 20 participants (annually)	District notify customers via mailing & Website	1/1/2010	1/1/2029	Evaluate Annually
4	Low Flow Kit. faucets $10 rebate for first 20 participants (annually)	District notify customers via mailing & Website	1/1/2010	1/1/2029	Evaluate Annually
5	Low Flow BR faucets $10 rebate for first 20 participants (annually)	District notify customers via mailing & Website	1/1/2010	1/1/2029	Evaluate Annually
6	Efficient Washing Machines $100 rebate for first 10 participants (annually)	District notify customers via mailing & Website	1/1/2010	1/1/2029	Evaluate Annually
7	Replace Old meters w/ radio read (400/Year for 10 years)	District shall perform Installation	5/1/2010	9/1/2020	
8	Provide $0.10 per sq.ft. rebate to customers who install LWU	District notify customers via mailing & Website	3/1/2010	3/1/2029	Evaluate Annually

9	Installation of 20 rain sensors/Year w/$10 rebate to customers	District notify custom-ers via mailing & Web-site	3/1/2010	3/1/2029	Evaluate Annually
10	Leak Detection and Replacement of leaking mains	District shall contract w/Leak Det. Service	3/1/2010	3/1/2029	Evaluate Annually

8.2 Develop Plan for Public Participation in Implementation

The District shall notify all customers of upcoming meetings, workshops and demonstrations via mailings, personal contact and on the District's website. In addition, there are 3 public meeting planned, between April, 2010 and June, 2010 to discuss the Conservation Plan. Also, the approved plan will be available on the District's Website.

8.3 Develop Plan for Monitoring and Evaluation Processes

The District shall submit its annual audit, water use records and any other data which is deemed appropriate, to YTG. The results shall be entered into the interactive spreadsheets and the evaluation of each measure and program shall be re-evaluated in this manner, annually. Successful programs shall be continued, and expanded, if necessary. Unsuccessful programs will either be modified, or eliminated. In addition, any customer can provide evaluation to the District, either in writing, at any of the monthly Board meetings, or via the District's website.

Table 8.2 – St. Charles Mesa Water District Evaluation of Conservation Measures and Programs

Year	# Taps Residential	Growth %	Res. *Usage* Ac.-Ft.	Use/Tap Ac.-Ft./Tap	Total Use Ac.-Ft.	% Total Use	Projected Savings Ac.-Ft.	Revised Usage *Forecast* Ac.-Ft.	Actual Metered Usage Ac.-Ft.
2000	3,606	-	1,684	0.47	-	-	-	-	-
2001	3,639	0.92%	1,609	0.44	1,971	81.6%	-	-	-
2002	3,681	1.15%	1,611	0.44	1,908	84.4%	-	-	-
2003	3,729	1.30%	1,487	0.40	1,823	81.6%	-	-	-
2004	3,753	0.64%	1,383	0.37	1,701	81.3%	-	-	-
2005	3,786	0.88%	1,549	0.41	1,910	81.1%	-	-	-
2006	3,810	0.63%	1,559	0.41	1,917	81.3%	-	-	-
2007	3,835	0.66%	1,499	0.39	1,791	83.7%	-	-	-
2008	3,873	1.00%	1,608	0.42	1,957	82.2%	-	-	-
2009	3,912	1.00%	1,687	0.43	2,054	82.2%	-	-	-
2010	3,951	1.00%	1,767	0.45	2,151	82.2%	13.5	1,754	-
2011	3,991	1.00%	1,847	0.46	2,248	82.2%	27.0	1,820	-
2012	4,031	1.00%	1,926	0.48	2,345	82.2%	40.5	1,886	-
2013	4,071	1.00%	1,945	0.48	2,368	82.2%	54.1	1,891	-

2014	4,112	1.00%	1,964	0.48	2,391	82.2%	67.6	1,897	-
2015	4,153	1.00%	1,984	0.48	2,415	82.2%	81.1	1,903	-
2016	4,194	1.00%	2,004	0.48	2,439	82.2%	94.6	1,909	-
2017	4,236	1.00%	2,022	0.48	2,461	82.2%	108.1	1,914	-
2018	4,279	1.00%	2,043	0.48	2,487	82.2%	121.6	1,922	-
2019	4,321	1.00%	2,064	0.48	2,512	82.2%	135.1	1,929	-
2020	4,365	1.00%	2,085	0.48	2,538	82.2%	139.4	1,946	-
2021	4,408	1.00%	2,106	0.48	2,563	82.2%	143.6	1,962	-
2022	4,452	1.00%	2,127	0.48	2,589	82.2%	147.8	1,979	-
2023	4,497	1.00%	2,147	0.48	2,614	82.2%	152.0	1,995	-
2024	4,542	1.00%	2,169	0.48	2,640	82.2%	156.3	2,013	-
2025	4,587	1.00%	2,189	0.48	2,665	82.2%	160.5	2,029	-
2026	4,633	1.00%	2,210	0.48	2,690	82.2%	164.7	2,045	-
2027	4,679	1.00%	2,231	0.48	2,716	82.2%	168.9	2,062	-

Year	# Taps Commercial	Growth %	Comm. Usage Ac.-Ft.	Use/Tap Ac.-Ft./Tap	Total Use Ac.-Ft.	%Total Use	Projected Savings Ac.-Ft.	Revised Usage Forecast Ac.-Ft.	Actual Metered Usage Ac.-Ft.
2000	161	-	362	2.25	-	-	-	-	-
2001	163	1.24%	267	1.64	1,971	13.5%	-	-	-
2002	165	1.23%	209	1.27	1,908	11.0%	-	-	-
2003	167	1.21%	250	1.50	1,823	13.7%	-	-	-
2004	169	1.20%	208	1.23	1,701	12.2%	-	-	-
2005	171	1.18%	259	1.51	1,910	13.6%	-	-	-
2006	177	3.51%	242	1.37	1,917	12.6%	-	-	-
2007	182	2.82%	177	0.97	1,791	9.9%	-	-	-
2008	184	1.00%	247	1.34	1,957	12.6%	-	-	-
2009	186	1.00%	265	1.43	2,054	12.9%	-	-	-
2010	188	1.00%	282	1.50	2,151	13.1%	2.0	280	-
2011	189	1.00%	299	1.58	2,248	13.3%	4.1	295	-
2012	191	1.00%	317	1.65	2,345	13.5%	6.1	310	-
2013	193	1.00%	321	1.66	2,368	13.5%	8.1	313	-
2014	195	1.00%	325	1.66	2,391	13.6%	10.2	315	-
2015	197	1.00%	329	1.67	2,415	13.6%	12.2	317	-
2016	199	1.00%	333	1.67	2,439	13.7%	14.2	319	-
2017	201	1.00%	337	1.68	2,461	13.7%	16.3	321	-
2018	203	1.00%	342	1.68	2,487	13.7%	18.3	324	-
2019	205	1.00%	346	1.69	2,512	13.8%	20.3	326	-
2020	207	1.00%	351	1.69	2,538	13.8%	21.0	330	-

2021	209	1.00%	355	1.70	2,563	13.9%	21.6	334	-
2022	211	1.00%	360	1.70	2,589	13.9%	22.2	338	-
2023	213	1.00%	365	1.71	2,614	13.9%	22.9	342	-
2024	216	1.00%	369	1.71	2,640	14.0%	23.5	346	-
2025	218	1.00%	374	1.72	2,665	14.0%	24.1	350	-
2026	220	1.00%	378	1.72	2,690	14.1%	24.8	353	-
2027	222	1.00%	383	1.72	2,716	14.1%	25.4	357	-

Year	# Taps Institutional	Growth %	Inst. Usage Ac.-Ft.	Use/Tap Ac.-Ft./Tap	Total Use Ac.-Ft.	%Total Use	Projected Savings Ac.-Ft.	Revised Usage Forecast Ac.-Ft.	Actual Metered Usage Ac.-Ft.
2001	8	-	95	11.84	1,971	4.8%	-	-	-
2002	8	0.00%	88	11.03	1,908	4.6%	-	-	-
2003	8	0.00%	86	10.78	1,823	4.7%	-	-	-
2004	8	0.00%	110	13.80	1,701	6.5%	-	-	-
2005	8	0.00%	102	12.79	1,910	5.4%	-	-	-
2006	8	0.00%	116	14.45	1,917	6.0%	-	-	-
2007	8	0.00%	115	14.40	1,791	6.4%	-	-	-
2008	8	0.00%	102	12.75	1,957	5.2%	-	-	-
2009	8	0.00%	102	12.75	2,054	5.0%	-	-	-
2010	8	0.00%	102	12.75	2,151	4.7%	0.9	101	-
2011	8	0.00%	102	12.75	2,248	4.5%	1.8	100	-
2012	8	0.00%	102	12.75	2,345	4.3%	2.7	99	-
2013	8	0.00%	102	12.75	2,368	4.3%	3.6	98	-
2014	8	0.00%	102	12.75	2,391	4.3%	4.5	97	-
2015	8	0.00%	102	12.75	2,415	4.2%	5.4	97	-
2016	8	0.00%	102	12.75	2,439	4.2%	6.3	96	-
2017	8	0.00%	102	12.75	2,461	4.1%	7.2	95	-
2018	8	0.00%	102	12.75	2,487	4.1%	8.1	94	-
2019	8	0.00%	102	12.75	2,512	4.1%	9.0	93	-
2020	8	0.00%	102	12.75	2,538	4.0%	9.3	93	-
2021	8	0.00%	102	12.75	2,563	4.0%	9.6	92	-
2022	8	0.00%	102	12.75	2,589	3.9%	9.9	92	-
2023	8	0.00%	102	12.75	2,614	3.9%	10.2	92	-
2024	8	0.00%	102	12.75	2,640	3.9%	10.4	92	-
2025	8	0.00%	102	12.75	2,665	3.8%	10.7	91	-
2026	8	0.00%	102	12.75	2,690	3.8%	11.0	91	-
2027	8	0.00%	102	12.75	2,716	3.8%	11.3	91	-

8.4 Develop Plan for Updating and Revising the Conservation Plan

Updates and revisions to the Conservation Plan shall take place immediately after the material outlined in 8.3, are delivered and assessed by YTG. This should occur in February of each year.

8.5 Define Plan Adoption Date / Plan Completed Date / Plan Approved Date

Step 9 – Monitor, Evaluate and Revise Conservation Activities and the Conservation Plan

9.1 Implement the Plan

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www.scmwd-pueblo.org

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