WATER CONSERVATION PLAN

for

The City of Lamar

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Lamar, CO 81052

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TEC Project No. 07-022.10

June 2010

THE ENGINEERING COMPANY

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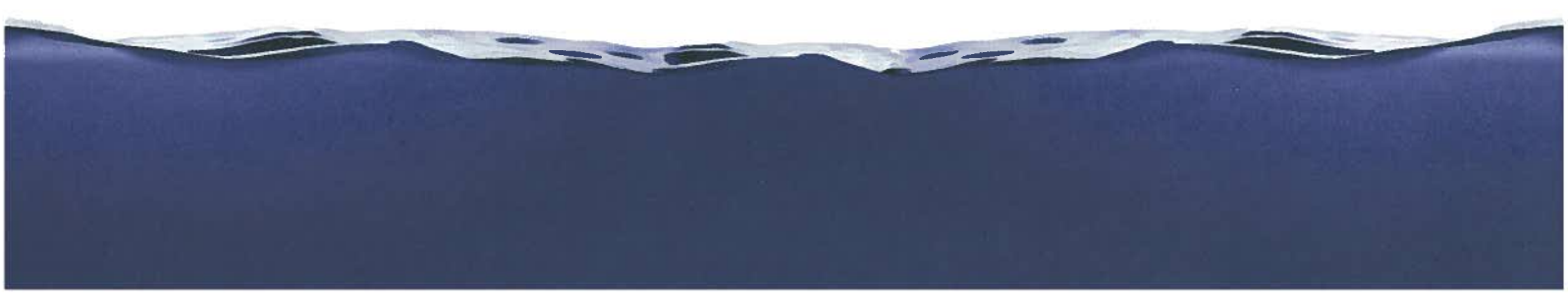


A. Purpose

The purpose of this Water Conservation Plan is to provide the City of Lamar with a living document that will address the use, conservation, and planning of their water resources. This plan is tailored for the needs and goals of the City of Lamar and its customers while meeting the requirements of Colorado Revised Statute §37-60-126, the "Water Conservation Act of 2004." The Plan should be reviewed annually to ensure that the conservation programs and activities are meeting the goals this Plan sets forth. Modifications should be made when necessary to reflect the changing goals and policies of the City's water department and its customers.

B. Water Conservation Act of 2004

The Water Conservation Act of 2004 was developed to ensure that water-providing agencies and/or municipalities were using their resources wisely in order to obtain financial assistance from either the Colorado Water Conservation Board (CWCB) or the Colorado Water Resources and Power Development Authority (CWRPDA). In order to show that water resources are being used wisely, the entity providing water must provide a water conservation plan to the State Office of Water Conservation and Drought Planning (OWCDP) for review. The water conservation plan must meet the criteria outlined by the Water Conservation Act of 2004. The OWCDP is also authorized by this act to provide grants to those entities in order to develop their water conservation plans. A guidance document, published on the CWCB's website, was created to help entities develop an acceptable water conservation plan.

According to the Water Conservation Act of 2004, a Plan must do the following:

- Provide a schedule for Plan implementation.
- Present water saving measures and programs, included as necessary, and to consider at a minimum the following:
  - Water efficient fixtures and appliances, including toilets, urinals, showerheads, and faucets;
  - Low water use landscapes, drought-resistant vegetation, removal of phreatophytes, and efficient irrigation;
  - Water reuse systems;
  - Distribution system leak identification and repair;
  - Dissemination of public information regarding water use efficiency measures, including 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; and,
  - Incentives to implement water conservation techniques, including rebates to customers to encourage the installation of water conservation measures.
- Provide a statement defining the role of the Plan in the City's supply planning.
- Outline the steps the City used and will use to implement, monitor, review, and revise its Plan.
- Define the time period (not to exceed seven years) after which the City will review and update its Plan.

- Report, either as a percentage or in acre-foot increments, an estimate of the amount of water that has been saved through a previously implemented conservation plan and an estimate of the amount of water that will be saved through conservation when the Plan is implemented.
- The Plan shall be made available for public review for no less than 60 days. A summary of the public review and comment process shall be included in the Plan with a list of the public comments received, if any, and the City's responses.

This Water Conservation Plan for Lamar was developed with the assistance of the guidance document found on the CWCB's website. The guidance document sets forth nine steps for the applicant to follow as addressed in the following chapters.

C. Previous Conservation Plan

The City of Lamar had previously prepared a Water Conservation Plan that was dated December 1, 2002. The plan was based on the requirements of the Water Conservation Act of 1991. This Act required that all entities that supply 2,000 acre-feet of water annually for domestic/commercial use must, within five years of the effective date, develop, adopt, make publicly available, and implement a water conservation plan. The Act required that a conservation plan:

1. Consider nine conservation measures;
2. Be published in draft form;
3. Be made publicly available for comment after public notice is given;
4. Solicit public comment for 60 days, minimum; and then,
5. The plan must be adopted and made publicly available.

The City's Water Conservation Plan, dated December of 2002, identified nine conservation measures that it planned on implementing. Table 1 lists the activities, proposed dates and the cost to the City for the measures.

Table 1: 2002 Conservation Measures

Measure	Start Date	End Date	City Cost
Water efficient fixtures *Revise Plumbing Standards*	1997	On going	$0.00
Low water use landscapes *Xeriscape future parks*	1987	On going	$5,000.00
Water reuse system *Ball parks*	1986	On going	Cost system = $1,500 Cost per year = $300
Distribution system leak repair *Leak detection, system repair/replacement*	1986	On going	$100,000
Dissemination of conservation information *Xeriscape information and Water Week promotion*	2002	On going	$500
Water rate structure *Rate Study*	2002	On going	$500
Regulatory measures *Wasting water ordinance*	Aug 2002	On going	$0
Incentives for conservation techniques *Lower tap fee for reduced tap size*	1986	On going	$0
Other management activities *Lost and unaccounted program Radio read meter system*	2002	On going	$50,000

CHAPTER 1
Profile of Existing Water System

CHAPTER 1: PROFILE OF EXISTING WATER SYSTEM

A. Purpose

The purpose of Chapter 1 is to summarize the service and operating characteristics of the City's water system to establish current conditions. These "baseline" conditions will be used to evaluate and frame the importance and value of water conservation in managing future water resources.

B. Service Area

The City of Lamar is located in the southeast portion of Colorado, more specifically east of Pueblo, approximately 30 miles from the Kansas border in the northwest portion of Prowers County. (See Figure 1-1.) The City's service area encompasses approximately four square miles that are not bounded by city limits.

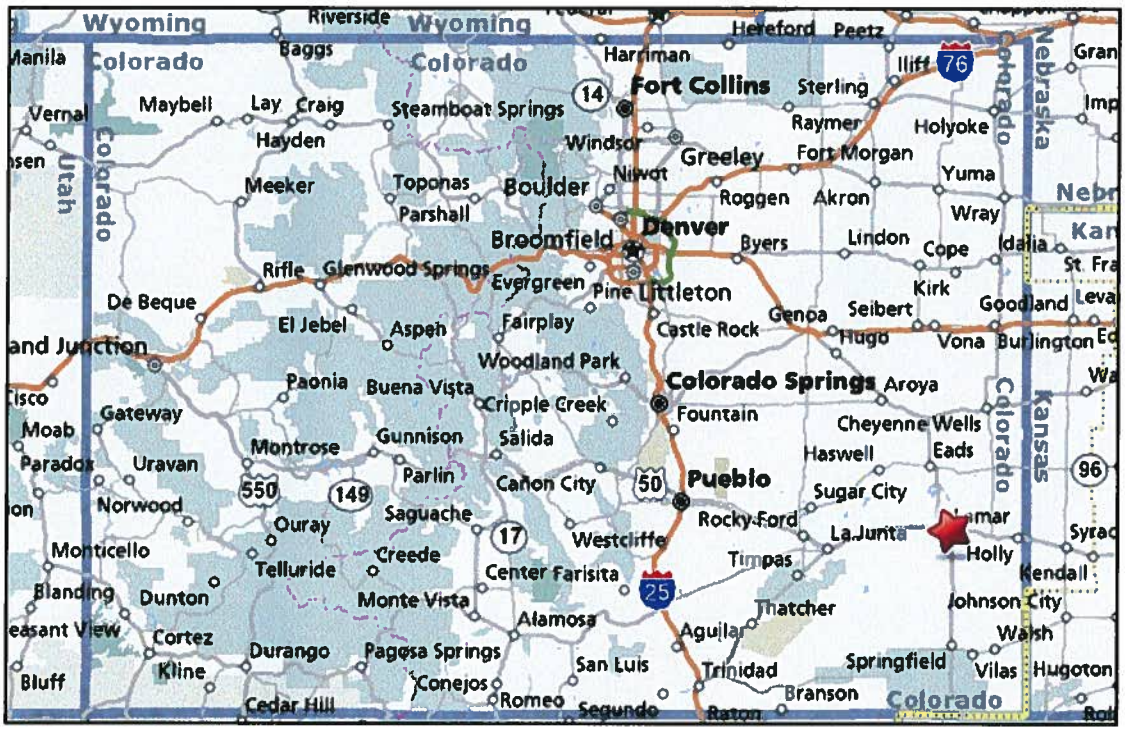


Figure 1-1: Vicinity Map

C. Water Service Facilities

The City of Lamar's potable water facilities include twenty-eight supply wells located in three separate well fields, with three main supply transmission lines, and four storage tanks. Well water is pumped to the two main storage tanks. From here water is piped to the chlorination station and then into the distribution system. The City has four pump stations: the Southside Booster Pump Station, the Westside Booster Pump Station, the South Well Field Collection Station, and the South Well Field Booster Station. These facilities are used to service the City and its three pressure zones. Table 1-1 provides a summary of the City's water system, its customers, billings, and capacity. More detail will be provided later in this Plan.

Table 1-1: Water System Profile (Worksheet 1-1)

SERVICE CHARACTERISTICS	Number		
Estimated service population	8,605		
Estimated service area (square miles)	45		
Miles of mains	90		
Number of treatment plants	1		
Number of separate water systems	One (1)		
Interconnection with other systems	None		
ANNUAL WATER SUPPLY	**Annual volume**	**Number of intakes or source points**	**Percent metered**
Groundwater	2,170 AFY	28	100%
Surface water			%
Purchases: raw			%
Purchases: treated			%
Total annual water supply	2,170 AFY		100%
SERVICE CONNECTIONS	**Connections**	**Water sales**	**Percent metered**
Residential	2,963	$712,022	100%
Commercial/Industrial	477	$310,936	100%
Public or governmental	47	$60,803	100%
Other			%
Total connections	3,487	$1,083,762	100%
WATER DEMAND	**Annual volume**	**Percent of total**	**Per connection**
Residential sales	354.9 MG	50%	119,777 gal
Nonresidential sales	208.0 MG	29%	396,947 gal
Other sales			
Non-account water: authorized and unauthorized uses	144.1 MG	20%	unknown
Total system demand (total use)	707.0 MG	100%	202,753 gal
AVERAGE & PEAK DEMAND	**Volume**	**Total supply capacity**	**Percent of total capacity**
Average-day demand	1.94 MGD	17.1 MGD	11.3%
Maximum-day demand	4.30 MGD	17.1 MGD	25.1%
Maximum-hour demand	6.62 MGD	17.1 MGD	38.7%
PLANNING	**Prepared a plan ☑**	**Date**	**Filed with state ☑**
Capital, facility, or supply plan	√	09/2007	
Drought or emergency plan			
Water conservation plan	√		√

The City's water supply originates from three well fields named the north well field, the south well field, and the middle well field. The north well field and middle well field are located east of Lamar near Clay Creek. The south well field is south of the City also in the Clay Creek alluvium. The wells are 50-150 feet deep and permitted to pump up to approximately 17.1 MGD. Table 1-2 summarizes the well permit and pumping information. Because the City has more than adequate pumping rights to fulfill current and projected demands, the City is not anticipating developing additional water rights within the planning period of this conservation plan.

Table 1-2: Well Summary

Permit No.	Well ID	Well Field	Aquifer	Depth	Permitted Pumping Rate (gpm)
21372-F	1	Middle	Clay Creek Alluvium	55.50	550
10678-F	2	Middle	Clay Creek Alluvium	148.00	225
21371-F	3	Middle	Clay Creek Alluvium	147.00	450
21374-F	4	Middle	Clay Creek Alluvium	55.50	225
18309W	5	Middle	Clay Creek Alluvium	52.50	225
RF-117	6	Middle	Clay Creek Alluvium	55.00	225
21373-F	7	Middle	Clay Creek Alluvium	62.00	225
19151R	8	Middle	Clay Creek Alluvium	65.00	225
19937R	9	Middle	Clay Creek Alluvium	67.90	200
19937S	10	Middle	Clay Creek Alluvium	54.70	200
19937U	11	Middle	Clay Creek Alluvium	54.80	200
19937V	12	North	Clay Creek Alluvium	63.30	250
20018R	13	North	Clay Creek Alluvium	67.30	475
20018S	14	North	Clay Creek Alluvium	67.00	690
20018T	15	North	Clay Creek Alluvium	78.00	330
20018U	16	North	Clay Creek Alluvium	96.30	470
20018V	17	North	Clay Creek Alluvium	90.70	380
20018W	18	North	Clay Creek Alluvium	80.20	490
20018X	19	North	Clay Creek Alluvium	81.20	350
20018Y	20	North	Clay Creek Alluvium	83.70	340
3809F	21	South	Clay Creek Alluvium	74.00	1,200
3808F	22	South	Clay Creek Alluvium	74.00	1,200
3747F	23	South	Clay Creek Alluvium	90.00	300
10750F	24	South	Clay Creek Alluvium	74.00	420
10748F	25	South	Clay Creek Alluvium	82.00	210
10749F	26	South	Clay Creek Alluvium	67.50	170
3390F	27	South	Clay Creek Alluvium	77.00	700
3391F	28	South	Clay Creek Alluvium	76.00	1000

Water is delivered to the City from the well fields through three transmission lines. The north line, an 18-inch line, conveys water from the north well field to the 24-inch line that supplies the City water and fills the 6 MG and 2 MG storage tanks. The middle transmission line includes a 14-inch line that reduces to a 12-inch line before it delivers water to the 6 MG and 2 MG storage tanks. The south transmission line is a 14-inch line that delivers water to a storage vault before water is pumped to the 6 MG and 2 MG storage tanks.

There are two concrete vaults and two ground level steel storage tanks that provide the City's water storage. These four tanks vary in size and provide the City with 8.144 MG of storage.

D. System Conditions

The water system for the City of Lamar has sufficient capacity for its expected growth, and is not in a critical water supply area; but its infrastructure is old and many portions of it are reaching the end of their design life. Some of the system is over 80 years old. In order to combat the aging infrastructure and non-account water problem, the City includes an item in their budgeting process for a main replacement program. The main replacement program is intended to provide increased service reliability and to reduce the amount of non-account (lost) water due to leaky mains and un-metered service. Table 1-3 summarizes the conditions of the City's water system.

Table 1-3: Summary of System Conditions (Worksheet 1-2)

PLANNING QUESTIONS	Yes	No	Comment
Is the system in a designated critical water supply area?		√	The system is not currently in a critical water supply area.
Does the system experience frequency shortages or supply emergencies?		√	The system does not experience supply shortages. Existing groundwater sources are capable of supplying the service area into the foreseeable future.
Does the system have substantial unaccounted-for and lost water?	√		The primary reasons for unaccounted for and lost water include leaky mains, un-metered use, line flushing, and hydrant testing.
Is the system experiencing a high rate of population and/or demand growth?		√	Population in the service area has shown a negative growth rate over the last several years and is expected to stabilize and show minor growth.
Is the system planning substantial improvements or additions?	√		System improvements are primarily intended to replace aging infrastructure.
Are increases to wastewater system capacity anticipated within the planning horizon?	√		The adequacy of the existing wastewater system was examined in the 2007 master plan in which alternatives for improvements or expansions are identified.

E. Current Water Conservation Efforts

Existing water conservation efforts that are being implemented by the City of Lamar include the following:

1. All connections to the water system are metered.
2. Water restrictions per Ordinance No. 877.
3. Water efficient plumbing fixtures are required by the State Plumbing Code as mandated by the 1992 Energy Policy Act. The City plumbing inspector has jurisdiction and is responsible for enforcement of the codes in the water service area.

The City of Lamar currently uses a combination of voluntary and mandatory restrictions for watering during the summer. The watering restrictions have been used in the City for more than a decade, and therefore the real conservation impact is unknown; however, the City does plan on continuing the restrictions. The 6-Stage Water Restriction Schedule is as follows:

6-Stage Water Restriction Schedule

- VOLUNTARY WATER USE GUIDELINES
  Hours – Outside water use should only occur between the hours of 3:00 p.m. and 10:00 a.m.
  Duration – Only a total of 3 hours of water use should occur per property.
  Water Uses – Water should not be used to wash sidewalks, walkways, patios, driveways, parking areas or other impervious surfaces.
  Limited water uses – (1) Washing of vehicles should be done by use of a hose with a positive shutoff nozzle or by use of a bucket, and at all times during the vehicle washing procedure, the vehicle should be parked on a grassy area. (2) Flowers, flower beds, trees, shrubs, vegetable gardens and plants should be watered with a bubbler system, a drip irrigation system or by hose with hand-held nozzle during the recommended hours and as part of or encompassed within the 3 hours of total watering time for each property.

- Stage 1 – **Mandatory** restrictions – Restrict hours - outside water use only during specified hours (3 p.m.–10 a.m.), 3 hours per property; no hose washing of sidewalks, walkways, patios, driveways, parking areas or other impervious surfaces; washing cars permitted only by hose with a positive shutoff or by bucket (car must be parked on grass area); flowers, flower beds, trees, shrubs, vegetable gardens may be watered with a bubbler system, drip irrigation system or hand held nozzle during the allowed hours.

- Stage 2 – **Mandatory** restrictions – limited outside watering times, three times per week, 15 minutes per area, 3 hours per property (east side of U.S. 287 on Sunday, Tuesday and Thursday, west side of U.S. 287 on Saturday, Monday and Wednesday); adding water to hot tubs, swimming pools, spas, fountains and other water features is prohibited; flowers, flower beds, trees, shrubs, vegetable gardens may be watered with a bubbler system, drip irrigation system or hand held nozzle – only during specified watering hours and on specified days; all other restrictions as stated in stage 1.

- Stage 3 – **Mandatory** restrictions – limited outside watering times, two times per week, 15 minutes per area, 3 hours per property. East of U.S. 287 on Sunday and Wednesday, West of U.S. 287 on Tuesday and Saturday; the allowed hours on your given day will be from 12:00 .a.m. (midnight) until 8:00 a.m. and 5:00 p.m. until 12:00 a.m. (midnight). All other restrictions as stated in stage 1 and 2.

- Stage 4 – **Mandatory** restrictions – limited outside watering, one time per week (east side of U.S. 287 on Monday, west side of U.S. 287 on Tuesday); all other restrictions as stated in stages 1, 2 and 3.

- Stage 5 – **Mandatory** restrictions – limited outside watering, one time per month (east side of U.S. 287 on the 15th, west side of U.S. 287 on the 30th) all other restrictions as stated in stages 1, 2, 3 and 4.

- Stage 6 – **Mandatory** restrictions – no outside watering.

During **Mandatory** water restrictions, the following charges will be in effect for any violations:

1. First violation, City of Lamar will issue a written warning.
2. Second violation, within 30 days, violators will receive a written notice of the violation along with a $100.00 fine in municipal court.
3. A third violation, within 90 days, will result in a written notice along with a $200.00 fine in municipal court.
4. If there is a fourth violation within 12 months, the customer will receive a written notice of the violation, a $300.00 fine in municipal court and flow restriction placed on the meter.
5. Additional violations may result in disconnection of water services.

ALL customers using water delivered by the City of Lamar's water distribution system and all "outside users" (customers residing outside the City limits) will be expected to abide by these restrictions or they will face possible fines.

Public announcements will be made when mandatory water restrictions are to be implemented.

An additional way that water conservation is implemented is through the State Plumbing Code as mandated by the 1992 Energy Policy Act. This code requires water efficient plumbing fixtures and is enforced by the City plumbing inspector.

The pricing structure for the City's water system is based on a straight price per 1,000 cubic foot block after the minimum allowance (set by the water meter size) is exceeded. The need to alter the pricing structure has not been necessary as the residential users, the largest user group and typically the biggest abuser of water, has a lower than normal usage. Therefore, it is important to note that the most common place to trim water use is already using approximately 33 percent less than the statewide typical residential user.

CHAPTER 2
Water Use and Demands Forecast

CHAPTER 2: WATER USE AND DEMANDS FORECAST

A. Purpose

Within this chapter, the City provides an estimate of the future water needs and demands, identifying potential gaps in the existing water supply system. These gaps could relate to total water demand, peak demand, or a combination of both.

B. Population and Per Capita Use

The City of Lamar has had a slightly negative growth rate for four of the last six years. Census data shows tremendous growth from 1890 to the 1930's, at which time growth slowed in the area. In the late 1990's the declining population in the City became apparent. In recent years, the growth in Lamar has stagnated. Figure 2-1 shows the historic growth in Lamar with the projected growth according to the 2007 Master Plan. The recent master plan estimated an annual growth rate of 0.3 percent and still called this growth optimistic.

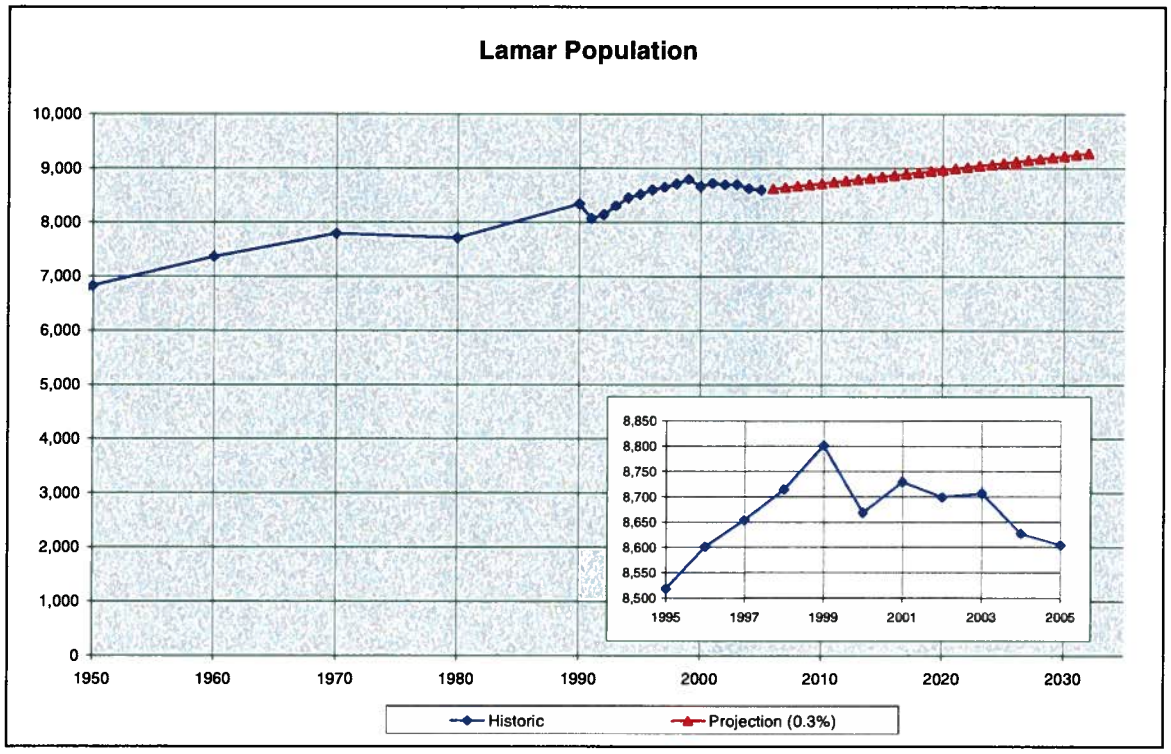


Figure 2-1: Lamar Population Data

The City of Lamar provides potable water service to approximately 3,500 customers inside and outside city limits. Census data from 2005 for the City of Lamar produced by the Colorado State Demographers Office show an average of 2.59 persons per household. Given that the City provides service to 2,963 residential taps, the estimated population serviced by the City is 7,674. When non-residential taps are included in this estimate, the service population is increased to 8,605.

From Table 1-1, the City's current total annual system demand is 707 million gallons. Given a service population of 8,605, the City's current per capita use rate equates to 225 gallons per person per day.

C. Historic Water Use

The City's water customers include residential, commercial, and industrial users. The residential customers account for approximately 51 percent of the annual usage, while the commercial and industrial use accounts for 29 percent. Non-account water accounts for approximately 20 percent of the total water use. Non-account (lost) water is attributed to line leakage, un-metered water use, fire demands, and line flushing. The pie chart shown in Figure 2-2 shows the delineation of annual water usage by type of customer and is based on data from 2006.

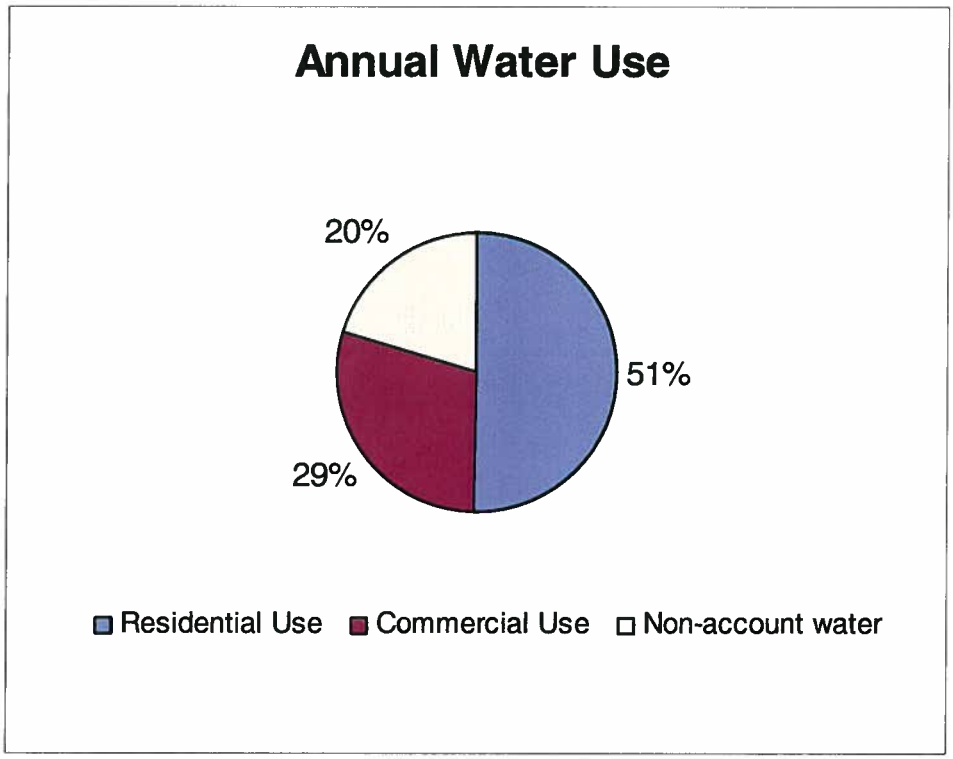


Figure 2-2: Annual Water Usage by Account Type

Overall water use statistics are shown in Table 2-1 where the annual and maximum day usage is broken down by water use. The Residential and Overall water use is substantially lower than the Commercial/Industrial water use. It should be noted that the Residential and Commercial/Industrial use does not include non-account water, while the Overall water use was derived by dividing the total amount of water processed through the treatment plant by the total number of taps in the system, thereby including the non-account water. The maximum day demand for the Overall system is closer to what is typically seen in water districts, but is still smaller than the widely accepted number of 1 gpm/tap.

Table 2-1: City of Lamar Water Statistics

Description	Residential	Commercial/Industrial	Overall
Average Day Demand	0.23 gpm/tap	0.80 gpm/tap	0.38 gpm/tap
Maximum Day Demand (2005)	0.58 gpm/tap	1.66 gpm/tap	0.85 gpm/tap
MDD:ADD ratio	2.52	2.08	2.24

The City of Lamar's water department, like other utilities in arid climates, sees an increase in water usage in the summer months for irrigation. The maximum day demands shown in the table above typically occur in the hottest of the summer months, and residential users tend to be the largest users of water for irrigation.

As opposed to the commercial and industrial users whose water use requirements are more or less dictated and fixed in nature, the residential users have the potential to conserve an ample amount of water. For instance, they can curtail their water use by choosing not to irrigate their lawns or landscaping. The drought around 2000-2002 has brought the typical residential user to have a greater understanding of water use and water conservation shown by the changes in peak season water use. Figure 2-3 below illustrates the changes in water use the water district has experienced around the drought. It is clear that residential use has dropped significantly during the summer months and commercial use has even dropped slightly during summer months. Future readings will tell whether the shift is permanent.

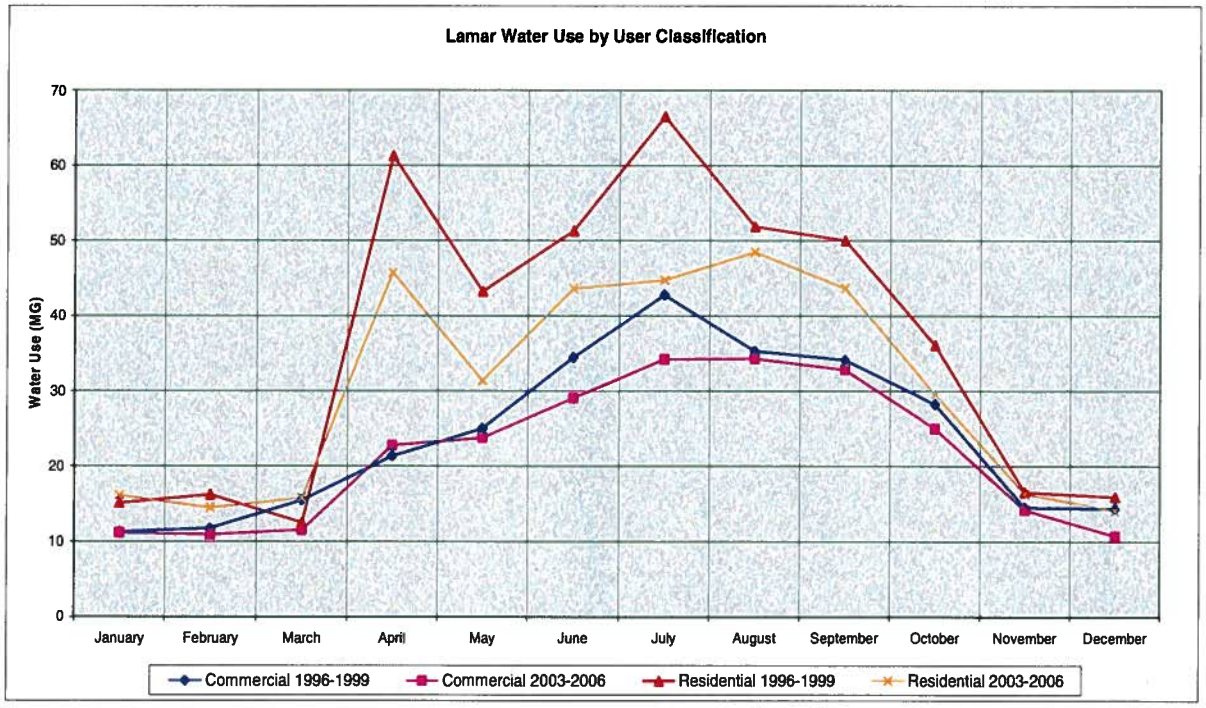


Figure 2-3: Annual Water Use by Classification

The City monitors its treatment facility on an hourly basis, and those readings were used to determine the maximum day demand pattern. The 2005 and 2006 demand pattern was compared to the 1994 demand pattern and the AWWA recommended demand pattern. The patterns show a general shift in water use over the last 10 to 15 years. Previously, the demand patterns reflected the general trends represented by the AWWA pattern with moderately high use in the middle of the day. Recently the general public has become more aware of effective irrigation practices resulting in the peak water use in the early mornings and the evenings as shown in Figure 2-4.

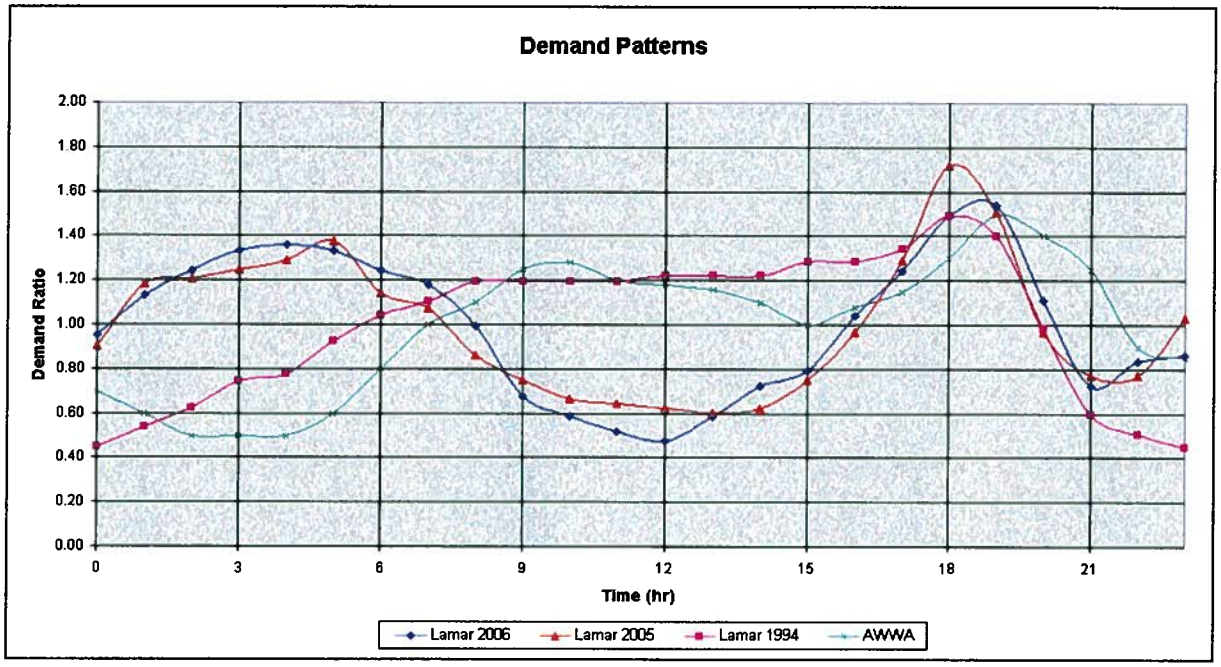


Figure 2-4: Daily Usage Pattern

D. Non-Potable Water Use

The City of Lamar currently irrigates 68 acres of the City's 107.7 acres of parks, athletic fields, and public areas with non-potable water sources. The City of Lamar studied the use of non-potable dual systems to irrigate parks, open spaces, and commercial and residential landscaping. The Colorado Water Conservation Board (CWCB) has provided some cost sharing assistance to the City to investigate additional non-potable irrigation locations. The study found that the City was a good candidate for non-potable irrigation by utilizing its shares of ditch water and groundwater rights. The study also developed preliminary construction costs for 6 phases of a project to bring non-potable water use into the City on a broad scale. The estimated construction costs for these phases of the project varied between $900,000 and $2.6 million with the total cost estimated at $10.4 million. The benefits of a non-potable system include increased capacity in the water mains, lower treatment costs, lowering pumping costs from the domestic wells, and lowering augmentation needs. However, it would also increase the amount of infrastructure the City would maintain, require coordination and cooperation of City residents with the installation of a secondary system, require a secondary source of water should the ditch shares be lower than expected, possibly increase monthly water bills to customers for additional debt retirement, and operation and maintenance of the new system.

E. Water Use Projections

Projection of the future demands for the City as a whole is based upon the historical growth of approximately 0.3 percent per year. This is a conservative approach as recent trends have shown a decreasing population at a rate of 0.4 percent per year over the last five years. It is difficult to predict the location or the magnitude of the future demands on the City. Obviously, the demands are dependent upon the location of future developments, new industries, etc., but with the recent decrease in population, projected growth is even more difficult to predict. Nevertheless, Table 2-2 summarizes the projected water demands based on the annual historic growth rate of 0.3 percent. Because of the expected low population growth and subsequent lack of need for additional infrastructure, the forecast amounts shown on the table for non-account water assume a fixed rate of 20 percent over the entire planning period, matching the 20 percent previously shown on Table 1-1. The table also indicates that the available water supply is significantly higher than the projected demands; therefore, the City is not in need of pursuing any additional water rights.

Table 2-2: Preliminary Water Demand Forecast (Worksheet 2-1)

	Item	Current year	5-year forecast	10-year forecast	20-year forecast
A	**RESIDENTIAL DEMAND**				
1	Current annual water residential sales (total gallons)	354,900,000			
2	Current population served [b]	8,605			
3	Residential sales per capita (line 1 divided by line 2) [b]	41,243			
4	Projected population [b]		8,752	8,876	9,129
5	Projected annual residential water demand (line 3 multiplied by line 4)		361.0 MG	366.1 MG	376.5 MG
B	**NONRESIDENTIAL DEMAND [C]**				
6	Current annual water nonresidential sales (total gallons)	208,046,887			
7	Current number of taps	524			
8	Water use per tap (line 6 divided by line 7)	397,036			
9	Projected number of taps		607	704	946
10	Projected annual nonresidential water demand (line 8 multiplied by line 9)		241.0 MG	279.5 MG	375.6 MG
C	**NONACCOUNT WATER (WATER NOT SOLD TO CUSTOMERS)**				
11	Current and forecast amount [d]	144.1 MG	144.1 MG	144.1 MG	144.1 MG
D	**WATER SYSTEM TOTAL DEMAND**				
12	Current total annual water demand (add lines 1, 6, 11)	707.0 MG			
13	Projected total annual water demand (add lines 5, 10, 11)		746.1 MG	789.7 MG	896.2 MG
14	Adjustments to forecast (+ or -)		0 MG	0 MG	0 MG
15	Current (line 12) and adjusted total annual water demand forecast (add lines 13 and 14) [e]	707.0 MG	746.1 MG	789.7 MG	896.2 MG
16	Current and projected annual supply capacity [f]	6,241 MG	6,241 MG	6,241 MG	6,241 MG
17	Difference between total use and total supply capacity (+ or -) (subtract line 12 from line 15)	5,534 MG	5,495 MG	5,451 MG	5,345 MG
E	**AVERAGE-DAY AND MAXIMUM-DAY DEMAND**				
18	Average-day demand (line 15 divided by 365)	1.94 MGD	2.04 MGD	2.16 MGD	2.46 MGD
19	Current maximum-day demand	4.5 MGD			
20	Maximum-day to average-day demand ratio (line 20 divided by line 19)	2.32			
21	Projected maximum-day demand (line 18 multiplied by line 20 for all forecast years)		4.74 MGD	5.02 MGD	5.71 MGD
22	Adjustment to maximum-day demand forecast [e]		0 MGD	0 MGD	0 MGD
23	Current (line 19) and adjusted maximum-day demand forecast (add lines 21 and 22)	4.5 MGD	4.74 MGD	5.02 MGD	5.71 MGD
24	Daily supply capacity (divide line 16 by 365)	17.1 MG	17.1 MG	17.1 MG	17.1 MG
25	Ratio of maximum-day demand to daily supply capacity (divide line 23 by line 24)	0.26	0.28	0.29	0.33

CHAPTER 3
Profile of Proposed Facilities

CHAPTER 3: PROFILE OF PROPOSED FACILITIES

A. Purpose

This step of the process is intended to identify the water supply needs for the City and estimate the costs for developing, operating, and maintaining the water supply and infrastructure.

B. Future Water Supply

The City of Lamar has acquired sufficient water rights to provide water to its current and future customers through ground water rights and acquired sufficient surface water rights used for augmentation. The City is also exploring the use of Fryingpan-Arkansas project water through the proposed Arkansas Valley Conduit. The proposed conduit's main function is to supply the towns and cities along the Arkansas River with treated drinking water because the quality of water in the Arkansas River is continually deteriorating. Levels of TDS have continued to increase over the years and have limited the time of year that the City can use diversions from the river to recharge the Clay Creek Aquifer. The water with high levels of TDS may "plug" the soils and reduce the ability to recharge the aquifer with Arkansas River diversions.

C. Facility Needs Analysis

The City of Lamar has recently completed an update to their water master plan. This plan provided the City with a list of the improvements necessary to provide and maintain adequate service to their customers (current and future) as projected for a 20-year planning horizon and a list of recommended waterline replacements for infrastructure near the end of its design life. The most important improvements for the City to complete are listed in Table 3-1; a summarized description of each improvement follows the table. All but the last one of these items affect the main transmission and treatment of the City's water system. It is important to note that no improvements are recommended to provide additional capacity. The City of Lamar has been approved for SRF funds through the State of Colorado. These funds will be available at a 2.5% interest rate for a period of twenty years.

Table 3-1: Improvements Required for Service (2008-2010)

Priority	Description	Estimated Cost
1	Valve House Replacement	$ 203,900
2	Tanks Piping Improvements and Chlorination Building Relocation	$ 1,998,750
3	Repair and Recoat 6.0 MG Storage Tank	$ 658,000
4	24-inch Transmission Line Replacement	$ 2,152,400
5	Willow Creek Park Non-Potable Irrigation Pump Station	$ 250,000
	Total Project Costs	**$ 5,263,050**

Improvement Summary, Priority 1

Project: Valve House Replacement
Project Cost: $ 203,900
Financing Cost: $ 5,100
Total Capital Cost: $ 209,000

The existing valve house is a central component to the overall water system. The majority of the water supply goes through the valve house and is distributed to the system. The existing piping in the valve house shows critical points of corrosion at several locations. These locations can not be easily repaired because the pipe is under pressure all the time. To replace the piping it will be necessary to construct a 24-inch bypass around the valve house.

Improvement Summary, Priority 2

Project: Tanks Piping Improvements and Relocation of Chlorination Building
Project Cost: $ 1998,750
Financing Cost: $ 50,250
Total Capital Cost: $ 2,049,000

The existing water treatment facility, the chlorination building, is located at a point in the system that does not allow adequate contact time for disinfection. Therefore, the master plan has recommended that the Chlorination Building be relocated to the main storage tank site for the City. The disinfection of water before it enters the storage tanks and the ability to remove one of the tanks from service will require some piping improvements. These improvements are included in priority item number 2.

Improvement Summary, Priority 3

Project: Repair and Recoat of 6.0 MG Storage Tank
Project Cost: $ 658,000
Financing Cost: $ 17,000
Total Capital Cost: $ 675,000

Inspections in 2007 of the 6.0 MG storage tank for the City of Lamar found significant coating failure and corrosion occurring in the roof of the tank, both of the interior and the exterior. If the piping improvements are completed as listed in priority 2 above, it will be possible to isolate the tank so that it can be drained, cleaned, repaired, and repainted.

Improvement Summary, Priority 4

Project: 24-inch Transmission Line Replacement
Project Cost: $ 2,152,400
Financing Cost: $ 53,800
Total Capital Cost: $ 2,206,200

One of the limitations of the water system serving the City residents is the single supply line. The 24-inch line is aging and is located in an area difficult to access if a water main break were to occur. In this light, the master plan recommended that an additional 24-inch line be constructed to serve as the primary delivery method from the City's storage tanks to the City residents. The old line would stay in place but would not be used except in an emergency situation.

Improvement Summary, Priority 5

Project: Non-Potable System for Willow Creek Park
Project Cost: $ 250,000
Financing Cost: $ 0 (Assuming project is paid directly from budgeted dollars)
Total Capital Cost: $ 250,000

The non-potable pump station proposed for Willow Creek Park is intended to use Fort Bent Ditch shares to irrigate the park. This would allow extra capacity in the City's delivery system and would eliminate the need for disinfection for the irrigation water the parks require.

In addition to the improvements described above, Table 3-2 lists the line replacements recommended by the master plan to replace aging infrastructure. All work is to be done as funds are available from the City's budget; therefore, no financing costs are expected. Table 3-3 summarizes the type of water demand that is affected by each recommended improvements.

Table 3-2: Waterline Replacements (2008-2014)

Priority	Description	Estimated Cost
1	Eighth St. Main Replacement from Ft. Bent Canal to Laurel Vac.	$ 45,000
2	Laurel Main Replacement from Eighth to Sixth	$ 42,000
3	Sixth St. Main Replacement from Laurel to Mayhew	$ 28,000
4	Third St. Main Replacement from Elm to Park	$ 54,000
5	Maple St. Main Replacement from Main to Ninth Maple St. Loop	$ 104,000 $ 69,000
6	10" and 12" Industrial Park Looping	$ 168,000
	Total Project Costs	**$ 510,000**

Table 3-3: Water Use Affected by Recommended Improvements

Facility Improvement	Type of Water Demand
Valve House Improvements	Maximum Day
Chlorination Building Relocation	Maximum Day
Repair 6.0 MG Storage Tank	Maximum Day
Chlorination Building Piping	Maximum Day
24-inch Transmission Line	Maximum Day
Non-potable Irrigation System	Maximum Day
Waterline Replacements	Peak Hour

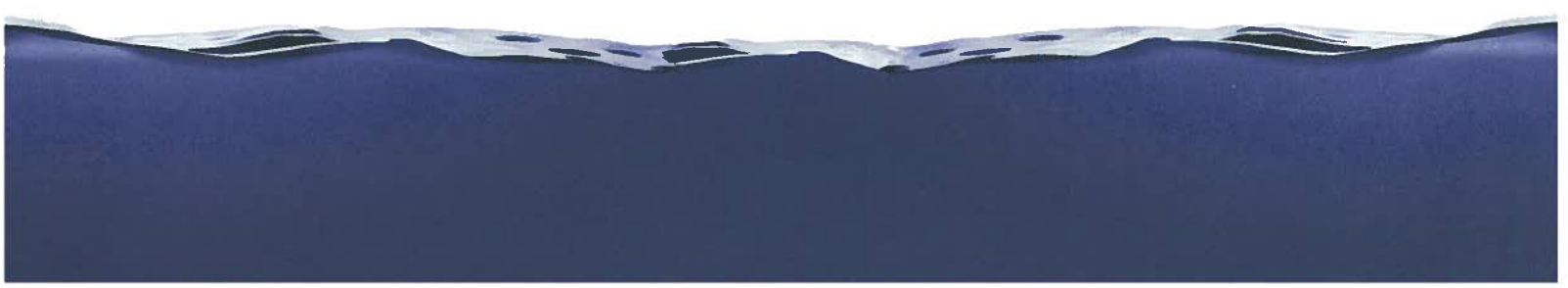
Beyond the capital improvement projects mentioned above, the City also plans to increase the capacity of the wastewater treatment facilities. A detailed study of the current wastewater treatment system was presented in the 2007 master plan. The study involved investigations of the adequacy of the various unit processes within the system, changes necessary to allow the system to comply with upcoming standards, and what is required to expand the system. Several alternatives were identified in the study. One alternative recommended an expansion to Lamar's wastewater treatment plant, involving minor modifications to the existing lagoon facility.

The selected alternative to the City's wastewater treatment plant involves the construction of a small settling cell in an existing cell to settle solids and provide a location for disinfection prior to discharge into an adjacent cell or into a pumping station for transfer to the ultimate discharge point in the Lamar Canal. A combined discharge permit with two discharge locations would be obtained to accommodate seasonal variations in plant operation. The current groundwater discharge permit would be renewed with an increased hydraulic capacity of 1.5 MGD. A surface water discharge permit would also be obtained for discharge into the Lamar Canal.

The groundwater discharge would occur through seepage from the floor of an existing lagoon cell. The Preliminary Effluent Limits (PEL) have indicated that the construction and operation of a disinfection system will be needed. Bulk liquid hypochlorite would be added to the wastewater to meet the required fecal limits. Disinfection would also be necessary to meet fecal limits on the surface water discharge, and the wastewater would need to be pumped approximately two miles to the discharge point on the Lamar Canal.

The engineer's opinion of cost for this project with aeration was approximately $1.3 million. If existing lagoon cells required cleaning and sealing, the project cost would rise to approximately $2.1 million. If the State Department of Health ultimately requires the City to seal the lagoons, an alternative involving high rate aerated lagoons should be considered. The master plan concluded that the City should plan on appropriating approximately $3.0 million for lagoon improvements.

CHAPTER 4
Identification of Conservation Goals



CHAPTER 4: IDENTIFICATION OF CONSERVATION GOALS

A. Purpose

Within this chapter, the City of Lamar develops reasonable and measurable goals based on anticipated benefits for the water system and customers.

B. Water Conservation Goals

Specific, attainable goals tied to a timeline for implementation with regular review and modifications are key components to a successful conservation plan. Furthermore, the City of Lamar recognizes the importance of conserving water while minimizing the impact to the customer. Thus the City has set forth one short term water conservation goal and two long term goals. Their goals are based on the existing system's conditions, current and future water demand projections, and anticipated needs for infrastructure improvements:

- Short Term Goal: Decrease water use by one percent each year over a ten-year period to 2019.
- Long Term Goal: Decrease overall water use such that a 0.3 percent increase in population over a 20-year period will not increase water use.
- Long Term Goal: Increase the use of non-potable water to irrigate parks, open spaces, and landscaping over a 20-year period.

The City believes these goals are attainable by targeting not only the residential per capita use, but the overall water use with particular attention to the non-account water.

As related to the system conditions as discussed in Chapter 1, non-account water accounts for a substantial 20 percent of the total water use. Line leakage, un-metered users, fire hydrant tests, and line flushing constitute the majority of the non-account usage. The system's infrastructure is old with many portions of it reaching the end of their design life. In order to combat the non-account water usage, the City has included a main replacement program in their budgeting process. The program is partially intended to reduce the amount of non-account water lost due to leaky pipes and un-metered service.

With respect to the water use projections presented in Chapter 3, Lamar's population is not expected to substantially increase over the next 20 years. A conservative growth rate of only 0.3 percent per year was used in the projections. However, since the residential users account for over 50 percent of the City's total water use, they are a reasonable target to focus on with respect to potential water conservation measures. Despite residential users already using 33 percent lower than the statewide average, the City believes further per capita reductions are possible by enhancing current water conservation efforts.

The City of Lamar has sufficient water rights to provide for its current and future customers. However, as mentioned in Chapter 3, the City has developed a list of improvements necessary to provide and maintain adequate service to both current and future customers over a 20-year planning horizon. One capital improvement project planned is the non-potable pump station for Willow Creek Park. Rather than using potable water, the pump station is slated to use Fort Bent Ditch water shares to irrigate the park. The City plans to continually investigate the installation of other non-potable systems that would thereby increase the capacity in the water mains, lower treatment costs, and reduce pumping rates and pumping costs from the domestic wells.

C. Goal Development Process

A collaborative effort between the City staff, officials, and consulting engineers was used in the goal development process. Data on the City's water system and current conservation measures were studied to characterize water supply, water demand, and customer use. Discussions were held in which target water users were identified based on the information that has been provided in the preceding chapters. The goals were then established based on those that would have the highest probability of success and public acceptance.

With overall importance to the success of the water conservation plan, another factor considered in the goal development process was whether or not the goals can be implemented under an effective monitoring plan. The development of these goals considered whether billing and well production data could be processed to annually measure the success of the goals. In order to measure the success, current data would need to be compared to historic data to identify trends and changes.

Public acceptance was another factor considered in the goal development process. For instance, the City did not want to establish goals that would be too restrictive on residential users nor excessively hamper local businesses. The goals also needed to be carefully crafted so as to not hinder any potential population growth. As a case in point, the one percent reduction in water use over a ten-year period is a goal the City felt could be met with public acceptance, appropriate as to not impact potential growth, measurable, and realistic.

CHAPTER 5

Identification of Conservation Measures and Programs

CHAPTER 5: IDENTIFICATION OF CONSERVATION MEASURES AND PROGRAMS

A. Purpose

Within this chapter, the City provides a synopsis of conservation measures and programs considered for potential implementation. A preliminary screening process is then applied to eliminate particular conservation measures and programs that do not meet Lamar's conservation goals. Those conservation measures and programs that remain are further evaluated in Chapter 6.

B. Identification of Conservation Measures and Programs

Conservation *measures* are specific technologies or practices that directly reduce water use. The customer, rather than the water provider, must implement the demand-side measures. For example, it is the customer who replaces an old toilet with a water-efficient model. The water provider, on the other hand, implements the supply side measures such as leak repair to transmission lines.

Conservation *programs* are the activities that a water provider undertakes to encourage or require conservation measures. For instance, the water provider can offer rebates to customers who replace old toilets. A program by itself does not save water; however, in this example, it is a key precursor to leak repair, a measure that does save water.

The City of Lamar developed a universal list of topics regarding conservation measures or programs that could potentially be implemented. Those considered during the development of this Plan include the measures and programs identified in CWCB's Water Conservation Plan Development Guidance Document and as specified in CRS 37-60-126 (4) (a)., which is located in Appendix A. Eleven topics of conservation measures or programs were considered as part of this step:

Conservation Measures, Demand-Side

1. Water-efficient fixtures and appliances, including toilets, urinals, showerheads, faucets, and washing machines.
2. Landscape efficiency, including low water use landscapes, drought-resistant vegetation, and efficient irrigation equipment and scheduling.
3. Industrial and commercial efficiency, including water-efficient processes.

Conservation Measures, Supply-Side

4. Water reuse systems.
5. Distribution system efficiency, including leak repair and removal of phreatophytes.

Conservation Programs, Demand-Side

6. Education and information dissemination, including public education, water-saving demonstrations, school programs, and water bill inserts.
7. Technical assistance, including water use audits targeted at large users and large landscapes.
8. Rate structure and billing systems designed to encourage efficiency, including volume billing and conservation (tiered) rate structure.
9. Regulations and/or Ordinances, addressing fixtures and appliances, landscapes, and water waste prohibition.
10. Incentives, including rebates.

Conservation Programs, Supply Side

11. Distribution system efficiency, including leak identification, meter testing and replacement, and analysis of non-account water.

C. Screening Criteria

Screening criteria were developed to eliminate certain conservation measures and programs from further consideration. These criteria were used to evaluate the effectiveness of each measure or program with respect to the City of Lamar's system. The eleven topics of conservation measures and programs listed above were evaluated against the following criteria:

Criteria 1. Lack of public acceptance.

Criteria 2. Insufficient water savings.

Criteria 3. Low benefit to cost ratio of implementation.

Criteria 4. Already met by existing conservation measure or program.

Criteria 5. Not applicable or relevant to Lamar's water system.

D. Screening of Conservation Measures and Programs

The conservation measures and programs considered for implementation to the City's water conservation plan were screened to determine which ones would be further evaluated in the planning process. Each of the eleven measure or program topics is repeated below, followed by a brief explanation as to why they were or were not selected for further consideration.

Demand Side Measures and Programs

1. Water-efficient fixtures and appliances, including toilets, urinals, showerheads, faucets, and washing machines:

   The City Water Department relies on the 2006 International Plumbing Code as enforced by the City of Lamar Water Developmental Services Director. The code requires that all indoor water using fixtures, showerheads, toilets, and faucets meet the requirements of the 1992 Energy Act. The City will establish a residential rebate program for toilets and washing machines. *Measures or programs are deemed appropriate for further consideration.*

2. Landscape efficiency, including low water use landscapes, drought-resistant vegetation, and efficient irrigation equipment and scheduling:

   The City of Lamar is interested in examining and implementing efficient water sprinkler systems and scheduling for irrigation within public areas. The City is also interested in sponsoring workshops provided by the State of Colorado Forest Service and the Colorado Tree Coalition. These workshops would cover such topics as xeriscaping, pruning, and the effect of drought on insects and diseases that attack trees. *The following measures or programs related to this topic are deemed appropriate for further consideration:*

   - *Efficient sprinkler system equipment and scheduling for irrigation in public areas including the installation of rain sensors and soil moisture controllers;*
   - *Initiate Rain Sensor and soil moisture controller rebate program for commercial, residential and irrigation only customers;*
   - *Irrigation Audits;*
   - *Workshops.*

3. Industrial and commercial efficiency, including water-efficient processes:

Within the City of Lamar, water-efficient industrial and commercial water-using processes, as well as larger industrial and commercial customers, all acknowledge that water conservation is a valid concern. Some conservation measures have already been implemented by some of these users, while others are being considered. Lamar will purchase low flow, high-pressure spray heads for prewash sprayers at restaurants in the City. *Measures or programs related to this topic are deemed appropriate for further consideration.*

4. Water reuse systems and non-potable use:

The City has determined that potable reuse systems are very expensive, and they usually do not become part of planning until supply and demand are nearly equal. Since this is not the case in Lamar, the City feels that potable reuse systems would not be a cost effective measure to pursue at this time. Currently the wastewater treatment facility is an evaporative lagoon system. In order to reuse the treated wastewater, the water rights must be modified to account for the use of the water that is currently being evaporated. Infrastructure to pump and pipe the treated effluent to the City and distribution within the City is a large cost. No cost analysis was completed due to the large amount of cost that is associated with this option. *Measures or programs related to water reuse systems eliminated by Criteria 3.*

Currently, the City utilizes part of the shares of Fort Bent Ditch water for non-potable irrigation purposes. However, recent growth and the majority of all future expansions to the city will be in areas where ditch water is not available. As such, additional irrigation demands could be imposed upon the potable water system in the future. Therefore, the City is interested in pursuing expansions to its use of non-potable water for irrigation. As mentioned in Chapter 2, the City currently irrigates 68 of the City's 107.7 acres of parks, athletic fields, and public areas with non-potable water. As part of this Plan, the City is considering irrigating an additional 20 acres with non-potable water.

The City of Lamar appointed Aqua Engineering to complete a report on the use of non-potable water for irrigation of public parks and landscaping and residential lawns and landscape in 2004. Their report determined that the cost to provide such a system would be approximately $10,437,000. Lamar currently only has 3,487 taps; therefore, this cost was determined to be too large for the City's residents when placed in conjunction with the SRF funding that Lamar is currently receiving for potable water system improvements. *Expansion of non-potable water use and water reuse will not be evaluated further due to Criteria Number 3.*

5. Distribution system efficiency, including leak repair and removal of phreatophytes:

The City recognizes that demand-side leaks within customer toilets and sprinkler systems could be a major cause for water loss after the water meter connection to the residence. The City Water Department shares with its customers, upon request, information regarding the use of food coloring for toilet tanks. The department also assists customers, either over the telephone or in person at the site, with questions regarding possible leaks in sprinkler systems. *Measures or programs related to demand-side leak repair eliminated by Criteria 4.*

Supply-side leaks within the distribution system have been an ongoing concern to the City. As discussed in Chapter 1, non-account water accounts for a substantial 20 percent of the total water use. Because the system's infrastructure is old with many portions of it reaching the end of their design life, line leakage may constitute a significant portion of the non-

account usage. In order to combat the non-account water usage, a list of recommended waterline replacements for the City's aging infrastructure has been outlined in the City's latest master plan.

Lamar will first investigate their operation and maintenance records to determine the areas of the City that have had many repairs in recent years and areas of the oldest infrastructure. The City will then isolate these areas and conduct tests to identify specific portions of the infrastructure that are exhibiting losses. Lamar will then determine whether they are to repair the line or replace it entirely. This is how Lamar has determined their main replacement program that was documented in the Water Conservation Plan. The Southeast Water Conservancy District has also discussed the option of procuring leak detection equipment and renting it to municipalities in the area on an as-needed basis.

The 20% of non-account water that Lamar reports includes line leakage, un-metered water use, fire demands, and line flushing. Not all of the non-account water is due to line leakage. *Supply-side leak repair and waterline replacement deemed appropriate for further consideration.*

The City has implemented a meter replacement program that involves replacing meters for its customers. This includes an automatic meter reading system. The City will use the new meters to track excessive water usage and flag all meters that record 24 hour usage for further leak detection and evaluation. This will allow the City to identify the users that are wasting water within their residence. *Meter replacement will considered for further evaluation.*

Because the City receives its water supply from groundwater sources and water is delivered to customers in a closed system, phreatophytes are not relevant. *Phreatophyte removal eliminated by Criteria 5.*

6. Education and information dissemination, including public education, water-saving demonstrations, school programs, and water bill inserts:

   The City Water Department works with local schools and other agencies to provide information as requested on water conservation. Water Treatment Plant tours are offered upon request. Also, water conservation literature is made available in the water billing office at City Hall. The City will continue these efforts and investigate adding customer training workshops and to expand the current K-12 programs. *Measures or programs related to this topic are deemed appropriate for further consideration.*

7. Technical assistance, including water use audits targeted at large users and large landscapes:

   As previously mentioned, the City's water system does not serve any sizeable commercial or industrial users. Outdoor, residential irrigation audits will be performed by City staff. They will initially focus on the largest users. *Audits and technical assistance deemed appropriate for further consideration.*

8. Rate structure and billing systems designed to encourage efficiency, including volume billing and conservation (tiered) rate structure:

   The City of Lamar Water Department currently uses a rate system that has a minimum charge dependent upon the water meter size and a uniform block rate structure after the minimum allowance for water use in cubic feet has been exceeded. The rates are higher outside the city limits.

The existing water usage rates implemented by the City of Lamar are as follows:

Table 5-1: Existing Water Usage Rates

Class	Meter Size	Monthly Minimum Usage (cf)	Monthly Minimum Charge	Charges for Use Above Monthly Minimum Usage
In City	¾"	500	$10.23	$13.33
	1"	835	$17.07	$13.33
	1 ¼"	1,165	$23.86	$13.33
	1 ½"	1,665	$34.12	$13.33
	2"	2,665	$54.58	$13.33
	3"	5,000	$102.35	$13.33
Outside City	¾"	500	$20.46	$26.66
	1"	835	$34.14	$26.66
	1 ¼"	1,165	$47.72	$26.66
	1 ½"	1,665	$68.24	$26.66
	2"	2,665	$109.16	$26.66
	3"	5,000	$204.70	$26.66

Increasing the water rates for the largest commercial users will be investigated. The total commercial water usage is 208,046,887 gallons and is used by 524 taps. If we assume that five (5) percent of the users use 20% of the water, then the increase in large amounts would affect this small percentage of the population. We believe that this rate increase will decrease the volume used by this section of people by 10%.

The City reviews its rate structure every three years. A complete rate study will be conducted after all of the SRF funds are obtained and the City has a handle on the amount of revenue required to maintain the City budget, and the necessary rate increase needed to promote conservation in this section of the population. This study will occur in 2010-2011, and the rate increase will occur in 2012. This rate study will provide recommendations for a tiered rate structure that deters residents from using excessive amounts of water. *Measures or programs related to this topic are deemed appropriate for further consideration.*

9. Regulations and/or Ordinances, addressing fixtures and appliances, landscapes, and water waste prohibition:

The City Water Department operates under all applicable American Water Works Association (AWWA) standards, federal, and state laws and regulations, 2006 International Building Code (IBC), and City of Lamar Ordinances. Also, the City currently has a 6-Stage Water Restriction Schedule in place (see Chapter 1, Section E); therefore, no additional regulations or ordinances will be implemented. The 6-Stage Water Restriction Schedule

is shown in the "Current Water Conservation Efforts Section". *Stricter enforcement and issuance of ordinances not deemed appropriate for further consideration due to Criteria 4.*

10. Incentives, including rebates:

The City does offer lower tap fees for reduced tap size. The City Water Department will look to develop a rebate program for residential and commercial indoor appliance and residential, commercial, and irrigation account outdoor equipment. *Measures or programs related to this topic are deemed appropriate for further consideration.*

11. Distribution system efficiency, including leak identification, meter testing and replacement, and analysis of non-account water.

As previously mentioned, supply-side leaks within the distribution system have been an ongoing concern to the City as non-account water accounts for a substantial 20 percent of the total water use. Because the system's infrastructure is old with many portions of it reaching the end of their design life, line leakage may constitute a significant portion of the non-account usage. In order to combat the non-account water usage, the City is interested in establishing a supply-side leak identification program. Furthermore, the City has been investigating improvements to its water use accounting system by incorporating a radio-read meter system.

Lamar will first investigate their operation and maintenance records to determine the areas of the City that have had many repairs in recent years and areas of the oldest infrastructure. The City will then isolate these areas and conduct tests to identify specific portions of the infrastructure that are exhibiting losses. Lamar will then determine whether they are to repair the line or replace it entirely. This is how Lamar has determined their main replacement program that was documented in the Water Conservation Plan. The Southeast Water Conservancy District has also discussed the option of procuring leak detection equipment and renting it to municipalities in the area on an as-needed basis.

The 20% of non-account water that Lamar reports includes line leakage, un-metered water use, fire demands, and line flushing. Not all of the non-account water is due to line leakage. *Supply-side leak detection and radio-read meter system deemed appropriate for further consideration.*

The City has implemented a meter replacement program that involves replacing meters for its customers. This includes an automatic meter reading system. The City will use the new meters to track excessive water usage and flag all meters that record 24 hour usage for further leak detection and evaluation. This will allow the City to identify the users that are wasting water within their residence. *Meter replacement will considered for further evaluation.*

CHAPTER 6

Evaluation and Selection of Conservation Measures and Programs

CHAPTER 6: EVALUATION AND SELECTION OF CONSERVATION MEASURES AND PROGRAMS

A. Purpose

In this chapter, the estimated savings and costs of the conservation measures and programs that were selected in the previous chapter are presented. A final group of conservation measures and programs are selected for implementation.

B. Evaluation and Selection of Water Conservation Measures and Programs

Table 6-1 summarizes the eleven measures and programs identified in CWCB's Water Conservation Plan Development Guidance Document. Each measure or program is listed with Lamar's existing measures or programs, and their selected measures or programs. The beginning dates for implementation are also included. The measures/programs listed in the proposed column are the selected measures/programs that will be implemented. Measures/programs that are eliminated will have the reasoning listed in the "Comment" column.

Table 6-1
Lamar - Existing and Selected Conservation Measures and Programs

Program Number	Conservation Measures	Existing Measures/Programs	Selected Measures/Programs	Beginning Date	Comments
	Demand Side				
1	Water-efficient fixtures and appliances, including toilets, urinals, showerheads, faucets, and washing machines.	The City Water Department relies on the 2006 Plumbing Code. The code requires that all indoor water fixtures, showerheads, toilets, and faucets meet the requirements of the 1992 Energy Act.	Lamar will continue their existing measures along with implementing a residential rebate program for low flow toilets and washing machines.	2010	
2	Landscape efficiency, including low water use landscapes, drought-resistant vegetation, and efficient irrigation equipment and scheduling.	None	Lamar will initiate a rain sensor and soil moisture controller rebate program for commercial, residential, and irrigation only customers. The City will also install rain sensors and soil moisture controllers at public parks and ball fields.	2010	
3	Industrial and commercial efficiency, including water-efficient processes.	None	Lamar will offer to purchase all restaurants in the City low flow, high-pressure spray heads for prewash sprayers.	2011	
	Supply Side				
4	Water reuse systems	Lamar does not currently implement any water reuse systems. Lamar currently utilizes part of the shares of Fort Bent Ditch water for non-potable irrigation purposes. The City currently irrigates 68 of the City's 107.7 acres of parks, athletic fields, and public areas with non-potable water.	Lamar will continue to use the non-potable water to irrigate 68 acres out of a total of 107.7 acres. Lamar appointed Aqua Engineering to complete a report on the use of non-potable water for irrigation of public parks and landscaping and residential lawns and landscape in 2004. This report determined that the cost to provide such a system would be approximately $10,437,000. Currently the wastewater treatment facility is an evaporative lagoon system. In order to reuse the treated wastewater, the water rights must be modified to account for the use of the water that is currently being evaporated. This would entail the City going to water court to change the water use designation and then finding water to augment the water that would being reused. Also, infrastructure to pump and pipe the treated effluent to the City and distribution within the City is another large cost.	NA	Eliminated due to high capital and operation and maintenance costs and legal issues (water rights).
5	Distribution system efficiency, including leak repair and removal of phreatophytes.	Lamar has implemented a main replacement program for sections of the City that have older infrastructure and problematic infrastructure.	Lamar will continue to implement the main replacement program and Lamar has implemented a meter replacement program that involves replacing meters for its customers. This includes an automatic meter reading system. The City will use the new meters to track excessive water usage and flag all meters that record 24 hour usage for further leak detection and evaluation. Lamar will conduct 1,000 LF of leak detection per year. They will rent the necessary equipment to conduct this inspection.	2011	
	Conservation Programs				
	Demand Side				
6	Education and information dissemination, including public education, water-saving demonstrations, school programs, and water bill inserts.	Water treatment plant tours are provided upon request. Water conservation literature is made available in the water billing office at City Hall.	Lamar will continue the current education programs, along with adding training workshops provided by State of Colorado Forest Service and the Colorado Tree Coalition.	2011	
7	Technical assistance, including water use audits targeted at large users and large landscapes.	None	Outdoor, residential irrigation audits will be offered by City staff.	2011	
8	Rate structure and billing systems designed to encourage efficiency, including volume billing and conservation (tiered) rate structure.	The City of Lamar Water Department currently uses a rate system that has a minimum charge dependent upon the water meter size and a uniform block rate structure after the minimum allowance for water use has been exceeded.	Lamar will appoint an engineer to conduct a complete rate study in the 2010 - 2011 time frame. This rate study will provide the City recommendations for a tiered rate structure that deters residents from using excessive amounts of water. The rate structure recommendations from the rate study will be implemented in the 2012 - 2013 time frame.	2010	
9	Regulations and/or Ordinances, addressing fixtures and appliances, landscapes, and water waste prohibition.	Lamar currently has a 6-Stage water restriction program.	Lamar will continue to implement the 6-Stage water restriction program.	On-Going	Lamar already uses less than the excepted amount per tap. These restrictions have aided in this and will continue to help the City maintain a lower than normal water use.
10	Incentives, including rebates.	Lamar offers lower tap fees for reduced size services.	Lamar will implement a residential rebate program for low flow toilets and washing machines. Lamar will also initiate a rain sensor and soil moisture controller rebate program for commercial, residential, and irrigation only customers.	2010	
	Supply Side				
11	Distribution system efficiency, including leak identification, meter testing and replacement, and analysis of non-account water.	Lamar has implemented a radio-read meter system.	Lamar will continue to implement the main replacement program and Lamar has implemented a meter replacement program that involves replacing meters for its customers. This includes an automatic meter reading system. The City will use the new meters to track excessive water usage and flag all meters that record 24 hour usage for further leak detection and evaluation. Lamar will conduct 1,000 LF of leak detection per year. They will rent the necessary equipment to conduct this inspection.	2011	

C. Estimate Costs and Water Savings of Selected Conservation Options

Table 6-2 provides an estimate of the water savings for the selected conservation measures and programs. The City does not have unlimited resources to implement its water conservation program. Therefore, efforts of the City will focus its resources on those programs that provide the most cost-effective water savings based on the analyses presented in Appendix B and summarized in Table 6-2 below.

Table 6-2: Summary of Costs for Water Saved for Selected Measures and Programs

Measures and/or Programs	Cost for Saved Water ($/acre-foot)	Source of Information
Residential Low Flow Toilet Rebates	$1,724	Appendix B
Residential Washing Machine Rebates	$2,827	Appendix B
Low Flow, High Pressure Spray Heads for Pre-Washer Sprayers	$213	Appendix B
Residential Rain Sensor Rebate	$335	Appendix B
Residential Soil Moisture Controller Rebates	$1,597	Appendix B
Residential Outdoor Irrigation Audits	$4,525	Appendix B
Park Irrigation System Upgrades	$127	Appendix B
Leak Detection	$818	Appendix B

D. Selected Conservation Measures and Programs

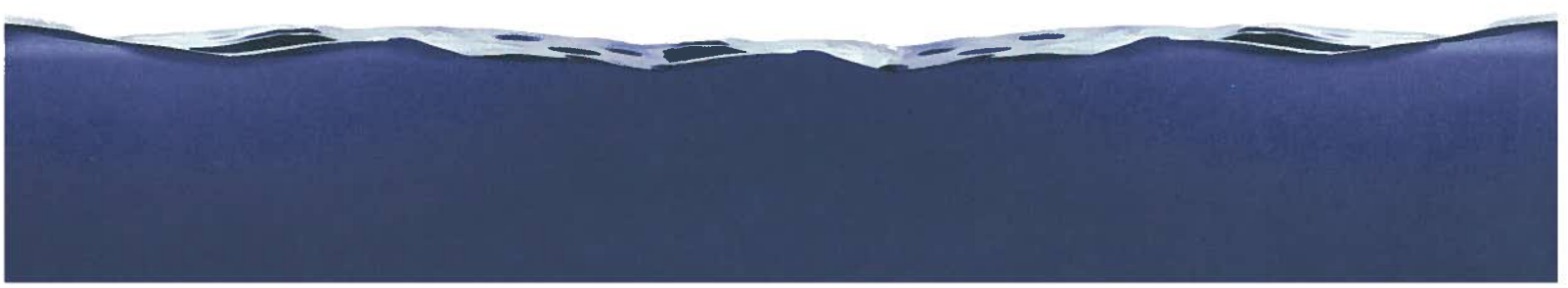
Table 6-1 shows the conservation measures and programs selected for implementation and those chosen for elimination based on the criteria listed in Chapter 5. Table 6-3 presents the estimated average daily demand savings for the selected measures/programs. Maximum daily demand reductions could not be estimated given that it is uncertain how the conservation measure or program will impact peak demands. Based on the selected conservation measures and programs, the total estimated reduction in average-day demands equates to approximately 38,909 gallons per day.

Table 6-3: Conservation Measures and Programs Selected for Implementation

Measure / Program	Selected ☑	Primary Criteria for Rejecting the Conservation Measure/Program for Implementation	Estimated Reduction in Average-Day Demand for Selected Measure/Programs (gallons per day)
Irrigation Water Conservation			
Park Improvements	√	Selected	18,311
Residential Improvements	√	Selected	910
Outdoor Irrigation Audits	√	Selected	545
Residential Indoor Improvements			
Low Flow Toilet Rebates	√	Selected	1,295
Efficient Washing Machine Rebates	√	Selected	474
Industrial and Commercial Efficiency			
Low Flow, High Pressure Spray Heads for Pre-Washer Sprayers	√	Selected	840
Water Rate Increases			
Water Rate Increase	√	Selected	11,400
Distribution System Maintenance			
Leak Detection and Repair	√	Selected	4,937
Radio-Read Meter System	√	Selected	197
Total of Selected Measures/Programs			**38,909**

CHAPTER 7

Integration of Resources and Modified Forecasts



CHAPTER 7: INTEGRATION OF RESOURCES AND MODIFIED FORECASTS

A. Purpose

The purpose of Chapter 7 is to modify the water demand and supply capacity forecasts from Chapters 2 and 3 to reflect the anticipated effects of conservation. This step of the Plan will indicate whether and how water savings from conservation will allow the system to eliminate, downsize, or postpone new facilities or water purchases.

B. Revised Demand Forecast

Table 7-1 summarizes the differences in demands with and without the water conservation measures and programs selected in the previous chapter. The amounts of water saved per year were evaluated using the spreadsheets included in Appendix B.

The spreadsheets in Appendix B show that the selected measures and programs can reduce the average-day demand cumulatively by approximately 18 percent by 2019. Maximum daily demand savings could not be estimated given that it is uncertain how the conservation measure or program will impact peak demands. The analysis assumed that the maximum-day to average-day ratio (2.32) before and after conservation will be the same.

Table 7-1: Modified Demand Forecast

Line	Item	Current Year	2014 Year 5	2019 Year 10	2029 Year 20
1	Average-day demand before conservation	1.94 MGD	2.044 MGD	2.164 MGD	2.461 MGD
2	Average-day demand after conservation		1.858 MGD	1.785 MGD	1.592 MGD
3	Reduction in average-day demand (line 1 less line 2)		0.186 MGD	0.379 MGD	0.869 MGD
4	Maximum-day demand before conservation	4.50 MGD	4.74 MGD	5.02 MGD	5.71 MGD
5	Maximum-day demand after conservation		4.31 MGD	4.14 MGD	3.69 MGD
6	Reduction in maximum-day demand (line 4 less line 5)		0.43 MGD	0.88 MGD	2.02 MGD
7	Ratio maximum-day to average-day demand before conservation (line 4 divided by line 1)	2.32	2.32	2.32	2.32
8	Ratio maximum-day to average-day demand after conservation (line 5 divided by line 2)		2.32	2.32	2.32

C. Identification of Project-Specific Savings

Water conservation practices can reduce water demands and consequently have the potential to eliminate, downsize, or delay the need for water supply capital projects. Conservation can also

reduce the amount of water rights that need to be purchased and thereby provide significant cost savings. However, the City of Lamar does not anticipate downsizing or eliminating capital projects as a result of water conservation within this planning period. They plan to continue with their infrastructure replacement to aid in the conservation plan by replacing the old mains that are experiencing leaks.

The City of Lamar believes that the implementation of this Plan will not significantly affect future capital expenditures associated with the development of groundwater or surface water supplies. Since the city already has adequate water rights to meet present and future demands, this Plan will not have the potential for the reduction of any water rights within the planning period.

As previously discussed, the city is not anticipating significant growth over the 20-year planning period. However, conservation efforts may reduce the water supply demands over time and thereby minimize the effect that any population growth may have on an increase to average-day demands.

D. Summary of Forecast Modifications and Benefits of Conservation

Figure 7-1 illustrates the projected demands with and without the selected conservation measures and programs, as well as the groundwater supply capacity of 19,153 AFY. As previously mentioned, the City of Lamar has more than adequate pumping rights to fulfill current and projected demands as dramatized in the figure below showing the City's supply capacity far above the scale of the chart. Because of this, the City is not anticipating developing additional water rights within the planning period of this conservation plan.

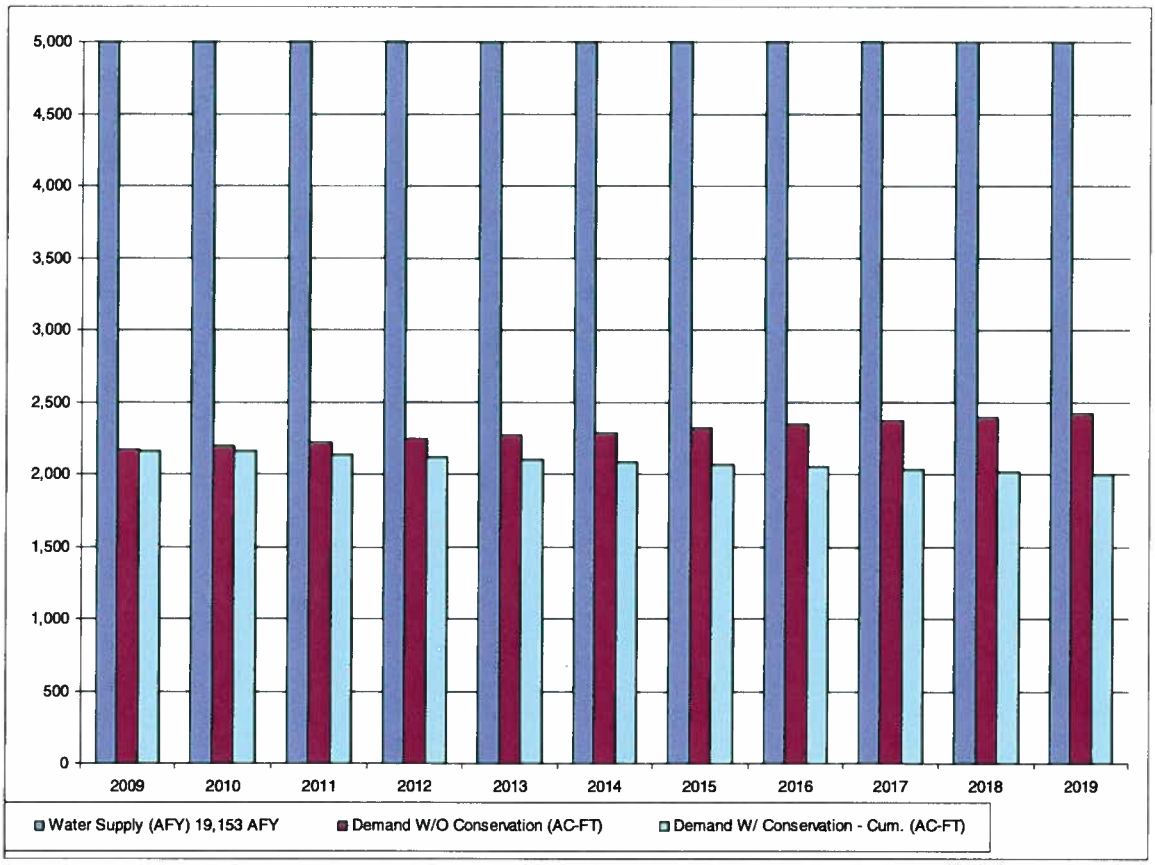


Figure 7-1: Projected Supply and Demands with and without Conservation

Table 7-2 identifies the cumulative savings from the conservation plans that Lamar will implement.

Table 7.2: Estimated Water Savings

Year	Annual Water Savings (acre-feet)	Cumulative Water Savings (acre-feet)
2009	7.73	7.73
2010	28.48	36.21
2011	42.89	79.10
2012	42.89	121.98
2013	42.89	164.87
2014	43.58	208.44
2015	43.58	252.02
2016	42.89	294.91
2017	42.89	337.79
2018	42.89	380.68
2019	42.89	423.56

As shown by the preceding table, the City of Lamar plans on saving a cumulative total of 423.56 acre-feet of water by 2019. The detailed analyses are presented in Appendix B.

E. Revenue Effects

Water conservation has the potential to reduce the amount of revenue received by the City. Revenues for Lamar are largely driven by the amount of water used by its customers. As the amount of water used by customers decreases, the less revenue is received. In order to make up for lost revenue, the City may need to increase water rates. However, the City may also save money through the reduction of water treatment and pumping costs associated with the reduction in demand.

The City of Lamar feels that it is unlikely that water use reductions resulting from conservation would be cause for a rate increase. The City plans to monitor cost expenditures for conservation measures and programs. If a conservation measure or program does not appear to be cost effective and may contribute to a need for increased water rates, the measure or program may be considered for elimination. Lamar reviews capital and operational expenditures and projected revenues on an annual basis. The City also conducts a water rate study every three years.

Nevertheless, the City Water Department continues to consider a rate structure that will promote water conservation while being fair and customer friendly. The goal is to focus on a message to customers that water conservation will bring them lower costs without reducing customer satisfaction.

CHAPTER 8
Development of Implementation Plan

CHAPTER 8: DEVELOPMENT OF IMPLEMENTATION PLAN

A. Purpose

Within this chapter the city presents a strategy and timetable for implementing the conservation measures and programs selected in the previous chapter. Other elements of the conservation plan are also discussed, including monitoring and evaluation of water conservation activities and revision and updating of the Plan.

B. Implementation Schedule

Table 6-1 summarizes the City's anticipated schedule for implementation of the selected conservation measures and programs. The City's existing measures and programs are also noted on the table.

C. Plan for Public Participation in Implementation

The City of Lamar Water Department presently serves 3,487 taps: 2,963 are residential, 477 are commercial or industrial, and 47 are municipal government. The Water Department desires that its customers understand the history, uses, and value of water in Colorado. Realizing the difficulty of the task it faces, the Department accepts the challenge to educate its customers and disseminate information to the public so they better appreciate the difficulty and complexity of water delivery systems as well as the valuable role of water in our ecosystem and economy. The Department plans to accomplish this through continual availability of water education materials, water treatment plant tours, and presentations at the area schools.

Beyond these existing actions and as part of this Plan, the City plans to sponsor workshops provided by the State of Colorado Forest Service and the Colorado Tree Coalition. The workshops will cover topics related to xeriscaping techniques as well as tree pruning and the effect that drought has on insects and diseases that could potentially attack trees.

As always, the public will play a key role in the overall effectiveness of the City's conservation plan. The success of the selected measure or programs depends on how the public responds to each. The more engaged the community is in altering their water-use behavior, the more effective the conservation plan will be. The City of Lamar will continue to implement public education programs, informing the public on why and how they can conserve water.

D. Plan for Monitoring and Evaluation Processes

At the end of each year, beginning in 2009, the City of Lamar will review the conservation measures and programs to determine the progress of each. A brief description of progress will be included in the City's annual report. Efforts will be made to quantify the success of each measure or program in terms of what has been accomplished. For example, the City will try to enumerate areas where expansions to non-potable irrigation systems have been installed. The report will be made available for public review.

Quantification of actual water savings per individual measure is more difficult to determine. However, the City will access those savings where possible. Where obtainable, the City will publish this information in its annual report as well. Total water consumption records are easier to quantify and will continue to be part of the City's Water Department management activities.

E. Plan for Updating and Revising the Conservation Plan

Colorado's Water Conservation Statute requires that a covered entity revise their conservation plan at a minimum of every seven years. The City of Lamar plans on updating and revising this Plan within five years from initial implementation, or by July, 2014. However, data will continually be collected and analyzed on an annual basis. If monitoring results or changes to the water supply system warrant changes to the conservation plan sooner than five years, the City will revise the Plan accordingly.

Any modifications to the Plan will incorporate findings of the annual data collection and analyses. Historic water use, water savings, and implementation costs of water conservation efforts will be assessed. The performance of each conservation measure or program will be evaluated and any changes that are necessary will be identified. Additional conservation measures or programs will also be evaluated and considered for inclusion into the revised Plan.

F. Plan Adoption, Completion, Approval Dates

The City of Lamar's Conservation Plan was adopted by the City on November 10, 2008. The formal documentation approving the Plan is presented in Appendix C.

G. Water Conservation Goals

Lamar's water conservation goals were presented in Chapter 4 and are as follows:

- Short Term Goal: Decrease water use by one percent each year over a ten-year period to 2019.
- Long Term Goal: Decrease overall water use such that a 0.3 percent increase in population over a 20-year period will not increase water use.
- Long Term Goal: Increase the use of non-potable water to irrigate parks, open spaces, and landscaping over a 20-year period.

As shown in Appendix B, Lamar is forecasted to decrease water use by more than one percent each year over a ten-year period to 2020. The long term goals will remain in place and monitored as the conservation plan is implemented.

APPENDIX A

Colorado Revised Statute 37-60-126

37-60-126. Water conservation and drought mitigation planning - programs - relationship to state assistance for water facilities - guidelines - water efficiency grant program - repeal.

(1) As used in this section and section 37-60-126.5, unless the context otherwise requires:

(a) "Agency" means a public or private entity whose primary purpose includes the promotion of water resource conservation.

(b) "Covered entity" means each municipality, agency, utility, including any privately owned utility, or other publicly owned entity with a legal obligation to supply, distribute, or otherwise provide water at retail to domestic, commercial, industrial, or public facility customers, and that has a total demand for such customers of two thousand acre-feet or more.

(c) "Grant program" means the water efficiency grant program established pursuant to subsection (12) of this section.

(d) "Office" means the office of water conservation and drought planning created in section 37-60-124.

(e) "Plan elements" means those components of water conservation plans that address water-saving measures and programs, implementation review, water-saving goals, and the actions a covered entity shall take to develop, implement, monitor, review, and revise its water conservation plan.

(f) "Public facility" means any facility operated by an instrument of government for the benefit of the public, including, but not limited to, a government building; park or other recreational facility; school, college, university, or other educational institution; highway; hospital; or stadium.

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

(h) "Water conservation plan", "water use efficiency plan", or "plan" means a plan adopted in accordance with this section.

(i) "Water-saving measures and programs" includes a device, a practice, hardware, or equipment that reduces water demands and a program that uses a combination of measures and incentives that allow for an increase in the productive use of a local water supply.

(2) (a) Each covered entity shall, subject to section 37-60-127, develop, adopt, make publicly available, and implement a plan pursuant to which such covered entity shall encourage its domestic, commercial, industrial, and public facility customers to use water more efficiently. Any state or local governmental entity that is not a covered entity may develop, adopt, make publicly available, and implement such a plan.

(b) The office shall review previously submitted conservation plans to evaluate their consistency with the provisions of this section and the guidelines established pursuant to paragraph (a) of

subsection (7) of this section.

(c) On and after July 1, 2006, a covered entity that seeks financial assistance from either the board or the Colorado water resources and power development authority shall submit to the board a new or revised plan to meet water conservation goals adopted by the covered entity, in accordance with this section, for the board's approval prior to the release of new loan proceeds.

(3) The manner in which the covered entity develops, adopts, makes publicly available, and implements a plan established pursuant to subsection (2) of this section shall be determined by the covered entity in accordance with this section. The plan shall be accompanied by a schedule for its implementation. The plans and schedules shall be provided to the office within ninety days after their adoption. For those entities seeking financial assistance, the office shall then notify the covered entity and the appropriate financing authority that the plan has been reviewed and whether the plan has been approved in accordance with this section.

(4) A plan developed by a covered entity pursuant to subsection (2) of this section shall, at a minimum, include a full evaluation of the following plan elements:

(a) The water-saving measures and programs to be used by the covered entity for water conservation. In developing these measures and programs, each covered entity shall, at a minimum, consider the following:

(I) Water-efficient fixtures and appliances, including toilets, urinals, showerheads, and faucets;

(II) Low water use landscapes, drought-resistant vegetation, removal of phreatophytes, and efficient irrigation;

(III) Water-efficient industrial and commercial water-using processes;

(IV) Water reuse systems;

(V) Distribution system leak identification and repair;

(VI) Dissemination of information regarding water use efficiency measures, including by public education, customer water use audits, and water-saving demonstrations;

(VII) Water rate structures and billing systems designed to encourage water use efficiency in a fiscally responsible manner;

(VIII) The department of local affairs may provide technical assistance to covered entities that are local governments to implement water billing systems that show customer water usage and that implement tiered billing systems;

(IX) Regulatory measures designed to encourage water conservation;

(X) Incentives to implement water conservation techniques, including rebates to customers to encourage the installation of water conservation measures;

(b) A section stating the covered entity's best judgment of the role of water conservation plans in the covered entity's water supply planning;

(c) The steps the covered entity used to develop, and will use to implement, monitor, review, and revise, its water conservation plan;

(d) The time period, not to exceed seven years, after which the covered entity will review and update its adopted plan; and

(e) Either as a percentage or in acre-foot increments, an estimate of the amount of water that has been saved through a previously implemented conservation plan and an estimate of the amount of water that will be saved through conservation when the plan is implemented.

(5) Each covered entity and other state or local governmental entity that adopts a plan shall follow the entity's rules, codes, or ordinances to make the draft plan available for public review and comment. If there are no rules, codes, or ordinances governing the entity's public planning process, then each entity shall publish a draft plan, give public notice of the plan, make such plan publicly available, and solicit comments from the public for a period of not less than sixty days after the date on which the draft plan is made publicly available. Reference shall be made in the public notice to the elements of a plan that have already been implemented.

(6) The board is hereby authorized to recommend the appropriation and expenditure of such revenues as are necessary from the unobligated balance of the five percent share of the operational account of the severance tax trust fund designated for use by the board for the purpose of the office providing assistance to covered entities to develop water conservation plans that meet the provisions of this section.

(7) (a) The board shall adopt guidelines for the office to review water conservation plans submitted by covered entities and other state or local governmental entities. The guidelines shall define the method for submitting plans to the office, the methods for office review and approval of the plans, and the interest rate surcharge provided for in paragraph (a) of subsection (9) of this section.

(b) If no other applicable guidelines exist as of June 1, 2007, the board shall adopt guidelines by July 31, 2007, for the office to use in reviewing applications submitted by covered entities, other state or local governmental entities, and agencies for grants from the grant program and from the grant program established in section 37-60-126.5 (3). The guidelines shall establish deadlines and procedures for covered entities, other state or local governmental entities, and agencies to follow in applying for grants and the criteria to be used by the office and the board in prioritizing and awarding grants.

(8) A covered entity may at any time adopt changes to an approved plan in accordance with this section after notifying and receiving concurrence from the office. If the proposed changes are major, the covered entity shall give public notice of the changes, make the changes available in draft form, and provide the public an opportunity to comment on such changes before adopting them in accordance with subsection (5) of this section.

(9) (a) Neither the board nor the Colorado water resources and power development authority shall release loan proceeds to a covered entity unless such covered entity provides a copy of the water conservation plan adopted pursuant to this section; except that the board or the authority may release such loan proceeds if the board or the authority, as applicable, determines that an unforseen emergency exists in relation to the covered entity's loan application, in which case the

board or the authority, as applicable, may impose a loan surcharge upon the covered entity that may be rebated or reduced if the covered entity submits and adopts a plan in compliance with this section in a timely manner as determined by the board or the authority, as applicable.

(b) The board and the Colorado water resources and power development authority, to which any covered entity has applied for financial assistance for the construction of a water diversion, storage, conveyance, water treatment, or wastewater treatment facility, shall consider any water conservation plan filed pursuant to this section in determining whether to render financial assistance to such entity. Such consideration shall be carried out within the discretion accorded the board and the Colorado water resources and power development authority pursuant to which such board and authority render such financial assistance to such covered entity.

(c) The board and the Colorado water resources and power development authority may enter into a memorandum of understanding with each other for the purposes of avoiding delay in the processing of applications for financial assistance covered by this section and avoiding duplication in the consideration required by this subsection (9).

(10) Repealed.

(11) (a) Any section of a restrictive covenant that prohibits or limits xeriscape, prohibits or limits the installation or use of drought-tolerant vegetative landscapes, or requires cultivated vegetation to consist exclusively or primarily of turf grass is hereby declared contrary to public policy and, on that basis, that section of the covenant shall be unenforceable.

(b) As used in this subsection (11):

(I) "Executive board policy or practice" includes any additional procedural step or burden, financial or otherwise, placed on a unit owner who seeks approval for a landscaping change by the executive board of a unit owners' association, as defined in section 38-33.3-103, C.R.S., and not included in the existing declaration or bylaws of the association. An "executive board policy or practice" includes, without limitation, the requirement of:

(A) An architect's stamp;

(B) Preapproval by an architect or landscape architect retained by the executive board;

(C) An analysis of water usage under the proposed new landscape plan or a history of water usage under the unit owner's existing landscape plan; and

(D) The adoption of a landscaping change fee.

(II) "Restrictive covenant" means any covenant, restriction, bylaw, executive board policy or practice, or condition applicable to real property for the purpose of controlling land use, but does not include any covenant, restriction, or condition imposed on such real property by any governmental entity.

(III) "Turf grass" means continuous plant coverage consisting of hybridized grasses that, when regularly mowed, form a dense growth of leaf blades and roots.

(IV) "Xeriscape" means the application of the principles of landscape planning and design, soil

analysis and improvement, appropriate plant selection, limitation of turf area, use of mulches, irrigation efficiency, and appropriate maintenance that results in water use efficiency and water-saving practices.

(c) Nothing in this subsection (11) shall preclude the executive board of a common interest community from taking enforcement action against a unit owner who allows his or her existing landscaping to die; except that:

(I) Such enforcement action shall be suspended during a period of water use restrictions declared by the jurisdiction in which the common interest community is located, in which case the unit owner shall comply with any watering restrictions imposed by the water provider for the common interest community;

(II) Enforcement shall be consistent within the community and not arbitrary or capricious; and

(III) Once the drought emergency is lifted, the unit owner shall be allowed a reasonable and practical opportunity, as defined by the association's executive board, with consideration of applicable local growing seasons or practical limitations, to reseed and revive turf grass before being required to replace it with new sod.

(12) (a) There is hereby created the water efficiency grant program for purposes of providing state funding to aid in the planning and implementation of water conservation plans developed in accordance with the requirements of this section and to promote the benefits of water efficiency. The board is authorized to distribute grants to covered entities, other state or local governmental entities, and agencies in accordance with its guidelines from the moneys transferred to and appropriated from the water efficiency grant program cash fund, which is hereby created in the state treasury. For the 2005-06 through 2010-11 fiscal years, the general assembly shall appropriate from the fund to the board up to five hundred thousand dollars annually for the purpose of providing grants to covered entities, other state and local governmental entities, and agencies in accordance with this subsection (12). Commencing July 1, 2008, the general assembly shall also appropriate from the fund to the board fifty thousand dollars each fiscal year through 2011-12 to cover the costs associated with the administration of the grant program and the requirements of section 37-60-124. However, if less than five hundred thousand dollars is appropriated or expended in any such fiscal year, an amount equal to the difference between five hundred thousand dollars and the amount actually appropriated or expended in that fiscal year shall be available for appropriation and expenditure to the grant program in the next fiscal year in addition to the five hundred thousand dollars available for appropriation in that fiscal year. Any moneys remaining in the fund on June 30, 2012, shall be transferred to the reserve in the operational account of the severance tax trust fund described in section 39-29-109.3 (3), C.R.S.

(b) Any covered entity or state or local governmental entity that has adopted a water conservation plan and that supplies, distributes, or otherwise provides water at retail to customers may apply for a grant to aid in the implementation of the water efficiency goals of the plan. Any agency may apply for a grant to fund outreach or education programs aimed at demonstrating the benefits of water efficiency. The office shall review the applications and make recommendations to the board regarding the awarding and distribution of grants to applicants who satisfy the criteria outlined in this subsection (12) and the guidelines developed pursuant to subsection (7) of this section.

(c) This subsection (12) is repealed, effective July 1, 2012.

Source: L. **91:** Entire section added, p. 2023, § 4, effective June 4. L. **99:** (10) repealed, p. 25, § 3, effective March 5. L. **2003:** (4)(g) amended and (11) added, p. 1368, § 4, effective April 25. L. **2004:** Entire section amended, p. 1779, § 3, effective August 4. L. **2005:** (1), (2)(b), and (7) amended and (12) added, p. 1481, § 1, effective June 7; (11) amended, p. 1372, § 1, effective June 6. L. **2007:** (1)(a), (2)(a), (5), (7), and (12) amended, p. 1890, § 1, effective June 1. L. **2008:** IP(4) amended, p. 1575, § 30, effective May 29; (12)(a) amended, p. 1873, § 14, effective June 2.

Editor's note: Subsection (12) was originally enacted as (13) in House Bill 05-1254 but has been renumbered on revision for ease of location.

Cross references: (1) In 1991, this entire section was added by the "Water Conservation Act of 1991". For the short title and the legislative declaration, see sections 1 and 2 of chapter 328, Session Laws of Colorado 1991.

(2) For the legislative declaration contained in the 2004 act amending this section, see section 1 of chapter 373, Session Laws of Colorado 2004.

APPENDIX B

Cost Benefit Analyses and Summary for Selected Water Conservation Measures and Programs

Residential Low Flow Toilet Rebate

Cost Assumptions	
cost per unit[a]	180
rebate per unit	100
cost of water per 1000 gallons from City	2.51
Estimated Savings per unit	
persons per unit	3.5
use per person	5.1
gallons per unit , before	4.5
gallons per unit , after	1.6
days/year of use	365
gallons saved per unit/year	18894.225
AF saved per unit per year	0.058
customer pay back period w/o incentives [b]	
customer pay back period w/ incentives [b]	

Estimated Penetration and Savings	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
LFT in use [c]	1,070	1,118	1,166	1,214	1,262	1,310	1,358	1,406	1,454	1,502	1,550	1,598
new units per year, rebate	25	25	25	25	25	25	25	25	25	25	25	25
new units per year, organic	5	5	5	5	5	5	5	5	5	5	5	5
new units per year, new construction	15	15	15	15	15	15	15	15	15	15	15	15
City residential population	8631	8657	8683	8709	8735	8761	8788	8814	8840	8867	8893	8920
total toilets in use [d]	5,349	5,365	5,381	5,397	5,413	5,430	5,446	5,462	5,479	5,495	5,512	5,528
total water use for residential toilets, gallons	48,791,032	49,148,064	49,509,953	49,876,797	50,248,701	50,625,768	51,008,109	51,395,835	51,789,060	52,187,902	52,592,483	53,002,926
per capita water use for toilets	5653	5677	5702	5727	5753	5778	5805	5831	5858	5886	5914	5942
total water savings with rebated LFT, gallon	472,356	472,356	472,356	472,356	472,356	472,356	472,356	472,356	472,356	472,356	472,356	472,356
total water savings with rebated LFT, AF	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
cumulative savings, AF	1.45	2.90	4.35	5.80	7.25	8.70	10.15	11.60	13.05	14.50	15.95	17.40
total cost to utility	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
total cost to utility per AF replacement water	1,724	1,724	1,724	1,724	1,724	1,724	1,724	1,724	1,724	1,724	1,724	1,724
cumulative cost to utility	2,500	5,000	7,500	10,000	12,500	15,000	17,500	20,000	22,500	25,000	27,500	30,000

Other Assumptions

Low Flow Toilets (LFT) are defined as those toilets that use no more than 1.6 gallons per flush
Estimated water savings based on Table 2.2, Amy Vicker, "Water Use and Conservation". June 2002
[a] cost per unit based on equipment cost plus installation
[b] customer payback period is based on the current cost of 100 gallons of water at the lowest tier
[c] estimated at 20% of exsting toilets in 2008
[d] estimated as 1.8 per residential tap (2,963 in 2008)

Residential Washing Machine Rebate

Cost Assumptions	
cost per unit[a]	750
rebate per unit	75
cost of water per 1000 gallons from City	2.51
Estimated Savings per unit	
Loads per capita per day	0.37
people per machine	4
gallons per load, before	43
gallons per load, after	27
days/year of use	365
gallons saved per unit/year	8643.2
AF saved per unit per year	0.027
customer pay back period w/o incentives [b]	
customer pay back period w/ incentives [b]	

Estimated Penetration and Savings	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
HE Washing Machines in Place	511	546	581	616	651	686	721	756	791	826	861	896
new units per year, rebate	20	20	20	20	20	20	20	20	20	20	20	20
new units per year, organic	5	5	5	5	5	5	5	5	5	5	5	5
new units per year, new construction	10	10	10	10	10	10	10	10	10	10	10	10
City residential population	8631	8657	8683	8709	8735	8761	8788	8814	8840	8867	8893	8920
total washing machines in use [c]	2,556	2,564	2,571	2,579	2,587	2,595	2,602	2,610	2,618	2,626	2,634	2,642
total water use for washing machines, gallons	59,372,302	59,550,419	59,729,070	59,908,257	60,087,982	60,268,246	60,449,050	60,630,398	60,812,289	60,994,726	61,177,710	61,361,243
per capita water use for washing machines	6,879	6,879	6,879	6,879	6,879	6,879	6,879	6,879	6,879	6,879	6,879	6,879
total water savings with rebated HE machines, gallon	172,864	172,864	172,864	172,864	172,864	172,864	172,864	172,864	172,864	172,864	172,864	172,864
total water savings with rebated HE machines, AF	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53
cumulative savings, AF	0.53	1.06	1.59	2.12	2.65	3.18	3.71	4.24	4.77	5.31	5.84	6.37
total cost to utility	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
total cost to utility per AF replacement water	2,827	2,827	2,827	2,827	2,827	2,827	2,827	2,827	2,827	2,827	2,827	2,827
cumulative cost to utility	1,500	3,000	4,500	6,000	7,500	9,000	10,500	12,000	13,500	15,000	16,500	18,000

Other Assumptions

Estimated water savings based on page 124, Amy Vicker, "Water Use and Conservation". June 2002
[a] cost per unit based on equipment cost plus installation
[b] customer payback period is based on the current cost of 100 gallons of water at the lowest tier
[c] estimated as 86% of residential tap have washing machines(2,963 in 2008)

Low Flow, High Pressure Spray Heads for Pre-Washer Sprayers

Cost Assumptions	
cost per unit[a]	40
rebate per unit	0
cost of water per 1000 gallons from City	2.51
Estimated Savings per unit	
Hours of use per day	4
Restaurants	5
gallons per day per restaurant, before	600
gallons per day per restaurant, after	432
days/year of use	365
gallons saved per unit/year	61,320
AF saved per unit per year	0.188
customer pay back period w/o incentives [b]	
customer pay back period w/ incentives [b]	

Estimated Penetration and Savings	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Low Flow, High Pressure Spray Heads in Place	-	-	-	5	5	5	5	5	5	5	5	5
new units per year	-	-	5	-	-	-	-	-	-	-	-	-
new units per year, organic	-	-	-	-	-	-	-	-	-	-	-	-
new units per year, new construction	-	-	-	-	-	-	-	-	-	-	-	-
City residential population	8631	8657	8683	8709	8735	8761	8788	8814	8840	8867	8893	8920
total low flow, high pressure spray heads in use [c]	-	-	5	5	5	5	5	5	5	5	5	5
total water use for standard spray heads, gallons	-	-	1,095,000	1,095,000	1,095,000	1,095,000	1,095,000	1,095,000	1,095,000	1,095,000	1,095,000	1,095,000
total water use for low flow, high pressure sapray heads, gallons	-	-	788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400
total water savings with LF, HP Spray Heads, Gallons	-	-	306,600	306,600	306,600	306,600	306,600	306,600	306,600	306,600	306,600	306,600
total water savings with LF, HP Spray Heads, AC-FT	-	-	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
cumulative savings, AF	-	-	0.94	1.88	2.82	3.76	4.70	5.65	6.59	7.53	8.47	9.41
total cost to utility	-	-	$ 200.00	-	-	-	-	-	-	-	-	-
total cost to utility per AF replacement water	#DIV/0!	#DIV/0!	$ 212.54	-	-	-	-	-	-	-	-	-
cumulative cost to utility	-	-	200	200	200	200	200	200	200	200	200	200

Other Assumptions

Estimated water savings based on page 271, Amy Vicker, "Water Use and Conservation". June 2002
[a] cost per unit based on equipment cost plus installation
[b] customer payback period is based on the current cost of 100 gallons of water at the lowest tier

Residential Rain Sensor Rebates

Cost Assumptions	
cost per unit[a]	35
rebate per unit	25
cost of water per 1000 gallons from City	2.51
Estimated Savings per unit	
Outdoor water use per irrigator, gal/yr.[b]	90000
watering days per year, before rebate	80
watering days per year, after rebate (7.5% fewer water days)_	74
efficiency	1.6
gallons saved per year/unit (Assumed 5%)	4500
AF saved per unit per year	0.014
customer pay back period w/o incentives [c]	
customer pay back period w/ incentives [c]	

Estimated Penetration and Savings	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
units in use	-	-	7	34	61	88	135	182	209	236	263	290
new units per year, give away	-	5	5	5	5	5	5	5	5	5	5	5
new units per year, rebate	-	-	20	20	20	20	20	-	-	-	-	-
new units per year, organic	-	-	-	-	-	20	20	20	20	20	20	20
new units per year, new construction	-	2	2	2	2	2	2	2	2	2	2	2
Total Taps	2972	2981	2990	2999	3008	3017	3026	3035	3044	3053	3062	3072
total residential irrigation systems [e]	2,229	2,236	2,242	2,249	2,256	2,263	2,269	2,276	2,283	2,290	2,297	2,304
total water use for residential irrigation, gallons	200,610,000	201,211,830	201,815,465	202,420,912	203,028,175	203,637,259	204,248,171	204,860,915	205,475,498	206,091,925	206,710,200	207,330,331
per residential irrigation use	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
total water savings with rain sensors, gallon	-	31,500	121,500	121,500	121,500	211,500	211,500	121,500	121,500	121,500	121,500	121,500
total water savings with rain sensors, AF	-	0.10	0.37	0.37	0.37	0.65	0.65	0.37	0.37	0.37	0.37	0.37
cumulative savings, AF	-	0.10	0.47	0.84	1.22	1.86	2.51	2.89	3.26	3.63	4.01	4.38
total cost to utility	-	175	125	125	125	125	125	125	125	125	125	125
total cost to utility per AF replacement water	#DIV/0!	1,810	335	335	335	193	193	335	335	335	335	335
cumulative cost to utility	-	175	300	425	550	675	800	925	1,050	1,175	1,300	1,425

Other Assumptions

Estimated water savings based on page 200, Amy Vicker, "Water Use and Conservation". June 2002

[a] cost per unit based on equipment cost plus installation

[b] outdoor water use estimated

[c] customer payback period is based on the current cost of 100 gallons of water at the lowest tier

[d] 35% of new construction will use sensors

[e] estimated 75% of taps in 2008 (2963)

Residential Soil Moisture Controller Rebates

Cost Assumptions	
cost per unit[a]	375
rebate per unit	75
cost of water per 1000 gallons from City	2.51
Estimated Savings per unit	
Outdoor water use per irrigator, gal/yr.[b]	90000
watering days per year, before rebate	80
watering days per year, after rebate (20% fewer water days)_	64
efficiency	0.5
gallons saved per year/unit (Assumed 5%)	4500
AF saved per unit per year	0.014
customer pay back period w/o incentives [c]	
customer pay back penod w/ incentives [c]	

Estimated Penetration and Savings	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
units in use	-	-	7	24	41	58	85	112	129	146	163	180
new units per year, give away	-	5	5	5	5	5	5	5	5	5	5	5
new units per year, rebate	-	-	10	10	10	10	10	-	-	-	-	-
new units per year, organic	-	-	-	-	-	10	10	10	10	10	10	10
new units per year, new construction	-	2	2	2	2	2	2	2	2	2	2	2
Total Taps	2972	2981	2990	2999	3008	3017	3026	3035	3044	3053	3062	3072
total residential irrigation systems [e]	2,229	2,236	2,242	2,249	2,256	2,263	2,269	2,276	2,283	2,290	2,297	2,304
total water use for residential irrigation, gallons	200,610,000	201,211,830	201,815,465	202,420,912	203,028,175	203,637,259	204,248,171	204,860,915	205,475,498	206,091,925	206,710,200	207,330,331
per residential irrigation use	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
total water savings with rain sensors, gallon	-	31,500	76,500	76,500	76,500	121,500	121,500	76,500	76,500	76,500	76,500	76,500
total water savings with rain sensors, AF	-	0.10	0.23	0.23	0.23	0.37	0.37	0.23	0.23	0.23	0.23	0.23
cumulative savings, AF	-	0.10	0.33	0.57	0.80	1.17	1.55	1.78	2.02	2.25	2.49	2.72
total cost to utility	-	1,875	375	375	375	375	375	375	375	375	375	375
total cost to utility per AF replacement water	#DIV/0!	19,395	1,597	1,597	1,597	1,006	1,006	1,597	1,597	1,597	1,597	1,597
cumulative cost to utility	-	1,875	2,250	2,625	3,000	3,375	3,750	4,125	4,500	4,875	5,250	5,625

Other Assumptions

Estimated water savings based on page 200, Amy Vicker, "Water Use and Conservation". June 2002

[a] cost per unit based on equipment cost plus installation

[b] outdoor water use estimated

[c] customer payback period is based on the current cost of 100 gallons of water at the lowest tier

[d] 35% of new construction will use sensors

[e] estimated 75% of taps in 2008 (2963)

Residential Outdoor Irrigation Audits

Cost Assumptions	
cost per audit[a]	125
cost to utility per audit	125
cost of water per 1000 gallons from City	2.51
Estimated Savings per unit	
Outdoor water use per irrigator, gal/yr.[b]	90,000
watering days per year, before audit	80
watering days per year, after audit (15% fewer water days)_	68
efficiency	0.68
gallons saved per year/audit [c]	9,000
AF saved per unit per year	0

Estimated Penetration and Savings	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
units in use	-	-	2	14	26	38	60	82	94	106	118	130
new units per year, rebate	-	-	10	10	10	10	10	-	-	-	-	-
new units per year, organic	-	-	-	-	-	10	10	10	10	10	10	10
new units per year, new construction	-	2	2	2	2	2	2	2	2	2	2	2
Total Taps	2972	2981	2990	2999	3008	3017	3026	3035	3044	3053	3062	3072
total residential irrigation systems [e]	2,229	2,236	2,242	2,249	2,256	2,263	2,269	2,276	2,283	2,290	2,297	2,304
total water use for residential irrigation, gallons	200,610,000	201,211,830	201,815,465	202,420,912	203,028,175	203,637,259	204,248,171	204,860,915	205,475,498	206,091,925	206,710,200	207,330,331
per residential irrigation use	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
total water savings with outdoor audits, gallon	-	18,000	108,000	108,000	108,000	198,000	198,000	108,000	108,000	108,000	108,000	108,000
total water savings with outdoor audits, AF	-	0.06	0.33	0.33	0.33	0.61	0.61	0.33	0.33	0.33	0.33	0.33
cumulative savings, AF	-	0.06	0.39	0.72	1.05	1.66	2.26	2.60	2.93	3.26	3.59	3.92
total cost to utility	-	250	1,500	1,500	1,500	2,750	2,750	1,500	1,500	1,500	1,500	1,500
total cost to utility per AF replacement water	#DIV/0!	4,525	4,525	4,525	4,525	4,525	4,525	4,525	4,525	4,525	4,525	4,525
cumulative cost to utility	-	250	1,750	3,250	4,750	7,500	10,250	11,750	13,250	14,750	16,250	17,750

Other Assumptions

Estimated water savings based on page 200, Amy Vicker, "Water Use and Conservation". June 2002

[a] cost per unit based on equipment cost plus installation

[b] outdoor water use estimated

[c] estimated water savings based on Amy Vicker, "Water Use anc Conservation" (page 152, 10%)

[d] 100% of new construction will get audits

[e] estimated 75% of taps in 2008 (2963)

Parks Irrigation Improvements

Annual Water Use
2008

Park	Area		Annual Use			Savings			Volume of Water (AF)
	Acre	Sq. Ft.	Gallons	gal/sq. ft/yr	In/yr	Gallons	gal/sq. ft/yr	In/yr	
Willow Creek	12.8	557,568	9,654,358	17.32	27.78	965,436	1.73	2.78	2.96
Bicentennial	1	43,560	1,519,294	34.88	55.95	151,929	3.49	5.60	0.47
McCorkell	2.2	95,832	2,977,060	31.07	49.83	297,706	3.11	4.98	0.91
Fairmount Cemetery	16.5	718,740	13,863,432	19.29	30.94	1,386,343	1.93	3.09	4.25
Northside Park	1.1	47,916	1,071,659	22.37	35.88	107,166	2.24	3.59	0.33
Escondido Park	2.3	100,188	2,371,300	23.67	37.97	237,130	2.37	3.80	0.73
Ball Fields	9.15	398,574	34,153,466	85.69	137.46	3,415,347	8.57	13.75	10.48
Riverside Park	13.5	588,060	1,205,112	2.05	3.29	120,511	0.20	0.33	0.37
Totals	**58.6**	2,550,438	66,815,681	26.20	42.03	6,681,568	24	37.91	**20.51**

Note: Used 5% savings for Rain Sensor and Soil Moisture Units. Page 200, *Handbook of Water Use and Conservation*, Amy Vickers

Water Rate Increase Analysis

Total Commercial Water Usage =	208,046,887.00	
Taps	524.00	
We assume that 5% of the users (taps) use 20% of the water.	26.20	Users
Therefore, they use	41,609,377.40	Gallons
Per user volume	1,588,144.18	Gallons
We propose adding a tier for the largest users, which would result in decreasing the volume used by 10%	4,160,937.74	Gallons
	12.77	Acre-Feet

The decrease in water use and therefore revenue, will be made up by the increase in the additional tier.

We will conduct a full rate study after all of the SRF loans are applied and the City knows exactly how much revenue they need. We plan on conducting this rate study in 2010 and 2011, which will allow for implementation in 2012.

Lamar Water Conservation Plan Analys

Measures and Programs

	2015		2016		2017		2018		2019	
	cost	Saved Water (AF)	cost	Saved Water (AF)	cost	Saved Water (AF)	cost	Saved Water (AF)	cost	Saved Water (AF)
Low Flow Toilet Rebate	$2,499.29	1.45	$2,499.29	1.45	$2,499.29	1.45	$2,499.29	1.45	$2,499.29	1.45
Washing Machine Rebate	$1,499.83	0.53	$1,499.83	0.53	$1,499.83	0.53	$1,499.83	0.53	$1,499.83	0.53
Low Flow, High Pressure Spray Heads for Pre-Washer Sprayers	$200.43	0.94	$200.43	0.94	$200.43	0.94	$200.43	0.94	$200.43	0.94
Rainfall Sensor Rebates	$217.45	0.65	$124.92	0.37	$124.92	0.37	$124.92	0.37	$124.92	0.37
Soil Moisture Controller Rebates	$595.51	0.37	$374.95	0.23	$374.95	0.23	$374.95	0.23	$374.95	0.23
Outdoor Irrigation Audits	$2,749.76	0.61	$1,499.87	0.33	$1,499.87	0.33	$1,499.87	0.33	$1,499.87	0.33
Park System Upgrades	$6,295.46	20.51	$6,295.46	20.51	$6,295.46	20.51	$6,295.46	20.51	$6,295.46	20.51
TOTALS	$14,057.73	25.06	$12,494.75	24.37	$12,494.75	24.37	$12,494.75	24.37	$12,494.75	24.37
CUMULATIVE WATER SAVINGS		147.93		172.30		196.66		221.03		245.40
AVERAGE COST PER ACRE FOOT SAVED										
Total WC Costs	$14,057.73		$12,494.75		$12,494.75		$12,494.75		$12,494.75	

WC Budget

$	$14,057.73		$12,494.75		$12,494.75		$12,494.75		$12,494.75	
Saved Water		25.06		24.37		24.37		24.37		24.37
Cumulative Water Savings		147.93		172.30		196.66		221.03		245.40

Other Municipal Activities and Budgets

Leak Detection Services (0.25% per year of unaccounte										
$	$5,000.00		$5,000.00		$5,000.00		$5,000.00		$5,000.00	
FTEs	0.01		0.01		0.01		0.01		0.01	
Unaccounted Water (AF)										
Saved Water		5.53		5.53		5.53		5.53		5.53
Cumulative Water Savings		38.70		44.22		49.75		55.28		60.81
Meter Testing and Replacement (Increasing billing accu										
$	$5,000.00		$5,000.00		$5,000.00		$5,000.00		$5,000.00	
FTEs	0.01		0.01		0.01		0.01		0.01	
Unaccounted Water (AF)										
Saved Water		0.22		0.22		0.22		0.22		0.22
Cumulative Water Savings		1.55		1.77		1.99		2.21		2.43
Water Rate Increase										
$	$5,000.00		$25,000.00		$5,000.00		$5,000.00		$25,000.00	
FTEs	0.01		0.01		0.01		0.01		0.01	
Unaccounted Water (AF)										
Saved Water		12.77		12.77		12.77		12.77		12.77
Cumulative Water Savings		63.85		76.62		89.39		102.16		114.93

Total

	2015		2016		2017		2018		2019	
Total WC Costs + Leak Detection + Meter $	$29,057.73		$47,494.75		$27,494.75		$27,494.75		$47,494.75	
FTE	0.03		0.03		0.03		0.03		0.03	
Saved Water (AF)		43.58		42.89		42.89		42.89		42.89
Cumulative Water Savings (AF)		252.02		294.91		337.78		380.68		423.56
Yearly Gallons Saved		14,199,196		13,974,181		13,974,181		13,974,181		13,974,181
Yearly Gallons Used - W/O Conservation		754,820,000		763,540,000		772,260,000		780,980,000		789,700,000
Daily Gallons Used - W/O Conservation		2,068,000		2,091,890		2,115,781		2,139,671		2,163,562
Daily Gallons Used - W/ Conservation		2,029,098		2,053,605		2,077,495		2,101,386		2,125,276
Daily Gallons Used - W/ Conservation (Cummulative)		1,843,011		1,828,616		1,814,221		1,799,826		1,785,431
Yearly Percentage Saved		1.88%		1.83%		1.81%		1.79%		1.77%
Cumulative Percentage Saved		11.2%		13.0%		14.8%		16.6%		18.4%
Total Cost to City	$29,057.73		$47,494.75		$27,494.75		$27,494.75		$47,494.75	

Lamar Water Conservation Plan Analysis

Measures and Programs

		2009		2010		2011		2012		2013		Year 2014	
	$/ac-ft Saved	cost	Saved Water (AF)	cost	Saved Water (AF)	cost	Saved Water (AF)	cost	Saved Water (AF)	cost	Saved Water (AF)	cost	Saved Water (AF)
Low Flow Toilet Rebate	$1,724.00	$2,499.29	1.45	$2,499.29	1.45	$2,499.29	1.45	$2,499.29	1.45	$2,499.29	1.45	$2,499.29	1.45
Washing Machine Rebate	$2,827.00	$1,499.83	0.53	$1,499.83	0.53	$1,499.83	0.53	$1,499.83	0.53	$1,499.83	0.53	$1,499.83	0.53
Low Flow, High Pressure Spray Heads for Pre-Washer Sprayers	$213.00	$0.00	0.00	$0.00	0.00	$200.43	0.94	$200.43	0.94	$200.43	0.94	$200.43	0.94
Rainfall Sensor Rebates	$335.00	$0.00	0.00	$32.39	0.10	$124.92	0.37	$124.92	0.37	$124.92	0.37	$217.45	0.65
Soil Moisture Controller Rebates	$1,597.00	$0.00	0.00	$154.39	0.10	$374.95	0.23	$374.95	0.23	$374.95	0.23	$595.51	0.37
Outdoor Irrigation Audits	$4,525.00	$0.00	0.00	$249.98	0.06	$1,499.87	0.33	$1,499.87	0.33	$1,499.87	0.33	$2,749.76	0.61
Park System Upgrades	$307.00	$0.00	0.00	$6,295.46	20.51	$6,295.46	20.51	$6,295.46	20.51	$6,295.46	20.51	$6,295.46	20.51
TOTALS		$3,999.12	1.98	$10,731.33	22.74	$12,494.75	24.37	$12,494.75	24.37	$12,494.75	24.37	$14,057.73	25.06
CUMULATIVE WATER SAVINGS			1.98		24.72		49.08		73.45		97.82		122.87
AVERAGE COST PER ACRE FOOT SAVED	$1,921.33												
Total WC Costs		$3,999.12		$10,731.33		$12,494.75		$12,494.75		$12,494.75		$14,057.73	

WC Budget

$		$3,999.12		$10,731.33		$12,494.75		$12,494.75		$12,494.75		$14,057.73	
Saved Water			1.98		22.74		24.37		24.37		24.37		25.06
Cumulative Water Savings			1.98		24.72		49.08		73.45		97.82		122.87

Other Municipal Activities and Budgets

Leak Detection Services (0.25% per year of unaccounted water per $1000 spent)													
$		$5,000.00		$5,000.00		$5,000.00		$5,000.00		$5,000.00		$5,000.00	
FTEs		0.01		0.01		0.01		0.01		0.01		0.01	
Unaccounted Water (AF)	442.23												
Saved Water			5.53		5.53		5.53		5.53		5.53		5.53
Cumulative Water Savings			5.53		11.06		16.58		22.11		27.64		33.17
Meter Testing and Replacement (increasing billing accuracy and leak detection) (0.01% per year of unaccounted water)													
$		$5,000.00		$5,000.00		$5,000.00		$5,000.00		$5,000.00		$5,000.00	
FTEs		0.01		0.01		0.01		0.01		0.01		0.01	
Unaccounted Water (AF)	442.23												
Saved Water			0.22		0.22		0.22		0.22		0.22		0.22
Cumulative Water Savings			0.22		0.44		0.66		0.88		1.11		1.33
Water Rate Increase													
$		$0.00		$50,000.00		$5,000.00		$5,000.00		$25,000.00		$5,000.00	
FTEs		0		0.01		0.01		0.01		0.01		0.01	
Unaccounted Water (AF)	442.23												
Saved Water			0.00		0.00		12.77		12.77		12.77		12.77
Cumulative Water Savings			0.00		0.00		12.77		25.54		38.31		51.08

Total

		2009		2010		2011		2012		2013		Year 2014	
Total WC Costs + Leak Detection + Meter $		$13,999.12		$70,731.33		$27,494.75		$27,494.75		$47,494.75		$29,057.73	
FTE		0.02		0.03		0.03		0.03		0.03		0.03	
Saved Water (AF)			7.73		28.48		42.89		42.89		42.89		43.58
Cumulative Water Savings (AF)			7.73		36.21		79.10		121.98		164.87		208.44
Yearly Gallons Saved			2,518,578		8,281,607		13,974,181		13,974,181		13,974,181		14,199,196
Yearly Gallons Used - W/O Conservation			707,000,000		714,820,000		722,640,000		730,460,000		738,280,000		746,100,000
Daily Gallons Used - W/O Conservation			1,936,986		1,958,411		1,979,836		2,001,260		2,022,685		2,044,110
Daily Gallons Used - W/ Conservation			1,930,086		1,932,982		1,941,550		1,962,975		1,984,400		2,005,208
Daily Gallons Used - W/ Conservation (Cummulative)			1,930,086		1,928,082		1,909,221		1,892,360		1,875,499		1,858,022
Yearly Percentage Saved			0.36%		1.30%		1.93%		1.91%		1.89%		1.90%
Cumulative Percentage Saved			0.36%		1.7%		3.6%		5.5%		7.4%		9.3%
Total Cost to City		$13,999.12		$70,731.33		$27,494.75		$27,494.75		$47,494.75		$29,057.73	

APPENDIX C

Formal Documentation Approving the City of Lamar's Conservation Plan

RESOLUTION No. 08-11-01

A RESOLUTION OF THE CITY OF LAMAR, COLORADO ADOPTING A WATER CONSERVATION PLAN FOR THE CITY

WHEREAS, the City of Lamar has an interest in being a good steward of its water resources; and

WHEREAS, it is appropriate for the City to address the use, conservation, and planning of its water resources; and

WHEREAS, City Council desires to meet the requirements of Colorado Revised Statute Section 37-60-126, the Water Conservation Act of 2004.

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

1. Adopts the Water Conservation Plan for the City of Lamar dated October 2008, attached hereto and made a part hereof by reference; and

2. Repeals any and all policies in conflict with the Water Conservation Plan as adopted; and

3. Directs the City Clerk to advertise that the plan will be made available for public review and comment for 60 days; and

4. After completion of the public comment period the City Administrator and the Water Resources Manager are authorized to submit the Water Conservation Plan as adopted to the Colorado Water Conservation Board for final approval.

INTRODUCED, PASSED, AND ADOPTED this 10th day of November, 2008.

CITY OF LAMAR, COLORADO

NELVA HEATH, Mayor

ATTEST:

MARIBETH KEMP, City Clerk

Community News

PUBLIC NOTICE

Notice is hereby given that at a regular meeting of the City Council of the City of Lamar, Colorado, held on November 10, 2008, Resolution No. 08-11-01 "A Resolution of the City of Lamar, Colorado Adopting a Water Conservation Plan for the City" was adopted.

The Water Conservation Plan for the City of Lamar will be available for public review for a period of 60 days at the Lamar Public Library located at 104 East Parmenter Street; Office of the City Clerk located at 102 East Parmenter Street; and the Lamar Water Department located at 103 North 2nd Street.

All comments must be submitted in writing to the Office of the City Clerk no later than 4:00 p.m. on January 9, 2009.

Happy 96th Birthday Ester Weimer

Last Sunday all of Esters family and friends came together in Wiley to Celebrate her 96th birthday. All were so happy to share that day with her."We all love you Ester and can't wait for your 97th birthday"

The persons attending Grandma's birthday party were:

> From out of town:

> Mr & Mrs Dave Reyher, Buena Vista, CO (Dave & Diane)
> Tennille Reyher, Laramie, WY

> From the Lamar, Wiley and McClave area:

> Mr & Mrs Jay Sneller (Jay & Maralyn)
> Mr & Mrs Darrell Sykes (Darrell & Jean)
> Mr & Mrs John Sykes, Jade & Jozlyn
> Audrey Bauer and son Jayce Bauer
> Mr & Mrs Jeff Leonard and Jaylene (Jeff & Angela)
> Mr & Mrs Ryan Sneller, Austin, Courtney & Brendan (Ryan & Angel)
> Shalah Ward and daughter Leeanna
> Mr & Mrs Jim Schleining (Jim & Cindy)
> Joan Weimer
> Lorraine Schleining
> Pastor & Mrs Mike Schneider (Mike & Judy)
> Pat Weimer

APPENDIX D

Ordinance No. 877

ORDINANCE NO. 877

AN ORDINANCE CONCERNING RESTRICTIONS ON USE OF WATER FROM THE CITY OF LAMAR WATER SYSTEM

WHEREAS, the City Council of the City of Lamar, Colorado recognizes that the supply of potable water available to residents of the City of Lamar is subject to limitations as to availability and quality, and that, in any given future period, the supply available might not be of such quantity or quality as to meet the needs of the users of the municipal water system, and

WHEREAS, said City Council also recognizes that there is no shortage in the municipal water supply at the present time, but deems it prudent to establish restrictions upon usage of water from the municipal water system for timely implementation in the event that future circumstances dictate that such water usage should be curtailed in the best interest of the citizens to insure that adequate potable water is available for necessary uses;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF LAMAR, COLORADO:

Section 1. That the Superintendent of the Lamar Water Department is hereby directed to, at all times, closely and diligently monitor the water supply available to the municipal water system, to inform Council and the Lamar Water Board, on a timely basis, as to the condition and circumstances of the then-available water supply, and to take such measures as said Superintendent may deem necessary to educate and inform the public as to the need for conservation of the City water supply, methods whereby said water supply might be conserved, and to investigate all measures aimed toward preserving the integrity of the municipal water system.

Section 2. That, in the discretion of the Lamar Water Superintendent, in consultation with Council and the Lamar Water Board, and as water availability and quality circumstances might dictate, said Lamar Water Superintendent is hereby authorized and directed to implement voluntary restrictions on the use of water for lawn and landscaping irrigation purposes by all users of the municipal water system. Said voluntary conservation efforts and restrictions shall be as follows:

a. Users shall be asked to voluntarily restrict usage of water, for lawn and irrigation purposes, based upon the address of the user, in the following manner, to-wit: addresses ending on an even number shall be asked to perform lawn and landscaping irrigation only on even numbered days of the month. Addresses ending in odd numbers shall be asked to irrigate for lawn and landscaping purposes only on odd numbered days of the month. All users shall be asked to cease lawn and landscape irrigating on the 31st day of each month. Government and quasi-governmental users, such as the City, the County, the School District, the Hospital District, and the State of Colorado shall be asked to limit their irrigation for lawn and landscape purposes to three day of each week.

Section 3. That mandatory water use restrictions shall become effective at any time the following criteria are met:

a. At such time that the average static level in all City water supply wells that are measurable shall drop to twenty-two feet six inches (22'6") in level, AND

b. The 6,000,000 gallon primary water storage tank of the municipal water system fails to recover to minimum water level exceeding eighteen feet (18') in the tank during any twenty-four hour period on each of four days, whether consecutive or not, within any period of seven consecutive days.

Section 4. That, in the event that the criteria for mandatory water use restrictions, above described, shall be disclosed on a timely basis to Council by the Water Superintendent, at which time Council shall take such measure as it deems prudent and necessary to so inform water users of the municipal water system of the implementation of such restrictions.

Section 5. That the mandatory water use restrictions thus implemented shall be identical to the voluntary conservation restrictions above described, as follows, to-wit:

a. All water users whose address ends in an even number shall utilize water, for lawn and landscape irrigation purposes, only on even numbered days of the month.

b. Water users whose address ends in an odd number shall utilize water for lawn and landscape irrigation purposes on odd numbered days of the month.

c. No users shall utilize water for lawn and landscape irrigation on the 31st day of each month.

d. Governmental and quasi-governmental users shall utilize water for lawn and landscape irrigation purposes only three days of each seven day week.

Section 6. In the event that mandatory water use restrictions shall become effective due to the existence of the criteria herein defined, any person violating such mandatory use restrictions, upon conviction thereof by the Municipal Court, shall be punished by a fine of not more than $300.00, or by imprisonment for not more than ninety days, or by both such fine and imprisonment.

Section 7. Nothing herein contained shall be construed or interpreted as limiting or prohibiting the imposition of water use restrictions more stringent than as described above, provided that such further restrictions shall be implemented, if at all, by the Council in emergency circumstances.

Introduced, read in full, passed on first reading, and ordered published this 23rd day of October, 1989.

Introduced, passed on second reading, and ordered published this 13th day of November, 1989.

NANCY TURNER - MAYOR

ATTEST:

MARVIN FOWLER - CITY CLERK

I Marvin Fowler, City Clerk of the City of Lamar, Colorado do hereby certify that the above and foregoing Ordinance was introduced and read in full at a regular meeting of the City Council of the said City of the 23 day of October, 1989 and that it was thereafter on the 27 day of October, 1989 published in full in the Lamar Tri-State Daily News, and that on the 13 day of November, 1989 at a regular meeting of the City Council, it was passed and approved upon final reading and was thereafter on the 17 day of November, 1989 again published in said Lamar Tri-State Daily News.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the City of Lamar, Colorado.

(SEAL)

MARVIN FOWLER - CITY CLERK

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