2018

Water Conservation Plan

Jenny Conlon; Administrative Specialist

jennyc@cityoflafayette.com

Douglas Short; Public Works Director

douglass@cityoflafayette.com

PUBLIC WORKS

City of Lafayette

January 3, 2019

Colorado Water Conservation Board
Department of Natural Resources
1313 Sherman Street, Room 721
Denver, CO 80203

RE: City of Lafayette 2018 Water Conservation Plan

To Whom it May Concern:

Enclosed is our 2018 Water Conservation Plan for your review. The following City of Lafayette staff members were involved in the Plan's creation: Douglas Short, P.E., Public Works Director; Melanie Asquith, P.E., Water Resources/CIP Assistant Manager; and Jenny Conlon, Public Works Administrative Specialist.

We also received information from our water conservation partners; ReSource Central and from the following documents:

- *Water System Master Plan for the City of Lafayette* McLauglin Rincon, May 2015
- *Water Conservation Plan* City of Lafayette, April 2010
- *Water Shortage Management Plan,* City of Lafayette, August 2001
- *City of Lafayette Municipal Code*
- *Statewide Water Supply Initiative,* Prepared for the Colorado Water Conservation Board, 2004
- *Water Programs Annual Report,* Center for ReSource Conservation, 2016

A draft of the Water Conservation Plan went out for public comment on January 4, 2019 for a period of 60 days. It will be advertised through the City's website, city news and Nextdoor. It will also be available in print at the Public Works counter, 1290 S Public Rd. The plan was originally submitted to Colorado Water Conservation Board (CWCB) in January 2018. After review by CWCB, we received a conditional approval. Revisions were needed as well as a public comment period. Once public comment period is over, and City Council adopts the plan, we are submitting the plan once again for full approval.

The City of Lafayette is committed to implementing this plan and will commit the resources needed to follow through with the measures and programs as described in our Conservation Plan.

Sincerely

Douglas M. Short, P.E
Public Works Director

Executive Summary

The 2018 Water Conservation Plan supersedes the plan prepared in April 2010 and fulfills statutory requirements under C.R.S. §37-60-126, the "Water Conservation Act of 2004." With Lafayette's aggressive water conservation program and increasing water rate block structure, it is expected that the total and residential gallons per capita per day will continue its gently decrease. This plan will be revised in 2023 unless the annual review shows that changes are needed sooner.

Since the drought and water shortages of 1976, the City has developed a comprehensive water conservation program that includes:

- A tiered water rate structure introduced in 1981
- Supply and demand management
- The development review process
- Water-wise landscape construction and maintenance practices
- Public education

Lafayette's current conservation program has reduced both overall water consumption and peak demand as demonstrated by lower water consumption since the drought of 2002. In a study completed in 2007 by Western Resource Advocates,[1] only two Colorado Front Range cities showed lower water use (measured in gallons per capita per day or GPCD) in 2006 than Lafayette: Boulder, with a *system-wide* GPCD of 148; and Colorado Springs, with a *residential* GPCD of 96. Lafayette was not included in that study, but for the same period, Lafayette's system-wide consumption in GPCD was 145 with a residential GPCD of 101.

This plan continues or expands all of our current programs and adds several others in order to meet specific, measurable goals:

1. Reduce total water use in 2023 by 149.5-acre feet through a combination of various demand-side measures.
2. Reduce system-wide water loss to 5% or less per year through improved distribution system efficiency measures and programs.

The City will add several new measures and programs to its existing conservation efforts to accomplish the above goals.

[1] Western Resource Advocates (http://www.westernresourceadvocates.org/index.php) is a nonprofit group dedicated to sustainable management of wat[1]er, energy and land resources in six western states (Colorado, Utah, Nevada, New Mexico and Idaho). The study referred to is *Front Range Water Meter: Water Conservation Ratings and Recommendations for 13 Colorado Communities, 2007*.

1. **Turf Replacement Program:** The second program targets outdoor water use. The design of the program is to encourage residents to replace a minimum of 200ft^2 of turf with either a xeric garden or permeable hardscape. Required irrigation system changes are expected and an audit performed by the Center for Resource Conservation (CRC). The CRC provides a turnkey project management. We have budgeted $13,400 annually for this program and anticipate saving approximately 0.9 AFY.
2. **Improved Water Accounting and System-wide Leak Detection:** In 2016, the annual water loss was at 7.2%. The City has embarked on a system-wide water meter replacement program and has provided accurate water sales data, which, in turn, has provided for accurate system lose calculations. If necessary, a system wide water audit will be conducted, if the annual system loss rises above 10%
3. **Fixture Replacement:** This program will analyze City facilities fixtures and replace faucets, toilets, and urinals if needed, for a projected water savings of 4.7AFY.
4. **Toilet Replacement Program:** This program will replace high-use toilets of 1.6gpf or higher with an efficient 0.8gpf Niagara Stealth toilet at a low cost to the resident. This is a turnkey program run by CRC with a cost of $21,000 to the City. Annual estimated savings is 6.9 AFY.
5. **Garden-In-A-Box Program:** This program offers beautiful professionally designed perennial xeric gardens for water utility customers to purchase at a competitive price. We have budgeted $5,800 annually to offer a $25 discount to the first 100 residents who purchase a garden.

The effectiveness of this Conservation Plan depends on the community's response to and participation in our conservation measures and programs. In order for the public buy in to water conservation behavior, it must understand the why and how of water conservation. Further, the City must demonstrate to the public that water conservation programs and measures are paying off. Lafayette will accumulate accurate data, analyze trends between demand and conservation measures, evaluate the effectiveness of individual conservation programs, and share this information with the public through the Public Works Department web pages. Revision of this plan will be in 2023.

Introduction

In response to the drought and water shortages of 1976, the City began to implement a program based on:

1. Reasonable cost
2. Quantifiable water savings
3. Community acceptance

Our strategy has gained the support and participation of the community. It is compatible with our water supply system, water resources management strategy, and community values while controlling costs and fostering conservation.

Lafayette's conservation approach targets both inside and outside water use. Elements of the program include:

- Tiered water rate structure
- Supply and demand management
- Development review process
- Landscape construction and maintenance practices
- Use of untreated water (taken downstream from Louisville's wastewater treatment plant to irrigate landscaping along Hwy. 287)
- Reuse of Water Reclamation Plant return flows (approximately 60%)
- Public Education

The Table 1 provides a description of each of the measures and programs planned or currently implemented by the City of Lafayette. Table 1A shows the estimated water savings from current conservation programs.

Table 1. Current and Planned Measures and Programs

Conservation Measures/Programs	Continuing/ Beginning Date	Description
Landscape and Irrigation Efficiency in Parks		
Drought resistant vegetation Low water use landscapes Scheduling	Continuing	Parks, Open Space & Golf plant drought resistant vegetation, use low water landscapes when appropriate and irrigates during the evenings and night when evaporation is at its lowest
Weather Station/Rain cans	Continuing	Installing of weather station to monitor at all existing parks and at Indian Peaks Golf Course. This system will detect precipitation and shut off the irrigation system if it is raining or if maximum moisture levels have been reached
Evapo-transpiration (ET) controllers	Continuing	Indian Peaks Golf Course has an on-site weather station that monitors weather and calculates evapo-transpiration. A similar system is in place for all Parks landscaping
Policies Addressing New Parks		
Design/layout preparation Irrigation equipment	Continuing	During the design of any City project, water requirements are evaluated and conservation methods are required
Water Efficient Fixtures		
Commercial and Residential	February 2014	Replaced pre-spray nozzles at 26 businesses
Fixture replacement program	January 2017	Toilets, urinals and faucets were replaced at City Hall
Landscape & Irrigation Efficiency for New Homes and Businesses		
Covers design and layout, soil preparation and irrigation equipment	January 2017	Established by Ordinance Data gathering is currently under way to establish effectiveness of this measure for water conservation
Landscape & Irrigation Efficiency for Existing Homes and Businesses		
Turf Replacement Program	January 2016	Offer residents an opportunity to replace 200ft^2 of turf with a xeric garden or permeable hardscape which may result in a credit to

		utility bill
Customer irrigation audit	Continuing	No cost irrigation audit program for all Lafayette utility customers with in-ground irrigation systems. The audit identifies and provides solutions for irrigation inefficiencies
Garden-In-A-Box	March 2013	Plant-by-number xeric gardens available to all Lafayette residents
Metering & Billing		
Tiered billing structure	Continuing /	Lafayette bills customers according to a tiered rate structure. The amount per 1000 gallons of usage increases as usage goes up. Rates will increase 5% per year until 2021
Billed metered consumption	Continuing	All accounts are metered. Lafayette completed change to radio-read meter reading in 2008
Meter service connections and meter replacement program	Continuing	All 1 ½“ or larger meters will be tested annually and repaired or replaced if necessary
Indoor water audits	January 2010	No cost indoor audit program for all Lafayette utility customers. The audit identifies and provides solutions for inefficiencies
Distribution / Treatment System Efficiency		
Leak Detection program	2019	Budget and contract for system-wide leak detection survey
Public Education		
Informative and understandable water bill	Continuing	Lafayette’s water bill provides each customer with information on how much water was used during the billing cycle as well as water used during the same cycle the previous year
Water-wise Seminars	Continuing	No cost seminars on Xeriscape, turf irrigation and related topics are offered every year in April to all Lafayette water customers
Educational material outreach	Continuing	Lafayette uses its website, social media and City newsletter to convey water conservation events and programs
Regulations & Ordinances		
Permanent Water Conservation Ordinance	November 2013	City enacted Ordinance 27-2013 prohibiting irrigation to occur between 10am to 6pm regardless of drought conditions

Table 1A Current Conservation Activities

Water Conservation Measure & Program	Approximate Current Annual Water Savings (AF)	Implemented	Plan to Continue
Rate Structure	Unable to quantify	1981	Yes
Informative Water Bill	Unable to quantify	2000	Yes
Irrigation Audit Program (1)	1.9	2004	Yes
Xeriscape Seminars	Unable to quantify	2004	Yes
Public Education Programs	Unable to quantify	2004	Yes
Lafayette Comprehensive Plan	Unable to quantify	2003	Yes
Landscaping/Irrigation Requirements	Unable to quantify	2004	Yes
Water Shortage Management Plan	Savings only during drought emergency	2000	Yes
Lafayette Parks & Golf Course (2)	344.0	1992	Yes
Water Reuse System (3)	1478.6	2003	Yes
Distribution System Efficiency (4)	125.3	1999	Yes
Water Conservation Ordinance	Unable to quantify	2013	Yes
Garden-In-A-Box	Potential of 930 gallons per 200ft^2	2013	Yes
Toilet Upgrade Program	2.2	2014	Yes
Turf Replacement Program (5)	0.34	2016	Yes

(1) Total of single family residents, commercial & HOA audits
(2) The US Highway 287 landscape irrigation saves 130 af annually and is included in this total savings figure and the Water Reuse System Water savings figure
(3) This is annual savings for 2008 only
(4) Based on a 3% savings of keeping water meters accurate
(5) Water savings for this program only occurs during irrigation season (May – Sept)

Water Conservation Plan

1 Existing Water System Profile

1.1 Physical Characteristics

The City of Lafayette is a small city located in the southeastern portion of Boulder County. The City provides water service to over 9,400 accounts both within the city limits and in adjacent areas. Outside the city limits, the City also provides water to two water districts. The City provides wastewater collection and treatment services to its in-city water customers.

The Baseline Water Treatment Plant (WTP) on the south side of Baseline Road in western Lafayette is currently the only water treatment plant serving Lafayette. This WTP has a current capacity of 13.0 MGD (million gallons/day). The WTP had maximum day demands of 8.7 MGD in 2016, 9.7 MGD in 2017 and 10.2 MGD in 2018.

Three pressure zones divide the distribution system: Blue, Orange and Red. The following table, adapted from the Water System Master Plan for the City of Lafayette (Master Plan), developed by McLaughlin Rincon in May 2004 and updated in 2015, shows the zones, the high and low service elevations, and the demand in each zone for both a "normal" year and at projected build-out.

Table 2. Distribution System Zones

Zone	High Service Elev. (feet)	Low Service Elev. (feet)	Peak Demand (MGD)	Peak Demand at Build-Out (MGD)
Blue	5450	5280	1.0	3.1
Orange	5320	5145	4.9	7.9
Red	5250	5100	3.1	6.8
		Total Peak Demand	**9.0**	**17.8**

The City of Lafayette's water system is adequate for current demands. Requirements are needed of additional treatment, storage and transmission facilities to provide water service when the City reaches full build-out (the City of Lafayette Comprehensive Plan estimates a population of 35,083 in 2022). In 2018, the total population served by Lafayette's water system, excluding out of-city customers, was 28,714 (estimate provided by Planning and Building Department).

Table 3 shows the distribution of the City's water connections and water sales at the end of 2018: (In and Out of City)

Table 3. Water Connections and Sales -2018

Type of Connection	Number of Connections	Water Sales (1,000's of Gallons)	Water Sales in Acre Feet (rounded)
Residential- single-family	8,387	707,214	2,170
Residential- multi-family	490	201,603	619
Commercial	349	178,350	547
Industrial	15	14,739	45
Industrial (Permitted Discharge)	19	39,504	121
Irrigation	181	233,044	715
Districts	2	34,229	105
TOTAL	9,443	1,408,683	4,323

Lafayette has experienced wild fluctuations in system losses. One area of concern is the accuracy of our smaller residential meters that have exceeded their useful life (<20 years). We have begun a process to replace these old, inaccurate brass impeller meters with "smart" meters, which have no moving parts and have a longer useful life which will improve water sales accuracy and system loss calculations. Completion of this project will be early 2020.

Annual System Losses

	Production	Sales	
Year	(1,000's of Gallons)		% Loss
2014	1,421,155	1,262,656	11.2%
2015	1,438,891	1,265,523	12.0%
2016	1,490,677	1,413,642	5.2%
2017	1,526,662	1,402,792	8.1%
2018	1,585,097	1,408,683	11.1%

1.2 Sources of Water

The City of Lafayette receives snowmelt runoff from South Boulder Creek, Boulder Creek and Coal Creek. This water flows into the Baseline, Waneka and the two Goose Haven reservoirs from nine ditches: Coal Ridge, Davidson, Dry Creek 2, Dry Creek Carrier, Enterprise, Goodhue, Leyner-Cottonwood, Lower Boulder, and South Boulder & Bear Creek.

When needed, delivery of Colorado-Big Thompson (CBT) and Windy Gap water to the Goose Haven #1 Reservoir through the Boulder Feeder Canal, Boulder Reservoir, Boulder Creek Supply Canal, Boulder Creek, and the 75th Street Pipeline.

1.3 Planning for the Future

Since the droughts of 1976 and 2002, the City of Lafayette has aggressively pursued water rights acquisition so that even during times of drought, our customers have adequate water supplies to meet basic needs.

In 1997, the City purchased controlling shares of Base Line Reservoir. The City successfully petitioned for inclusion in the Northern Colorado Water Conservancy District in 2003, and added raw and potable water storage facilities. Lafayette is also actively involved in the Northern Integrated Water Supply Plan (NISP) and Windy Gap Firming regional water supply projects. The 75th Street Pipeline, begun prior to the 2002 drought, provides a delivery system for the City's South Boulder Creek water rights, as well as water delivered from the Colorado Big Thompson project (CBT), Windy Gap, and NISP. Any new development with a projected total annual water use of five acre-feet or more is required to dedicate units of Colorado Big Thompson water to the City. They may also financially participate in the expansion of our Goosehaven reservoir complex, which adds firm water to our portfolio.

The *2015 Water System Master Plan* for Lafayette proposes future improvements to the water system based on population and use assumptions at build-out. Future improvements include an additional 2 MG Red Zone tank in the southern portion of the city, a peaking water treatment plant of up to 6 MGD, an additional 2 MG Blue Zone tank and a new Orange Zone potable water transmission main. Since Lafayette's growth, per ordinance, is limited to a maximum of 200 new single-family units per year, or 1200 homes in six years, the exact year of build-out is unknown. Our existing facilities are sufficient for current demand.

1.4 Water Billing

The City charges all water customers monthly for water utility services. The utility bill consists of the following components:

- A fixed fee for storm drainage

- Wastewater fee – a fixed monthly charge plus a volume charge based on the customer's average winter water usage December - February)
- Water use fee – A fixed monthly service charge (based on tap size) plus a tiered volume charge based on water usage

1.5 Water Rates

Lafayette was the first city in Colorado in early 1980 to use a tiered or increasing block water rate structure. In this rate structure, the unit price for water increases in steps as the volume consumed increases.

The following table shows the current water rates for residential customers with a 5/8" water meter. These rates represent the second year of a six-year plan to increase water by 5% per year or a total increase of 41% compounded by 2021. Residential customers located outside the city limits of Lafayette pay double the in-city rates. Customers are also billed a fixed water service charge.

This rate structure sends a strong message to customers about the value of the water they are using and the dollar benefits of conservation. It is also very effective in encouraging conservation and reducing peak flows

Table 4. 2018 Water Rates

Residential Water Service Charge	$13.52
Plus Usage:	k/gal
1,000 – 5,000	$2.84
6,000 – 10,000	$3.60
11,000 – 15,000	$4.75
16,000 – 20,000	$6.29
21,000 and above	$8.55

Rates for monthly wastewater charges for residential and nonresidential accounts are based on the average water consumption during the months of December, January and February. Adjustment of the rate is completed every March, for the next 12 months. This gives customers an incentive to reduce indoor water use. Currently wastewater rates have completed four years of increases ending in 2019 that will produce a total increase of 92% compounded.

Table 5. 2018 Wastewater Rates

Residential Wastewater Service Charge	$22.80
Plus Usage:	k/gal
Tier One – 0 to 5,000	$2.37
Tier Two – 5,000 to 10,000	$2.57
Tier Three – 11,000 and above	$2.78

Non-residential wastewater service charges are higher than residential customers are as shown in table 6.

Table 6. 2018 Non-Residential Wastewater Charges

Basic Monthly Charge	**Tier One (0 – 10,000 gallons)**	**Tier Two (11,000 – 20,000 gallons)**	**Tier Three (21,000 gallons and above)**
$32.19	$2.94*	$3.94*	$4.67*

*charge based per 1,000 gallons

1.6 Development Fees and Utility Tap Fees

The dedication of water rights occurs with the platting of properties based on proposed use. Water rights may be dedicated at the time of platting or deferred until the issuance of a building permit, for nonresidential uses. The amount of water rights dedication for nonresidential uses is based on projected annual water use based on the planned use of the property.

Residential Water Rights Dedication

Single-Family Dwelling	0.50 acre-feet per unit
Multi-Family Dwelling, including duplexes	0.35 acre-feet per unit
Accessory Dwelling / Apartment	0.25 acre-feet per unit

Nonresidential Water Rights Dedication

Once the building permit is issued, water rights dedication is required in most nonresidential subdivisions. The water rights dedication amount is based on the proposed land use and the projected annual water use.

Any development with a projected total annual use of five acre-feet or more is required to dedicate units of Colorado Big Thompson (CBT) water. New development has the option to financially participate in the expansion of Goosehaven Reservoir complex that will all firm water to our portfolio. Developments with a projected total annual water use of less than five acre-feet may pay a cash in-lieu fee, subject to approval by the Director of Public Works. The cash in-lieu fee is subject to periodic change based on the market value fluctuation of CBT units. If the projected number of CBT units results in a fraction, the total number of CBT units is rounded up to the next whole number.

Acre-foot Yield per CBT Share

One CBT share yields 0.7 acre-feet of water

Cash-in-Lieu Fee

$18,900 per acre-foot. Along with the dedication of water rights, developments are required to pay a Windy Gap/Northern Integrated Supply Project (NISP) Supplemental Water fee for each acre-foot of water dedicated.

Windy Gap/Northern Integrated Supply Project (NISP) Supplemental Water Fee

$5,021 per acre-foot of dedicated water

Nonresidential water meter sizes are determined using the plumbing code flow rates. Continuous flow rates are used for irrigation applications. Meters are installed by the City of Lafayette.

Table 7. Non-Residential Utility Tap Fees

Water Meter Size	Maximum Peak Flow (GPM)	Allowable Continuous Flow (GPM)	Meter Fee	Water Tap Fee	Wastewater Fee
5/8”	25	1-10	$329	$7,800	$5,300
¾”	35	11-15	$346	$9,360	$6,360
1”	55	16-25	$392	$13,026	$8,851
1.5”	150	26-50	$1,462	$25,974	$17,649
2”	200	51-80	$1,712	$41,574	$28,249
3”	500	81-320	$2,099	$83,226	$56,551
4”	1000	321-500	$3,522	$130,026	$88,351
6”	2500	501-1000	$6,092	$259,974	$176,649

Residential Utility Tap Fees

Water Service Fee			
Single family with 5/8" water meter		$7,800	
Single family with ¾" water meter		$9,360	
Duplex dwelling (2 unit multi-family)		$14,625	
Multi-family dwelling	$7,800 per building plus	$4,290	per unit
Accessory dwelling		$4,290	per unit
Wastewater Tap Fee			
Single family with 5/8" water meter		$5,300	
Single family with ¾" water meter		$6,360	
Duplex dwelling		$9,940	
Multi-family dwelling per unit	$5,300 per building plus	$2,870	per unit
Accessory dwelling		$2,870	per unit

2 Water Use and Demand

2.1 Historic Usage

Population, land use, climate conditions, drought awareness, and conservation efforts affect water usage within the city. The table below shows water use per capita for the City of Lafayette since 2008. The table shows a slight decrease in per capita consumption between 2008 and 2016 except for the very warm and dry summer of 2012.

Table 8. Historic Usage (GPCD)

City of Lafayette (Gallons per Capita per Day (GPCD)[1]		
Year	**Total System GPCD**	**Residential GPCD**
2008	133	94
2009	118	85
2010	120	86
2011	130	91
2012	145	101
2013	119	84
2014	118	83
2015	118	80
2016	131	85
2017	128	83
2018	126	82

(1) = In City only information

Given all the variables in water use, it is difficult to quantify the amount of water savings attributable to individual conservation efforts. Water use in 2002 was at its lowest due to drought awareness—restrictions on outdoor use, widespread regional news coverage and local customer educational efforts.

Beginning in January 2006 and continuing through 2021, Lafayette water rates have been raised 5% per year. That, combined with other conservation programs, has prevented our residential GPCD from rising to pre-drought levels. In 2018, our residential GPCD was 27% below residential usage in 2001 while our total system GPCD was 12% below the 2001 GPCD.

2.2 Projected Potable Water Demand at Build-Out

Based on projected development (based on land use and number of acres or units) taken from Lafayette's Comprehensive Plan, the table below estimates Lafayette's water demand at build-out. This table is reproduced on the following page from the 2015 *Water System Master Plan* developed by McLaughlin-Rincon.

Table 9. Projected Potable Water Demands at Build-Out

	Acres or Units	Acre-Ft./Acre or Unit	Average Acre-Ft. per Year	Allowed Treatment Loss of 1.50%	Dry Year Design
Parks	142	2.75	391	397	413
Single-Family	9,935 units	0.43	4,272	4,336	4,510
Multi-Family	5,989 units	0.23	1,377	1,398	1,454
Office	430	1.00	430	396	422
Institutional/Public	293	1.00	293	297	309
Retail	431	1.50	646	656	682
Industrial	479	0.35	167	170	177
Total			**7,576**	**7,690**	**7,998**

3 Proposed Facilities

Lafayette will experience slow growth within the next few decades because of growth restrictions currently in place. Developers are required to dedicate water rights to the City based on predetermined projected uses as described in *Section 1.6 Development Fees and Utility Tap Fees*. Potable transmission lines will be built as needed as development continues and will depend upon rate of development.

Land acquisition has been completed and the Goose Haven Reservoir complex is under construction to increase storage of non-potable and raw water.

The goals for water treatment storage outlined in the *Water System Master Plan* (May 2015, prepared by McLaughlin Water Engineers) include:

- Providing adequate pressures during fire and peak hour flow in all areas of the system.
- Providing multiple points of treated water input into the distribution system to reduce the size of transmission lines required and add reliability if tanks are taken out of service for maintenance.
- Maintaining the largest amount of storage in the higher zones in order to reduce operational costs and ensure water delivery to all water zones if a portion of any supply point is taken out of service.

In order to provide for the above, proposed changes to the system include an additional 2 MG Red Zone storage tank in the southern part of the City, a peaking water treatment plant of up to 6 MGD, an additional 2 MG Blue Zone tank, and a new Orange Zone potable water transmission main.

These recommendations are based assumptions regarding peak day demands on Lafayette's water system based on historical data and projected customer use. In 2012, existing development exerted a design maximum daily demand of approximately 11.1 MGD. The Water Master Plan applied the same unit demands to projected growth to estimate future daily demand. Using this data, The Water Master Plan projects peak day demand during an average year at 16.7 MGD. Future improvements to the water system are based on these numbers. Our current Water Treatment Plant has a production capacity of 13 MGD and a total of 13 MG of potable water storage.

As our rates have increased on a regular annual basis coupled with the various water conservation

programs, the Public Works Department has noticed that peak demand is not growing as rapidly as before the 2002 drought. In 2018, our peak day demand was 10.2 MGD. The results of peak day demand is increasing slowly, we continue to push out the need for our water treatment peaking plant into the future. Section 7 of this plan details the reasons for the slowdown in peak day demand. Public Works staff continue to monitor peak demand to determine when the peaking plant is needed.

4 Conservation Goals

1. **Annual Water Use Reduction.** The actual savings of water due to Lafayette's water conservation program, in most cases, is very difficult to quantify if not impossible. The City of Lafayette feel that a true measure of our successful water conservation program is that our gallon per capita per day has been slightly decreasing since 2001 as seen in Section 7, Table 19. The current housing development have larger homes and smaller lots resulting in less irrigated landscape. This, in conjunction with an aggressive increasing block rate billing structure has decreased residential usage and total gallons per capita per day despite adding on average, 150 homes per year for the last 16 years.
2. **Reduce System-Wide Water Loss to 5% or Less.** Unaccounted for water loss reached a high of 13.6% in 2011 based on water sales vs. water production numbers. In 2016, water loss was at 7.2%, which is a reflection of replacing water meters that have exceeded their useful life.

5 Conservation Measures and Programs

5.1 Rate Structure and Billing System

Section 120-58 of the Code of City Ordinances provides for a tiered rate structure. The City initiated this rate structure in April 1981. The City was the first city in the state to use this structure, which has a higher cost per gallon for higher water usage. Since 2003, water rates have increased annually. (See Section 1.5.)

5.2 Informative Water Bill

The water bill gives current usage and usage from the previous year. If a sudden spike in water use is recorded on a water meter, the City notifies the water customers. Water customers are then encouraged to locate possible leaks in their system. Adjustment to the water bill is made, if the customer discovers a leak and produces proof of timely repairs.

5.3 Irrigation Audit Program

In 2004, the City collaborated with the Resource Central (RC) to provide no cost irrigation audits for all Lafayette utility customers with in-ground irrigation systems. This program identifies irrigation inefficiencies. The auditor checks soil type, root depth and sprinkler pressure, and advises participants how to adjust water schedules, identify broken sprinkler lines and heads, adjust head types and spacing, and determine suitable pressures for the irrigation system. Offers of irrigation audits are on a first-come/first served basis during the irrigation season.

In 2014, we enhanced the Irrigation Audit program by adding installation of rotary nozzles and rain sensors for interested homeowners. This added feature is at no cost to the resident.

From 2004 – 2017, 1095 residential properties, 23 HOA's, and 4 commercial properties, have taken advantage of the program. Estimated water savings from the audits is 1.9 AFY and future water savings are expected to remain the same. Lafayette will continue the program by funding 125 irrigation audits per year, 10 rotary nozzle retrofits and 25 rain sensor installations.

5.4 Turf Replacement Program

In 2016, the City of Lafayette began offering a turf replacement program to incentivized water customers to replace a minimum of 200ft^2 of turf with either a xeric garden (softscape) or permeable (hardscape). This is a turnkey program managed by RC, with a budget of $13,400 for 30 participants annually.

Participants are required to attend a Turf Replacement seminar, which details the criteria of the program. Part of the application process is to review the status of the turf through current pictures as well as summer usage history. The focus of the program is to reduce water consumption for those residents who are investing large amounts of water consumption on their turf. This program is not a beautification program for areas of yard that are neglected or bare.

Participants receive a free 200ft^2 xeric garden from the Garden-In-A-Box series with the softscape option, and/or participants can also replace 200ft^2 or more with hardscape. Hardscape is required to be permeable to receive $1 per ft^2 in a form of a credit on their water bill, with a maximum credit of $1,000. Participants are also required to convert their irrigation system zone to a drip system under the softscape option, and to cap off irrigation zones for areas converted to hardscape. The last requirement of the program is for each participant to have an irrigation audit performed by RC to make sure irrigation systems are capped off, the irrigation system is programmed to include the changes and to go over the findings of the audit for efficiency.

It has been estimated by RC that typical Kentucky Bluegrass is watered April – October. A resident who converts 200ft^2 of turf to a xeric garden, has the potential to save an average of 673-935 gallons per 200ft^2, while residents who convert 200ft^2 of turf with hardscape, which would not require any watering, can see an average savings of 1100 – 1600 gallons of water per 200ft^2. For calculation purposes, we are using an average of 804 gallon savings for softscape and 1350 gallon savings for hardscape.

Table 10. Turf Replacement Participants

Year	Number of Participants	Softscape	Hardscape	Total softscape removed (ft^2)	Gallons Saved with Softscape	Total hardscape removed (ft^2)	Gallons Saved with Hardscape
2016	36	22	14	4400	17,688	7813	52,742
2017	28	24	4	6929	27,854	1702	11,491
		Total for 2016 & 2017		**11,329**	**45,542**	**9,515**	**64,233**

Table 10 shows the amount of gallons saved for each option, totaling 109,777 gallons for removing 20,845ft^2 of turf. Based on the amount of turf removed, 0.34 AF of water is conserved every summer between the months of May – September on average by eliminating the need to water the removed turf.

This program is gaining momentum and we expect to have more residents participate moving forward. We will be featuring some transformation examples of households (Appendix A) who participated in the program as future outreach. We hope it will encourage residents with large yards to participate.

5.5 Xeriscape Seminars

Together with the Resource Central, the City offers a series of no cost seminars each spring covering xeric principles, planning and implementation, soil enhancement, and efficient turf irrigation. These seminars are available to all Lafayette water customers on a first-come, first-served basis. The topics include Introduction to Xeriscaping, Landscaping for Conservation, Plants for Xeriscapes, Edible Xeriscaping, Renovating an Existing Landscape to Xeriscape, Drip Irrigation, and Water Wise Wildlife Gardening.

5.6 Other Public Outreach

The City currently uses several means to disseminate conservation information. These methods include a Public Works Event Calendar, the City's website, the City's quarterly newsletter, social media and various sites where the Public Works Event Calendar are available (City Hall, Public Works Department, and Library). These tools have proven to be effective means for distribution of information to customers. Current enhancements to the outreach program include:

- **Website –** Lafayette created a vanity url www.cityoflafayette.com/waterconservation which details the Water Conservation ordinance as well as the water conservation programs available to residents with links to other pertinent information.
- **Newsletter –** Include water conservation information in each issue of the City's quarterly newsletter.
- **Social Media –** Use Facebook and Nextdoor social media platforms to announce programs as well as upcoming events.

Adding programs in partnership with RC, our outreach for water conservation has increased. The City of Lafayette as well as RC use social media for outreach. We have increased our presence in the social media circuit, since it is the primary way the public stays informed. What we find is that the public then shares information with others, creating an electronic “word of mouth” advertisement.

5.7 Lafayette Comprehensive Plan (2013)

The **2013 Lafayette Comprehensive Plan** was developed through a cooperative effort of citizens, business and property owners, the Citizen Advisory Committee, the Planning Commission and City Council, City staff, and a consultant team. The plan serves as a guide for current and future public decisions, especially the distribution and intensity of development, the location of future land uses, including public facilities and open space, and requested zoning changes.

The plan sets forth several goals and policies dealing with the conservation of environmental resources. The water conservation policies (J.2.1, J.2.2 and J.2.5) support conservation through the following activities:

- Public education
- Supply management
- Demand management
- Landscape construction and maintenance practices
- Development review process
- Use of untreated water or reclaimed water for irrigation in areas where such application will not pose health concerns (e.g., Hwy 287 landscaping)

The Lafayette Comprehensive Plan will be updated in 2019.

5.8 Landscaping and Irrigation Requirements – New Construction

In March 2004, the City passed new landscaping regulations and guidelines. These became Section 26-19-5 of the **City of Lafayette Municipal Code**. In Section 26-19-5, residential property developers and commercial property owners are required to use water efficient design principles to facilitate water conservation. This section of the code covers annual water budget, sprinkler system design, flow rate, type of plants, turf types, use of mulch and so forth. Total annual water use in the landscaped area may not exceed 15 gallons per ft^2.

All land development plans are to be submitted with a landscape plan than meets the requirements of this code. This code applies to development plans for subdivision; however permit applications for individual single-family homes do not require landscape plans.

The code is modeled by accepted water-wise landscaping principles and addresses the following:

- Landscape planning and design
- Appropriate plant selection
- Size of turf areas
- Grouping plants according to their water needs
- Soil preparation
- Use of mulch
- Irrigation system design

In 2018, the City of Lafayette decided to update Section 26-19-5 of the **City of Lafayette Municipal Code**. A land-use consultant will be hired to review the code and concentrate on landscape code revisions and tighten water conservation requirements.

5.9 Plumbing Fixtures

In 2015, the City of Lafayette received a grant from Colorado Water Board Conservation (CWCB) to replace and address the plan to retrofit plumbing fixtures at City Hall.

January of 2017, the bathrooms at City Hall began a full remodel to comply with new ADA requirements. In that remodel, we applied the plumbing fixture retrofit for the lavatory faucets, toilets and urinals. Based on the assumptions and estimates in the tables below, replacing these fixtures will result in a water savings of 0.24 AF per year.

The City plans to review all City facility's plumbing fixtures and budget in replacements of water saving fixtures where applicable.

Table 12. Plumbing Fixture Retrofit -City Hall

TOILETS								
	Uses/ Day	**# Employees**	**Current GPF**	**Current Use in Gallons**	**Retrofit GPF**	**Retrofit Use in Gallons**	**Daily Savings in Gallons**	**Annual Savings in Gallons**
Men	1	16	3.5	56	0.8	13		
Women	3.5	20	3.5	245	0.8	56		
				301		69	**232**	**60,372**
URINALS								
Men	3	16	1	48	0.5	24	**24**	**6,240**

FAUCETS								
	Number of Faucets	**Rated Flow (gpm)**	**Estimated Use in Minutes (1)**	**Daily Use in Gallons**				**Annual Savings in Gallons**
Current	6	1.0	94	94				
Retrofit	6	0.5	94	47				
				47				**12,220**

(1) Uses per day of both toilets and urinals times the number of employees using each toilet & urinal times 10 seconds per use.

Assume 260 work days a year

Faucet Use Time (In Seconds) = 10

	Gallons	Acre-Feet
Total Annual Water Savings	**78,832**	**0.24**
Normal Daily Use =		**443**
Normal Monthly Use =		**9,746**

5.10 Water Shortage Management Plan

In August 2001, the City of Lafayette developed a **Water Shortage Management Plan**[4] as a guide to respond to possible short- or long-term water shortages. This plan is intended to be used by staff, management, and elected officials to implement a voluntary or mandatory water rationing plan in the event of a water shortage or a below normal spring run-off. An internal staff group meets regularly each year between March and June to evaluate snow pack, reservoir storage, projected water demand and carry-over storage. Based on their analysis, the group recommends possible courses of action to the City Administrator and City Council.

During the drought of 2002, Lafayette's City Council adopted emergency provisions based on the authority of Lafayette's **Water Shortage Management Plan**: resulting in a 75% reduction in outdoor landscape irrigation for all water customers.

Although City of Lafayette has not experienced a drought of the magnitude of 2002, we continue to make recommendations in order to conserve our existing water resources. In 2013, City of Lafayette enacted Ordinance 27-2013. The ordinance included:

- No watering of outdoor landscaping between the hours of **10 AM** and **6 PM** except—
  - Watering by hand with a hose equipped with an automatic shut-off valve
  - City-owned golf course, athletic fields, and commercial agriculture
- Excessive overrun of water onto any area not covered by vegetation such as sidewalks, curbs, driveways, streets and other paved areas is prohibited
- Washing down paved areas such as driveways with a hose is not allowed

5.11 City-Owned Properties

The City of Lafayette promotes water conservation in the planning and development of new City-owned landscape projects, such as parks, building grounds and golf courses. Ordinance 16-19-5 establishes policies for low water use landscapes and efficient irrigation. During the design of any project, water requirements are evaluated by the Public Works Department and conservation measures are required.

The Water Fund financed CIRRUS, a state-of-the-art irrigation system that monitors the irrigation system 24 hours a day. Complex databases insure accurate control over the parks and each microenvironment on the golf course. This system has its own on-site weather station that monitors the weather and calculates evapo-transpiration rate (ET). The CIRRUS system saves the Indian Peaks Golf Course 192 acre-feet annually compared to manual watering rates.

Treated water is supplied to parks and are metered. The landscape irrigation along U.S. Hwy. 287 is from Coal Creek. This raw water supply is part of Lafayette's water reuse system and saves 130-acre feet of fresh water annually.

In Colorado, the two phreatophytes of greatest concern are the tamarisk and the Russian olive. These are both considered invasive species. Non-native phreatophytes and other invasive species are eradicated per Boulder County and City of Lafayette policy.

However, City policy requires replacement of trees removed with equivalent caliper-inches of new trees. Lafayette designates some of the trees "historical." These include phreatophytes (e.g., cottonwoods) that cannot be removed for environmental and wildlife habitat reasons.

5.12 Water Reuse Systems

To optimize the City's raw water system, the City built an irrigation pump station that takes water from Coal Creek downstream from Louisville's wastewater treatment plant to irrigate the landscaping on U.S. Highway 287. Most of this water (130 AF annually) is technically reuse of Lafayette's wastewater, exchanged upstream on Coal Creek. To make further use of the return flows from the Water Reclamation Plant (WRP), Lafayette also takes 1,349 AF of water from Boulder Creek by exchange and stores it in the Goose Haven reservoirs. Lafayette currently reuses about 60% of its WRP return flows.

The City also has a design for a pipeline between the Water Reclamation Plant and the Goose Haven Reservoir complex to store water owned by Lafayette and released from the WRP. This would maximize the full use of return flows from the WRP. The pipeline is anticipated to be built in 2020.

5.13 Distribution System Efficiency

The City of Lafayette employs many measures that contribute to distribution system efficiency. Among them are:

- Hydrant inspection – Inspections performed during citywide flushing program. Repair of malfunctioning hydrants are immediately scheduled.
- Valve exercising and inspection – Inventory all valves for our utility GIS system with completion in 2019. Valves are cleaned, exercised and repaired or replaced as necessary.
- Meter repair and replacement – Meter testing, repair and replacement is ongoing. Beginning 2009, all meters above 1-1/2 inches are tested and repaired or replaced every three years.
- Pressure reduction valves (PRV) –Lafayette main lines have pressure-reducing valves at interconnects between pressure zones. PRV's are visited monthly, tested regularly, and repaired when necessary. PRV's are installed in select meter pits, and are tested regularly.
- All residential meters (5/8" & ¾") are being replaced and is expected to be completed in 2020.

Our unaccounted for water loss has fluctuated between 11% to 5%. During that period, the City found and repaired all leaks in the distribution system. The unaccounted for water loss figures cited above include water used for firefighting, street cleaning, sanitary line jetting, and water line flushing. It also includes water lost due to main breaks.

Lafayette is in the process of replacing all of its old inaccurate water meters in 2019. In 2020, we will have a more accurate picture on the water loss.

Table 16. Proposed Implementation Plan for Supply-Side Water Loss Control

Proposed Measure / Program	Beginning Date	Completion Date	Notes
AWWA water audit	As needed	Ongoing	Yearly audit
Leak detection survey	As needed	Ongoing	Annual budget

Beginning in 2019, Lafayette will contract for a leak detection survey to locate actual water losses in our distribution system. Assuming that Lafayette can reduce system-wide water loss from the current 11% to 5% through a leak detection survey.

5.14 Water Efficient Industrial and Commercial Processes

Commercial and industrial users in Lafayette account for approximately 15% of all water used. The 370 users in these categories use approximately 634 AF. Of these users, 31 are industrial and 332 are commercial. Most of the facilities that fall under the commercial/industrial categories are retail or office buildings. Commercial and industrial facilities are eligible to participate in our irrigation audit program for in-ground irrigation systems (see section 5.3).

Twenty-six accounts are billed as restaurants. Annual water use in these restaurants ranges from 1.16 AF to 4.58 AF per year per restaurant, which in some cases includes water used for irrigation or are restaurants, which are part of a building that share a water meter with other businesses.

In February 2014, the City of Lafayette received a grant from CWCB to reach out to our commercial accounts with a Rinse & Save pre-rinse spray valve (PRSV) replacement program. In conjunction with Center for ReSource Conservation (CRC), outreach letters of the program were distributed to 72 locations, which included 62 restaurants, 3 senior living complexes and 7 BVSD schools. Twenty-nine PRSV's were exchanged at 26 participating businesses with a 1.07 gpm PRSV.

Monthly water usage data from January and February in the years of 2013- 2015 were used to represent winter usage to compare pre and post replacement usage. The estimated annual water savings based on the original PRSV flow rate compared to the upgraded PRSV flow rate with assumed minutes of 120 min per day at 325 days per year, totaled 888,030 gallons. This results in an estimated savings of 2.73 AF annually for all 29 PRSV replacements.

6 Evaluation of Selected Measures and Programs

Conservations measures and programs currently implemented by Lafayette.

Table 19. Conservation Measures and Programs Evaluated

Demand-Side Measures	Already Implemented?	Evaluated in Plan?	Comments
Water-efficient fixtures and appliances			
Toilets	Yes	Yes	City Hall
Urinals	Yes	Yes	City Hall
Showerheads	No		Recreation Center
Faucets	Yes	Yes	City Hall
Washing Machines	No	Yes	Cost prohibitive to City
Indoor audits	Yes	Yes	Program will continue
Landscape efficiency			
Low water use landscapes	Yes	Yes	Program will continue
Drought-resistant vegetation	Yes	Yes	Program will continue
Efficient irrigation	Yes	Yes	Program will continue
Equipment	Yes	Yes	Program will continue
Industrial and commercial efficiency			
Water-efficient processes	Yes	Yes	Industrial and commercial use addressed by irrigation audit program
Cooling equipment efficiency	No	No	Not applicable to Lafayette industries
Supply-Side Measures			
Water reuse systems	Yes	Yes	The City reuses 60% of its water reclamation plant return flows or 1,479 AF
Removal of phreatophytes	Yes	Yes	Removed per Boulder County and City policy
Distribution system efficiency	Yes	Yes	The City employs various means to enhance distribution system efficiency.
Leak Repair	Yes	Yes	Leak detection and repair will be enhanced through a distribution system audit
Source optimization			
Conjunctive Use	NA	NA	NA
System integration with other utilities	Yes	Yes	Lafayette currently has interconnects with both Louisville and Erie to employ in emergencies
Demand-Side Programs			
Education/information dissemination	Yes	Yes	Through website, newsletter, social media
Public education	Yes	Yes	Water-wise seminars
Water-saving demonstrations	No	Yes	Lafayette will feature homes which have participated in the CRC programs as examples
School programs	No	Yes	Lafayette does not have sufficient staff to offer this routinely
Informative & understandable water bill	Yes	Yes	Program will continue
Water bill inserts	Yes	Yes	Program will continue
Technical Assistance	Yes	Yes	Irrigation and indoor water audits
Customer water use audits	Yes	Yes	Irrigation and indoor water audits
Targeted at large water users	No	Yes	Excessive users will be targeted with the water rate structure and 5% increase through 2021
Targeted at large landscapes	Yes	Yes	Irrigation water audits, Garden in A Box xeric planting, and Turf Replacement Program
Water conservation expert available	Yes	Yes	Seminars, irrigation and indoor audits, turf replacement, toilet upgrade, xeric gardens information available through Center for ReSource Conservation
Rate structures designed to encourage efficiency	Yes	Yes	Five tier water rate structure with a 5% increase in water rates projected through 2021

Demand-Side Measures	Already Implemented?	Evaluated in Plan?	Comments
Regulations/Ordinances			
Addressing fixtures & appliances	Yes	Yes	Municipal Code requires IPC requirements for new construction
Time of sales upgrades	No	No	Not covered by ordinance
Addressing landscaping	Yes	Yes	Ordinance 26.19 covers all new development
Watering restrictions/wasting	Yes	Yes	Enforced with Ordinance 27.13
Incentives			
Rebates/Give-aways	No	Yes	Will not be offered due to the many demand side programs available to residents
Supply-Side Programs			
Distribution System Efficiency			
Leak identification	No	Yes	Leak detection audit
Meter source water	No	No	Source water measured per legal requirements
Meter service connections	Yes	Yes	All service connections are metered
Meter testing & replacement	Yes	Yes	Program will continue
Improved water accounting	No	Yes	Improved accounting using AWWA water loss control audit
Analysis of non-account water	Yes	Yes	Improved accounting using AWWA water loss control audit
System-wide pressure management	Yes	Yes	Ongoing
Pressure-reducing valves	Yes	Yes	PRV's installed at connections between pressure zones and in meter pits in high pressure areas

6.1 Toilet Upgrade Program

In 2012, Lafayette began a toilet rebate program focusing on households with toilets that are pre-1994 and use 3.5 gallons per flush (gpf) or more. The program offered an $80 rebate credited to the water bill with a budget for 100 participants. The criteria to receive the rebate were:

- Toilet had to be 3.5gpf or higher
- New toilet had to be a 1.28gpf or less Water sense toilet
- Old toilet was required to be recycled at our service center facility

From 2012 – 2014 we had 127 residents participate in the rebate program. A total of 190 water-guzzling toilets were replaced with 1.28gpf toilets, resulting in a cumulative savings of 1,419,147 gallons of water, approximating 4.36AF.

In 2015, RC started a pilot program with City of Boulder for a Toilet Upgrade program. The upgrade program consisted of replacing any toilet 1.28gpf or higher with a Niagara Stealth 0.8gpf toilet. City of Lafayette joined this program because it is a turnkey program and it would reach more households. RC implemented our requirement to recycle the old toilets and perform a visual inspection.

The Toilet Upgrade program has received very positive reviews. Residents like the elimination of the cumbersome rebate form and they now get two choices. Residents can either pay $175 for a RC technician to install the new toilet and recycle the old one, or $75 and resident can install it themselves, requiring them to drop off the old toilet at the ReSource facility in Boulder. The toilet upgrade program has a waitlist every year since its inception, due to its popularity.

According to RC, water savings from this program are estimated based on comparison of a 1.6gpf toilet to the new flush rate of 0.8gpf, assuming some basic usage values. The calculation assumes each household has three full-time residents who each flush the toilet 5 times per day, 360 days per year. For 2015 -2016, the cumulative annual water savings was 1,423,125 gallons, approximating 4.37AF.

It is safe to assume that this program will generate an approximate annual water savings of 2.2AF. The budget for this program is $15,000 for 100 toilet upgrades annually.

6.2 Indoor Water Audits

The American Water Works Association estimates that 13.7% of indoor daily water use is wasted through leaks.

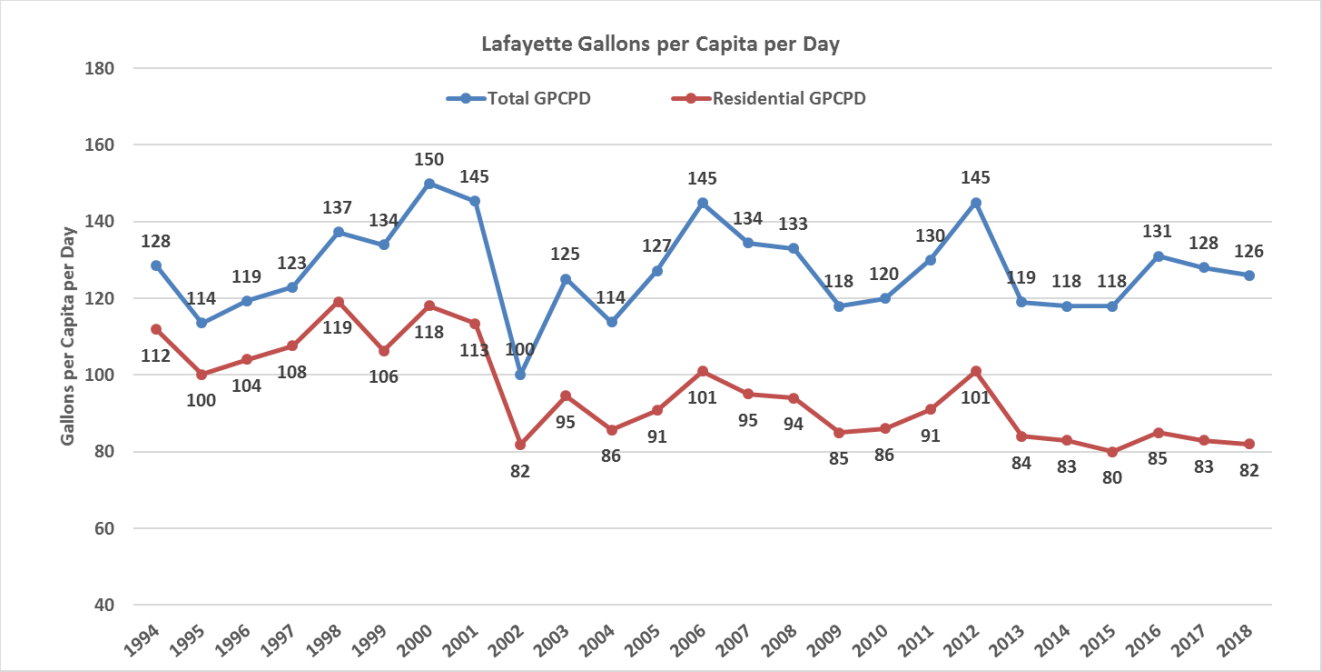
In 2010, City of Lafayette collaborated with RC once again to provide no cost indoor audits to our residents. The service consists of flow tests of fixtures, checks for leaks and other common problems, and the installation of low-flow showerheads and aerators. Upon completion, RC's technician presents the resident with a prioritized list of recommended changes to improve water efficiency.

There are many factors considered in the calculation of the water savings for this program. RC provides a detailed final report with water savings every year. On average, based on the amount of audits performed, the approximate water savings has been 8,000 – 11,500 gallons annually. City of Lafayette will continue to fund this program annually for 25 audits. Indoor water audits are an effective way to educate customers and benefit all participating water customers. We can assume this program will generate 0.04AF of water savings annually.

7 Demand Forecast Modification

The water savings for many of the currently employed water conservation measures cannot be quantified with any degree of accuracy.

Table 19. Water Savings from Current Measures



One major indicator that residents are conserving water through water conservation measures is to look at how many gallons of water, on average, each person is using on a daily basis. In the industry this is known as Gallons per Capita per day or GPCPD. Table 19 is Lafayette's GPCPD for in-city residential customers only and the total system GPCPD.

Residential GPCPD is the water used by only the single family and multi-family class, which represent the total population of Lafayette. It is a prime indicator of the success or failure of residential water conservation measures that Lafayette has been pursuing for over ten years.

The total system GPCPD takes the entire water consumption of all customer classes in Lafayette including residential, commercial, industrial, irrigation, etc. and that consumption is divided by the

total population. This gives a feel for what water consumption is in total, whether there is a large non-residential component to water consumption or if growth and other customer class are causing overall daily per person water consumption to increase.

Table 19 shows some very interesting characteristics of Lafayette water consumption. During the 2002 drought, where we required our citizens to reduce outdoor consumption by 75% (they achieved 73%), there was a significate drop in per capita consumption. After the 2002 drought and during the full implementation of our residential water conservation programs, the Residential GPCPD have been significantly reduced when compared to 2002 data. There is a slight downward trend in Residential GPCPD since 2002.

We have attributed this downward trend to the following three reasons:

1. Lafayette has an aggressive increasing block tier and pricing structure that sends a very strong financial message to the customer that using water above a nominal level will result in a significate increase in your monthly Lafayette utility bill. In addition, water rates have been raised consistently for over ten years and will continue to rise, as discussed in Section 1.5.
2. Water conservation programs and messages are making a difference in reducing water consumption. Lafayette has a wide variety of water conservation programs that target overall use and summertime, outdoor use that are cost effective to the consumer and beneficial to the water utility.
3. The housing stock being built in Lafayette have changed dramatically since the mid-1990's where large homes on large lots with thousands of square feet of landscaping were being built. Now, due to the cost of housing and what consumers are looking for in housing, Lafayette is seeing smaller lots with homes that take up most of the lot and outdoor landscaping being minimized. We are also seeing a significant increase in townhomes and smaller homes with very little outdoor landscaping.

What is significate is that Lafayette has been adding about 150 new homes, on average, each year since 2002 but the residential GPCPD for 2018 is the same as the drought year of 2002! Prior to the 2002 drought Residential GPCPD were all above 100. After the drought and during the implementation of our water conservation programs they have been below 100 and average in the 80's range. You can also tell what years had hot/dry summers, like 2006 and 2012, as the GPCPD jumped up.

In 2018, Lafayette citizens and business consumed 4,323 acre-feet of water.

Acre-Feet Consumption by Class

	2014	*2015*	*2016*	*2017*	*2018*
Residential					
In-City	617,291	604,951	648,340	648,584	659,008
Out-of-City	54,551	45,424	49,954	48,289	48,206
Multifamily					
In-City	205,857	198,645	212,987	205,080	201,485
Out-of-City	835	140	80	107	118
Commercial					
In-City	140,461	135,151	148,582	162,032	177,166
Out-of-City	1,545	2,335	2,091	1,372	1,184
Irrigation					
In-City	167,444	184,096	212,361	201,744	181,234
Out-of-City	2,077	2,245	2,663	3,234	2,963
City Parks Irrigation	4,958	15,627	45,285	42,697	48,847
Industrial	11,324	10,960	13,009	13,516	14,739
Special Industry	26,907	35,844	42,872	42,241	39,504
Baseline WD	12,373	13,820	15,609	14,248	15,232
EBCWD	17,033	16,285	19,809	19,648	18,997
Total	**1,262,656**	**1,265,523**	**1,413,642**	**1,402,792**	**1,408,683**
Total Acre-Feet	**3,875**	**3,884**	**4,338**	**4,305**	**4,323**
Total In City	1,174,242	1,185,274	1,323,436	1,315,894	1,321,983
Total In-City Acre-Feet	3,604	3,637	4,061	4,038	4,057
Total Out of City	88,414	80,249	90,206	86,898	86,700
Total Out of City Acre-Feet	271	246	277	267	266
In & Out SF & MF	878,534	849,160	911,361	902,060	908,817
In & Out SF & MF Acre-Feet	2,696	2,606	2,797	2,768	2,789
Total Accounts: In and Out of City	8,846	8,998	9,077	9,317	9,443
Lafayette Population	27,236	27,513	27,741	28,246	28,714

7.1 Estimated Future Water Savings

2023 Estimated Water Use* **= 4,837.0 AF**

Reductions:

Outdoor Landscape Design	=	71.4 AF
City Facility Water Fixture Retrofit	=	1.9 AF
Irrigation Audits	=	13.2 AF
Restaurant Pre-Spray	=	21.8 AF
Turf Replacement Program	=	19.2 AF
Toilet Upgrade Program	=	22.0 AF

Cumulative Savings by 2023 = 149.5 AF

2023 Modified Water Use = 4687.5 AF Total Reduction = 3.1 %

*Number adjusted to include savings from existing water conservation measures and programs and based on estimated population of 34,001 in 2023

7.2 Conservation and Potential Revenue Effects

Water revenues are driven only in part by the amount of water used by customers. There are significant and rising costs associated with the procurement, treatment and distribution of water. Water rates must reflect the true value of the water and will be raised if necessary to meet operational expenditures, but it is highly unlikely that the rates will be raised because of conservation measures and programs. An effective water rate structure, such as the City's current tiered rate structure, can simultaneously promote water conservation and assure our water utility of stable revenues.

8 Implementation Plan

The measures and programs will be implemented according to the summary and scheduling information given in Section 5 and summarized in Table 1.

8.1 Public Participation in Conservation Plan Implementation

The draft of the Water Conservation Plan was submitted for public comments during a 60-day review period January 2019. This was announced and posted on the City's website, Nextdoor and sent out as City news. It was also available for review in the Public Works Department at City Hall. The plan will then be presented to Council for their approval on April 2019, after the public comment review time. The final Water Conservation Plan will be submitted to the State of Colorado in April 2019, after Council approval.

9 Program Evaluation and Revision

Lafayette will revise this plan by 2023. In preparing this plan, the City was hampered by incomplete information regarding the actual water savings of existing programs. The changes made to this plan and the amount of information tracked will make it easier to evaluate the effectiveness of our conservation efforts and to see if our goals are on track. The information evaluated and analyzed will include:

- Monthly customer usage by customer category (information Lafayette has tracked 1995)
- Daily water treatment and water reclamation production
- Weather patterns
- Water supply
- Monthly water billing information
- Irrigation records from Parks, Open Space and Golf
- Allowed variance in meter accuracy
- Unaccounted for water (monthly)
- Annual costs of each conservation measure and program
- Population data
- Feedback from the public

A full analysis of the above information will be completed yearly and areas of success and areas requiring improvement will be identified. The annual analysis will alert us to areas of concern. Should these concerns warrant revisions to this conservation plan prior to the end of the required seven-year timeframe, the plan will be revised. The revised plan will examine the effectiveness of existing measures and programs and will evaluate additional measures programs for inclusion in the updated plan.

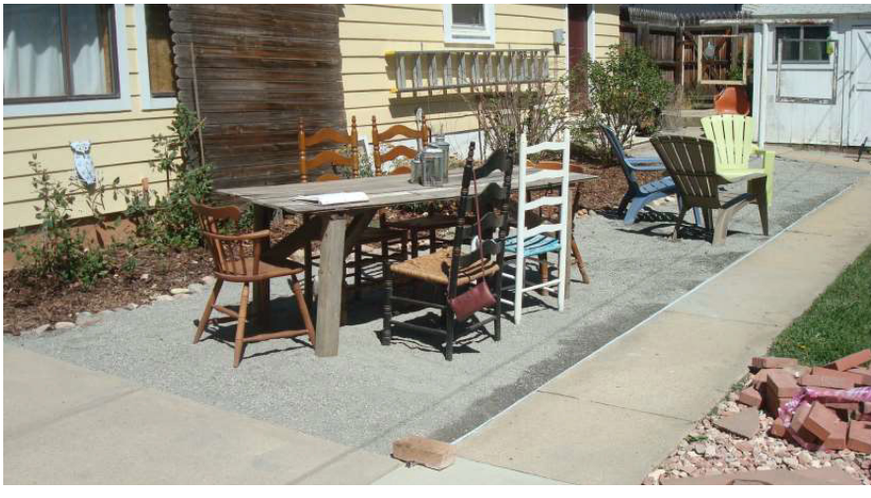
References

McLaughlin Rincón, May 2015, *Water System Master Plan for the City of Lafayette*. City of Lafayette, April 2010, *Water Conservation Plan*. City of Lafayette, August 2001, *Water Shortage Management Plan*. CDM, *Statewide Water Supply Initiative*, 2004, Prepared for the Colorado Water Conservation Board.

City of Lafayette Municipal Code

Center for ReSource Conservation, 2016, *Water Programs Annual Report*, 2016

APPENDIX A:
EXAMPLES OF 2016 TURF REPLACEMENT PROJECTS



APPENDIX B

From: Jenny Conlon
To: City Council
Cc: Douglas Short; Susan Barker; Debbie Wilmot
Subject: 2018 Water Conservation Report
Date: Monday, January 7, 2019 4:21:31 PM
Attachments: 2018 Water Conservation Final.pdf
image003.png

Good afternoon,

Per the State Colorado Water Conservation Board guidelines, Public Works has updated our 2010 Water Conservation Report. It is attached for your review and comments as required per the State process. This report is currently in draft form and has a conditional approval from the State. The report is also on the city website and out for public comment until March 7, 2019. We will be submitting it to Council approval once public comment period is over and we receive a final approval from the State.

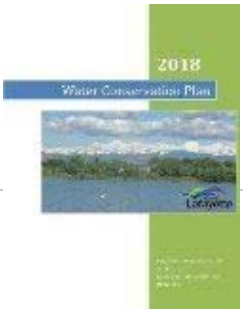
https://www.cityoflafayette.com/871/Water-Conservation

Thank you

Jenny Conlon
Administrative Specialist
City of Lafayette | Public Works Department
(303) 661-1273
www.cityoflafayette.com

Water Conservation

READ the 2018 Water Conservation Plan



The Public Works Department has updated the 2010 Water Conservation Plan. This plan entails programs which benefit you, the consumer, as well as measures that call upon the City for better stewardship of our shared resources.

Please take a moment to read the **2018 Water Conservation Plan**.

We encourage and welcome your comments and suggestions by completing this form.
Comment period ends on March 7, 2019.

Lafayette City Council enacted a permanent water conservation ordinance on November 6, 2013 putting in place watering restrictions to protect the City's water resources. It was determined that these practices are beneficial conservation practices for Lafayette regardless of drought conditions.

- No watering of outdoor landscaping between the hours of **10 a.m. and 6 p.m.** except:
  - Watering by hand with a hose equipped with an automatic shut-off valve
  - City-owned golf course, athletic fields, and commercial agriculture
- Excessive overrun of water onto any area not covered by vegetation such as sidewalks, curbs, driveways, streets and other paved areas is prohibited
- Washing down paved areas such as driveways with a hose is not allowed

What does "hand watering" include?

Hand watering is the manual use of a hose equipped with an automatic shutoff nozzle. The hose must be attended at all times while water is running. Hand watering does not include attaching a hose to a sprinkler, manually operating an irrigation system, or placing a hose with running water on the ground.

Fines

This ordinance applies to all City of Lafayette, in-city and out-of-city, municipal water customers. Fines will be assessed to water customers disregarding the permanent water conservation ordinance regulations.

1. Two warnings will be issued and the third infraction will result in a municipal summons
2. First conviction: mandatory minimum fine of $100 plus court costs
3. Second conviction: mandatory minimum fine of $250 plus court costs
4. Third conviction: mandatory minimum fine of $500 plus court costs

ID	Submission Date	First Name	Last Name	Are you a Lafayette resident?	Comment
20932	1/8/2019 9:53	Randy	Stevens	Yes	Regarding Ordinance 27-2013, "Washing down paved areas such as driveways with a hose is not allowed"... I often see City workers violating this by using a power washer to clean the sidewalks at the Waneka Lake Park. They also routinely use a power washer to clean out the restrooms and concrete areas around the Waneka Lake boathouse. I do think it is appropriate to use a power washer to thoroughly clean an area, but not to do it on a routine basis. For example, in the spring or early summer, I use a power washer to clean out the "winter" that accumulates in my garage. The City should follow their ordinance. The ordinance should be modified to allow a one-time, seasonal exception for such cleaning.
20941	1/8/2019 18:10	Darlene	Wojdyla	Yes	I'm totally in favor of the water restrictions in place. I realize that we live in a desert. The one problem I have is that the city is allowing a lot of new home development. I'm wondering where the water for all the new residences is supposed to come from. I think new home development should be restricted some. I know this is a popular area to live in, but we do need to think of if there is enough water for all.
20945	1/9/2019 8:20	Jude	Vrazel	Yes	I would consider requiring builders to install individual water meters on all town homes, or coming up with some way that an individual Town home can be monitored for water usage and require that of builders. Town home developments typically share a single water meter and then that water bill is split between the residences. This method does allow any feedback to the owners as to how much water they are using, and it also makes it had to figure out where leaks are. If each individual unit had a meter, then the owner would have the feedback necessary to understand if there is a leak, or if they need to change their behavior.

21339	2/19/2019 14:42	Kari	Baars	Yes	I read the 2018 Water Conservation Plan and I am hopeful about the direction that Lafayette is heading in regards to water conservation. I would like to suggest that new commercial buildings or new Lafayette businesses would be required to have Xeric landscaping installation vs. having turf installed around their building/business. It seems this would be a better use of water (drip irrigation or no irrigation) and at the same time provide habitat for birds and beneficial insects. I see many businesses that have turf that get watered (often over watered) and mowed a lot but that never get used. Conserving water takes the whole community. I am hopeful that more citizens would take advantage of the services Lafayette offers as well, including the turf replacement.