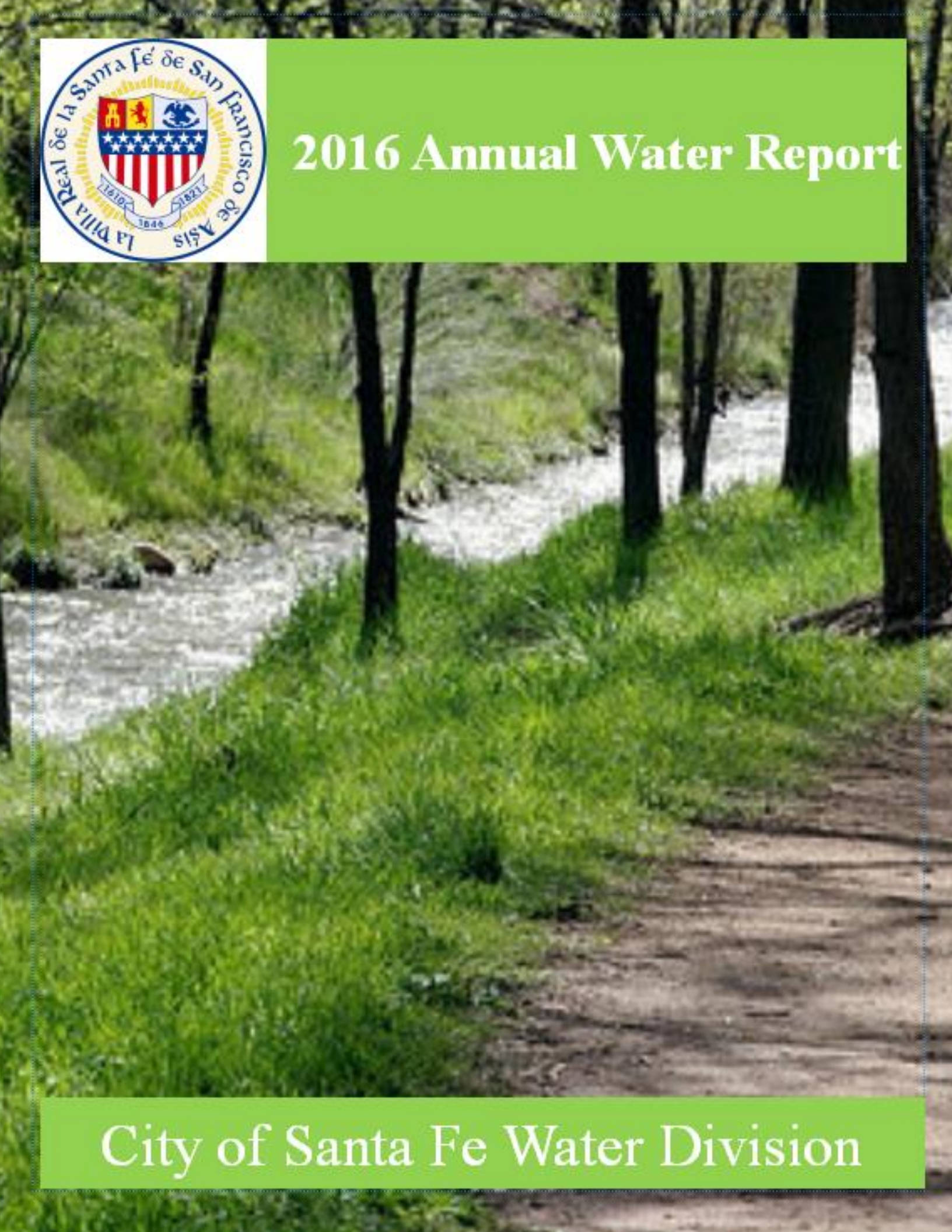

2016 Annual Water Report

City of Santa Fe Water Division

City of Santa Fe, New Mexico

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Cover Photo: Santa Fe River

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Executive Summary

The mission of the Santa Fe Water Division is to provide reliable, safe, and sustainable water supply to meet the needs of our customers and community.

The purpose of this report is to provide information about the state of the City of Santa Fe's Water Division and the water supplies we depend upon and to describe the 2016 operations of the system to citizens and customers.

This report is submitted pursuant to City Code Section 25-9.5 SFCC 1987 and summarizes information about the City of Santa Fe's Water Division including water supply, water rights, production water demand, types of water use, drought and precipitation, and water utility management.

The City's surface water comes from the Santa Fe River and San Juan-Chama Project (SJCP) water via the Rio Grande, both of which are treated through conventional and advanced treatment processes.

The City Well Field is mostly located in close proximity to the Santa Fe River and consists of seven active wells located within the City limits of Santa Fe. The Buckman Well Field consists of 13 wells located near the Rio Grande, approximately 15 miles northwest of Santa Fe.

The Water Division supplied 8,659 acre-feet of water to its water utility customers in 2016. Also, the Water Division met its acequia irrigation deliveries and provided "Living River" bypass flows to the Santa Fe River.

The City of Santa Fe continued its water conservation efforts that, in part, contributed to a service-area gallon per capita per day (GPCD) demand of 87.

2017 Water Demand and Supply Picture

In the chart below, the 2017 projected demand (black line) is approximately 9,195 acre-feet over the 12-month period. The BDD annual production is projected to be 4,061 acre-feet, Canyon Road Water Treatment Plant is projected to produce 3,229 acre-feet, the City Wells are projected to produce 922 acre-feet, and Buckman Wells are projected to produce 982 acre-feet over the 12 month period.

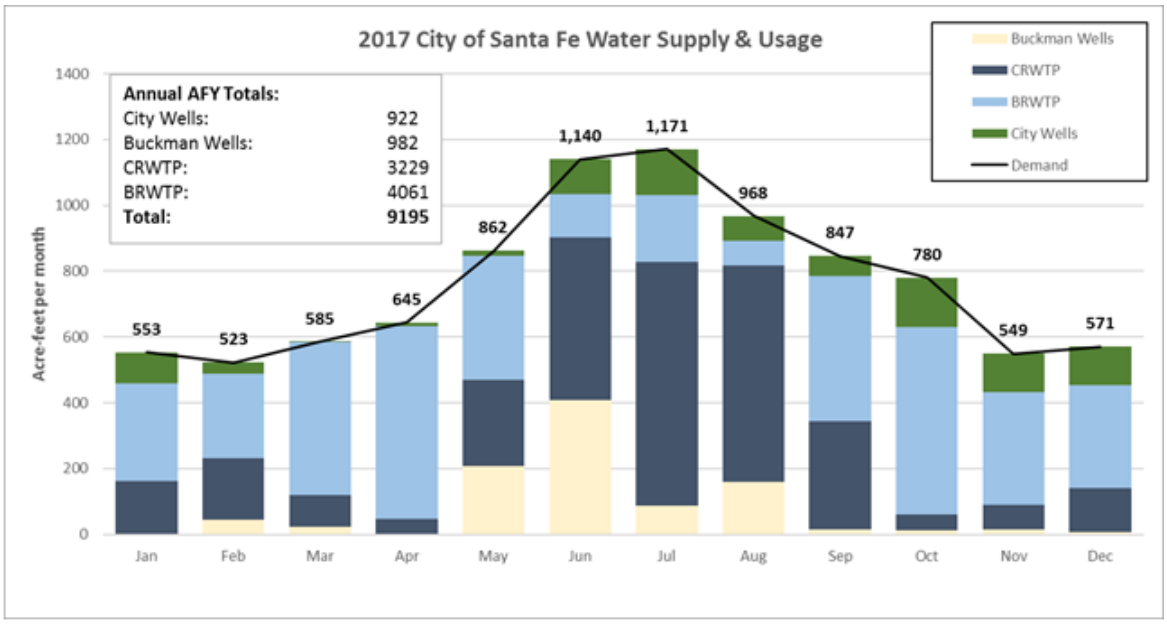

Figure 1: 2017 Water Demand and Supply Picture

Water Supply Sources

The City of Santa Fe has four sources for drinking water:

- Santa Fe River
- San Juan-Chama surface water via the Rio Grande
- City well Field
- Buckman well field

A fifth water supply source is the utilization of reclaimed water from the Paseo Real Wastewater Treatment Plant. Reclaimed water reduces the demand on the total supply of potable water.

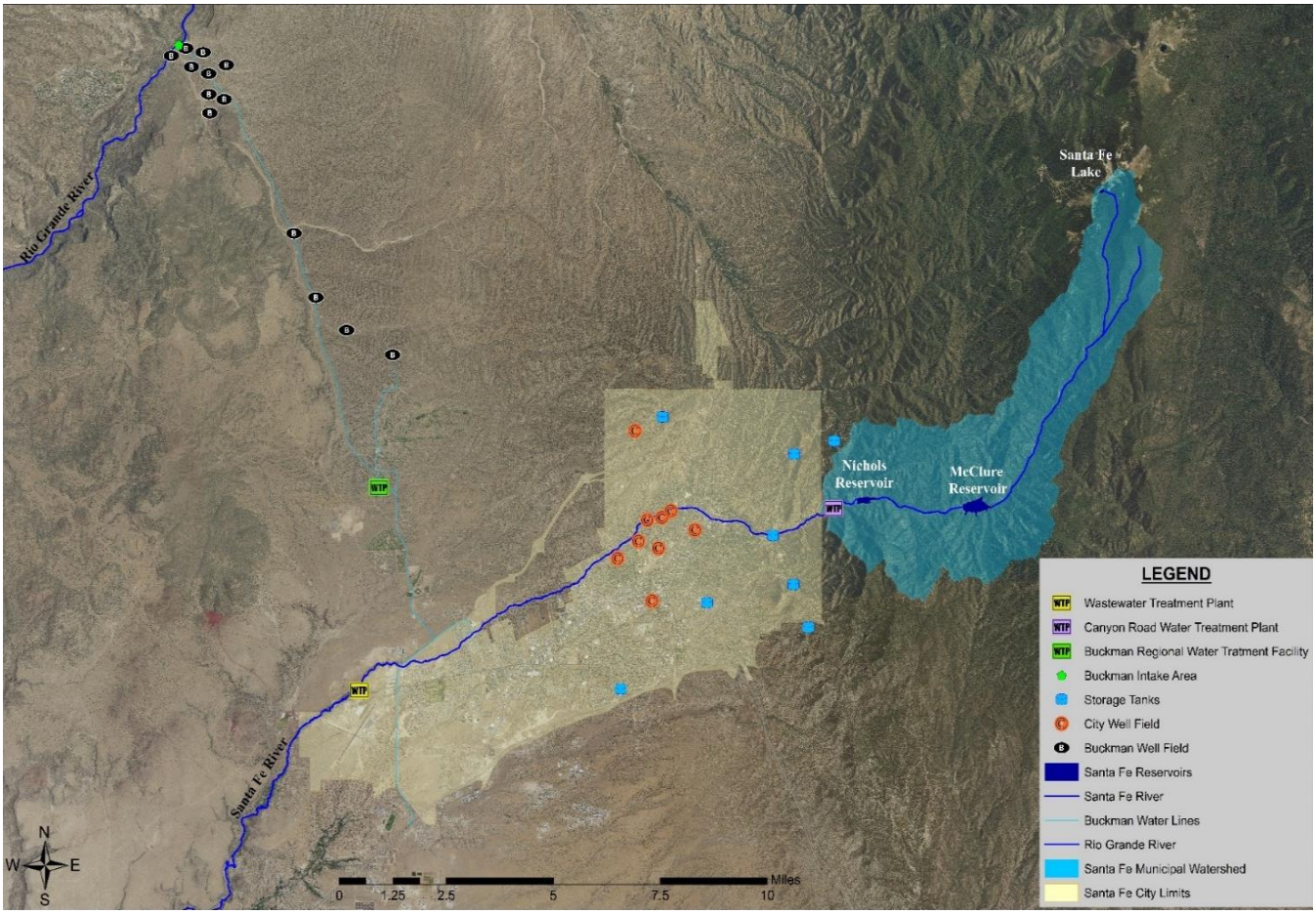

Figure 2: Map of City of Santa Fe Water Supply Sources

Water Rights

Surface Water

The City of Santa Fe has a license to store up to 3,985 acre-feet (combined) of Santa Fe River water in McClure and Nichols Reservoirs. Both municipal drinking water supply reservoirs are located east of the City within the Santa Municipal Watershed as shown in Figure 1. In 2015, a new intake tower was installed at McClure Reservoir.

Table 1: City of Santa Fe Diversion Water Rights and Supply Portfolio

Source	Water Rights (acre feet)	Available Water (acre feet)
Santa Fe River	5,040	4,040 assuming 1,000 bypassed to the river
City Wells	3,586/4,865	sustainable use when needed
Buckman Wells	10,000	sustainable use when needed
Buckman Direct Diversion	5,230	Imported San Juan-Chama water per the Colorado River Compact

The Buckman Regional Water Treatment Plant (BRWTP) treats San Juan-Chama Project water imported from the Colorado River Basin and delivered via the Rio Grande. As a contractor of the San Juan-Chama Project, the City of Santa Fe can consume up to 5,230 acre-feet per year of drinking water. A joint City of Santa Fe and Santa Fe County board governs the BRWTP and the Buckman Direct Diversion (BDD) Project facilities.

Ground Water

The City of Santa Fe has seven active groundwater wells within the City limits, most of which are focused near the Santa Fe River (see figure 1). Combined, the wells are permitted to produce up to 4,865 acre-feet per year of drinking water supply for Santa Fe.

In addition to the City well field, there are also thirteen groundwater wells in the Buckman well field, which is located near the Rio Grande, approximately 15 miles northwest of Santa Fe (see figure). The Buckman Wells are operated under one permit that allows the City of Santa Fe a maximum pumping rate of 10,000 acre-feet per year for drinking water supply and which requires groundwater pumping offsets in the Rio Grande, Nambe-Pojoaque-Tesuque, and La Cienega Basins. High rates of construction and the availability of SJCP water from BDD have allowed the city to minimize pumping from the Buckman Wells in recent years. The newest Buckman Wells are about 2,000 feet deep and began production in 2003. The older Buckman Wells began production in the 1970s.

Surface Water Rights Used for Offsets

In addition to water rights directly diverted for water supply, Santa Fe maintains a portfolio of ‘offset’ surface water rights that are associated with the Buckman well field and the Northwest Well.

The purpose of offset water rights is to allow the city to comply with the conditions of approval attached to the Buckman Well Field permit issued by the NM Office State of the Engineer (OSE). When wells are pumped surface water is likely to be absorbed into the aquifer at a greater rate in order to fill the void created by pumping the well. The OSE requires that the city offset reduced surface water availability due to increased infiltration to groundwater from Buckman Wellfield pumping by acquiring water rights in each impacted basin and reducing the demand for surface water. City water planners are working on strategies to minimize groundwater pumping and to meet offset obligations in different ways.

The City of Santa Fe has acquired sufficient water rights to satisfy its current obligation on the Rio Grande, Rio Tesuque, and Rio Nambe/Rio Pojoaque through acquired surface water rights.

Table 2: City's Surface Water Offsets

Stream system	Water rights (af)	Offsets needed in 2016 (af)
Rio Tesuque	49	34
Rio Pojoaque	88	57
Rio Grande	1,438	1,092
La Cienega	1	2.5

Relinquishment Credits

New Mexico water storage rights holders received relinquishment credits when the quantity of Rio Grande water provided to Texas is above that required by the Rio Grande Compact. Relinquishment water allows the City to store relinquishment 'credit' water in the municipal reservoirs during times when the Rio Grande Compact would otherwise limit the City's right to store water. Based on times when the city "over delivered" stored water in the past.

The OSE administers relinquishment credits to the City. As an alternative to using relinquishment credits, the City often releases its San Juan-Chama Project water into the Rio Grande in exchange for the right to store Santa Fe River water, at times when it would otherwise be prohibited by the Rio Grande Compact. The City has a current balance of 6,452 acre-feet in relinquishment credits.

Water Production

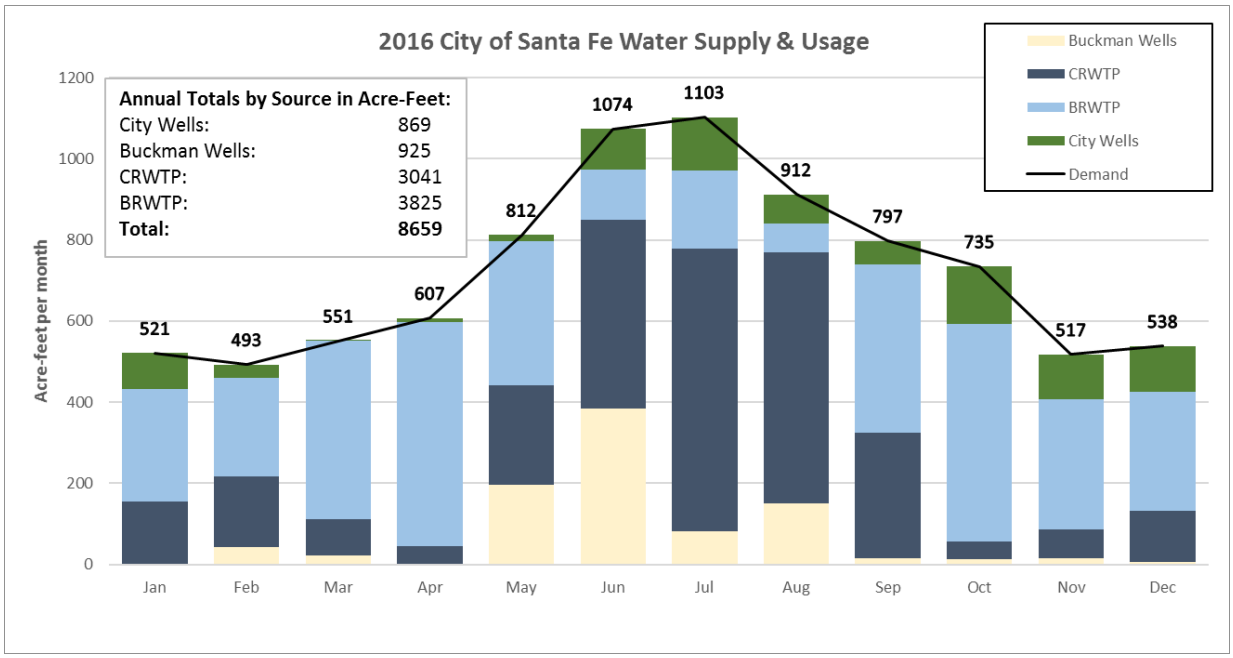

Figure 3: 2016 Monthly Production by Supply Source with the Annual Total in acre-feet

Production by Supply Source

As shown in the Production by Supply Source above (figure 2), the City has continued to take advantage of increased availability of surface water from the Buckman Regional Water Treatment Plant to decrease use of the City and Buckman well fields, allowing the wells to recover for use in drier years when surface water is not as readily available. In 2016, the total production for the City of Santa Fe's utility customers was 8,659 acre-feet with an additional 131 acre-feet of water produced for the Santa Fe County Water Utility and approximately 15% was groundwater.

Wholesale Water Deliveries

The Santa Fe County Water Utility is a ½ owner of the BDD facility and the majority of the water supplied to the County Water customers comes from the facility. The City Water utility also provides up to 1,350 acre-feet per year of wholesale water to the County Utility and an agreement between the City and County on the terms of that arrangement was signed at the end of 2016. Las Campanas receives drinking water service from the County Water Utility and also diverts untreated water via the BDD Diversion to be used for turf irrigation.

The Santa Fe County Water Utility typically is delivered potable water from the City of Santa Fe when the BDD facility is not producing drinking water due to poor water quality conditions in the Rio Grande. Under the Water Resources Agreement with the City of Santa Fe, Santa Fe County Water Utility took delivery of 131 acre-feet of water in 2016.

Treated Effluent Water Deliveries

The City of Santa Fe's reclaimed wastewater (treated effluent) has many uses including: irrigation to recreational fields and local golf courses; dust control at the regional landfill and for other construction projects; watering for livestock and wildlife on the Caja del Rio mesa; contribution to the on-site, wildlife, education; pond at the NM Game & Fish facility; and supporting the lower Santa Fe River downstream of the City's wastewater treatment plant which supports the riparian ecosystem and local agriculture in the La Cienega and La Bajada areas.

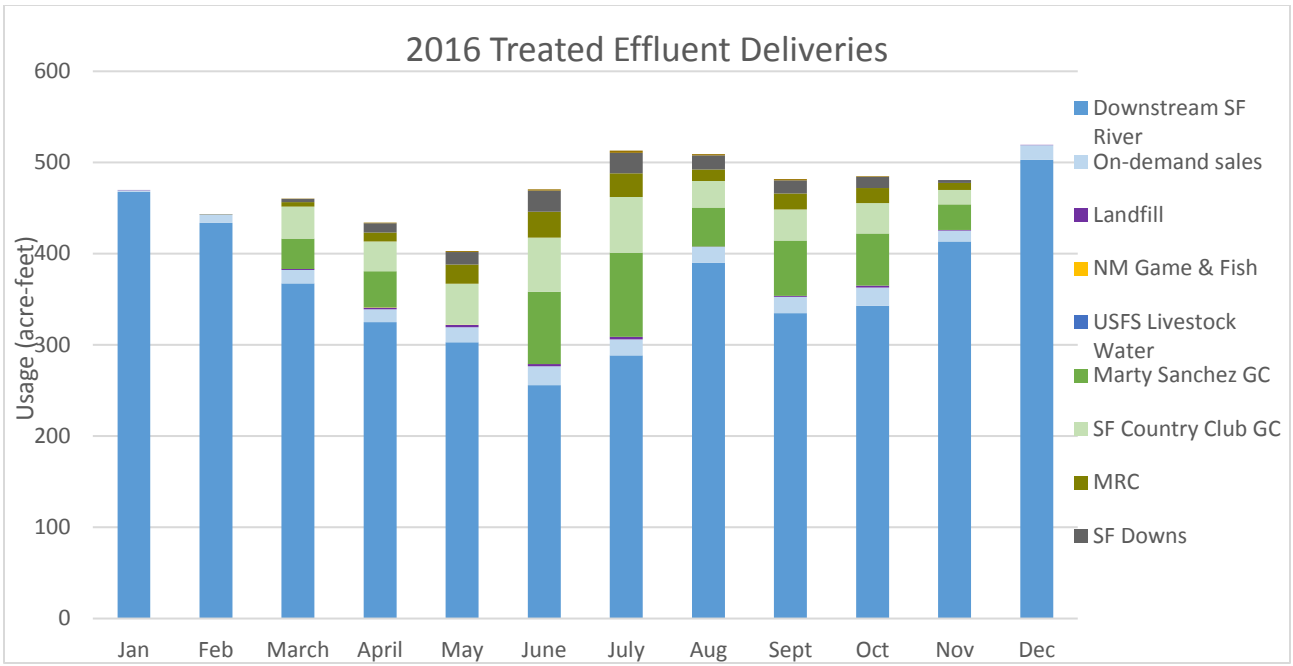

Figure 4: 2016 Treated Effluent Deliveries by Contractor

Treated effluent from the City's treatment plant is sold directly to contractors via an onsite standpipe. The total production of treated effluent was 5,727 acre-feet in 2016, or 66% of the City's total production of 8,659 acre-feet. 23% of the treated wastewater was reused and the remaining 77% flowed into the lower Santa Fe River.

In 2015, the City Water Division completed the Santa Fe Basin Study: Adaptations to Projected Changes in Water Supply and Demand. The purpose of this report was to evaluate the impacts of population growth and climate change on the Water Division's ability to meet future potable water demand. The report identified a potential shortfall of several thousand acre-feet by the year 2055 due to a combination of population growth and climate change reducing surface water availability in the Santa Fe River and Colorado River Basins. The report also identified Reclaimed Wastewater as the most viable alternative for augmenting future water supplies. In 2016, another report was completed – the Santa Fe Water Reuse Feasibility Study – which evaluated how to best utilize reclaimed wastewater to address the future water shortages predicted in the 2015 Basin Study. Seven potential options were evaluated and the alternative, which scored the highest, largely due to providing the greatest benefit in terms of acre-feet of water available and doing so at the lowest cost per acre-foot provided, was to pursue return flow credits on the Rio Grande. This alternative would involve construction of a pipeline to convey the portion of the City's treated effluent that is derived from imported SJCP water to a discharge location on the Rio Grande. Returning unconsumed water to the Rio Grande from which it was delivered would enable the City to divert additional water from the Rio Grande until the entire SJCP portion of the City's water rights – 5,230 acre-feet – is fully consumed. The City only consumes about 35% of the water that runs through the system this could be a benefit of several thousand acre-feet per year.

Figure 5: Secondary Clarifier Weirs and Clarivacs

Drought & Precipitation

Drought is a normal recurrent feature in the arid southwest. Santa Fe has a very dry, high desert climate with intense sunlight. On average, the city experiences more than 300 sunny days per year. The highest temperatures in July and August are 80-90 ^{o}F with only 3-6 days per year with 90+ ^{o}F highs.

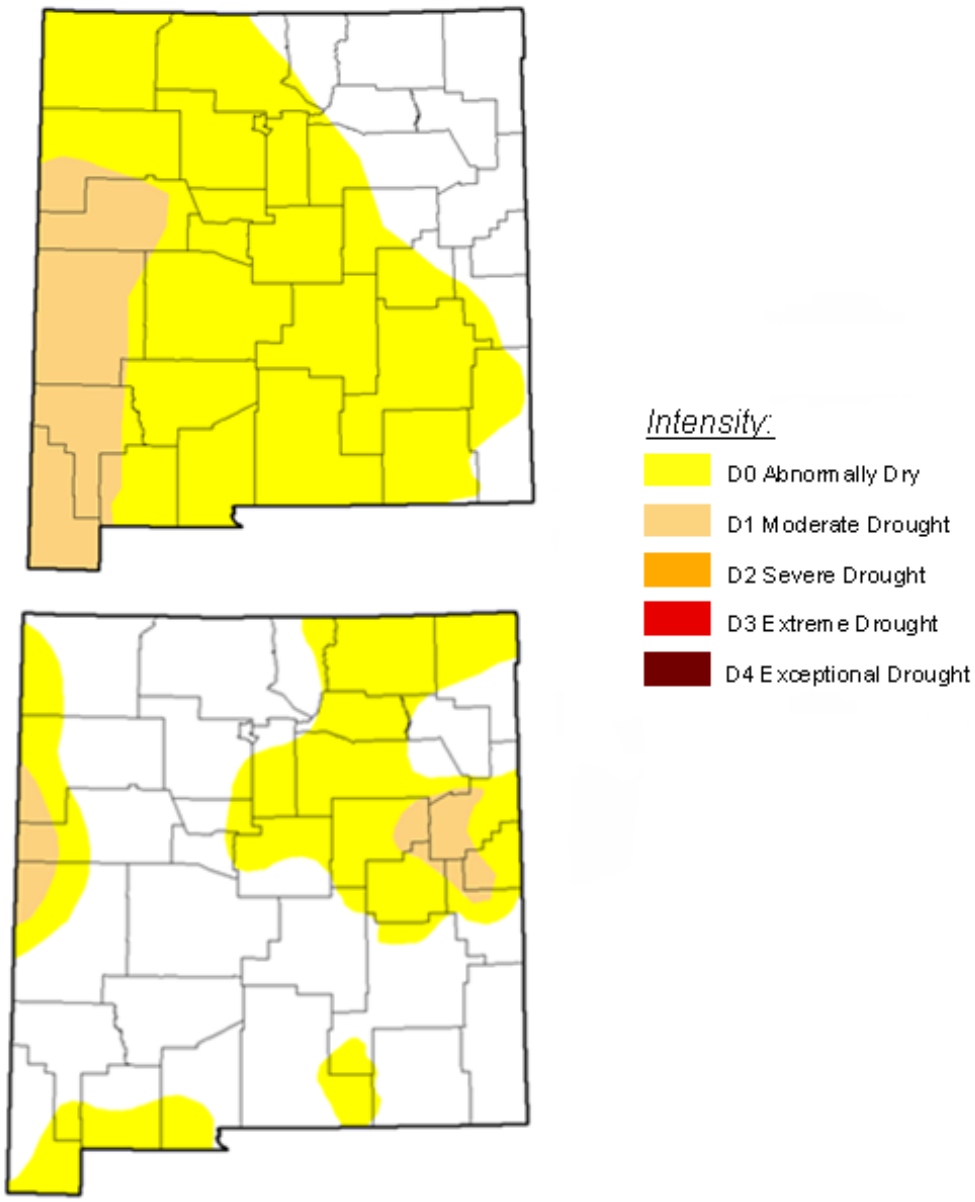

Figure 6: Drought comparison for July 2016 (top) and December 2016 (bottom) courtesy of the Drought Monitor, which focuses on broad-scale conditions. Data is mapped weekly by National Oceanic and Atmospheric Administration (NOAA), the U.S Department of Agriculture (USDA), and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln.

Overall, Santa Fe received above average rainfall in 2016. Among other factors (water demand section), the precipitation likely contributed to a reduced need for outdoor watering, which accounts for approximately 40 percent of Santa Fe's total water use. Additionally, there are no returns from water used for outdoor watering, so water used for this purpose is not available for lower Santa Fe River (SFR) flow or reuse.

In 2016, precipitation in New Mexico was near the average rainfall. Spring 2016 snowmelt and subsequent runoff started early and was well below normal for the sixth year in a row, which follows climate change predictions. 2016 was well above normal temperatures in early spring and the dry and windy spring quickly reduced the snowpack. The monsoons arrived late and produced heavy rains.

Table 3: NRCS SNOTEL Data for 2016 Calendar Year, Santa Fe Watershed

SNOTEL Station	Elevation (Feet)	Accumulated Precipitation (inches)
Santa Fe	11,445	27
Elk Cabin	8,210	19.1
Seton Village*	6,834	14.65

*Not a SNOTEL Station

According to the Western Regional Climate Center, Santa Fe receives on average 13.84 inches annually of precipitation. National Resource Conservation Service (NRCS) 'SNOTEL' weather stations measure accumulated precipitation. There are two SNOTEL weather stations in the upper Santa Fe River municipal watershed (see Table 3).

Precipitation data is also gathered at additional locations near Santa Fe. Seton Village (approximately 4.5 miles south of downtown Santa Fe) reported 14.65 inches for the year 2016. With the geographic spread in Santa Fe, it is hard to generalize rain precipitation. The data from these three stations shows how different precipitation can be from one location to the next within Santa Fe.

Water Demand

Per Capita Consumption

A common metric for comparing annual water use and water conservation effectiveness is gallons per capita per day (gpcd). Essentially, it is derived by dividing the amount of water supplied to the City of Santa Fe by the population of utility customers served. In 2016, the City's water customers decreased average daily water use from 92 gpcd in 2015 to 87 gpcd in 2016.

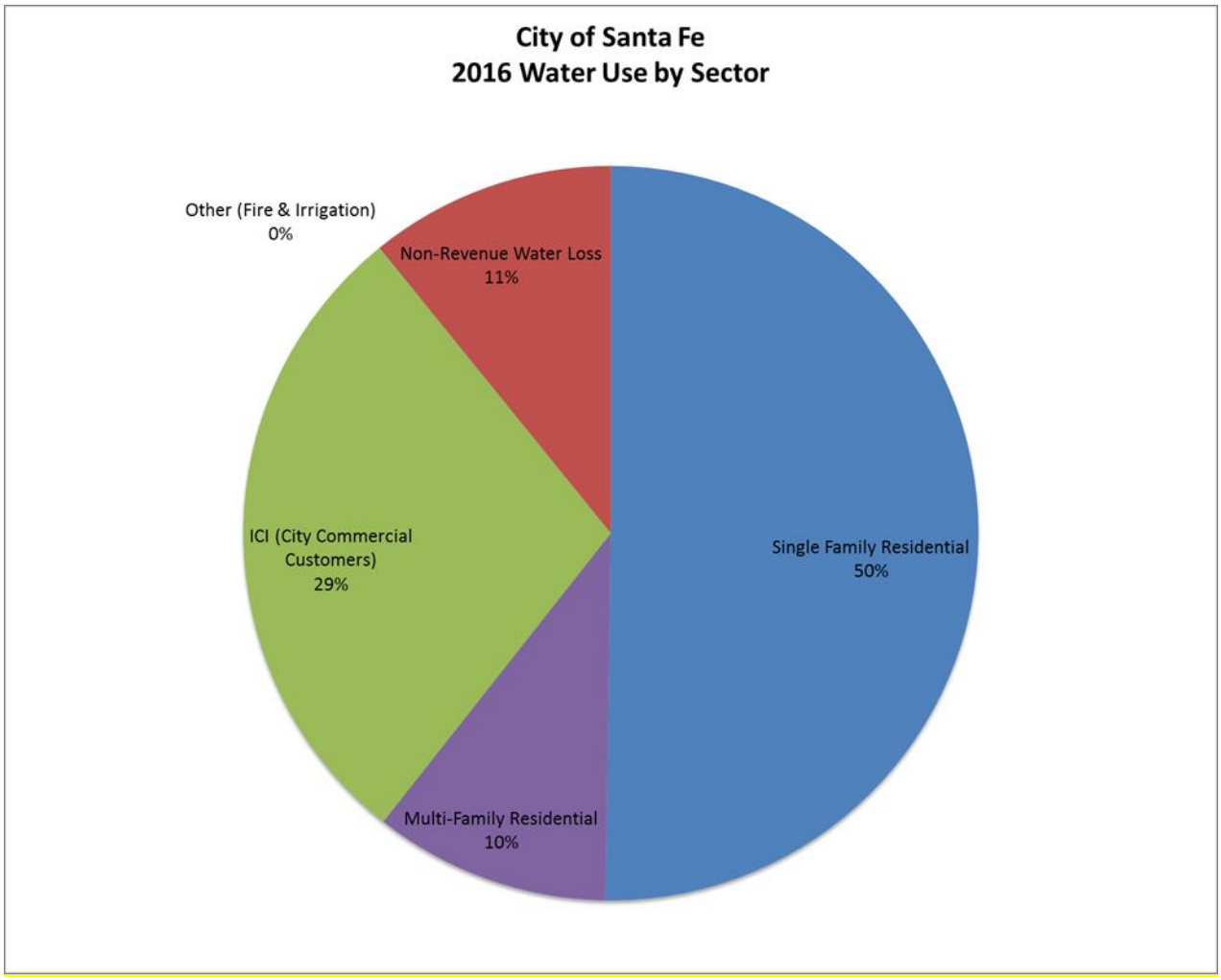

Figure 7: 2016 Water Use by Sector

The gpcd calculation is based upon the New Mexico Office of the State Engineer's (NM OSE) methodology*, which bases the population served upon the number of water division residential customers multiplied by 2014 American Community Survey (ACS)-derived vacancy rate, and an ACS-based residents per occupied household value. The submittal of the NM OSE gpcd fulfills a compliance requirement with the NM OSE's diversion permit for surface water to the Buckman Direct Diversion (BDD) facility and includes data for imported (SJCP) water and exported (wholesale sales) water.

Past GPCD calculations revealed a higher than expected single family GPCD. It was determined that several accounts were being pulled as part of the query that did not belong in the single family residential category but rather the commercial category. As a result the query was adjusted so that instead of address or meter location being used, specific billing tables were used instead. This change made a significant difference in the way the different customer classes were represented in the overall GPCD. This new approach changed the GPCD numbers slightly from the past but the important thing is that it more accurately represents each individual sector.

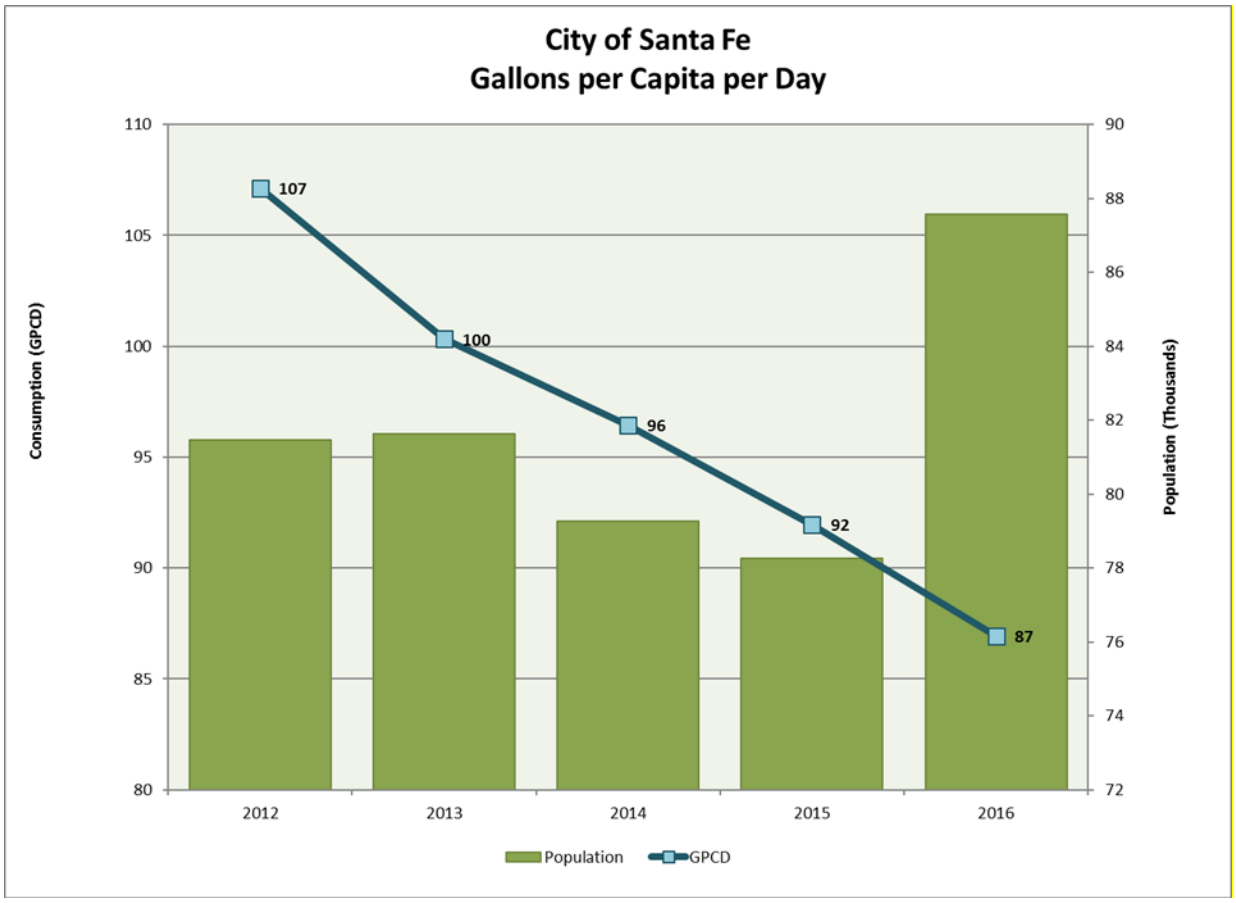

Figure 8: Gallons per capita per Day (GPCD) from 2012-2016

The population for the GPCD is calculated using several different factors and a 5 year average. Several discussions were held about whether or not changes should be made to the methodology to better represent the population. It was determined that the best approach would be to maintain consistency with how population was calculated in the past. Discussions with the NMOSE also revealed that several other utilities had the same issue but the idea was to have everyone calculate it the same using the census data outlined within the calculator itself, for consistency.

Although water conservation outreach and education programs contribute to the overall decrease in water consumption, there are several other factors to take into account. The city experienced a net loss in water customers after annexation to the county in which the typically high water use communities of La Tierra and La Campanas were transferred to Santa Fe County.

*Prior to utilizing the NM OSE gpcd methodology, the City of Santa Fe Water Division gpcd method, used for the previous seventeen years, determined the population served upon the most recent (2010) U.S. Census population data (adjusted for households that rely solely on domestic well water) and updated it annually utilizing growth rates from annual housing permits.

Contractual and Other Water Demands

Santa Fe River

As directed by ordinance, in mid-April of each year the annual target flow allocation is determined based upon projections for the year's anticipated watershed yield. The 2016 flow target was set at 740 acre-feet based upon moisture content in the Santa Fe Municipal Watershed snowpack, (see the 2016-17 Santa Fe River Target Flow Hydrograph in Figure 8). The 2016 target flow allocation began April 15, 2015 through April 30, 2017. It was extended due to construction in the Santa Fe River channel below Nichols Reservoir that occurred between September 4th through October 28th. The NRCS streamflow forecast on April 1st, 2017 for the Santa Fe River was 76% of the 30 year average, so 760 acre-feet was bypassed from the reservoirs for 'Living River' flows.

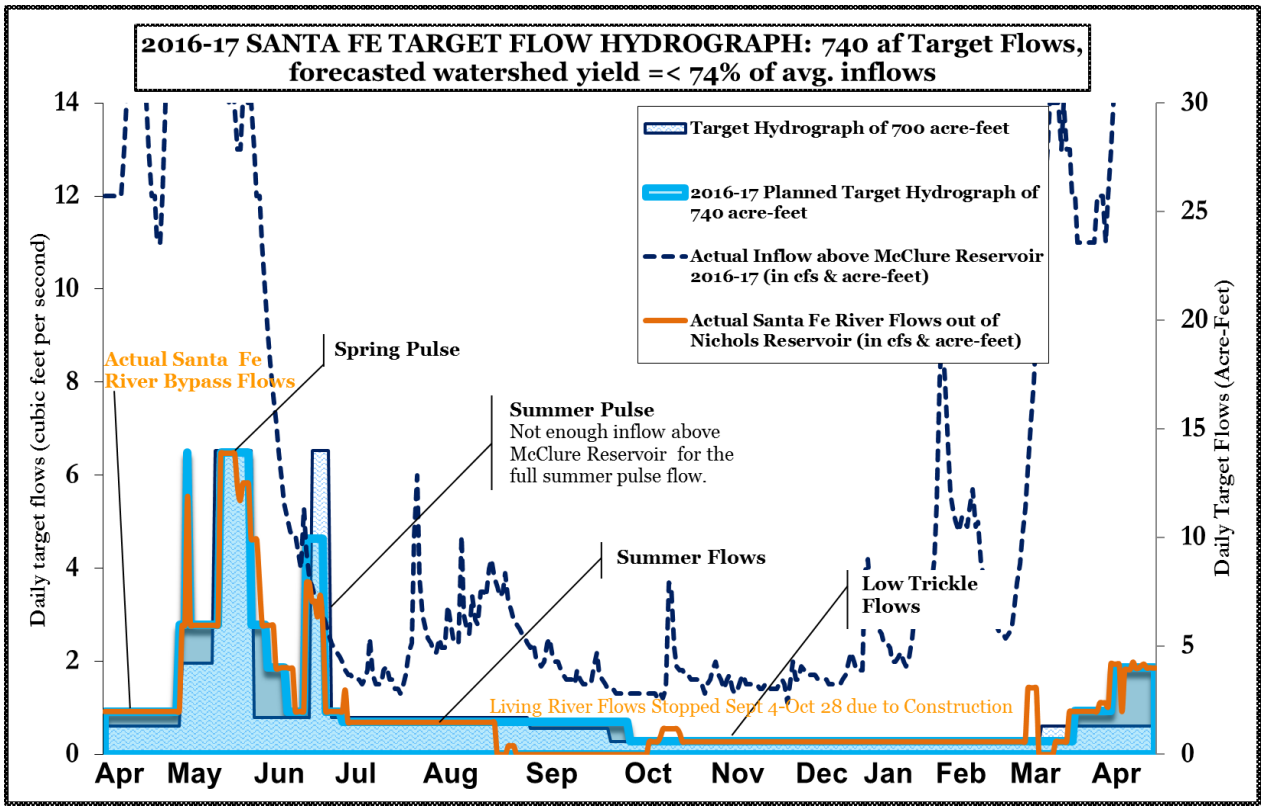

Figure 9: 2016-2017 Santa Fe River Target Flow Hydrograph

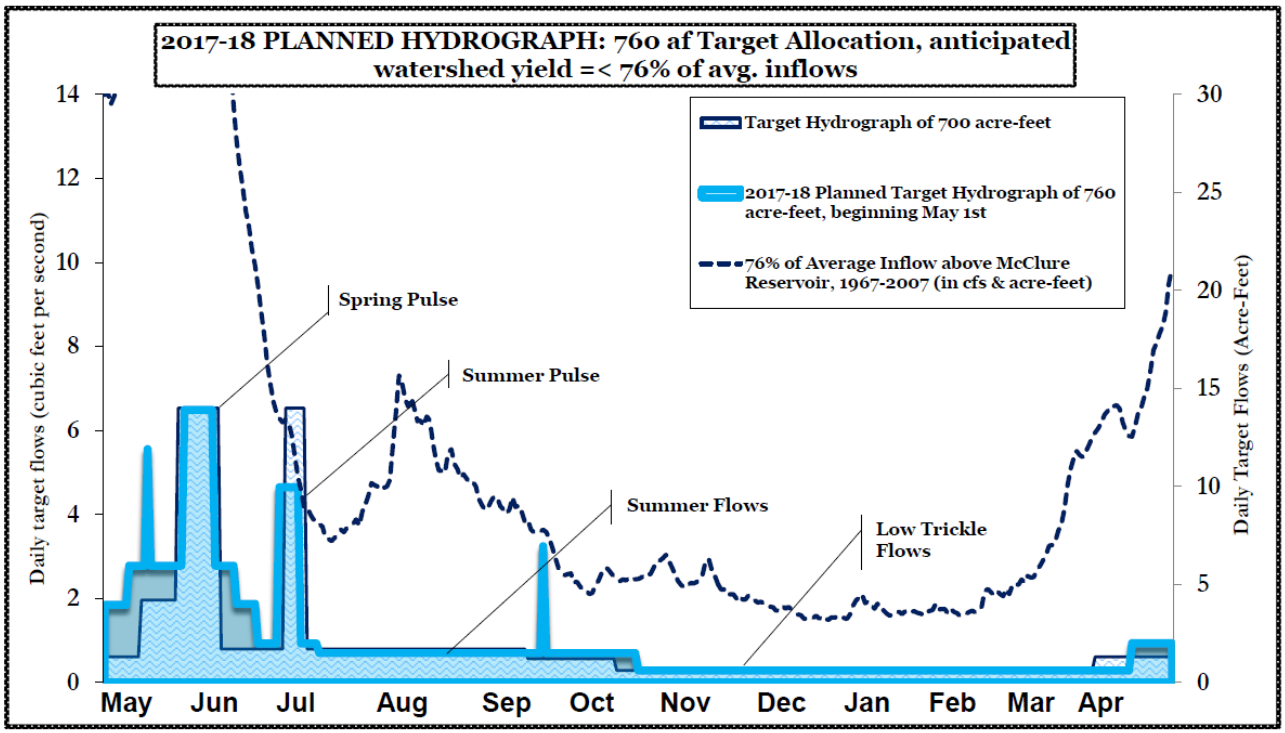

Figure 10: 2017-2018 Planned Hydrograph

Water Bank

New water demand on the City water system requires a water credit from the Water Bank in an equal amount, with the goal being to maintain sufficient rights to meet increasing water obligations. The City requires that any new construction project which will results in a net increase in demand on City water account for that increase either through purchasing water credits from the City's Water Bank, or by transferring Water Rights to the City Water Division. When water credits are purchased from the City, the source of these credits is conserved water realized through conservation rebate programs or water rights which have been purchased by the City. When water rights are transferred to the City water bank, these water rights are used as offset rights (see Water Rights Used for Offsets).

Affordable Housing Offsets	2009	2010	2011	2012	2013	2014	2015	2016
Initial Balance	-5.2	51.67	45.46	40.96	36.91	33.16	28.16	26.36
Governing Body allocations to Affordable Housing	59.32	0	0	0	0	0	0	0
Annual Dedications to Affordable Housing	2.45	6.21	4.5	4.05	3.75	5	1.8	2.04
End-of-year affordable housing water credit pool balance	51.67	45.46	40.96	36.91	33.16	28.16	26.36	24.32

WBAO Banked Water Balance	2009	2010	2011	2012	2013	2014	2015	2016
Initial Balance	0	0	26.27	25.44	16.05	5.34	34.6466	78.0326
City Allocations for Developer Sales						36.61	55	
Conservation Credits Gernerated	0	32.46	9.04	7.15	5.8	6.3226	2.926	8.0997
WBAO Sales	0	6.19	9.87	16.54	16.51	13.626	14.54	13.32
City Revenue From Sales	$0.00	$100,000.00	$160,000.00	$270,000.00	$270,000.00	$228,979.00	$241,364.00	$221,112.00
End-of-year conserved water credit reserve for sale to developers	0	26.27	25.44	16.05	5.34	34.6466	78.0326	72.8123

City Water Rights Credits	2009	2010	2011	2012	2013	2014	2015	2016
Initial Balance	0	0	39.64	39.64	40.73	40.73	58.2832	21.7002
Water Rights Deposits into water bank	9.62	39.64	0	1.09	0	54.1632	18.417	0
Toilet Retrofit Credit Deposits into water bank							54.325	32.7
Withdrawals (allocations by the governing body)	9.62	0	0	0	0	36.61	55	0
End-of-year balance of city owned water rights not yet allocated	0	39.64	39.64	40.73	40.73	58.2832	21.7002	21.7002

Privately Owned Water Credits	2009	2010	2011	2012	2013	2014	2015	2016
Initial Balance	403.28	455.89	483.5	518.21	498.9	489.95	578.654	656.549
Deposits into Water Bank	62.74	33.32	41.75	0	31.05	94.91	114.695	6.513
Withdrawals (dedications by developers to their projects)	10.13	5.71	7.04	19.31	40	6.206	36.8	25.214
End-of-year balance of privately owned water rights	455.89	483.5	518.21	498.9	489.95	578.654	656.549	637.848

Privately Owned Water Credits from Old Toilet Retrofit Program	2009	2010	2011	2012	2013	2014	2015	2016
Initial Balance	4379.025	4340.025	4322.025	4309.025	4291.025	4279.025	3895.025	3576.7
Withdrawals (dedications by developers to their projects / City Purchases)	39	18	13	18	12	384	318.325	32.7
End-of-year balance of privately owned water rights	4340.025	4322.025	4309.025	4291.025	4279.025	3895.025	3576.7	3544

Figure 11: Water Bank Balances

*The City's water bank tracks the inflows (credits), allocations (debits), ownership, and designated use. For detailed information, please refer to the following ordinances and city code: 2005 Water Transfer Ordinance, 2009-38 Water Budget Requirements (effective January 1, 2010), and Water Conservation provisions in City Code Chapter 25.

Water Resources Planning

The overall goal of water resources planning is to ensure that the City's water resources are managed efficiently in a manner reflecting the values of the community. City water planning staff work to find innovative solutions to improve system resiliency and to ensure water will be available to meet future demands without damaging the cultural or physical landscape of the region.

Management responsibility includes source water protection and watershed management under the City of Santa Fe's Municipal Watershed Management Program, protecting the source of 40% of the City's drinking water supply. Water resources planning and management efforts cover a broad range of duties, including being a good steward of the precious and finite resource: water.

Fiscal Responsibility

The Water Division is committed to fiscally responsible management of the water utility. This is achieved by an annual review of the finance plan. The review provides projections for both revenue and expenditures including the capital improvement plan (CIP). The goal is to be fiscally responsible while maintaining a high level of service and increasing effectiveness and efficiency. The last rate increase went into effect July 1, 2013 and the Water Division does not project another increase until 2019.

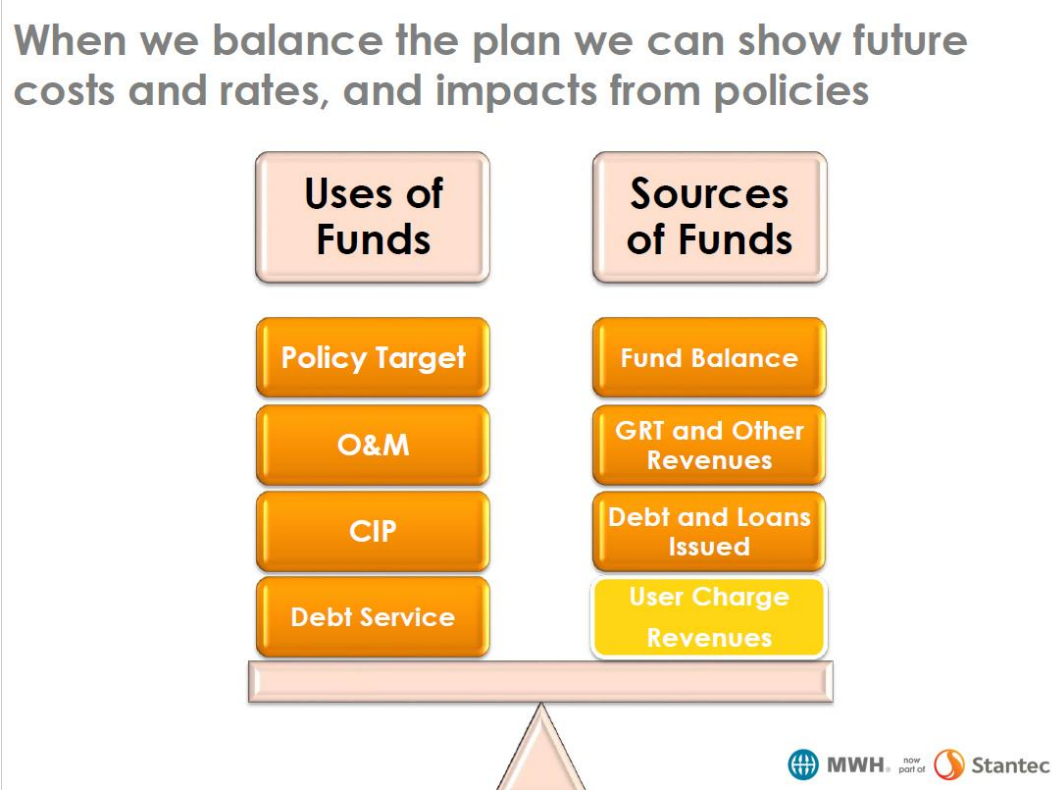

Figure 12: How the water division must balance its budget

In Fiscal Year 2016 several significant actions were taken in regard to the Water Division budget. The water division paid off $55 million in debt, issued $37 million in refunding revenue bonds, eliminated gross receipts tax revenue from the water division's funding, and initiated a franchise fee transfer from the Water Division to the City's general fund. This franchise fee, which is 4% of the Division's revenue, is used to replace the franchise fee formerly paid by PNM prior to the City's purchase of the water company and is a fee associated with operating a utility within City limits.