

Security Water District

Water Conservation Plan Update

March 2018

INTRODUCTION

Security Water District has been fortunate, since its inception, in having an adequate supply of water. Wells and participation in the Frying-Pan Arkansas Water Project have enabled the District to provide for needs of its customers and the community. Using this adequate water supply efficiently is an important part of the District's water supply planning. The District is small (less than 20,000 people), but its supply system is complex. It is comprised of wells in two aquifers, and Frying-Pan Arkansas Project Water, necessitating agreements with Colorado Springs Utilities and the U.S. Bureau of Reclamation, the Southeastern Colorado Water Conservancy District, augmentation plans and aquifer recharge agreements. Efficient water use will ensure the District meets these contractual obligations, while providing a dependable supply for its customers.

The District developed its first conservation plan in 2004. That plan was updated and expanded by its Water Conservation Plan written in 2010, which is now being updated. The Water Conservation Plan Update will be completed in compliance with C.R.S. 37-60-126 (4.5) (HB 10-1051). Reporting required by HB 10-1051 has been performed annually by the District, beginning in 2013, as required by the Water Conservation Act of 1991 (HB 91-1154).

The District will update its Plan by:

- Profiling the existing water supply system
- Profiling historical water demands and historic demand management efforts
- Considering integrated planning and water efficiency benefits and goals
- Selecting water efficiency activities
- Implementing and monitoring the Plan

As a special district under Colorado law, Security Water District's jurisdiction is limited to its boundaries and its customers. Ordinances cannot be enacted by the District such as landscape ordinances, for example, that would normally be governed by the County. Therefore, the Plan will be developed with involvement of its customers and its Board of Directors only. Concurrently, the District will adhere with all local and regional ordinances to which it is subject, including the proposed County Water Plan in development of its update.

Additionally, the District and Water Matters! reviewed the Colorado Water Plan to ensure the Water Conservation Plan Update followed all relevant elements of the Water Plan. <https://colorado.gov/pacific/cowaterplan/plan>

Security Water District is located within the Arkansas River Basin. That Basin is estimated by the Colorado Water Plan and the Statewide Water Supply Initiative to experience a gap between water supply for municipal and industrial needs and water demand for those needs of approximately 560,000 acre feet in the year 2030. An acre foot is the amount of water needed to supply two families' needs for one year. The Colorado Water Plan's goal is to reduce that gap to zero by 2030 in the Arkansas River Basin. This can be accomplished if each municipality in the Basin can reduce its consumption by one percent a year for the next 13 years, through successful and consistent implementation of its active water conservation activities and its new or expanded water supply projects.

1.0 THE EXISTING WATER SYSTEM

Security Water District is located in unincorporated El Paso County. It encompasses approximately five square miles, bordered generally on the north by Milton Proby Parkway, on the west by I-25, on the east by Grinnel Boulevard and on the south by Fontaine Boulevard.



Figure A Security Water District Service Area

Security Water District currently provides a reliable water supply for a population of nearly 20,000 people. Until recently, the District obtained its water supply from numerous wells located within its service area, and from Frying Pan-Arkansas Project

water delivered from Pueblo Reservoir through the Fountain Valley Authority Conduit. In addition, the Southern Delivery System came online in April, 2016, providing an additional means of conveying water from Pueblo Reservoir. Recently, however, the discovery of Perfluoroalkyl substances (PFASs) in the District's groundwater wells, possibly coming from the nearby Air Force Base has caused the Water District to suspend use of groundwater for the immediate future, until new treatment facilities can be built to handle the contamination.

Security has a strong portfolio of water rights which include a complex system of decrees, well permits and agreements. Water rights include the following five groups:

1. The wells drilled into the Widefield Aquifer and the Windmill Gulch Aquifer
2. Frying Pan-Arkansas Project water and return flows from this source of supply delivered through the Southern Delivery System and Fountain Valley Authority.
3. Augmentation plans utilizing senior water rights and Fry-Ark return flows to replace depletions associated with operation of wells in the Widefield Aquifer and Windmill Gulch Aquifer.
4. Water supplies being developed by Security for storage in Pueblo Reservoir and delivery through the Fountain Valley Authority
5. Water rights being developed by Security for artificial recharge of the Widefield Aquifer.

The District's water supply system is being expanded to provide additional capacity in anticipation of limited growth within the water service area (approximately two percent per year until buildout, which is expected to occur within the coming decade); but perhaps more critically, to ensure a reliable and independent supply against recurring droughts and other unforeseen events. The following projects are being planned and implemented to enhance Security's water supply:

1. Development of additional water supplies in the Widefield Aquifer, particularly including upgrading of the Clear Springs wells and implementation of a new 25-year lease, and perpetual lease for 45 percent of the water rights and production capacity of the Venetucci Wells.
2. Purchase and change of Fountain Mutual Irrigation Company, Lock Ditch and Chilcott Ditch senior water rights along Fountain Creek.
3. Recent purchase of the Base Ranch water rights in Freemont County, and participation in the Super Ditch Project along the lower Arkansas River.
4. Completion of the Southern Delivery System in cooperation with Colorado Springs Utilities, the City of Fountain, and Pueblo West Metropolitan District. Water Deliveries began on April 28, 2016.
5. Participation in the planned Widefield Aquifer recharge project in cooperation with Widefield Water and Sanitation District and the City of Fountain.

At this writing, the District's surface water, that is, its Frying Pan-Arkansas Project water is treated by Fountain Valley Authority and Colorado Springs Utilities and delivered to Security for distribution. Use of groundwater, as stated previously, has been suspended for the short term, pending construction of new water treatment capacity to remove PFASs. Currently, the District is operating without the water from these wells by purchasing additional water from Colorado Springs Utilities. This limitation will be discussed in depth in Section 1.3, Supply Side Limitations and Future Needs.

During the lifetime of the Water Conservation Plan Update, the District plans to construct treatment facilities to treat groundwater from wells that have been subject to contamination by perfluoroalkyl substances.

Approximately 100 miles of pipeline distribute treated water to businesses and customers in the District, across three pressure zones

1.1 Water Supply Reliability

Security Water District has projects or plans in place to address its increasing water demands, including conservation, reuse, agricultural transfers and new water supply projects. However, even if water providers in the Arkansas Basin are fully successful in implementing all plans, they can only meet about 80 percent of the identified need, leaving about a 20 percent gap in water supply needs. To the extent these identified projects and processes are unsuccessful, the gap will be larger and will occur sooner. (Colorado Water Conservation Board). The Updated Water Conservation Plan will implement several active conservation measures, in addition to those already in effect under the Plans of 2010 and 2004, to address this gap.

The District's water system yield is presented in the following tables, and is divided into current water system yield, near term future water system yield, and long future water supply. (This information is available in greater detail in W.W. Wheeler, Water Resources Report).

Table 1 Current Water System Yield

	Annual Yield in acre-feet
Deliveries through Fountain Valley Conduit (primarily Fry-Ark Project water, but also supplemented with other fully consumable sources)	1,564 ¹
Widefield Aquifer Wells (excluding Venetucci and Clear Springs Wells)	2,577 ^{2,4}
Windmill Gulch Wells	240
Clear Springs Wells in Widefield Aquifer	600 ³
SDS – Fry-Ark Project Water and Return Flows	930 ⁵
Total	<u>5,911</u>

1. The Fry-Ark Project water delivered through the Fountain Valley Conduit is typically approximately 1,646 acre-feet per year, less 5 percent for conveyance and treatment losses, for a net supply of 1564 acre-feet. The Fry-Ark Project yield is reduced during drought cycles, but deliveries through the Fountain Valley Conduit are also supported by Security's 6,387 acre-feet of storage capacity in Pueblo Reservoir, together with Fry-Ark return flows, FMIC, Lock and Chilcott water rights that are stored in If-and When and Long-Term Excess Capacity storage accounts in Pueblo Reservoir.
2. The 2577 acre-feet of Widefield Aquifer supply includes a 20 percent temporary increase in the pumping allocation.
3. The current lease for use of the Clear Springs wells by Security expires on December 31, 2037, but the parties may agree to extend the lease for additional terms thereafter.
4. Currently replaced with short term contract with CSU.
5. Deliveries through the Fountain Valley Conduit are also supported by Security's 6,387 acre-feet of storage capacity in Pueblo Reservoir plus Southeast Colorado Water Conservancy District master contract of up to 1,500 acre feet and SDS storage of up to 1,500 acre feet.

Table 2 Near Term Future Water System Yield

	Annual Water Supply Sources	Typical Augmentation Requirement
Deliveries through Fountain Valley Conduit (primarily Fry-Ark Project water, but also supplemented with Other fully consumable sources during drought cycles)	1,564 ²	0 ²
Widefield Aquifer Wells (excluding Venetucci and Clear Springs wells):	2,000	102 ³
Case No. W-4212	343	172
Other cases		
Windmill Gulch Wells:		
Augmented by Widefield Water and San District	200	0
Augmented by Security	40	20
Venetucci Wells in Widefield Aquifer (available by 2027 or earlier if needed)	596	298
Leased Clear Springs Wells in Widefield Aquifer	600 ⁴	300
<u>Southern Delivery System (construction completed in 2016)</u>	930	1,000 ⁵
Subtotal	6,273	1,892
Additional 10 percent Widefield Aquifer Allocation	294 ⁶	147 ⁶
Total	6,273 to 7,137	1,892 to 2,039
Estimated Drought Cycle Water Supply Sources as Limited by Near-Term Augmentation Supplies	5,073 ⁷	

1. Augmentation requirements are estimated to be 50 percent of the amounts diverted, except as noted for the SDS Project
2. The Fry-Ark Project yield is reduced during drought cycles, but deliveries through the Fountain Valley Conduit are also supported by Security's 6,387 acre-feet of storage capacity in Pueblo Reservoir, together with Fry-Ark return flows, FMIC, Lock and Chilcott water rights that are stored in If-and When and Long-Term Excess Capacity storage accounts in Pueblo Reservoir.
3. Augmentation in Case No. 2-4212 is primarily covered by Security's 1.73 cfs interest in Priority No. 4. An additional 102 acre-feet of Fry-Ark return flows is used for augmentation in this case during winter.
4. The Clear Springs wells are leased from Colorado Springs Utilities for a term that extends through December 31, 3037, and for additional terms by future agreement of the parties.
5. The Southern Delivery System water supply will be provided through reuse of Fry-Ark Project return flows, Chilcott shares, FMIC shares, Lock Ditch and Super Ditch Project water rights delivered in to Pueblo Reservoir by exchange or trade,

together with additional future water rights that may be acquired. Augmentation requirements include additional allowances for evaporation losses at Pueblo Reservoir and for transit losses as water rights are delivered for storage in Pueblo Reservoir by exchange or trade.

6. It is unknown whether the 10 percent increase in the Widefield Aquifer pumping allocation will be permanent.
7. Security's augmentation supplies effectively limit the amount of annual deliveries from Security's water supply sources, particularly during a drought cycle. The estimated 5,643 acre-feet per year can be reliably supported by the near-term water supplies available to Security.

As shown in the table above, the total near-term water system yield available to Security is approximately 5,643 acre-feet per year. The 5,643 acre-feet of annual water supply is a reasonably firm figure for current water supply planning purposes because Security has acquired the appropriate water rights to support this water supply. The Southern Delivery System is considered to be firm for water supply planning purposes. It is a complex matter to evaluate average and drought cycle yields of water supply sources, while also considering the carry-over storage in Fountain Valley Authority accounts and the Long Term Excess Capacity storage at Pueblo Reservoir. Therefore, the specific estimate herein of Security's water system yield is subject to continuing analysis and revision.

Table 3 Long-Term Future Water Supply

The long-term future supply to be provided by Security's water system is dependent on numerous factors, including the acquisition of additional water rights, extension of the Clear Springs lease after 2037, and development of the Widefield Aquifer Recharge Project.

	Annual Yield (acre-feet)
Near-term sources listed in preceding section	6,843
Less Clear Springs wells if the lease is not extended After 2037	600?
Future Widefield Aquifer Recharge Project	
Total	6,243 to 7,568

As previously stated, Security has adequate water supplies and augmentation water rights to meet its current water demand, plus its commitments for future water service. Security's additional near-term water supplies will provide greater levels of drought protection and redundancy within its water system.

1.2 Supply Side Limitations and Future Needs

On May 19, 2016 EPA announced lifetime health advisory levels for PFOS and PFOA of 70 parts per trillion. Additionally, the Colorado Department of Public Health and Environment included PFHpA in that level. At the same time, levels of Perfluoroalkyl substances (PFASs) were detected in its groundwater wells which supply about 50% of the District's drinking water. Security discontinued use of groundwater wells, advised its customers to take precautionary measures, and began purchasing additional water from Colorado Springs to meet its drinking water needs. PFASs appear to have originated from a local air force base. Security immediately began installing additional piping to allow more extensive use of surface water in the affected areas.

It is important to note that the District's adequate water supplies and its established working relationships with its neighboring water providers allowed it to withstand the unexpected and potentially devastating impacts of the 2016 health advisory revision. This unforeseen emergency also points up the importance of Security Water District's long-standing and proactive stance on system redundancy and water conservation. Because the District's foundational conservation efforts (system loss management and control, data tracking, and water rates and tap fees), its commitment to backup measures in both system and supply (redundancy), and the Board of Directors' willingness to respond quickly with implementation of voluntary watering restrictions, coping with the unexpected was not so disastrous as it might have been. By June 1, the new watering restrictions program was in place, and has since been revised to include the District's ability to move from voluntary restrictions to two or even one day a week mandatory restrictions as conditions warrant.

In order to treat groundwater for PFAS incursion, the District will need to build treatment facilities, at a substantial cost. Postponing this additional treatment capacity is not an option, it must be completed as soon as possible. Because wells provide a significant part of the District's supply, conservation will not generate sufficient savings to preclude their use, or to avoid purchase of supply from other providers. Purchasing additional Project water from Colorado Springs is only feasible as a stopgap measure, and, although the ability to purchase such water short term was a viable solution to providing safe drinking water to the District's customers, its high cost makes this short term solution unsustainable.

As discussed in depth in the previous section, Security has an adequate and reliable supply for its future, considering that it is approximately eighty percent built out, and that its growth rate is low. The challenge it faces for the life of this Plan Update is that of putting new treatment capacity in place quickly to handle the more stringent health advisory levels of PFASs. Security Water District does not face substantial supply-side needs beyond those of treatment.

2.0 PROFILE OF WATER DEMANDS AND HISTORICAL DEMAND MANAGEMENT

2.1 Demographics and Key Characteristics of the Service Area

Security Water District was established in 1954. It is located in unincorporated El Paso County. Current population is approximately 19,630. The District serves a military population of about 4,700. This represents a relatively transient population, yielding an annual turnover of approximate 25%. The District's housing stock is varied, with about 40% of homes built around 1960 or earlier. About 40% of homes were constructed between 1960 and 2000, and another 20% were built after 2000.

A review of indoor use over the past five years shows an ***average annual indoor*** decrease of approximately 500,000 gallons, just under 1% of total consumption. This average decrease is not consistent year to year, which may be related to demographics and population movement. However, because toilets account for about forty percent of indoor use, it is likely that this average decrease reflects normal replacement of toilets in the older housing stock, as well as replacement of showerheads, washing machines, faucets and dishwashers as required by the Energy Policy Act of 1992 (only low flow appliances and fixtures are now available for purchase), combined with the tendency toward water conserving behavior observed nationwide. This document decrease in indoor water use over time is referred to as passive savings, and is a result of fixture replacement.

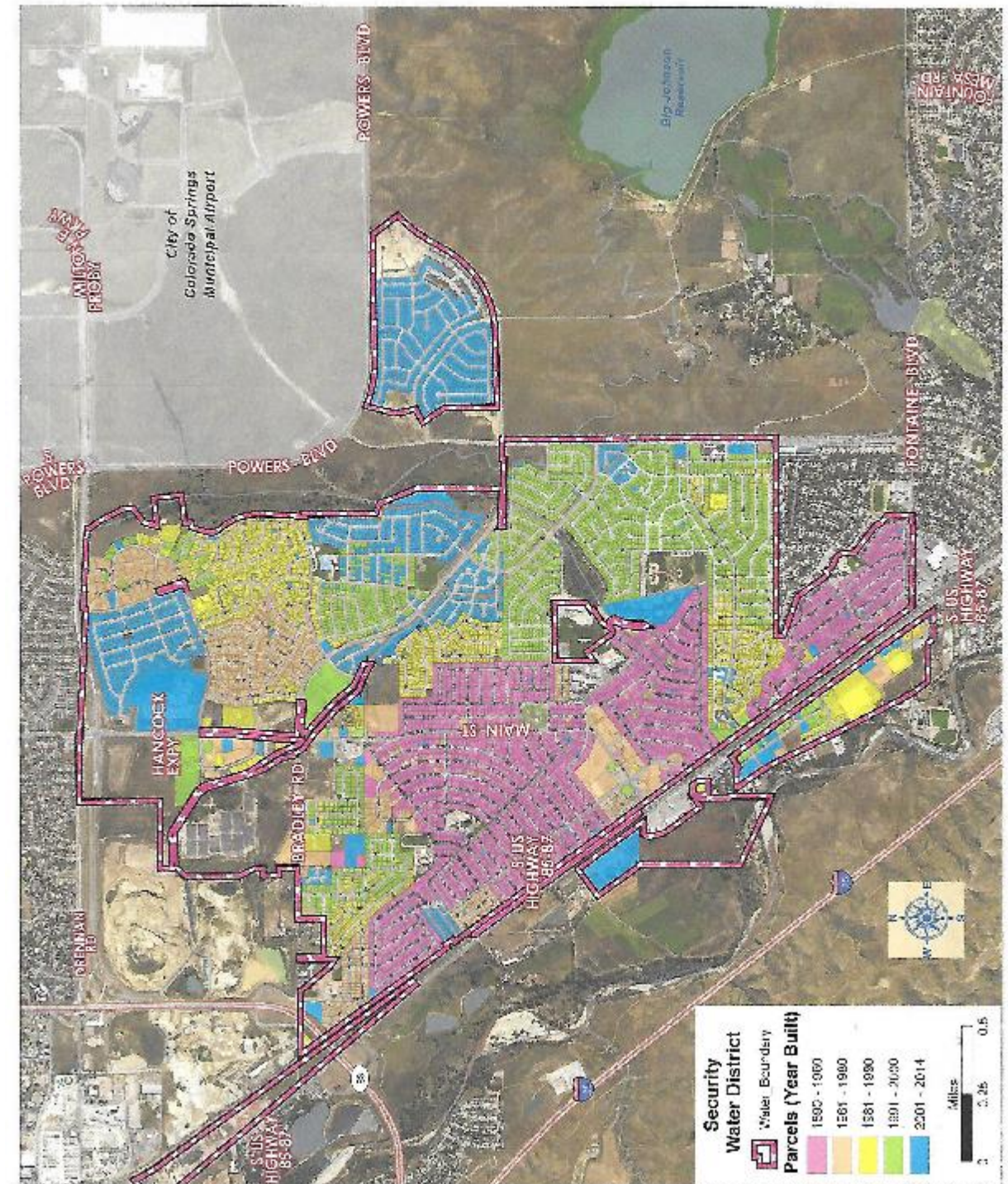


Figure B Security Water District Housing Stock

Security divides its customers into the following categories:

- Single family residential
- Multifamily residential
- Commercial
- Commercial irrigation

The following graph illustrates the distribution of demand among customer categories:

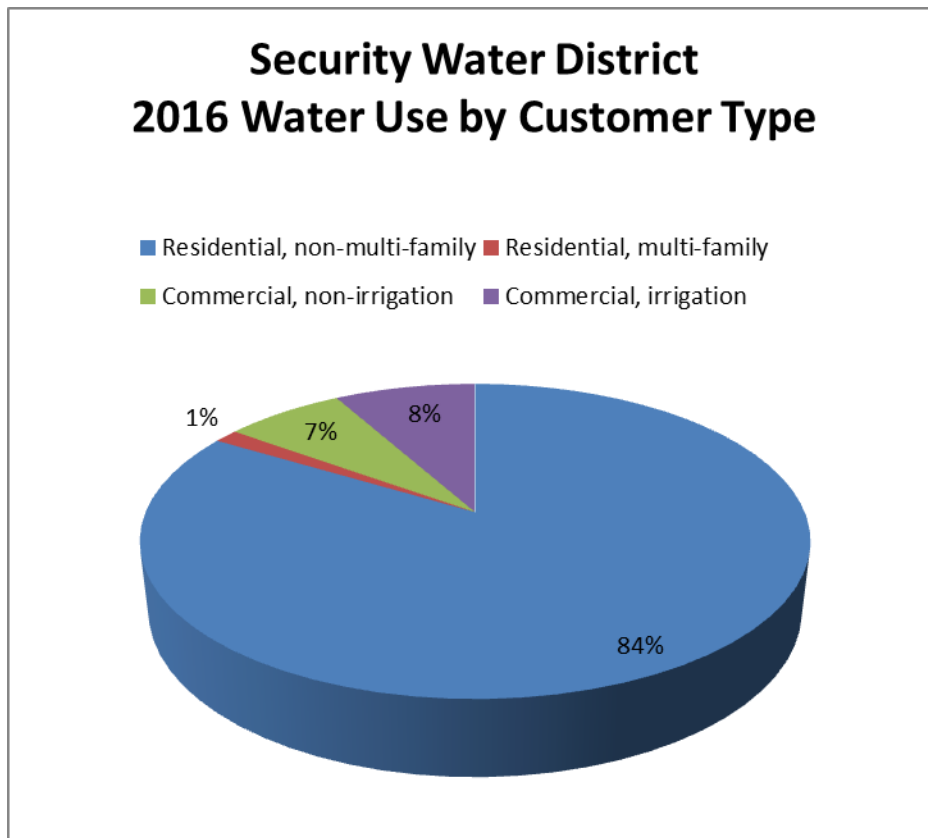


Figure C Water Use by Customer Type

2016 appears to have been a typical water use year, therefore 2016 production, consumption and loss figures were used for illustration.

2.2 Historical Water Demands

It is interesting to note that over the last ten years, Security has consistently served seven apartment buildings. The number of businesses has remained approximately the same, as have the irrigation customers. There has been a slow, but consistent growth in residential single family meters. Population growth is between 1.5% and 2% percent per year, and is comparable to growth in the District's neighboring communities, including the City of Colorado Springs.

Total residential water use (indicated by the per capita systemwide use) has been gradually decreasing over the last five years. The indoor component has decreased slightly, on average, more or less consistent with nationwide estimates for passive savings as discussed in the previous section. Outdoor use has decreased significantly from over 500 million gallons in 2012, to just over 310 million gallons in 2016. Multifamily use has remained somewhat steady, suggesting a possible future gain through some sort of cooperative program aimed at fixture replacement with one or several of the multi-family dwellings. Commercial use has remained quite steady through the end of 2015, but appears to have increased significantly during 2016. This may be due to new industry, and should be monitored for savings opportunities. Commercial irrigation seems to vary from year to year, following no particular pattern (although it is not within the scope of this study to normalize for weather). Again, this consumption should be monitored for savings opportunities related to more water efficient landscaping. Consideration should also be given to tracking weather conditions throughout the year, especially during the irrigation season. Weather tracking (temperature, wind run, precipitation) data are available through the County. Since consumption data should more or less follow weather data, where it does not opportunities for water savings may be identified.

There were no challenges encountered by the consultant in gaining access to complete and accurate data regarding historical demand.

As shown in the following graph, residential indoor use is consistently about 55% of total use. This is not only true of Security Water District, but is fairly consistent throughout the west.

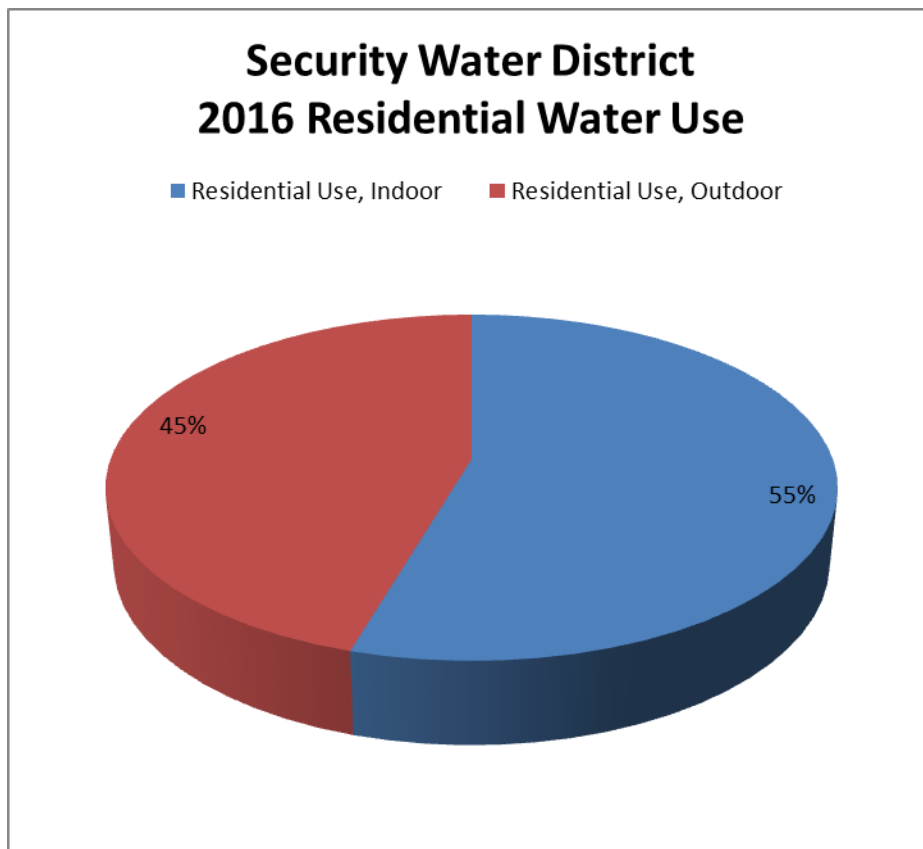


Figure D Indoor and Outdoor Residential Consumption

The next graph illustrates the relative consistency of indoor use, and the bell curve that represents outdoor consumption. The curve of outdoor use represents quite accurately the irrigation demands of blue grass during the irrigation season. The evapotranspiration (the amount of water plants absorb from the soil and through their leaves) curve is nearly identical to the April to November outdoor water use curve. Again, this is typical, not just for the District, but for all western states.

Security Water District 2016 Monthly Residential Water Use (in gallons)

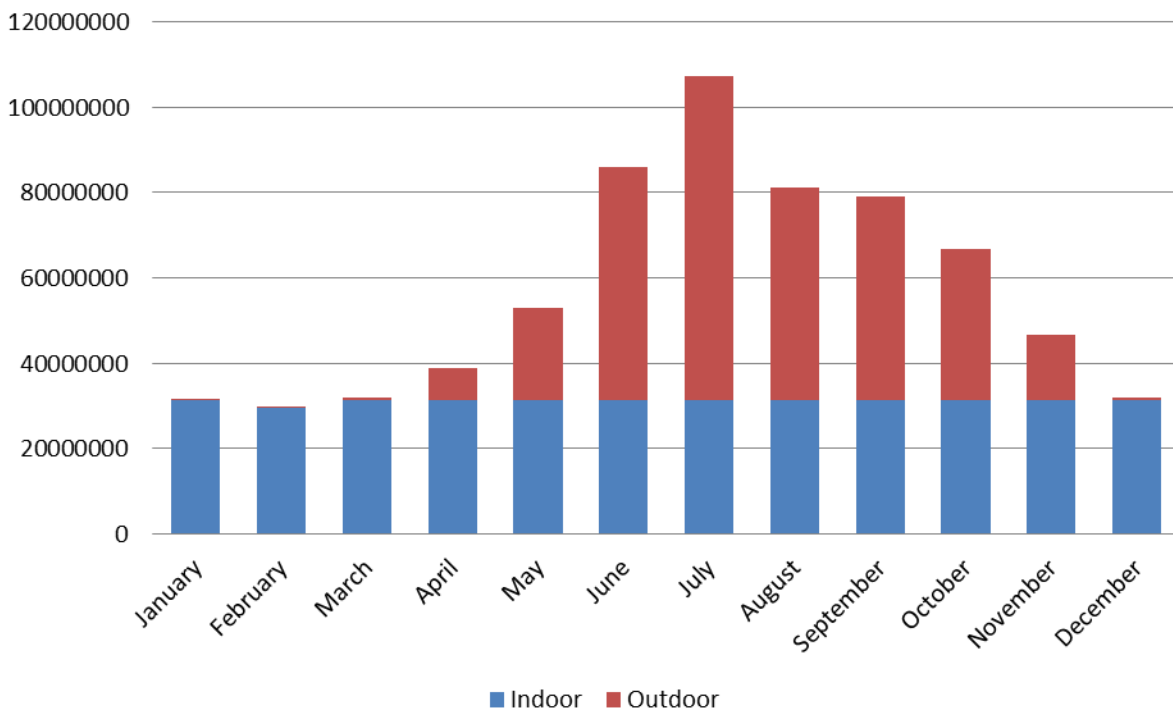


Figure E Residential Indoor and Outdoor Use, by Month

Annual water loss or non-revenue water

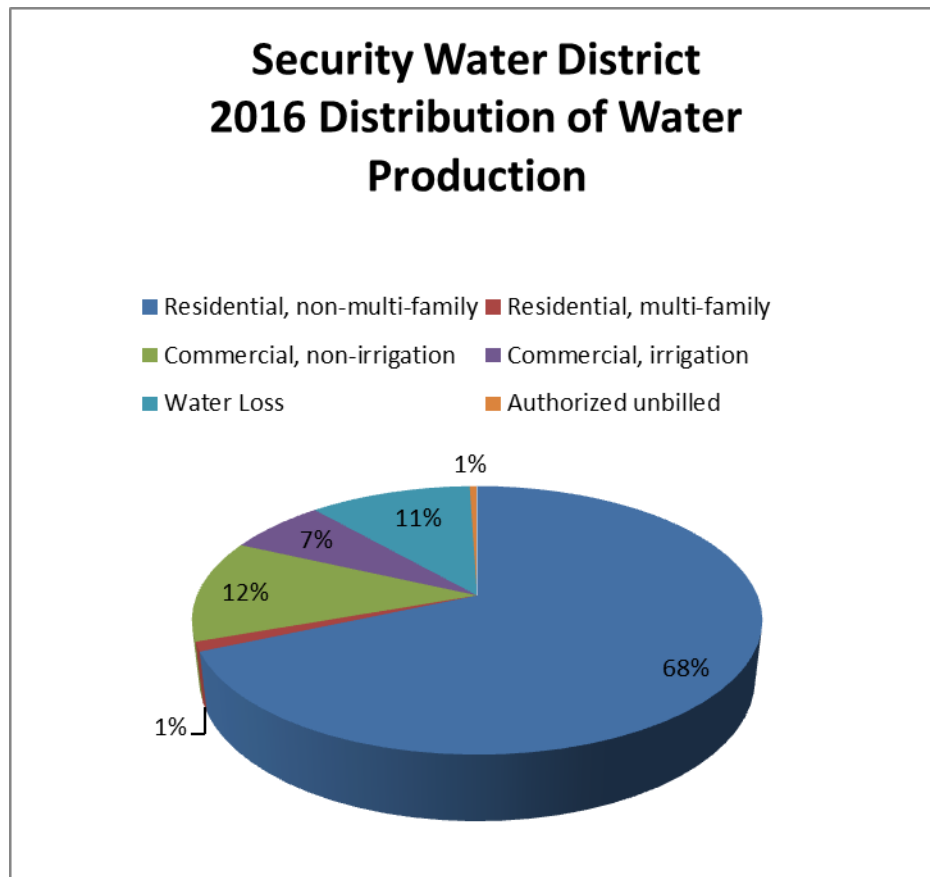


Figure F Distribution of Water Produced

Figure F shows all water produced, all water billed for in the categories shown in Figure C and the difference between production and authorized uses. This amount represents lost water, or non-revenue water.

Security Water District is concerned about reducing its non-revenue water, or water loss. Although Security Water District's non-revenue water is not excessive, a reduction in the amount of non-revenue water of about 3% per year per connection would bring its water loss per connection in range of the American Water Works Association's recommended 20 gallons per connection. The District has chosen to make the reduction of non-revenue water the centerpiece of its conservation programs for the life of the Water Conservation Plan Update. The District performed Water Loss Control Audits in 2013, 2014, and 2016. (The Audit for 2015 was not completed because the District was consumed with its response to the groundwater issues described earlier.) The findings of each audit, conducted in compliance with the AWWA M36 manual, are presented here in summary:

The American Water Works Association considers two different types of water losses, apparent and real. Apparent losses are non-physical losses that occur when water is successfully delivered to the customer but, for various reasons, is not measured or recorded accurately, causing a degree of error in the amount of customer consumption. Apparent losses may be viewed as paper losses, in that no water is physically lost from the supply process. Apparent losses consist of three primary components:

1. Customer metering inaccuracies
2. Systematic consumption data handling errors, and
3. Unauthorized consumption

Real losses represent the physical losses of treated water from the distribution system and are comprised of breaks and leaks from water mains and customer service connection pipes, joints and fittings and from tank overflows. For the District, as for most water systems, real losses are the majority of non-revenue water losses. The following summaries refer to real water losses.

2013 – The audit indicated that 36.5 gallons per connection per day in real water losses, at a cost to the system of \$169,995. The audit suggested that about 66 million gallons of loss might be addressed through future action.

2014 – This audit indicated that real water losses had been reduced to 28.9 gallons per connection per day, which was a 20% reduction over the losses shown in 2013. Cost to the system was \$136,569, and the report suggested that this volume of loss could be reduced by reduced to 20 gallons per connection per day.

2016 - The audit performed in 2016 indicated that real water losses had risen to 35.1 gallons per connection per day. The system cost was \$167,416. The report again suggested that the volume of loss could be reduced to 20 gallons per connection per day.

The three audits show that water loss and system leaks fluctuate, but have been fairly consistent through the years. The District's ongoing practices are effective and should be continued. It is suggested that leak detection and repair work be carried out in phases up to the annual economic level of water loss.

2.3 Past and Current Demand Management Activities and Impact to Demands

(2004 Water Conservation Plan and 2010 Water Conservation Plan savings are considered to be part of the District's baseline of consumption. 2010 Water Conservation Plan savings are shown below, but have not been recounted in the Water Conservation Plan Update.) Existing conservation programs and measures include:

- Water efficient fixtures – new construction in the District’s service area complies with the Energy Policy Act of 1992 and the Uniform Plumbing Code of 1997 as adopted by the Pikes Peak Regional Building Department. The savings accrued to the District from passive conservation (replacement of older fixtures with the required low flow and water saving fixtures) appears to be ***about 500,000 gallons per year on average.***
- Water efficiency education – the District offers two landscape efficiency seminars annually through its partnership with Water Returns. These seminars are well attended (an average of fifty participants per seminar), and well rated. Landscape evaluations are offered at these seminars, and result in twenty to twenty-five onsite consultations by Water Returns personnel each year. These consultations include plant selection, soil improvement and irrigation advice and training. EPA estimates savings from education (including all venues) to be on the order of 4%. The District therefore includes its work with commercial plan reviews, its website, bill stuffers and bill design as part of the overall water efficiency savings. Past educational savings are estimated at ***approximately 500,000 gallons per year.***
- Multi-family, commercial and industrial developments are encouraged to use the District’s list of low water plant materials for landscaping projects. These savings are included in the estimate of landscape education measures.
- District regulations require commercial and industrial developments to submit landscaping for approval prior to implementation. Again, these savings are included in water efficiency education.
- The District maintains a website which includes both indoor and outdoor water saving tips. These savings are also included in the water efficiency education category, and in indoor savings as “passive” savings, largely attributed to the effects of the 1992 Energy Policy Act legislation.
- The District’s meter department scrutinizes high water consumption monthly and investigates for possible leaks that customers may not be aware of. District policy requires property owners to initiate repairs within 24 hours if deemed necessary. An estimate of savings due to this proactive oversight is not available. Full metering of a water system is estimated by AWWA to save between 20 and 40 percent of water produced, and can be one of the most important water conservation measures any community can implement. Because Security Water District has been fully metered since 2001, these savings have been considered a part of the District’s baseline, and not included in the accounting of the Water Conservation Plan Update as future conservation savings.

- Security monitors water pumped versus water sold on a regular basis by examining its production records versus consumption records. It conducts daily inspections (through observation) of the service area for leaks and uses leak detection equipment to locate leaks. The District's SCADA system can identify leaks or pressure changes in tanks or pumps. The District also has an ongoing program to replace cast iron mains with ductile iron mains, copper service lines with polyethylene services lines. ***Leak detection and leak repair is estimated to have saved about 2% of water produced, or approximately 25,000,000 gallons per year.***
- The District evaluates and upgrades its Water Distribution System Design and Construction Specifications on an ongoing basis. Specific attention is given to use of materials not subject to corrosion and leakage and to minimize system component failure. Estimates of savings from materials have not been quantified for purposes of this update.
- All service connections are metered, a program is in place for meter testing and replacement. Metering of service connections was completed in 2001, and meters are now becoming subject to a second meter replacement program. All source water is metered and accounted for according to the District's various water supply agreements. ***Meter testing and replacement is estimated to save 20% of water produced. Because savings from the District's second meter replacement program will be realized in the life of the Updated Water Conservation Plan, savings from this program will be counted as part of the update as well as past program savings.***
- The District uses rate structures and billing systems designed to encourage efficiency. Billing is accomplished on a monthly basis, all meters are ARM, and the bills have been recently redesigned to add an informational component and to allow bill stuffers. Importantly, all District bills are reviewed by staff for unusually high consumption, and customers notified of such findings. ***Savings attributed to educational and timely billing systems are included in the estimate of educational savings.***
- The District has a Water Waste prohibition. The District has enforcement authority for its prohibition, including levying fines. No savings estimates are associated with this measure, but it is an important one in terms of reinforcing the District's position regarding conservation.
- Leak detection programs are in place at the District as noted earlier, and in 2010, in connection with its goals set forth in the 2010 Water Conservation Plan, the District purchased leak detection "listening" equipment. In 2013, the District began conducting water audits according to AWWA's M36 Manual Guidelines. The results of these audits are discussed at Section 2.2, Historical Demands. To date, no significant savings have been realized as a result of the equipment purchase. However, the District plans to pursue more in-depth leak investigation as part of the updated Water Conservation Plan.

- The District implemented voluntary/mandatory (depending on need) staged watering schedules in 2016. Stages begin with three days per week voluntary watering schedules, and progress through mandatory two days per week, mandatory one day per week and mandatory no outdoor watering. Although stage one, voluntary three day per week watering restrictions do not yield large water savings, they set a valuable precedent in behavior. Sending the message that watering lawns is not unlimited, and that exceeding three days a week is wasteful is a good foundation upon which to base water conservation programs. Three day per week voluntary schedules are particularly effective when, as is the case for the District, the published policy includes stages for much greater restriction, should the need arise. It is much easier to move from a three day a week program to a two day a week program in a water emergency than it is to move from no restrictions at all to serious cutbacks.

Measures which conserve by creating new supply:

- Security Sanitation has eliminated its lagoons, saving substantial amounts of water previously lost to evaporation. As part of Security's decreed augmentation plan, evaporation losses at the wastewater treatment plant are assessed against Security's water rights. Eliminating evaporation losses, therefore, results in ***a direct increase to supply. This increase is estimated to be approximately 100 acre feet per year.***
- In accordance with the District's contract for Frying-Pan Arkansas Project water, that water is available directly for municipal purposes, and useable to extinction. A significant portion of that water returns to Fountain Creek in the form of treated sewage effluent and lawn irrigation return flows. Since this water is almost entirely transbasin water from the headwaters of the Colorado River, these return flows become a new source of water to the stream system. This water is available for use as a replacement source in augmentation plans. Security has the right to purchase annually the return flows associated with its Frying-Pan Arkansas Water under a perpetual contract. Security's decreed augmentation plan (Case No. 90CW28) provides for quantification of its wastewater return flows. Quantification of the lawn irrigation return flow³ is included in the District's Case No. 01CW149. As with lagoon elimination, return flows have the effect of providing an increase in existing supply. ***Savings in the form of new supply from lawn irrigation flows are estimated to be on the order of 122 acre-feet.***
- Security Water District and Widefield Water and Sanitation District formed a partnership in 2003 (WARA) to evaluate the feasibility of recharging the Widefield Aquifer to increase their base pumping amounts as allowed by the

Widefield Aquifer Stipulation. A ruling was made in 2010 in this case. This ruling increased the District's annual pumping allotment from the Widefield Aquifer from 2228 to 2898 acre feet, an annual increase of 670 acre feet. This allows Security to replenish the aquifer with water from any source, and by doing so, increases the amount the District can pump out by an equal amount. **WARA is, in effect, a reuse program that increases the District's supply by 670 acre feet. In a recent presentation entitled "Implementing Colorado's Water Plan", the Colorado Water Conservation Board mentioned this cooperative partnership as an activity of note in the Arkansas River Basin.**

In 2010, the District estimated its overall water savings to date by comparing the systemwide gallons per capita per day usage recorded in 2004 (the year its first conservation plan went into effect) to its 2009 systemwide gallons per capita per day usage. In 2004, customers of Security Water District used 158 gallons per capita per day. By 2009, customers had reduced daily consumption to 128 gallons per capita per day. This reduction of 19 percent over five years reflected the District's conservation efforts, and the impact of "passive conservation" that occurs as old fixtures are replaced under requirements of the Energy Policy Act of 1992, as well as the prevailing attitude among customers nationwide that conserving water is the right thing to do.

By 2016, the District had reduced its systemwide gallons per capita per day usage to 122 gallons. This number represents a reduction of 21% over seven years, ***well over the one and one half percent per year goal set out in the 2010 Water Conservation Plan.*** During this same period, the District experienced a 10% increase in its population. The District's water rates and tap fees were, and will continue to be, a prime contributor to this decrease. Although the District's rates remain among the most reasonable in the area, their steady increase (in a water efficiency encouraging tiered structure) has served to remind customers of the value of water in a semi-arid region, and to encourage wise use. Education, landscape efficiency training in twice annual seminars, ongoing leak detection, and landscape approvals for commercial development are also significant contributors to per capita use reductions. A large portion (nearly half) of the District's homes are built before 1960, so "passive" savings, or the replacement of older, water wasting fixtures that now must comply with Energy Policy Act played a role as well.

Between 2010 and 2016, the District's conservation programs and the District's customers have saved in excess of 400 acre feet per year of treated drinking water. In addition, the District's aggressive programs to create new supply through effective management (reuse, lawn irrigation return flows, and evaporation control have added approximately 892 acre feet of supply.

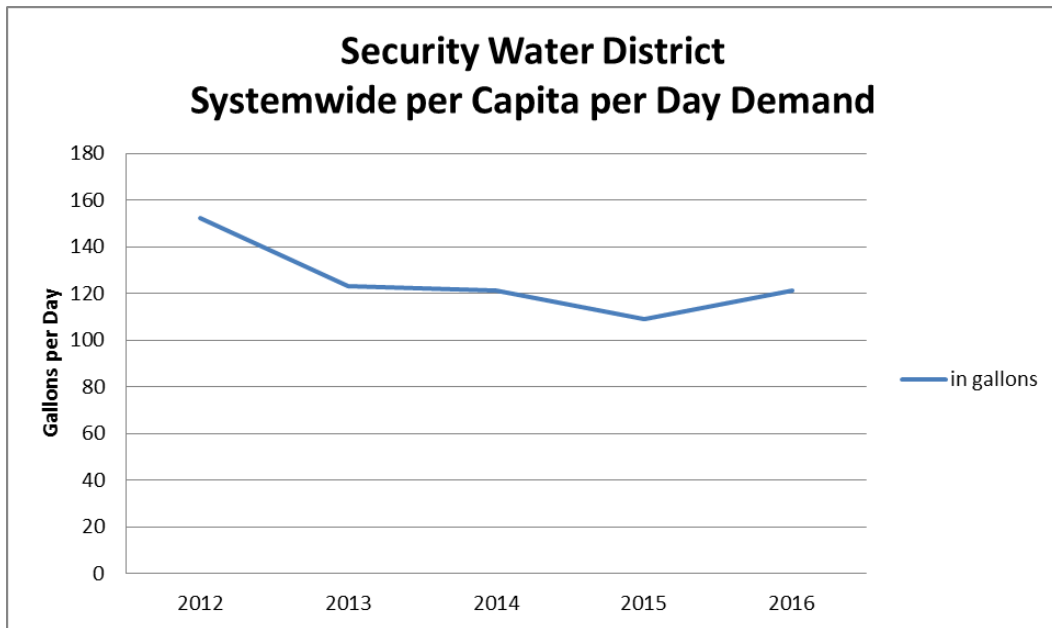


Figure G Systemwide per Capita/per Day Demand over five years

The uptick in demand in 2016 reflects, among other factors, an increase in industrial use, an increase in population, and weather conditions.

2.4 Demand Forecasts

This Plan covers the ten-year period from 2017 to 2027. Projections of demand cover the same ten years. Demand projections are based on past growth in population and water taps. In general, each tap represents 2.5 people. Population increase is based on the number of additional taps each year, and coincides with an approximate 2.5% increase in people.

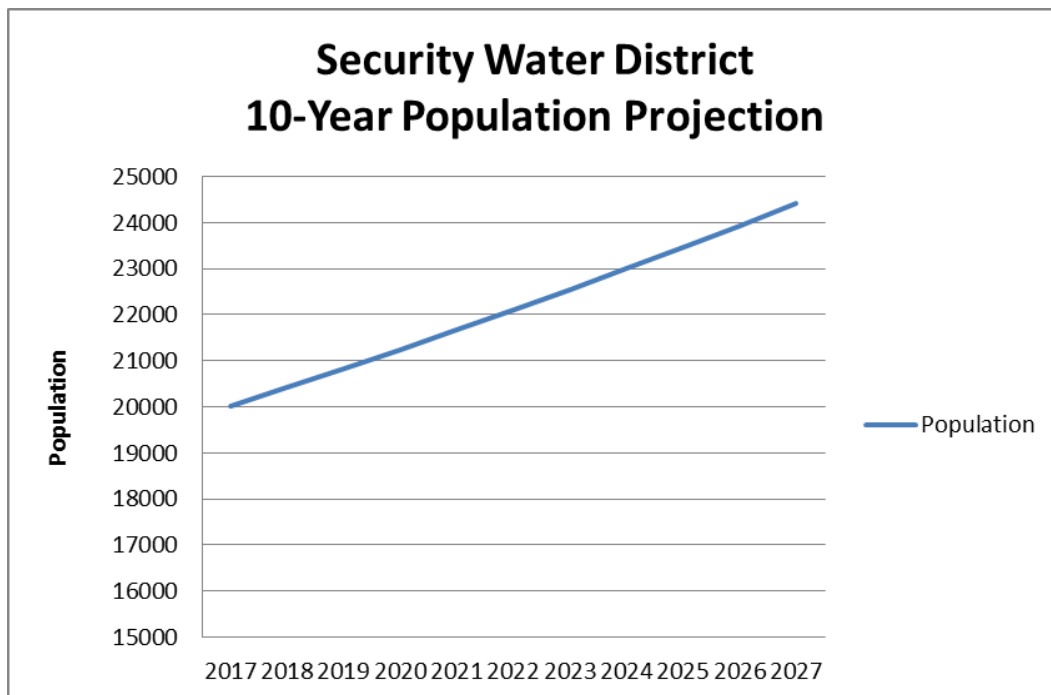


Figure H Ten Year Population Projections

Population projections are based on a review of historic growth, and District records reflecting average increase in taps over time. Average increases in population are fairly consistent, both within the District and in comparison with the District's neighbors in Widefield, Fountain and southern Colorado Springs.

Figure I shows both unmodified demand (demand without conservation), and demand including the effects of passive and active water conservation.

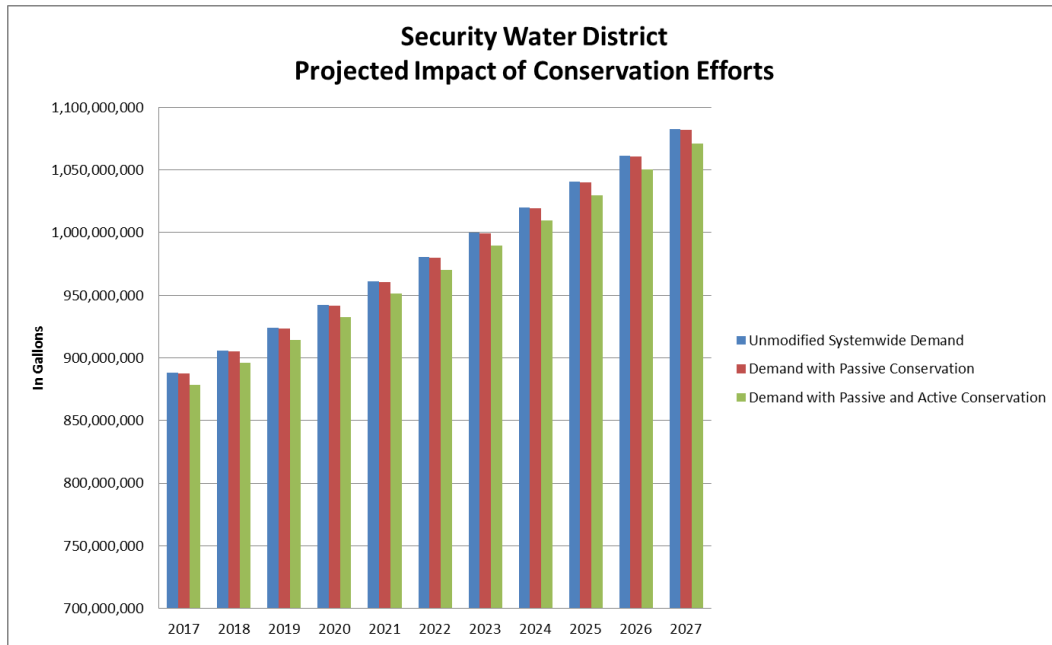


Figure I Projected Impact of Conservation Efforts

As a point of reference, Figure J shows the impact of passive conservation only. Although the impact of passive savings, assuming it continues at the same average rate achieved over the last five years, is very modest, Figure J makes two graphic points. One, in order to meet the District’s water savings goals, more must be done than to rely on passive savings alone (e.g., replacement of fixtures and appliances as a normal course of events). Two, should the conservation efforts put forward in this Updated Water Conservation Plan be less than successful, passive savings could be increased through an expanded rebate/replacement plan (as discussed in the 2010 Water Conservation Plan).

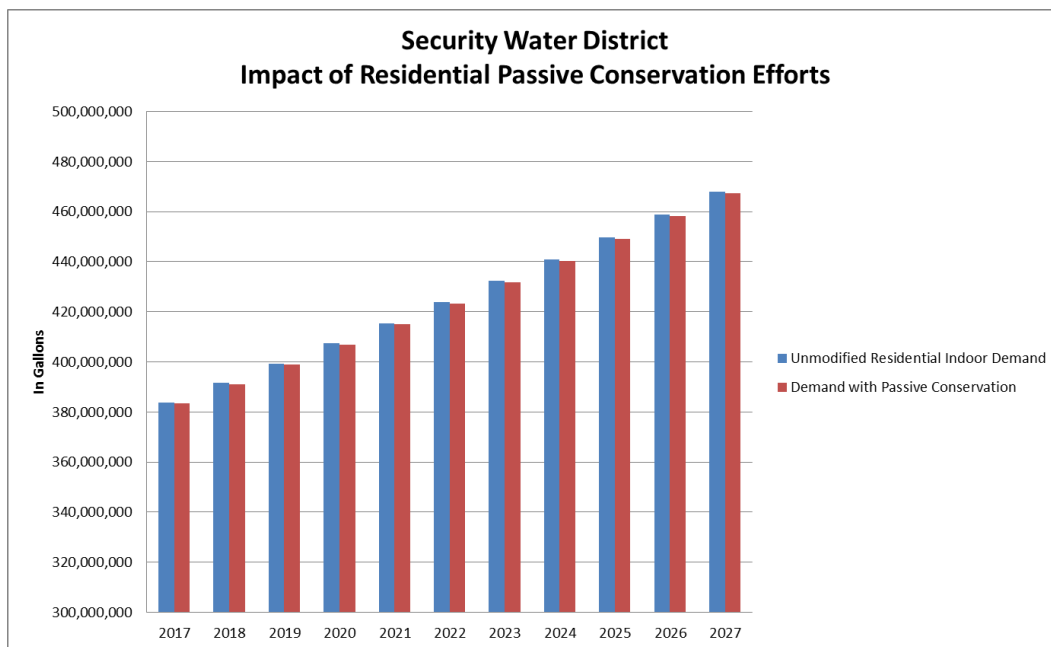


Figure J Impact of Residential Passive Conservation Efforts

Predicting water savings, like predicting weather over a ten-year period is really more art than science. Ultimately, all water savings are dependent on human behavior. Many water professionals believe that there may be some risk in making savings too Draconian. As water savings activities become institutionalized, demand becomes “hardened”. When that occurs, facing some unforeseen water emergency such as extended drought or system devastation, there is nowhere to go to squeeze out more savings. It is with that thought in mind that the District treats some activities with caution.

3.0 Integrated Planning and Water Efficiency Benefits and Goals

3.1 Water Efficiency and Water Supply

As discussed earlier, the District is fortunate in having an adequate supply to meet customer needs well into the future. Needs for augmentation have been provided for. The new water treatment facilities discussed are necessitated by a stricter health advisory with regard to constituents that have contaminated groundwater by entities located outside the District’s boundaries. Construction of these treatment facilities cannot be delayed, with or without conservation.

Conservation’s role in the District’s future supply planning is to make that supply adequate for future generations. That planning was begun during the life of the 2010 Water Conservation Plan. Because the conservation efforts of the District, effective 2004 through the present have been well documented and proven to be effective,

future planning efforts can be based on projections modified for conservation with confidence.

One cost of implementing the District's Water Conservation Plan Update will be that of further investigating the water loss identified in the Water Loss Audits of 2013, 2014 and 2016. That cost has not yet been determined, but the District plans to issue an RFP for the work in the near future, and hopes to seek a conservation implementation grant from CWCB to fund the work. The anticipated savings from the investigation have been incorporated in the modified projections. It is important to note, however, that although some aspects of the investigation can be performed without major cash outlays, other elements of the investigation could require funding that is not cost effective. A review of the District's Water Audits indicates a "revenue cost of lost water" that, in the scheme of things, may not be large enough to justify the cash outlay necessary to correct it – unless and until circumstances make regaining the lost water imperative at any cost.

Water saved through conservation planning will be used for augmentation, and to extend supplies to meet needs of future generations. Although the increased supply will be used to facilitate modest growth, historical data shows that systemwide per capita per day use is decreasing while populations is increasing.

3.2 Water Efficiency Goals

The conservation goals of the updated Water Conservation Plan represent a logical progression from the goals of the 2010 Plan. For example, the landscape efficiency seminars were conducted twice a year under the 2010 Plan. A goal for the Updated Plan is to increase the seminars to include indoor water conservation and, as suggested by the Colorado Water Plan, a seminar on what delivering water to the District's customers entails, from water rights to coping with drought. The goals for more rigorous leak detection grew from the District's concern about water loss that weren't met through the purchase of leak detection equipment. That concern led to Water Loss Audits, which led to recommendations for how to proceed.

Goals for the Updated Conservation Plan are:

- Reducing non-revenue water loss
- Educating the public on the value of Security's water and the complexity of its system
- Reducing residential outdoor water use
- Achieving water efficiency at a price the District can afford

Achievement of water efficiency goals will be evaluated as they have been in the past. Systemwide per capita per day use will be compared to that achieved in 2017. The District is confident its planned activities will meet or exceed the 1% water savings per year goal suggested by the Colorado Water Plan.

Benefits of water efficiency that will accrue to the District will not include the ability to postpone, eliminate or downsize future projects. Acquisition of new water has already taken place, again based on modified demands and an understanding of the District's impending built out status. As discussed earlier, the additional water treatment facilities needed to treat an incursion of perfluoroalkyl into the District's groundwater supply cannot be postponed for any reason. However, less dramatic benefits will accrue such as:

- Moderate increases in water bills, where commodity charges may be offset by lower consumption
- Lower wastewater charges because of lower indoor consumption during the indoor calculation months
- Reduction of outdoor irrigation runoff, potentially improving water quality for downstream users
- Lessening operational costs such as pumping and water treatment
- Providing "insurance" for uncertainties such as drought or stronger Safe Drinking Water Act requirements

4.0 SELECTION OF WATER EFFICIENCY ACTIVITIES

4.1 Summary of Selection Process

The water efficiency activities selected for inclusion in the Updated Water Conservation Plan include:

- Reduction of non-revenue water (water loss) - **Potentially 4,800,000 gallons per year saved, and dependent of the cost effectiveness of identifying the cause**
- Expansion of the District's popular water efficiency seminar program to include a seminar on the value of water, expansion of newsletter/bill stuffer/survey programs (adding a seminar will be tested in 2018 for cost effectiveness and customer acceptance - **500,000 gallons per year saved (from total education program)**)
- Continued interface with the District's largest customers, the school district, Schlage Lock and others to expand their water efficiency - **500,000 gallons or more per year saved**
- Continue the District's newly implemented watering schedule restrictions. - **500,000 gallons per year saved**
- Passive **savings of 500,000 gallons per year** from fixture replacement

The selected activities were chosen based on a review of the Colorado Water Plan, a review of CWCB's Guidance Document for developing Water Conservation Plans, and

discussions with staff and District consultants. They were then evaluated for savings potential, and reviewed by a volunteer focus group selected from the 2017 fall landscape efficiency seminar.

4.2 Demand Management Activities

Please note that the full range of demand management activities required by HB 91-1154 were reviewed in connection with the preparation of the 2010 Water Conservation Plan. Because that review and evaluation were both recent and complete, the review was not repeated in its entirety. Rather activities were selected as a result of the Water Loss Audits conducted in 2013, 2014 and 2016; and because they were logical expansion activities to those chosen during 2010. The focus group concurred.

4.2.1 Foundational Activities

Metering

Security Water District is fully metered, on both the supply side and the demand side. Meters were installed prior to 2001 and all meters are read automatically (AMR). The Water Loss Audit conducted in 2016 recommended that a meter sampling program begin to determine overall accuracy of the District's meters, and this activity has been included in the District's new conservation activities.

Demand Data Collection and Billing Systems

The District's billing system is fiscally responsible. Billing categories include commercial, commercial irrigation, residential and multi-family. Bills are issued monthly, and are reviewed by management staff for high use occurrence. As a result of evaluation for the 2010 Water Conservation Plan, water bills were redesigned for ease of access and to incorporate conservation tips. Bills were reconfigured so that bill stuffers such as newsletters could be included. No immediate changes are planned as a result of the Updated Conservation Plan.

Water Efficiency Oriented Rates and Tap Fees

Water rates for the District effective February 21, 2018 are:

Residential Service Charge \$16.63 for ¾" meters, \$21.32 for 1" meters (higher service charges apply to larger meter sizes)

Residential Volume Charges

0-5000 gals	5001-15000 gals	15001-25000 gals	25001 + gals
\$3.62/1000 gals	\$4.53/1000 gals	\$5.67/1000 gals	\$8.51/1000 gals

Commercial Service Charge

\$17.78 for ¾" meters, \$22.47 for 1" meters (higher service charges apply to larger meter sizes)

Commercial Volume Charge

0-25000 gals	25001-50000 gals	50001 + gals
\$4.42/1000 gals	\$4.42/1000 gals	\$4.42/1000 gals

Commercial Irrigation Service Charge

\$17.78 for ¾", \$22.47 for 1" – (higher service charges apply to larger meter sizes)

Commercial Irrigation Volume Charge

\$5.58/1000 gals

Water Fees for New Construction

Tap Fees

¾ inch	\$5,200
1 inch	6,500
1 ½ inch	9,500
2 inch	11,800
3 inch	21,400
4 inch	33,700

Water development fee:

Typical single family residence - \$11,000 (¾ tap size with approximately one-half acre-foot of water diversion)

Commercial to be determined upon plan review

Inspection fee and construction water fee:

Residential and commercial inspection fee - \$28.00

Residential construction water fee - \$30.00

Commercial construction water fee – determined at time plans are reviewed

System Water Loss Management and Control

Distribution system leak identification and repair designed to encourage water efficiency in a fiscally responsible manner have been fully identified and implemented in connection with the 2004 and 2010 Water Conservation Plans.

Water loss management and control programs, including water audits, leak detection and repair programs and water line replacement programs are in place, and have been discussed under existing demand management activities, Section 2.3.

4.2.2 Targeted Technical Assistance and Incentives

Water efficient fixtures and appliances (including toilets, urinals, clothes washers, showerheads and faucet aerators) were fully evaluated for the 2010 Water Conservation Plan. Incentives to encourage customers to install fixtures and appliances were considered at that time. The 2010 Plan includes limited rebates to encourage

installation. At this time, the District does not believe additional rebates or incentives will be cost effective. The District has limited resources, including staff, to devote to the administration of rebate programs, which can be quite labor intensive. In prioritizing which new measures will offer the greatest return for the lowest investment, other activities (to be discussed later) were chosen for inclusion in the District's updated Plan.

Level 1 Utility/Municipal Facility Water Efficiency

As a special district, Security Water District has no jurisdiction over municipal facilities. Its own office is small, housing three restrooms. Its equipment garage also has one restroom. These facilities use water efficient fixtures.

The District's primary conservation activity for the Updated Water Conservation Plan is its pursuit of non-revenue water as described in an earlier section. Following an initial investigation and any corrections necessary, the District plans to hire a contractor with the specialized skills of leak detection to investigate further. According to the District's Water Loss Audit, it will be possible, with in depth detection, to reduce its per connection loss to about 20 gallons per day. This program is anticipated to result in savings of approximately 4,800,000 gallons annually, but will only be possible with financial assistance such as a grant.

Level 2 Management of Largest Customer Demands

Security Water District serves several schools, and the manufacturing plants for Schlage Lock. These entities comprise the most of District's largest customers. Although large customers were not targeted in the 2010 Water Conservation Plan, the District has already assisted one of the school with the installation of four smart meters which are read daily. District personnel are available to assist the schools on an as needed basis to achieve maximum efficiency. In the Updated Plan, the District plans to include Schlage Lock in its program of in person, as needed assistance. The District estimates that this effort on behalf of its largest customers will save approximately two percent of the customers' water use annually, about 500,000 gallons. This activity can be implemented using existing field staff, and existing consultants, making it cost effective.

Level 3 Management of Remaining Customer Demands

Security Water District plans, under its Water Conservation Plan Update, to manage customers' demands in two ways:

- Expanding its current educational program that offers two landscape efficiency seminars per year. In 2018, the District will add one seminar to address the Colorado Water Plan's goal of helping customers understand the challenges of delivering water to customers in the west, on a trial basis. The seminar will include an overview of water rights, compacts and other issues unique to western water. As discussed in a previous section, the District will monitor impact and community acceptance of this added seminar. The two existing landscape efficiency seminars will continue. All three will offer ten landscape evaluations per session. The landscape evaluations, including irrigation system inspection and controller assistance, will be conducted by the District's conservation partner, Water Returns. The seminars are, historically, attended by 35 to 60 people each. Therefore, beginning in 2018, between 105 and 180 people will receive a 2-hour training session, and 30 customers will receive a two hour on site landscape and irrigation efficiency evaluation. These seminars are the centerpiece of the District's education efforts, and are very well received. They are attended by staff, District management and members of the District's Board of Directors, and provide an excellent opportunity for customers to meet water District personnel. The District expects that this major component of its education programs will continue to generate savings of about 500,000 gallons of total water use per year.
- The District will continue its newly implemented policy of voluntary watering restrictions. As discussed earlier, the activities' baseline requirement is a three-day watering schedule – with days specified – and is voluntary. However, the program as implemented comprises stages. It progresses from 3-day voluntary, through 2-day mandatory to one-day mandatory and in extreme situations, no watering at all, mandatory. Because the new program includes enforceable provisions for mild to severe drought conditions, or a system failure, it is expected that customers will adhere to the schedules. The restriction program is anticipated to generate savings on the order of 500,000 gallons per year.

4.2.3 Ordinances and Regulations

- No ordinances or regulations are anticipated, as the District is a special district, with no jurisdictional powers.

4.2.4 Educational Programs

- The District plans to expand its existing educational programs as detailed in Level 3 Management of Remaining Demands above.

5.0 IMPLEMENTATION PLAN

5.1 Implementation Plan

Technical Assistance to School District 3 and Schlage Lock, (District's largest customers)

- This activity has already begun, and will continue on an as needed basis. It entails on site visits by District staff and District consultants to review individual needs of these customers. For example, smart meters have been installed at the school. The District will contact Schlage Lock, noting their water use history and offering assistance as needed through District personnel or consultants of the District. No additional cost to the District is anticipated. Letters to the largest customers will be mailed prior to the start of the 2018 irrigation season and followed up with personal contact.

Expanded Education program to all water customers

- The program has existed since 2008. It will be expanded to include an additional seminar, and an additional ten landscape efficiency audits. Detail is provided above. Seminars are coordinated and conducted by the District's consultants, Water Returns. They are currently held twice a year, and will be expanded to three times a year (depending on community acceptance). Evaluations are conducted by Water Returns. Each seminar costs the District approximately \$500, plus ten landscape/irrigation evaluations at \$50 each. Historically, seminars take place in April and October. The third seminar will be added mid-summer 2018. This expansion will cost the District one evening of staff time (above the current two seminars) and \$550 in fees to the consultant for the seminar and the evaluations.

Voluntary/Mandatory watering restrictions

- The District's Board has already approved this program. It has been posted on the District's webpage, disseminated in bills, and made available in hard copy at the District office. District field staff provide enforcement. No additional cost or staff time is anticipated.

Advanced Leak Detection

- As recommended in the 2016 Water Loss Audit, the District will employ specialized contractors to perform highly sophisticated leak identification procedures, including calibration of supply meters associated with the Fountain Valley Authority water, depending on funding and cost effectiveness. The District will correct problems within its purview, identified in connection with real or apparent losses, in order to reduce its per connection per day loss to 20 gallons by 2027, again depending on funding and cost effectiveness. It will also begin a program to sample meters for accuracy and continue to replace meters as needed. Existing experienced staff will carry out appropriate sampling, repairs and replacements. A Request for Proposal will be issued in 2018 for services of investigation and calibration consultants. Cost of the services are unknown at this time, but it is anticipated that the District will apply for a Colorado Water Conservation Board grant to implement this work, making it cost effective for the District. Implementation of this plan will be contingent on receipt of grant funding.

5.2 Monitoring Plan

Monitoring data will be collected, as they have been since the inception of the 2010 Water Conservation Plan, in order to monitor progress. The data reviewed will include:

- Annual costs of implementing the activities
- Water savings estimates, based on demand numbers, particularly system wide per capita per day numbers (these data are collected and processed annually in connection with HB 10-1051 reporting to the Colorado Water Conservation Board.)
- Activity tracking data such as attendees at seminars, number of landscape evaluations, surveys, specific actions for large customers, costs and findings of leak detection investigations. (Data is developed following each of the activities, by consultants and staff).
- Relevant weather data will be collected from the El Paso County weather stations to normalize consumption data for irrigation use.

A report on the progress of implementation of the Water Conservation Plan Update will be provided to the Board of Directors once each year.

6.0 ADOPTION OF NEW POLICY

6.1 Adoption of New Policy

No new policy is associated with the Updated Water Conservation Plan.

6.2 Public Review Process

The Plan will first be reviewed by District staff, then by a focus group selected from volunteers at the fall landscape efficiency seminar. Concurrent with focus group review, the Plan will be made available for public review on the District's website and in the District office and presented to the District Board at its February meeting. Lastly, the Plan, including any comments received during public comment and any suggestions made by the focus group, will be presented to the Board for its approval in March. All comments from the focus group and the Board meeting will be recorded and included as an appendix to the Plan.

6.3 Local Adoption and State Approval Processes

The Plan will be formally adopted by the District's Board of Directors. A copy of the official adoption document will be included as an appendix.

6.4 Periodic Review and Update

The District anticipates its next Plan update will be due in the year 2025. The Water Conservation Plan update will be conducted using the monitoring data described above.