CASTLE ROCK water
Securing our future drop by drop

DECEMBER 2017

Demolition of Old Wastewater Treatment Plant on Caprice Drive

By: Tim Friday, Asst. Director and Shawn Griffith, Operations Manager

A fixture in the landscape that has occupied the address at 1400 Caprice Drive for over 30 years, the remnants of the former Castle Rock Wastewater Treatment Plant (WWTP), was finally reduced to rubble and then filled in to pave the way for future improvements, namely the Parks and Facilities Management Operations and Maintenance Building.

This facility was built in the early 1980s and was operated until 1990 when the Plum Creek Wastewater Authority was formed (now known as Plum Creek Water Reclamation Authority - PCWRA) and the Town's wastewater was redirected for treatment at PCWRA. The old WWTP consisted of a headworks building, secondary treatment, advanced water treatment and sludge drying beds.

Old wastewater treatment plant before demolition – Sep. 13, 2017.

In order to make this happen, bids were solicited and two were received: one for $322,000 and one for $618,900. Even the low bid was higher than expected, so we worked with the low bidder (53 Corporation) to remove backfilling the structures from their scope and the contract amount was reduced to $155,500. Ultimately, the demolition work was completed for $147,748. To complete the project, the Operations Division worked with Public Works and Douglas County to remove sand from a stormwater pond along Prairie Hawk Drive, killing two birds with one stone. Six thousand one hundred (6,100) cubic yards of sand were removed and hauled to the old WWTP site to backfill the structures. This work had to be done anyway and finding a site to place the sand would have resulted in more costs. So not only did the Town

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WWTP Demolition, continued

save $174,000 in costs for purchasing and placing backfill material, but the pond was cleaned out and the material was beneficially reused for fill. The final result is the old WWTP was demolished, the holes were backfilled. Douglas County has a new location for operating their slash program, Public Works has a relocated area to store excess snow and Parks and Facilities Management have a relatively clean site on which to construct a new O&M building.

The dirt from the stormwater pond was trucked to the old wastewater plant and utilized to backfill the basins.

The old wastewater plant is the future site of the Town of Castle Rock Parks Operations & Maintenance facility. This project utilized 744 truckloads of dirt and workers traveled a total of 3,794 miles during the operation.

Castle Rock Water reviewed 80 applications (see below) this month which compares to 59 during the same time period in 2016. The average assigned due date by Development Services was six days, and we completed the reviews in an average of five days.

3	Agreements
2	Planned Development Plans
6	Field Change Orders
13	Grading, Erosion, and Sediment Control (GESC) Plans
2	Miscellaneous
3	County Referrals
6	Plats
7	Preliminary Project Applications
16	Construction Drawings
15	Site Development Plans
7	Technical Criteria Variances

The applications reviewed consisted of:

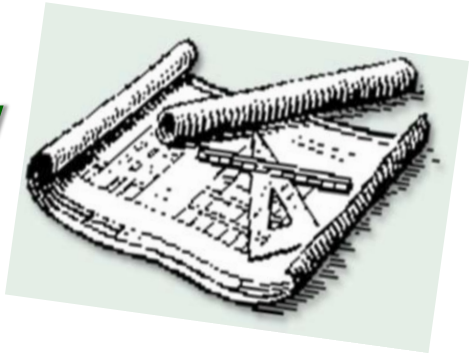
32	1st Submittals
20	2nd Submittals
28	Special reviews
31	Completed late*
61	Completed on-time as scheduled*

** Total late/on-time applications are greater than the total number of projects, due to some projects being reviewed by multiple reviewers, so it was both late and on-time, depending on reviewers work load.*

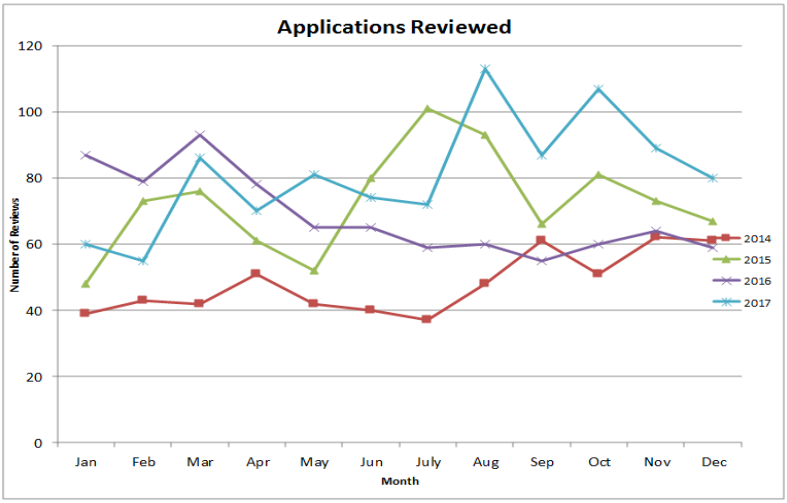
In addition, Castle Rock Water completed 53 building permit reviews and associated system development fees.

Plan Review Update

By Tina Close
Plan Review Engineer



Castle Rock Water provides plan review for all water, wastewater and stormwater projects submitted through the development review process. The line graph (below) shows development activity data (by month and year) since 2014.



2017 Water Demands

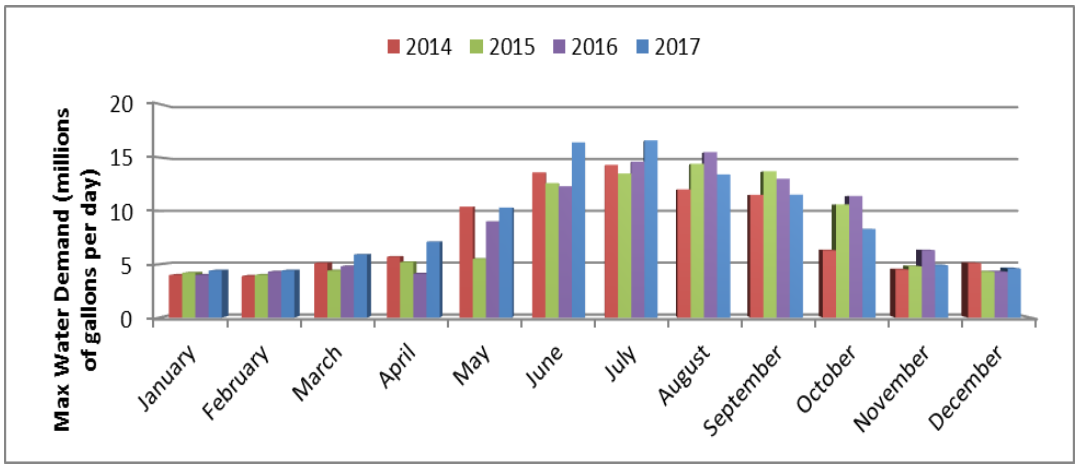
By: Sheri Scott, Water Resources Program Analyst

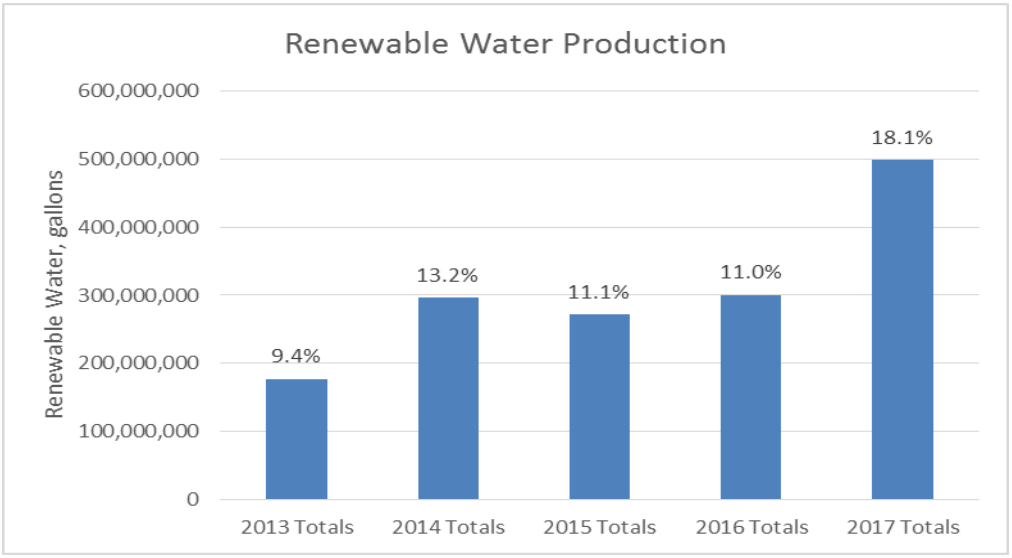
The maximum daily water demands are plotted by month from 2014 to the current month. As observed by the data, the maximum demand for the month of December was 4.6 million gallons per day (MGD) which was approximately equal to the 5-year average maximum daily demand for the month. Summer time maximum demands inform us of the size of the infrastructure necessary to provide water service over short periods of time and help us to plan future water resources needs. The water demand total for December was 127.3 million gallons (MG), which was about a 7.5% decrease from the November 2017 total of 137.5 MG, and a 2.7% increase from the December 2016 demand of 124.0 MG.

The CR-1 diversion produced an average of 1.5 MGD for the month of December. The Town's thirteen alluvial wells and CR-1 produced a total of 75.7 MG of renewable water during December, which represents 59.5% of the total water supply for the month and 18.1% (498 MG or 1,528 acre-feet) of the annual water supply (2.747 billion gallons). The total renewable water produced since the opening of the PCWPF has surpassed 1,543 MG, which represents 12.8% of the Town's total water supply since the alluvial wells began pumping in May 2013. Renewable supplies are those water sources that can be used over and over, to extinction. Reusable supplies can be renewable (e.g. WISE water) or nonrenewable (Denver Basin Groundwater). From 2013 through 2016 Castle Rock has used an average of 9.2% of available reusable supplies, however, in 2017 we have really ramped *Continued on next page*

Water Demands, continued

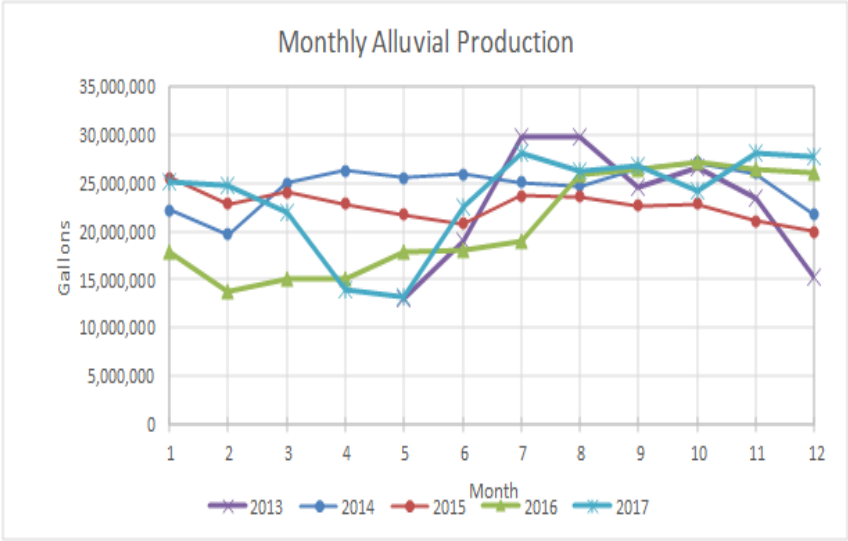
up our usage of this resource. The average reusable supplies used by Castle Rock for 2017 through December is 32.4% with 71.4% of available reusable supplies being used in the month of December.





The percentage shown on top of the bars is the amount of renewable water relative to total water production.

The graph (right) shows the monthly production of the Town's alluvial well system. The production from the alluvial wells in December 2017 was 27.8 MG, which is more than it had been in any previous December since we began operating PCWPF.



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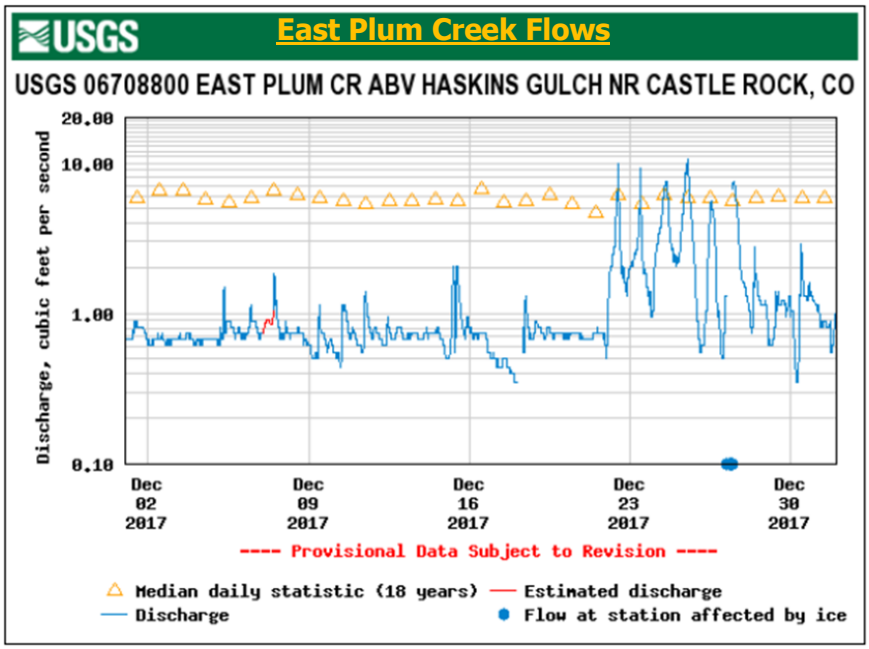
Water Demands, continued



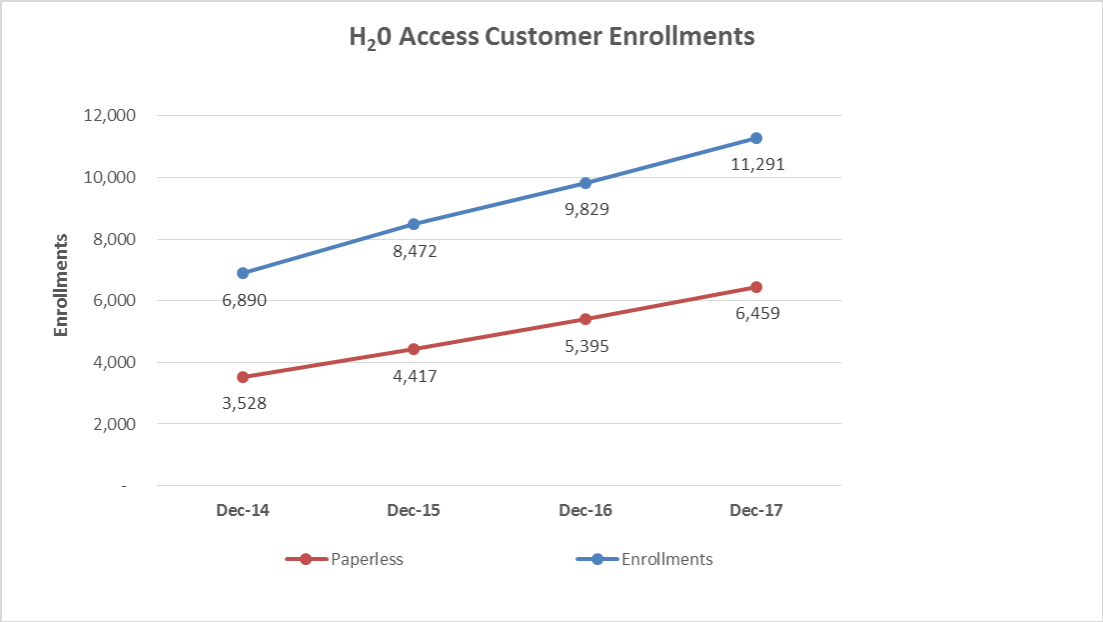
The flow hydrograph represents stream flows in East Plum Creek taken from the stream gauge located above Haskins Gulch. The hydrograph shows that flows in the East Plum Creek basin ranged between 0.5 and 10 cubic feet per second (cfs) during the month of December, with flows averaging around 0.6 cfs for the majority of the month until precipitation later in the month caused spikes of 10 cfs. During December, there were active calls on the South Platte River. Some of the active calls have had a more senior water right than some of the Town's water rights. This means that those diversions are out-of-priority, so the stream depletions will be covered by non-tributary return flows. This also means that the Town will have slightly less reusable water going down Plum Creek during an active call. The priority date on a river call may change each day depending on the stream flow available and the seniority of the diversions that need water on that day. According to the U.S. Drought Monitor from USDA, the majority of the South Platte River Basin is experiencing abnormally dry conditions. The NRCS Colorado SNOTEL report for January 3, 2018 shows the snow/ precipitation for the South Platte River Basin is at 100% of average.

Business Solutions

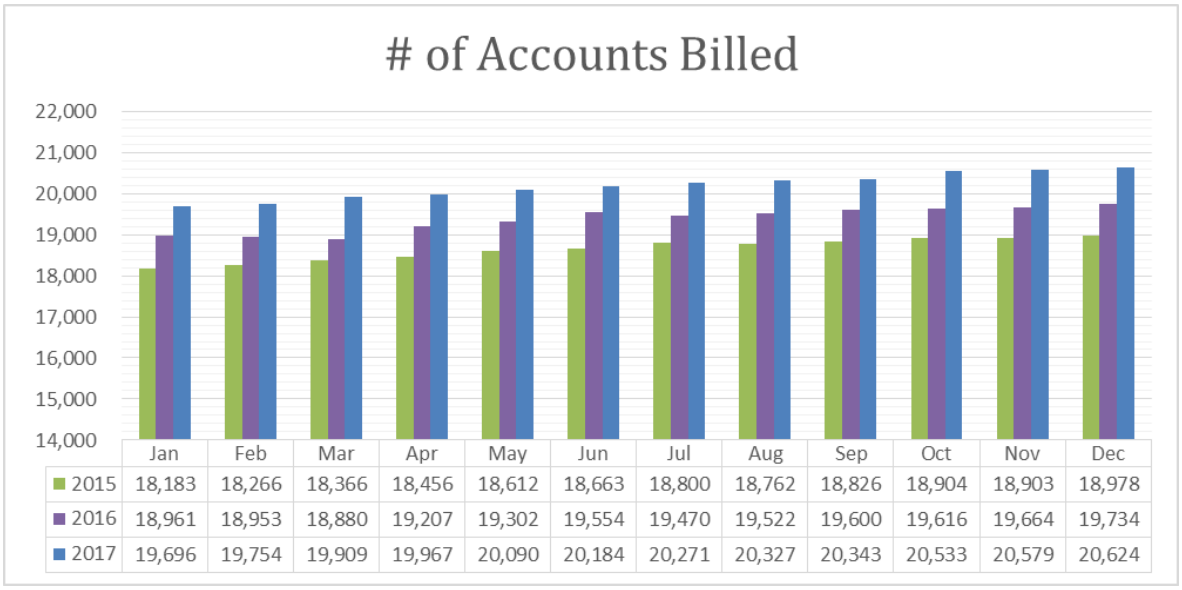
Customer Statistics

By: Anne Glassman, Business Solutions Manager

Our Business Solutions Team continues to track a host of statistics and data as we continue to evaluate our levels of service and look for efficient ways to improve on these levels.

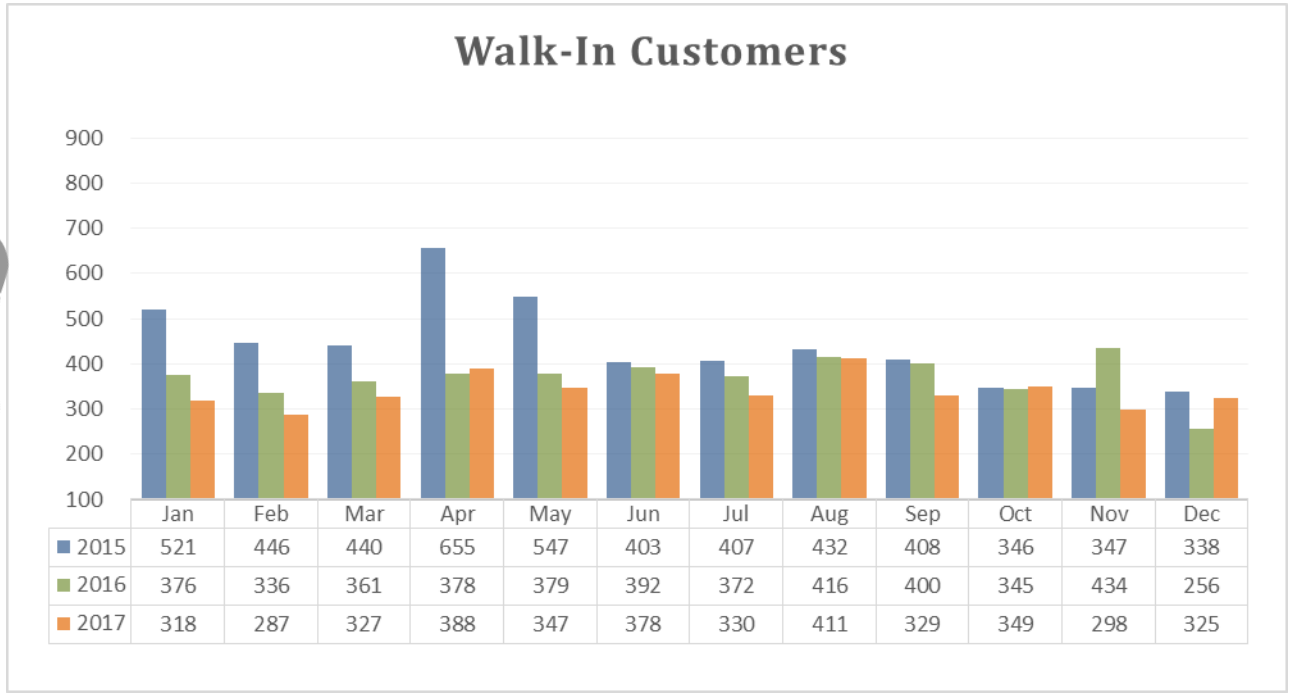


Customer enrollments have increased by 64% and customers choosing to go paperless have increased by 85% since December 2014. The customer online portal has been available to customers since January 2014 when it was first launched.



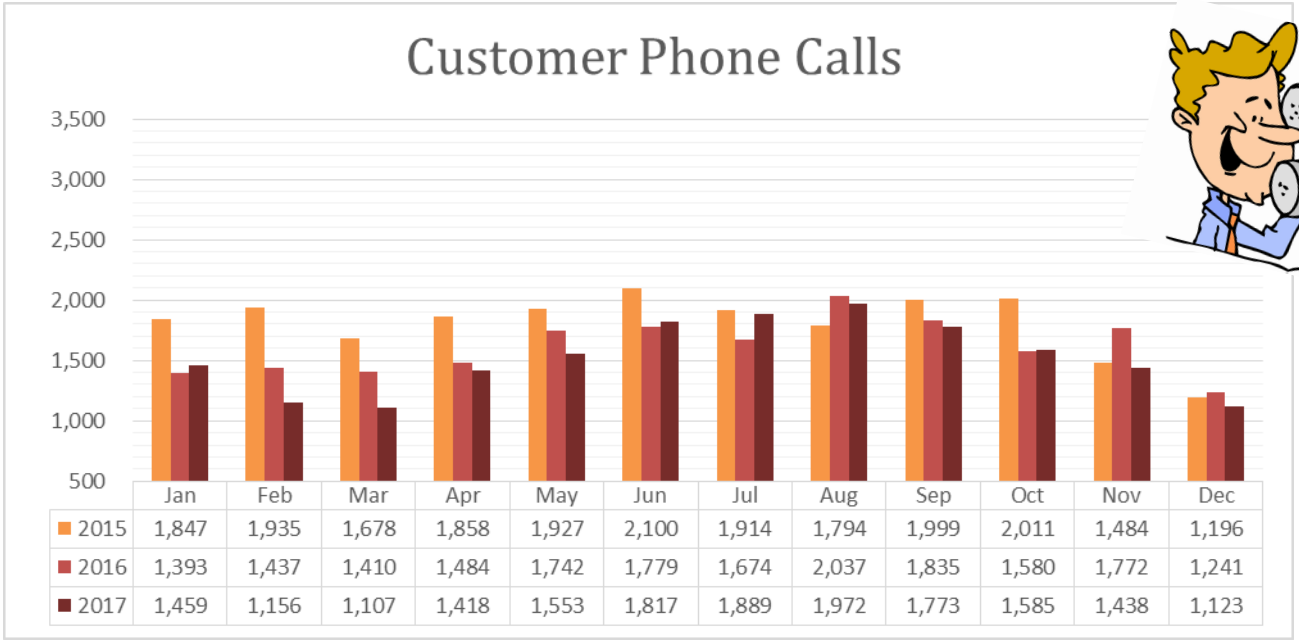
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	18,183	18,266	18,366	18,456	18,612	18,663	18,800	18,762	18,826	18,904	18,903	18,978
2016	18,961	18,953	18,880	19,207	19,302	19,554	19,470	19,522	19,600	19,616	19,664	19,734
2017	19,696	19,754	19,909	19,967	20,090	20,184	20,271	20,327	20,343	20,533	20,579	20,624

The number of accounts billed continues to increase year over year due to new residential and commercial growth.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	521	446	440	655	547	403	407	432	408	346	347	338
2016	376	336	361	378	379	392	372	416	400	345	434	256
2017	318	287	327	388	347	378	330	411	329	349	298	325

Walk-in customers are consistent with this same time in the previous years.



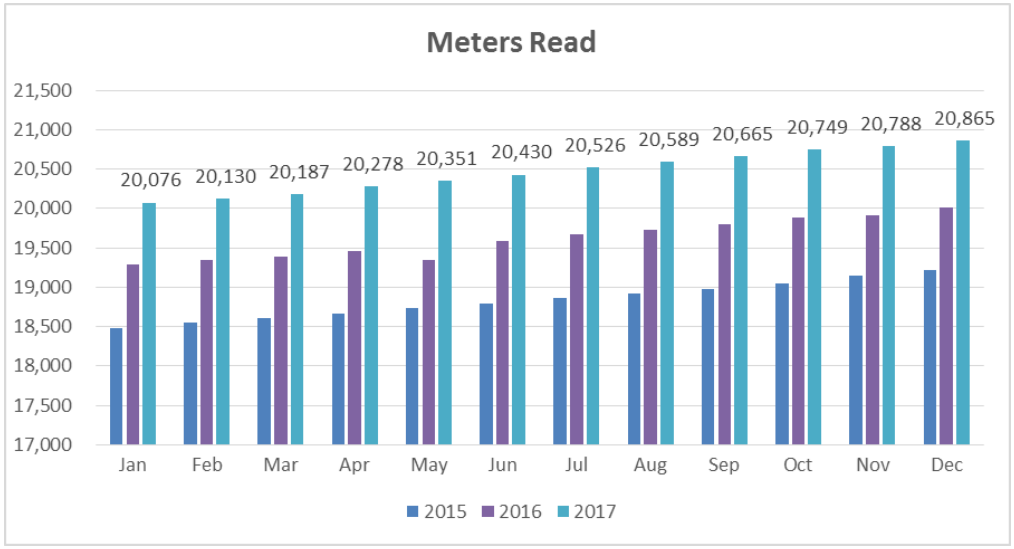
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	1,847	1,935	1,678	1,858	1,927	2,100	1,914	1,794	1,999	2,011	1,484	1,196
2016	1,393	1,437	1,410	1,484	1,742	1,779	1,674	2,037	1,835	1,580	1,772	1,241
2017	1,459	1,156	1,107	1,418	1,553	1,817	1,889	1,972	1,773	1,585	1,438	1,123

Customer phone calls are consistent with this same time in the previous years

METERS

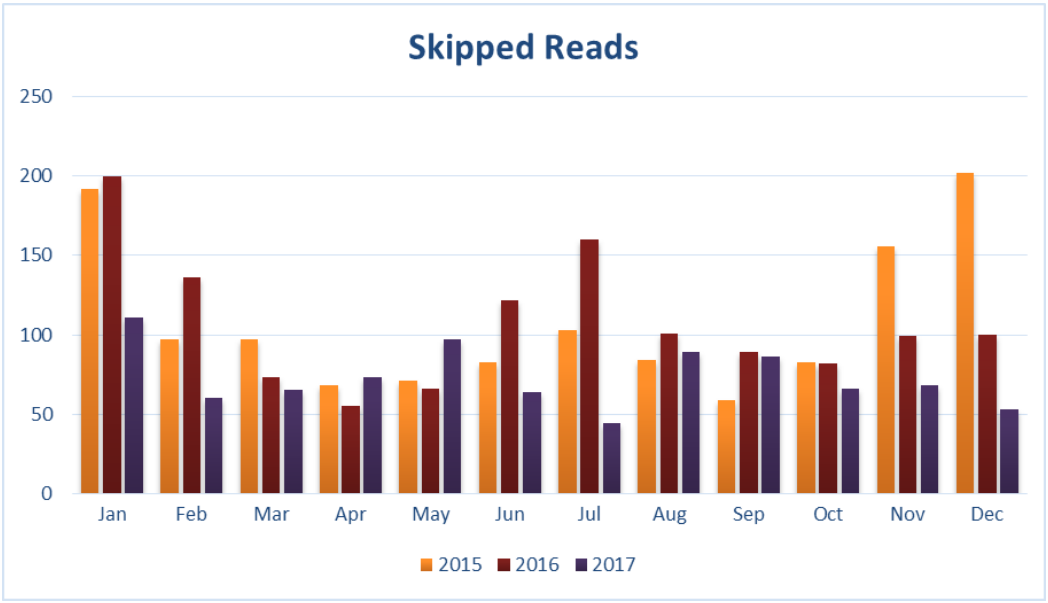
Meter Sets

Month-to-Date 79
Year-to-date 896



The meters read continues to increase month-to-month due to new residential and commercial accounts, with a significant increase year-over-year.

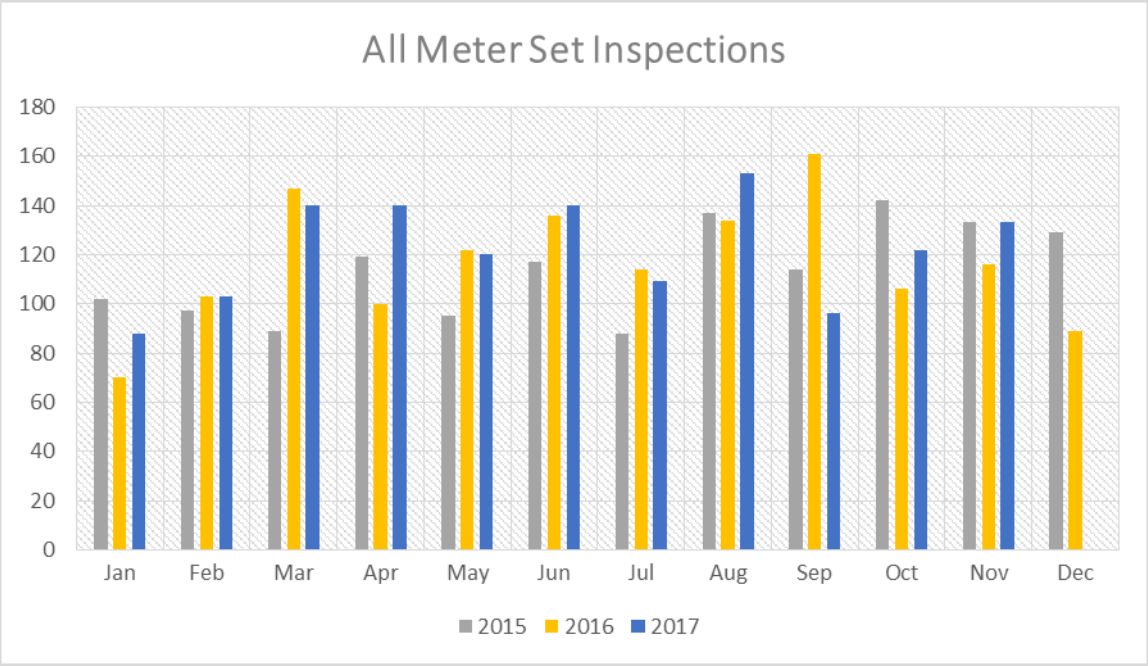
Skipped Reads



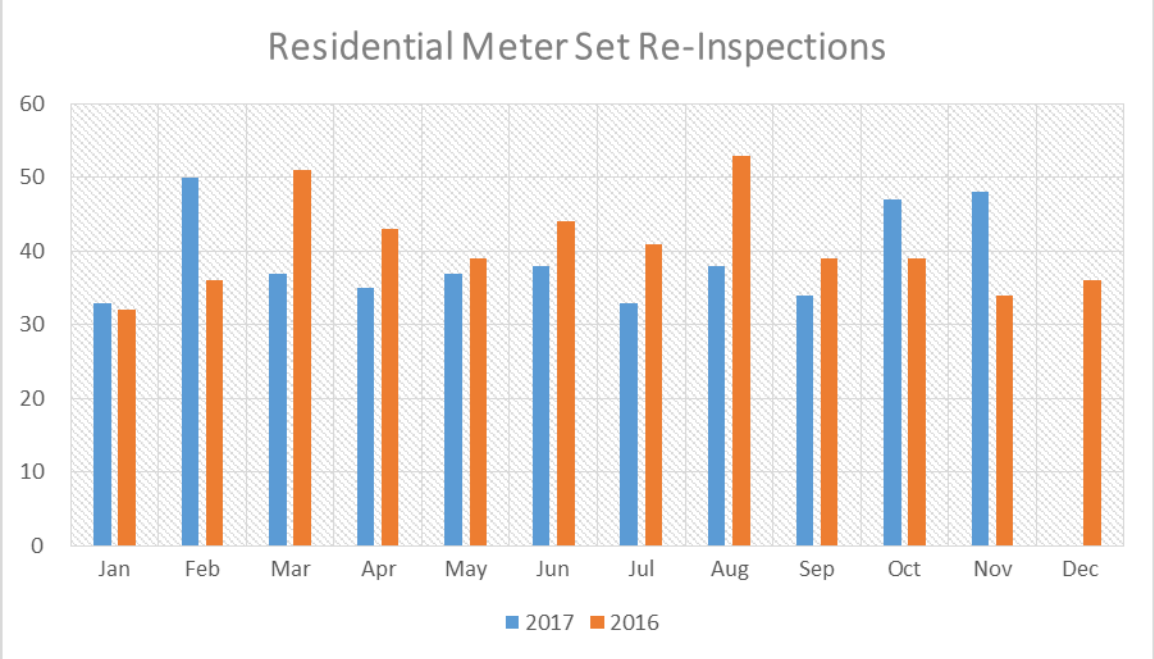
The American Water Works Association (AWWA) standard for skipped reads is 2 percent, so at 0.25 percent in December, we still continue to stay below the industry average. Skipped reads are down significantly year-to-date at 876 compared to year-to-date 2016 at 1,283. This is a result of continued maintenance and repair efforts on meter infrastructure.

WHY IS THIS IMPORTANT?

It is a strong indication of the level of preventative maintenance being done by our team. A skipped read is indicative of a problem with the metering infrastructure (i.e. battery, wiring, etc.) Fewer skipped reads means more properly working meters, which is good for all our customers.



Meter set inspections are consistent with the trends we see this time of year.



Residential meter set re-inspections are slightly lower in total for 2017 compared to the same time period last year. This is a good indication meters are being set properly the first time, thus not creating additional inspections.

A vital part of our preventative maintenance program is conducting annual leak detection of the distribution system. In December, 144 miles of pipeline was successfully inspected. The photos show a small leak that was detected, and was then repaired by the field services team, before it became a big problem.

Stormwater Update

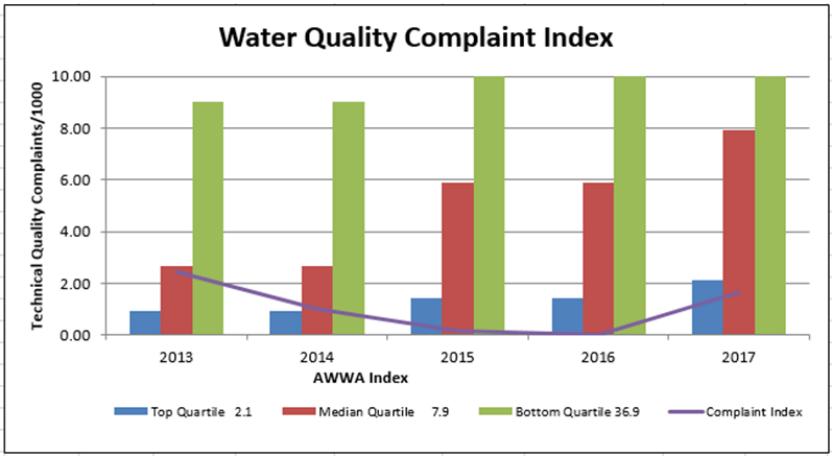
Our team of four "storm troopers" maintains over 138 miles of pipe and drainageways, 110 detention ponds and 4,439 inlets as well as completes special projects designed to improve water quality.

The Stormwater team and Public Works participated in a joint project moving dirt from a stormwater pond to the old wastewater plant on Caprice Drive for backfill. Maintenance was conducted on the Omni Regional pond, near Prairie Hawk Dr., removing its built up sediment and restoring pond capacity. For more details on this project, see page 1 and 2.

Our team maintains about 810 miles of water, wastewater and stormwater pipeline, enough to run from Castle Rock to Las Vegas, Nevada.

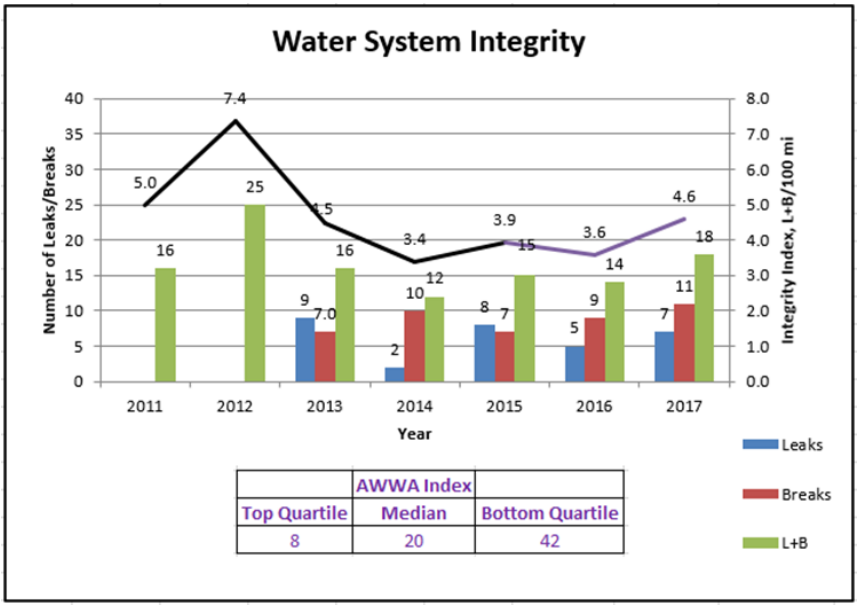
Water Quality Complaints

The Water Quality Complaint index shows that we are doing very well in this category; rating in the Top Quartile since at least 2015 according to the American Water Works Association. Our score was even better in 2016! There were no water quality complaints in December 2017



For more information, view the current water quality report at CRgov.com/**waterqualityreport**.

Water System Integrity



As the Water System Integrity chart indicates, our occurrence rate has generally decreased over the last four years. We have been in the top quartile, the top 25%, for water system integrity based on American Water Works Association benchmarking since 2011. There were four water system integrity issues in December.

Before you start a project, call 811. Whether you are planning to do it yourself, or hiring a professional, we'll help you do it safely. The local 811 Call Center will contact Castle Rock Water. We will schedule a time to come out to locate public water and wastewater lines in the road and in your project area.

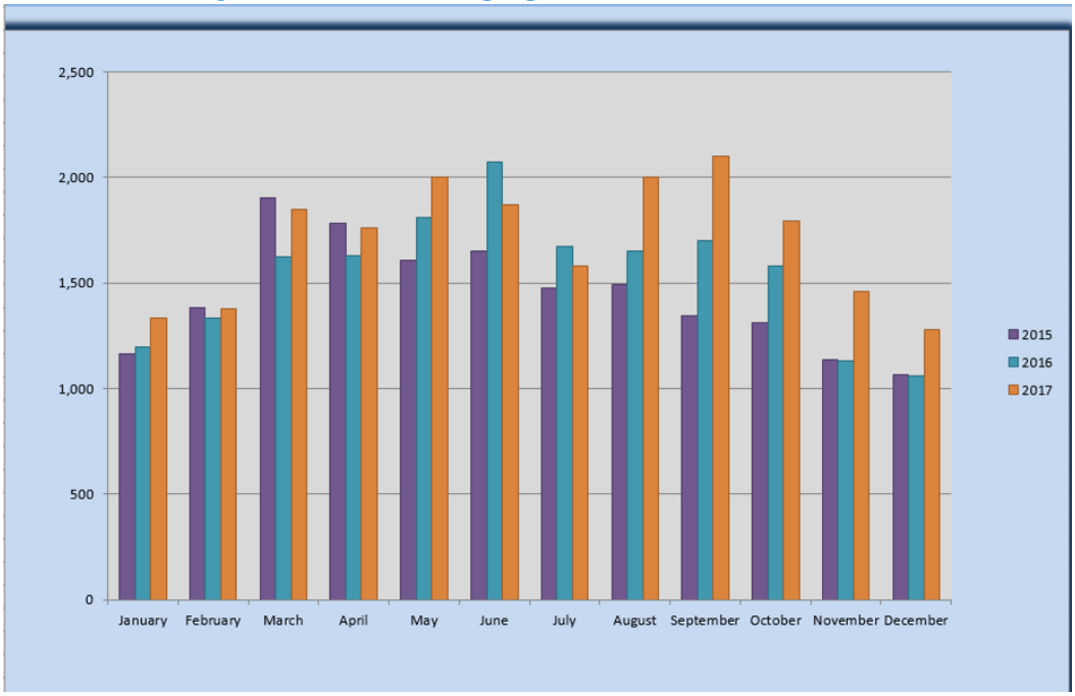
The graphs below show our monthly utility locates and a chart showing the year-to-year comparison

ANNUAL UTILITY LOCATES

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
January	577	475	617	1,190	1,289	1,162	1,199	1,334				
February	521	485	538	1,094	1,093	1,383	1,334	1,378				
March	660	552	818	1,437	1,349	1,906	1,625	1,851				
April	838	681	1,025	1,482	1,552	1,784	1,631	1,760				
May	853	863	985	1,541	1,531	1,609	1,809	2,002				
June	969	844	982	1,314	1,399	1,654	2,075	1,872				
July	680	582	859	1,350	1,392	1,477	1,675	1,582				
August	901	723	1,123	1,476	1,468	1,494	1,651	2,001				
September	880	723	1,029	1,240	1,373	1,343	1,701	2,102				
October	715	688	1,155	1,501	1,376	1,314	1,579	1,792				
November	536	518	1,041	1,072	866	1,134	1,131	1,460				
December	415	405	925	1,005	1,043	1,063	1,059	1,277				
Total	8,545	7,539	11,097	15,702	15,731	17,323	18,469	20,411	0	0	0	0

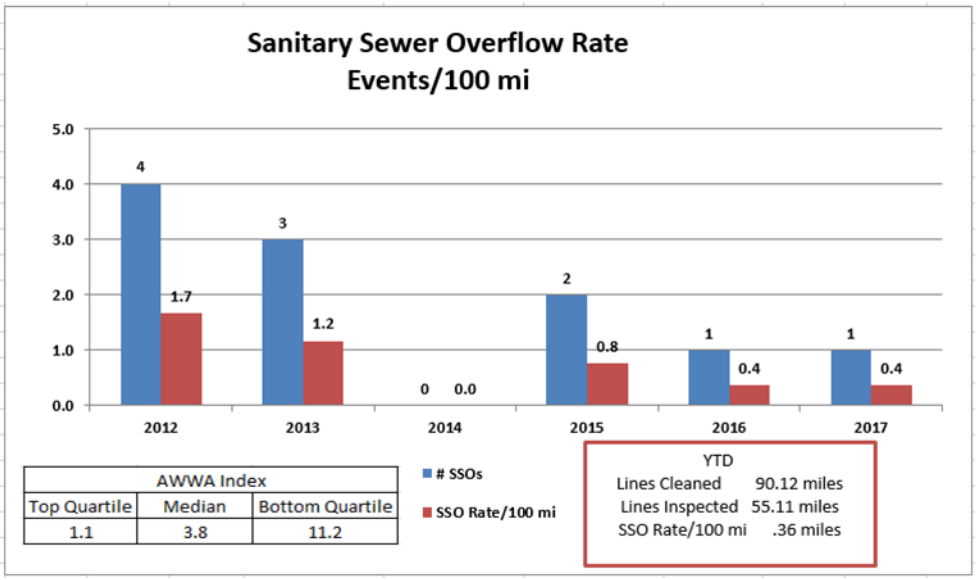
811 Know what's below. Call before you dig.

3-YEAR LOCATE TREND



Sanitary Sewer Overflows

We are also tracking in the Top Quartile in the Sanitary Sewer Overflow Rate since 2014, according to the American Water Works Association, showing one incident in 2017. There were no sanitary sewer issues in December.



How do we avoid overflows?

Our team runs a camera through the sewer mains to look for problems. When problems are identified they are cleared with a high pressure water jet.

The goal this year was to clean and video approximately 33 percent of the collection system or about 90 miles. The goal was achieved in late December.

DECEMBER LEVELS OF SERVICE

Drinking Water Compliance
Castle Rock Water will deliver water that meets or exceeds both Primary Drinking Water Regulations and Secondary Maximum Contaminant Levels 100% of the time.
Seventy routine samples were completed. All samples were within the parameters set forth by the Federal Safe Drinking Water Act and Colorado Drinking Water Standards.

Pressure Adequacy
< 1% of our customers will experience less than 43 pounds per square inch (psi) of pressure at the meter during normal operations.
There were no issues in December.

Sewer System Effectiveness
<1% of our customers will experience a sewer backup caused by the utility's sewer system per year.
There were no issues in December.

Drinking Water Supply Outages
<5% of our customers will experience water outages for one or more events totaling more than 30 hours/year.
There was a service line break in The Meadows. Three homes were out of water for less than three hours, and one home was out of water for more than four hours during the repair.

There was one service line break in an old town neighborhood causing no water service for about 30 minutes.

There was a water main break in the Glovers neighborhood affecting 25 homeowners. Service was never lost to these homes during the repair.

Water was shut off for about 30 minutes during a water main break at Oakwood Plaza.