Castle Rock Water
Securing our future drop by drop

JULY 2018

Fill the Rock with water savings!

For 2018, the Fill the Rock Conservation Challenge was moved to July and expanded. During the entire month, customers were asked to take daily actions to conserve. Each action was registered online at CRconserve.com and used to 'fill' Castle Rock with water savings. Each action was also an entry for weekly drawings for prizes totaling more than $800, such as passes to the MAC, trampoline time, cool water bottles and the grand prize of a smart irrigation controller.

237 people participated in the promotion with a total of 1,271 actions logged, 'filling' the Rock 81 percent!

Thank you to everyone who participated!

Douglas Lane Tributary Stabilization

By: Barbara Horton, P.E., Project Manager

The Douglas Lane Tributary Stabilization project is located between the Union Pacific Railroad and Plum Creek Boulevard, near the new Fire Station 152. The primary objectives of this project were to manage stormwater runoff, minimize flood hazards, improve water quality along Douglas Lane Tributary, and provide stream stabilization improvements consistent with the Stormwater Master Plan.

BEFORE – looking upstream at Drop 4

AFTER – looking upstream at Drop 4

Continued on next page

OUR VISION

We will be a national leader among water utilities focused on customer satisfaction and delivering outstanding quality and value.

Douglas Lane, continued

Channel improvements generally included six grade control structures, with fill and riprap lining along the degraded low flow, to restore the historic channel invert, reduce erosion and protect existing foliage along the drainageway. Due to aggressive stream degradation, several trees have been lost in recent years due to undercutting and erosion in the channel. Although it was impossible to save all existing trees during construction, significant effort was made in the design process to minimize the number of trees to be removed as a result of construction. Additionally, the improvements will help restore essential root support along the drip line of existing trees to maintain ecological health along the corridor.

The project also included improvements to the existing Heckendorf Regional Detention Pond, which was frequently silted in due to channel instabilities, to ensure adequate storage volume during storm events. Storm flows are now being diverted into the northeast corner of the pond, while base flows are continuing along the original channel alignment. This diversion allowed for a new forebay to be constructed further away from the existing outfall. Along with the construction of trickle channels, a micropool with defined boulder edge and replacement of the outlet structure orifice plate and trash rack, the improvements are expected to improve the overall function of the pond and help ensure the outlet structure remains unobstructed to comply with stormwater release requirements.

Lawrence Construction Company was awarded the construction contract which began in March and was substantially completed in August. The total construction cost for the project is approximately $800,000.

Pond Outlet – obstructed by sediment

Drop 3 – flows being diverted into pond

Take the Survey!

Meeting customer's needs is a priority for Castle Rock Water. In the past, the Town has provided an RV dump location for campers, but that service was discontinued due to costs.

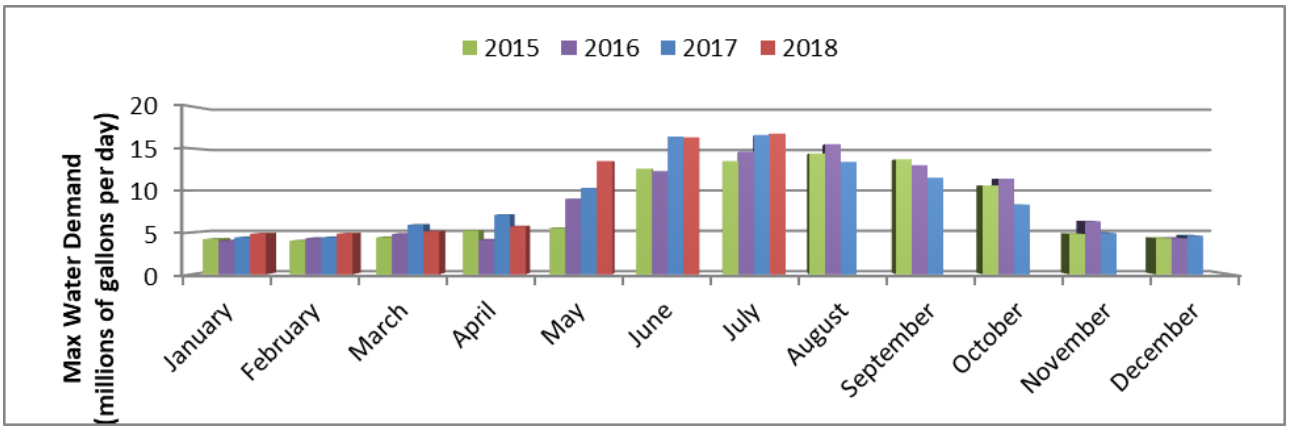
Now, we want to know what you think. Is an RV dump station in Castle Rock something you're interested in? Would you be willing to pay for it? Take our survey, to tell us what you think.

https://www.surveymonkey.com/r/R6JC92Q

2018 Water Demands

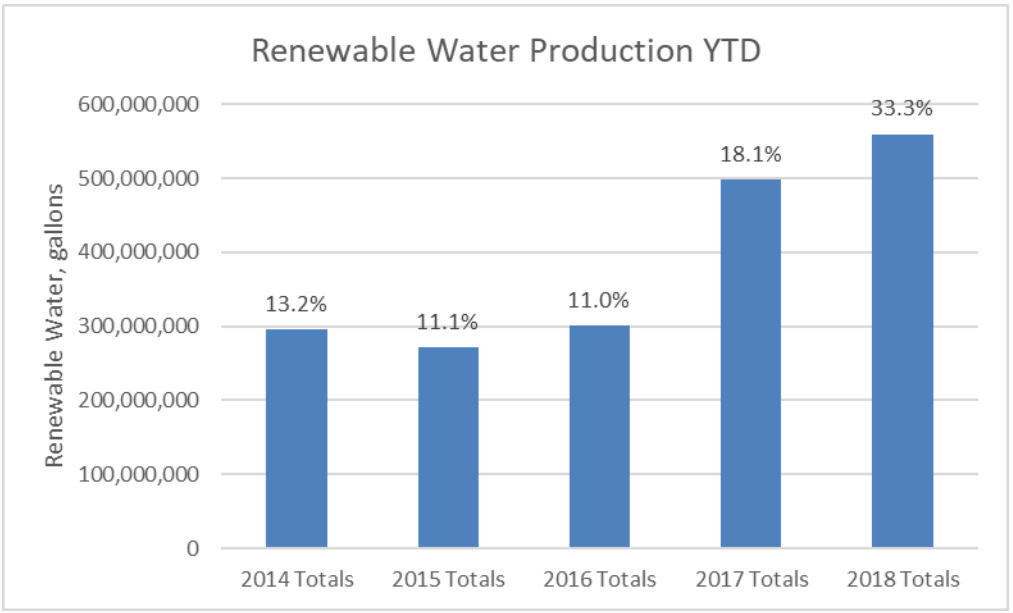
By: Lauren Tyner, Water Resources Program Analyst

The maximum daily water demands are plotted by month from 2015 to the current month. As observed by the data, the maximum demand for the month of July was 16.8 million gallons per day (MGD) which was 11% greater than 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 July was 402.9 million gallons (MG), which was about a 4.7% decrease from the June 2018 total of 422.9 MG, and a 3.5% increase from the July 2017 demand of 389.4 MG.



The CR-1 diversion produced an average of 0.76 MGD for the month of July, supplemented by 73.05 acre-feet (AF) (minus stream losses) from our Bell Mountain – Denver Well during the majority of July. The Town's thirteen alluvial wells and CR-1 produced a total of 43.5 MG of renewable water and imported deliveries, which included WISE and stored water from Rueter Hess Reservoir (RHR), totaled 59.0 MG during July, which represents 25.3% of the total water supply for the month (405 MG or 1,242 acre-feet) and 33.3% of the annual water supply (1,678 MG or 5,151 acre-feet).

Renewable supplies are those water sources that are replenished by precipitation (think of our alluvial wells, CR-1, WISE, and RHR supplies) whereas reusable supplies are those waters that are either from the Denver Basin (deep wells) or imported supplies (such as WISE and RHR) that can be used over and over, to extinction. The average reusable supplies used by Castle Rock for 2018 through July is 46.3% with 19.9% of available reusable supplies being used in the month of July.



**2018 renewable production will vary as demand increases and additional sources are brought online.*

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

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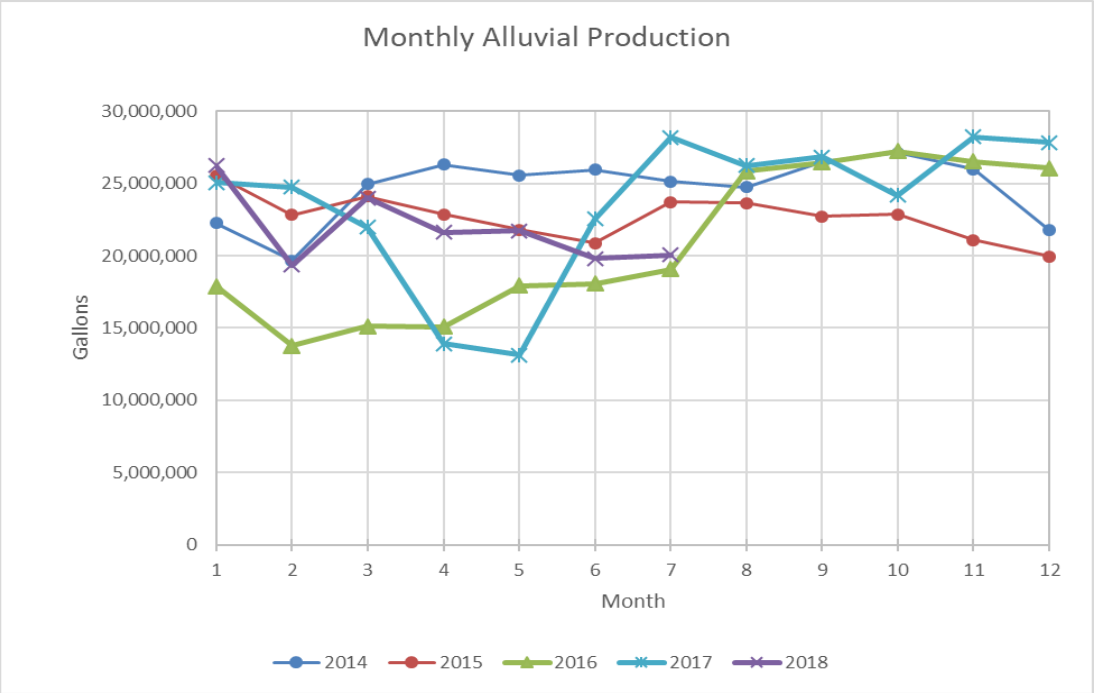
Water Demands, continued

The graph below shows the monthly production of the Town's alluvial well system. The production from the alluvial wells in July 2018 was 20 MG, which is less than the second half of 2017. Lower production combined with decreasing water levels is primarily due to low stream flows in East Plum Creek. Well rehabilitation is scheduled for this fall.



The flow hydrograph (on the next page) 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 0.01 and 456 cubic feet per second (cfs) during the month of July. We had several precipitation events throughout the month, with most occurring during the second half of July. This July, the average streamflow in East Plum Creek (EPC) was 1.04 cfs which is approximately 16% of the median daily streamflow of 6.5 cfs. As a comparison, in July 2017 the average streamflow in EPC was 12.6 cfs, which is 194% of the median daily streamflow. Low streamflows in EPC correspond to a decrease in the amount of water that we can divert at CR-1, negatively impacting this surface water supply. We were, however, able to supplement East Plum Creek with 73.1 AF of water (minus stream losses) from our Bell Mountain – Denver Well upstream of CR-1.

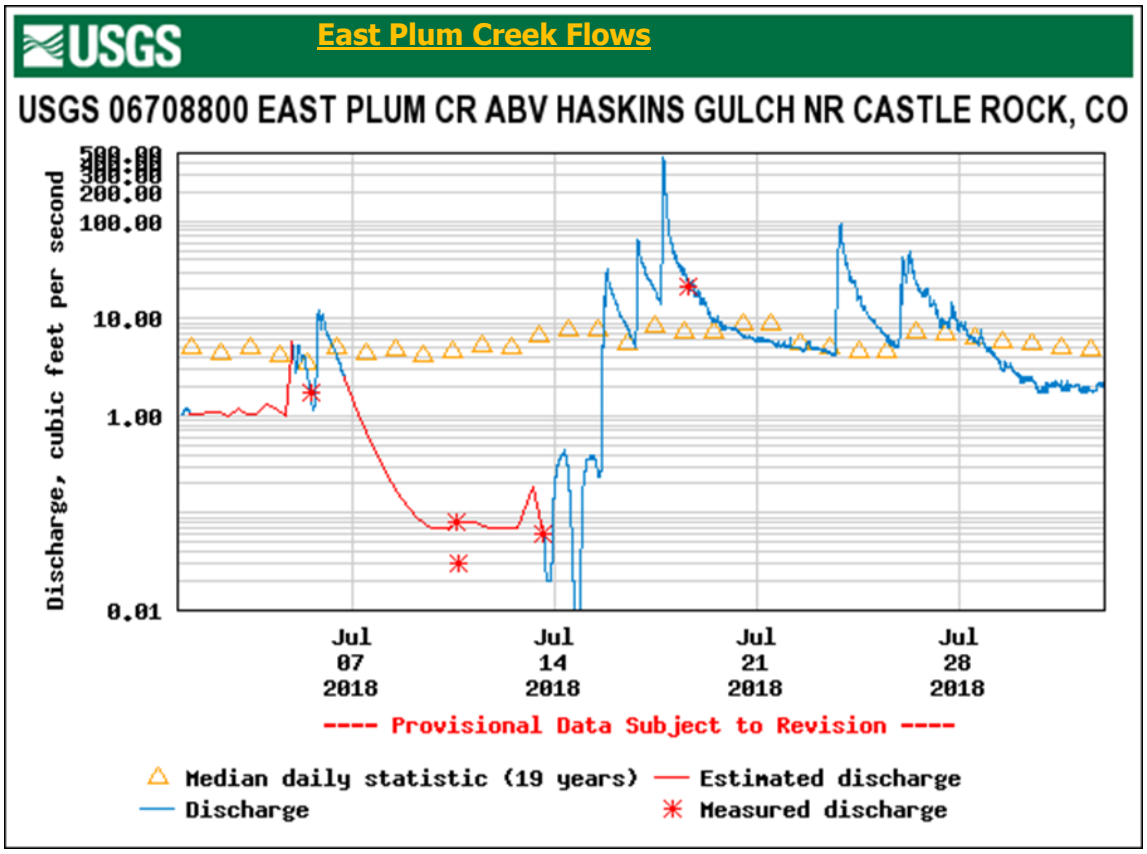
There were active calls on the South Platte River in July. Some of the active calls have had a more senior water right than some of the Town's water rights. This means that those diversions are out-of-priority, so the stream depletions will be covered by non-tributary return flows. This also means that 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 northern half of Douglas County is abnormally dry, while the southern half is considered to be in a moderate drought. In April 2018, Town Council approved a Town of Castle Rock Drought Management Plan. This plan uses a Water Supply Index (WSI) for the Town that is similar to the U.S. Drought Monitor in that it provides us an indicator to drought level; however, the WSI accounts for local conditions relative to the Town's capability to address our water resources and daily water demands. The WSI is calculated by taking the sum of our supply

Continued on next page

Water Demands, continued

(deep groundwater, alluvial wells, surface water, and WISE) and dividing that by our maximum daily demand. We generally want to see a WSI above 1.1, which means that we have enough resources to meet our demands. Anything below a 1.1 will trigger a drought stage relative to its severity. The average WSI for July was 1.4, above the 1.1 trigger level, which is good.



Plan Review Update

By Tina Close, Plan Review Engineer

Castle Rock Water reviewed 83 applications (see below) this month which compares to 72 during the same time period in 2017. The average assigned due date by Development Services was 10.5 days, and Castle Rock Water completed the reviews in an average of 10 days.

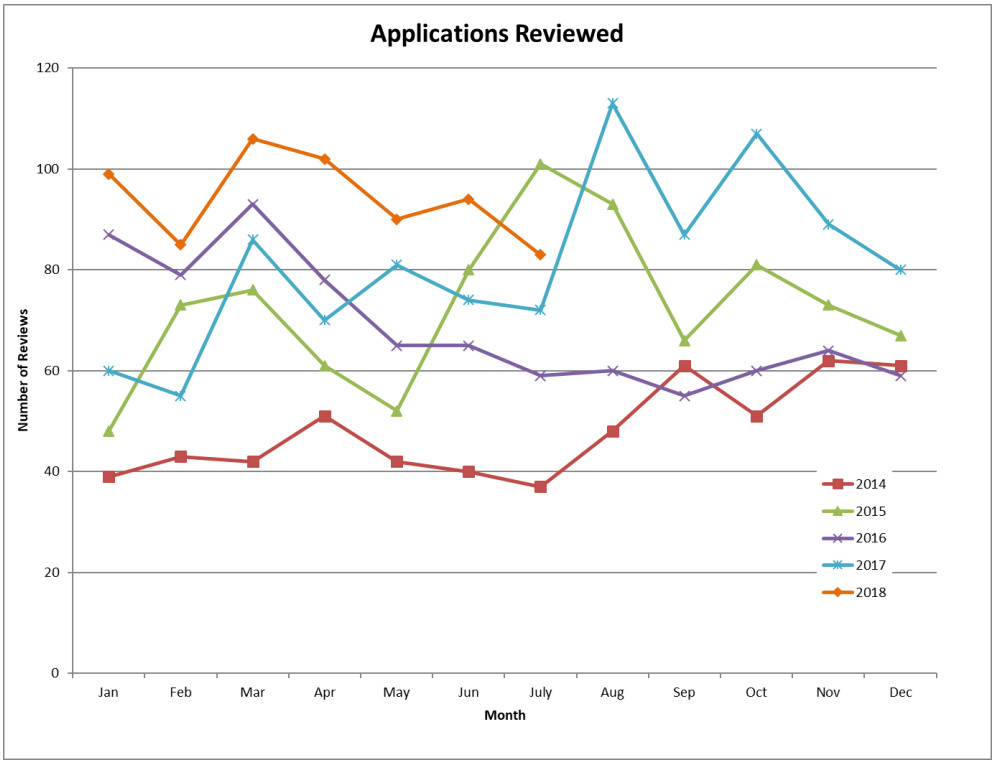
- 4 Agreements
- 13 Field Change Orders
- 10 Grading, Erosion, and Sediment Control (GESC) Plans
- 2 County Referrals
- 1 Planned Development Plan
- 6 Plats
- 7 Preliminary Project Applications
- 17 Construction Drawings
- 16 Site Development Plans
- 9 Technical Criteria Variances

The applications reviewed consisted of:

- 38 1st submittals
- 27 2nd submittals
- 13 3rd submittals
- 5 Special reviews
- 12 Completed late
- 71 Completed on-time as scheduled

In addition, Castle Rock Water completed 36 building permit reviews and associated system development fees.

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.

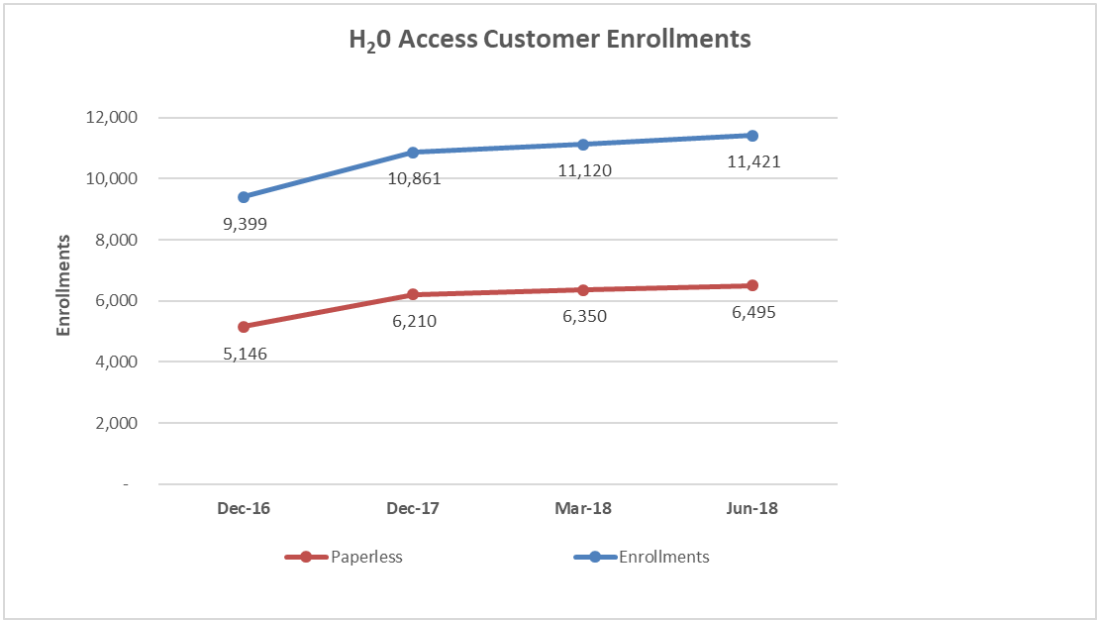


Business Solutions

Customer Statistics

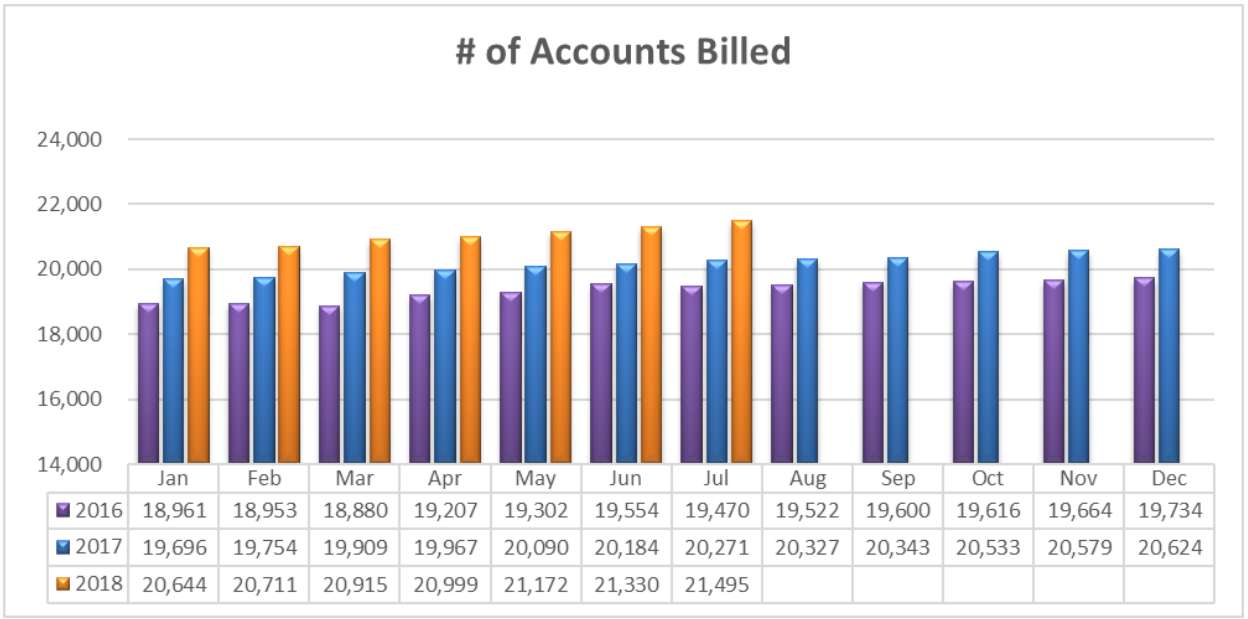
By: Anne Glassman, Business Solutions Manager

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.



Updated quarterly - Data reported quarter ending 6/2018

The number of customers enrolled in paperless billing has remained steady at 57 percent over the last several months.

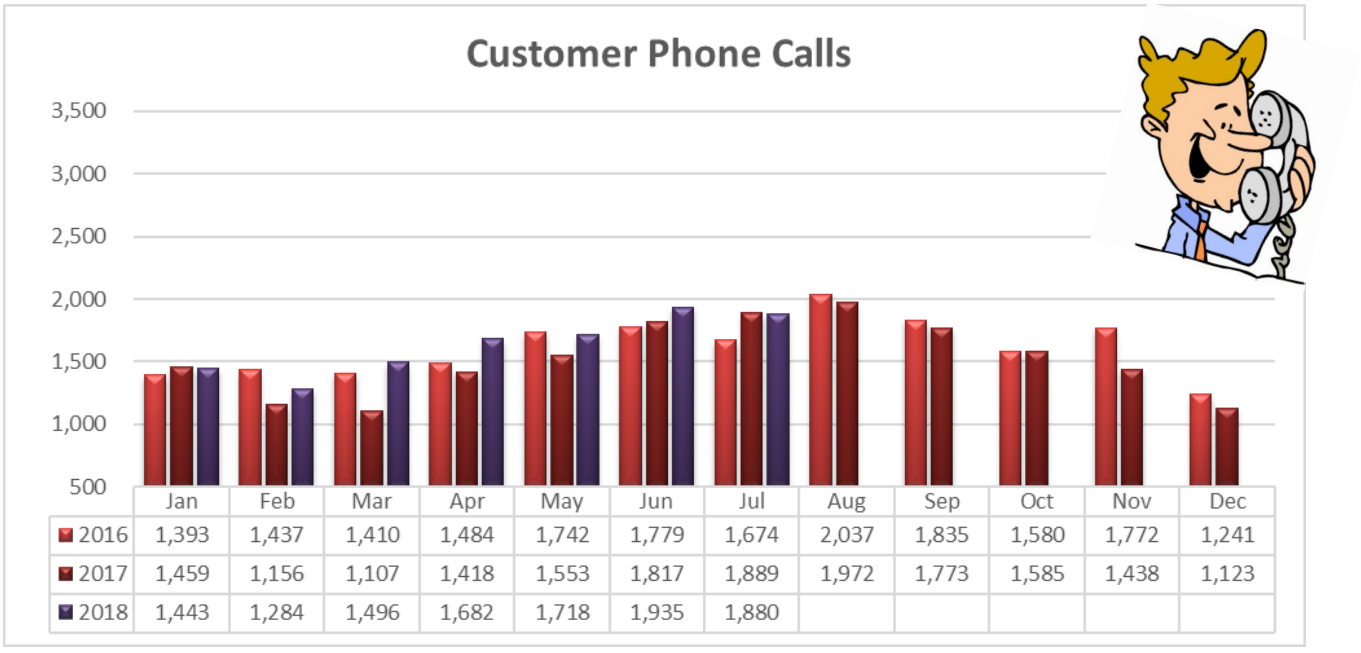


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	18,961	18,953	18,880	19,207	19,302	19,554	19,470	19,522	19,600	19,616	19,664	19,734
2017	19,696	19,754	19,909	19,967	20,090	20,184	20,271	20,327	20,343	20,533	20,579	20,624
2018	20,644	20,711	20,915	20,999	21,172	21,330	21,495					

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
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
2018	411	348	355	400	417	369	390					

Walk-in customers are higher this time of year due to the irrigation season, specifically the water schedule, water wiser workshops, and overall general water conservation questions.



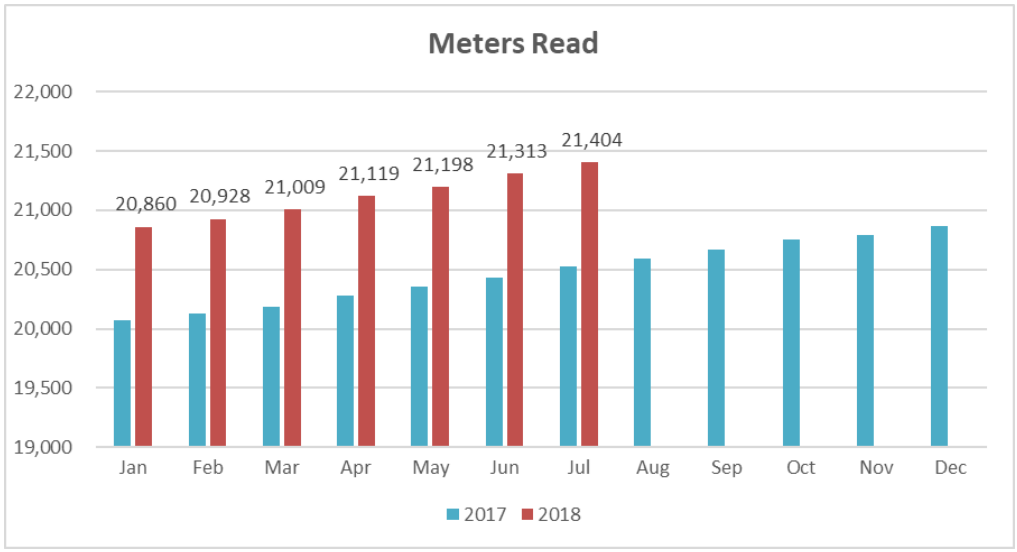
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	1,393	1,437	1,410	1,484	1,742	1,779	1,674	2,037	1,835	1,580	1,772	1,241
2017	1,459	1,156	1,107	1,418	1,553	1,817	1,889	1,972	1,773	1,585	1,438	1,123
2018	1,443	1,284	1,496	1,682	1,718	1,935	1,880					

Customer phone calls are higher this time of year due to the irrigation season, specifically the water schedule, water wiser workshops, and overall general water conservation questions.

METERS

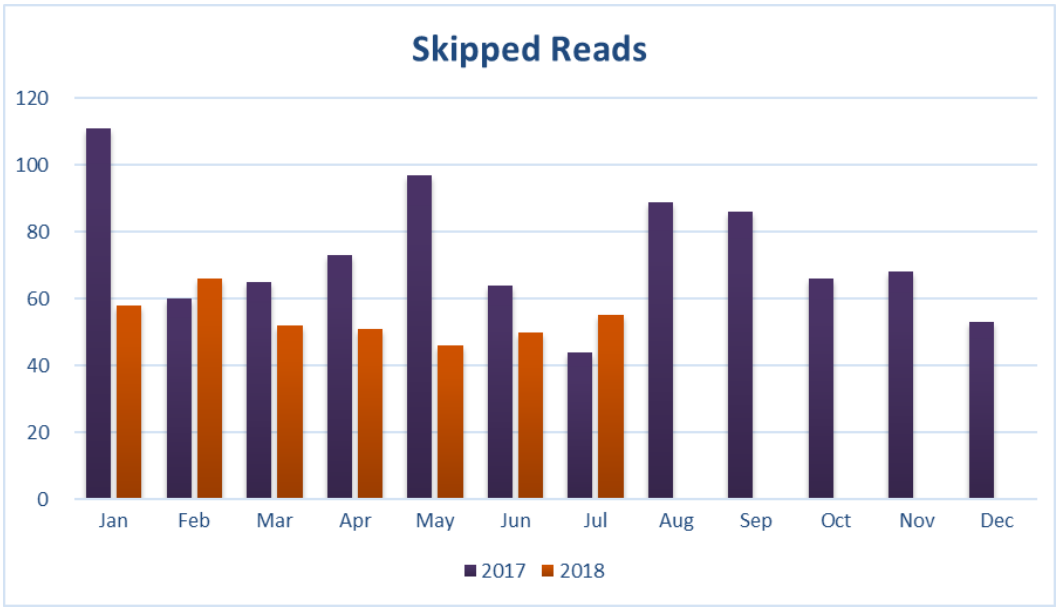
Meter Sets

Month-to-Date 101
Year-to-date 639



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

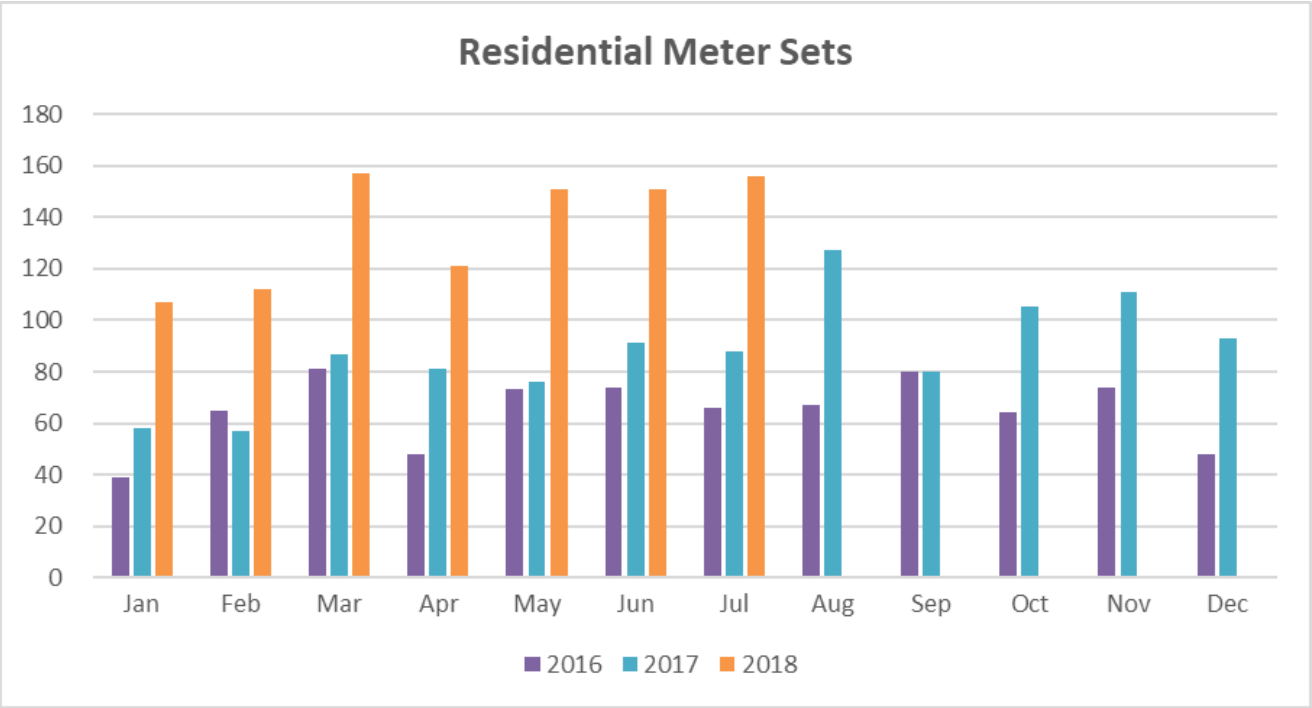
Skipped Reads



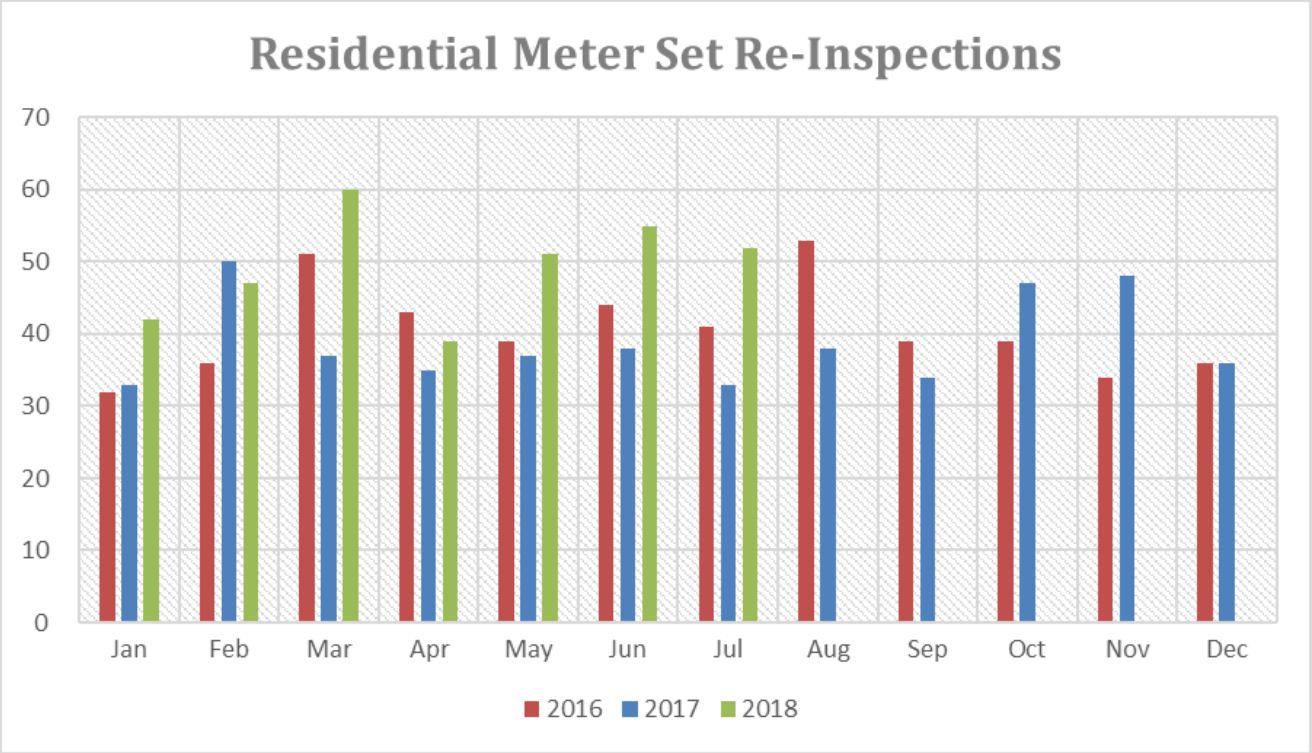
The American Water Works Association (AWWA) standard for skipped reads is 2 percent, so at 0.26 percent in July we still continue to stay well below the industry average. This is a result of continued maintenance and repair efforts on meter infrastructure.

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.



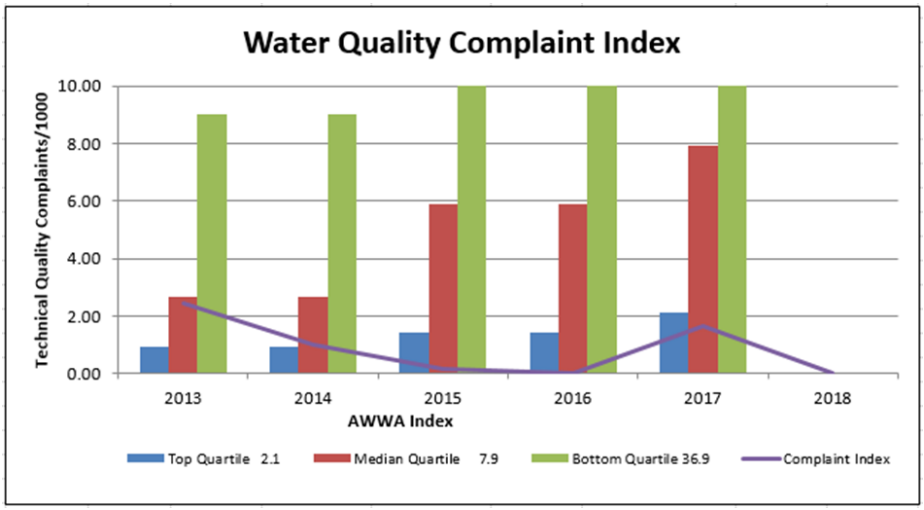
Residential meter sets continue to remain higher than last year due to new commercial and residential development.



Residential meter set re-inspections in July are consistent with that seen in June.

Water Quality Complaints

The Water Quality Complaint index shows that we are doing very well in this category; rating in the top quartile since 2015 according to the American Water Works Association. There were no water quality complaints in July 2018.



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

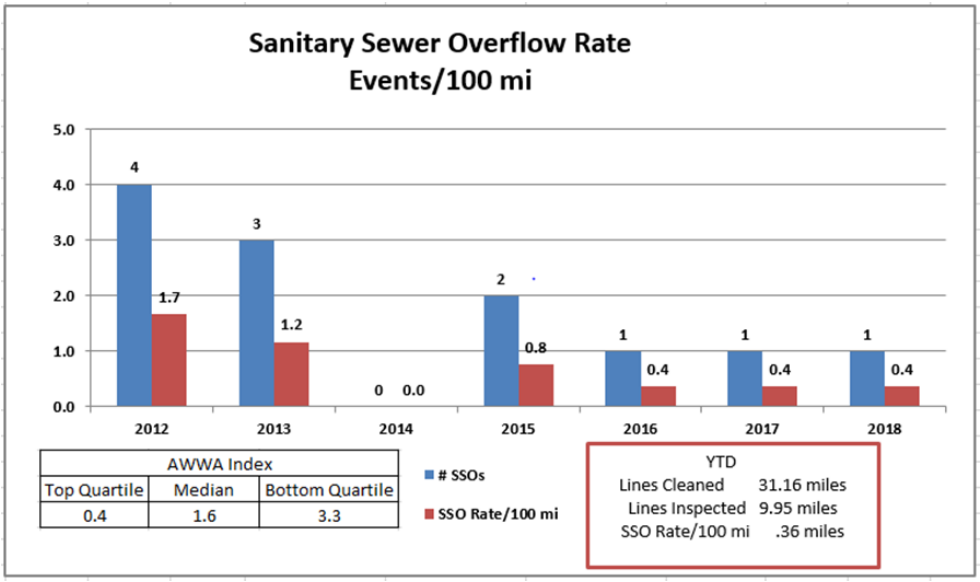
Stormwater Update

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 regraded the Prairie Hawk Ditch, removing woody vegetation and debris; restoring channel flows as originally engineered. The team performed many pond, catch basin and trouble spot inspections throughout Town, following numerous heavy rain events. As a result of these storms, they also jetted three large pipes at Prairie Hawk and Wolfensberger, to remove sedimentation caused by the heavy runoff.

Sanitary Sewer Overflows

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

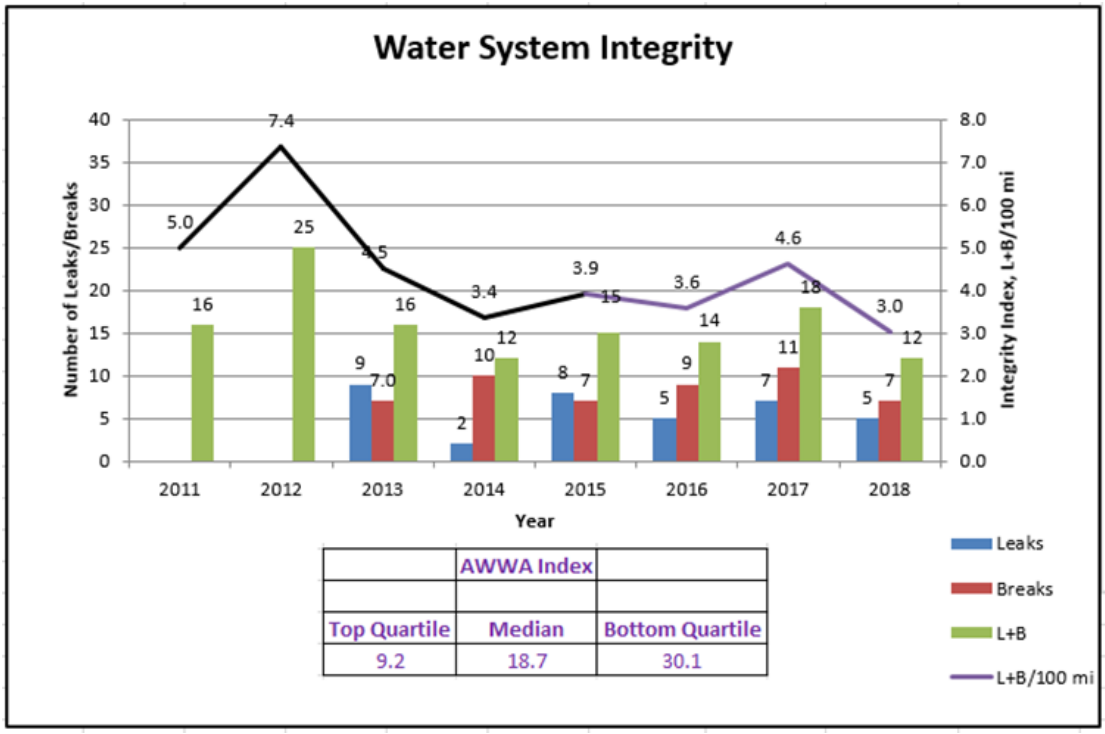


How do we avoid overflows?

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. So far, we have cleaned and inspected 31.16 and 9.95 miles, respectively.

The goal this year is to clean and video approximately 33 percent of the collection system or about 90 miles.

Water System Integrity



As the Water System Integrity chart indicates we have consistently remained in the top quartile of 25 percent for water system integrity based on American Water Works Association benchmarking since 2011. There was one water system integrity issue in July.

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.

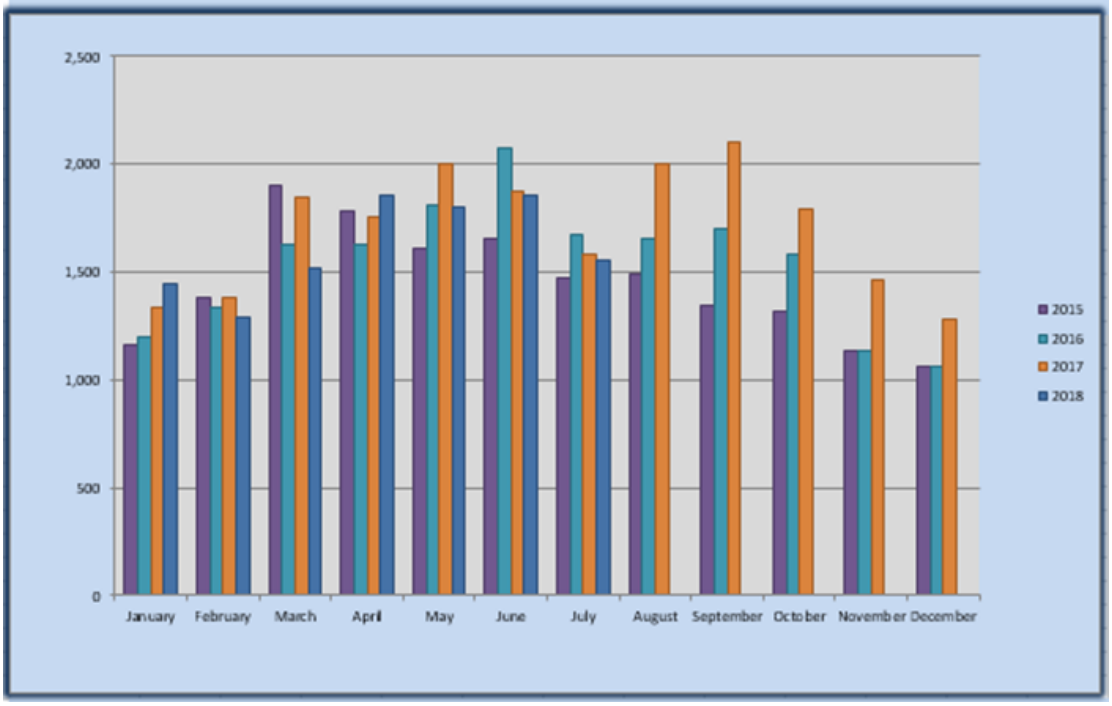
The graphs below show our monthly utility locates and a chart showing the year-to-year comparison

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	1,442			
February	521	485	538	1,094	1,093	1,383	1,334	1,378	1,293			
March	660	552	818	1,437	1,349	1,906	1,625	1,851	1,514			
April	838	681	1,025	1,482	1,552	1,784	1,631	1,760	1,856			
May	853	863	985	1,541	1,531	1,609	1,809	2,002	1,801			
June	969	844	982	1,314	1,399	1,654	2,075	1,872	1,854			
July	680	582	859	1,350	1,392	1,477	1,675	1,582	1,556			
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				
Totals	8,545	7,539	11,097	15,702	15,731	17,323	18,469	20,411	11,316			

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

4 Year Locate Trend



Castle Rock Water's locate requests from 811 have continued to rise, year over year. Our locating team has correctly marked all locate requests. To date, there has not been damage to lines as a result of incorrect locate marks.

JULY 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 Safe Drinking Water Act and Colorado Drinking Water Standards. Our annual Consumer Confidence Report is available to view at CRgov.com/waterquality.

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 seven internal water pressure customer issues in July.

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 July.

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 water main break in The Woodlands on an 8-inch ductile iron pipe (DIP). The water was shut off for about four hours while repairs were made.