CASTLE ROCK water
Securing our future drop by drop

AUGUST 2016

Alluvial Well Field Project

By: Matt Hayes, Project Manager

Utilities recently completed the construction of three new wells in the Central Well Field located along East Plum Creek.

The Central Well Field consists of seven alluvial wells located in The Meadows development near East Plum Creek. Three wells in the Central Well Field were completed in 2013 and a fourth one was added in 2014 near Atrium Drive.

The three new wells that were constructed this year are located near the Meadows Parkway Bridge. Utilities constructed these additional wells to increase the available renewable water supply to the Plum Creek Water Purification Facility. The Plum Creek Alluvial Well Field Project consisted of constructing the three remaining alluvial wells planned for the Central Well Field. Alluvial wells are simply defined as wells constructed in the alluvium deposits of a stream. Since the water source for the alluvial wells is precipitation and surface water recharged into an alluvial aquifer, in this case East Plum Creek, the wells are classified as a renewable water source.

Continued on next page

AL-18 vertical well drilling.

East Plum Creek Stabilization at Meadows Parkway

By: Barbara Horton Project Manager

Sheet pile protection across the low flow channel of East Plum Creek (EPC) was installed in 1992 as part of the 16-inch water main construction project to provide water service to the Meadows. In May 2015, the Town became aware of a potential failure of the sheet pile. High flows along EPC in June 2015 accelerated erosion around the west end of the sheet pile causing failure of the system, which resulted in flow around the end of the sheet pile instead

Continued on page 3

OUR VISION

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

Alluvial, continued

Velocity Constructors along with Layne Christensen Company and Directed Technology Drilling constructed the project. The project consisted of drilling three new vertical wells that are approximately 50-feet deep with approximately 450 feet of horizontal directionally drilled screen. The contractor also installed approximately 4,000 feet of 4-inch and 12-inch raw water pipe and the required electrical connections to operate the wells. A new metering vault and control panels were also installed at the site. The construction of the project was completed in June, and the facility was approved by the Colorado Department of Public Health & Environment in the beginning of August. The new alluvial wells are anticipated to produce approximately 300,000 gallons per day.

AL-16 lateral arm installation.

AL-16, AL-18, and AL-20 metering vault.

Mark Billman
Environmental Health and Safety Program Analyst

Alex Tarnawski
Water Distribution System Operator I

East Plum Creek, continued

of over the top. The design life of the existing sheet pile was compromised due to the insufficient depth and width installed in relation to the EPC flow conditions at this location.

Town Operations and Maintenance Staff were able to mobilize quickly in 2015 to place large sand bags between the sheet pile and eroded bank to redirect flow back over the top of the sheet pile in effort to maintain approximately 3 feet of remaining stream bed cover over the water main. This effort was an emergency response to minimize the impacts to the water main until the permanent stabilization improvements are constructed.

Permanent improvements include installation of a new sheetpile cutoff wall the entire width of the 100-year floodplain and soil riprap bank protection immediately upstream and downstream of the cutoff wall to provide additional protection and minimize risk of exposure to the existing water main during high flow events.

The Town consulted with Felsburg Holt & Ullevig, Inc. (FHU) to provide design support and environmental permitting services. For projects along EPC, Utilities also relies on our Parks Natural Resource Specialist to provide guidance for compliance with Habitat Conservation Plan requirements. 53 Corporation was awarded the contract to construct these improvements, which began in August and are anticipated to be substantially complete in September.

The total construction cost for the Project is approximately $600,000. Because this was an unanticipated and unbudgeted project, the Stormwater and Water Capital Reserve funds were utilized to cover engineering and construction costs. Phase II, to be completed at a later time, includes a grouted sloping boulder grade control structure immediately downstream of the cut-off wall and is estimated to cost approximately $300,000.

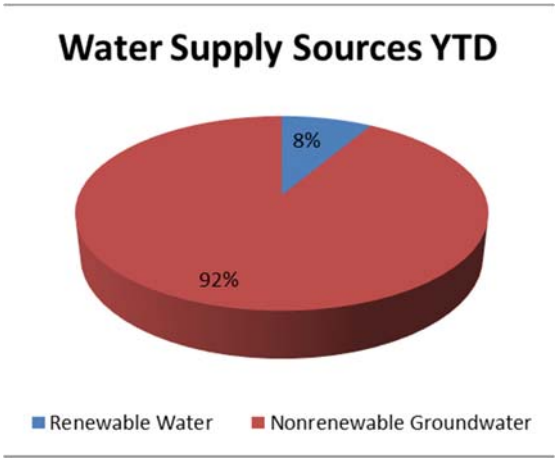

Before


During Construction

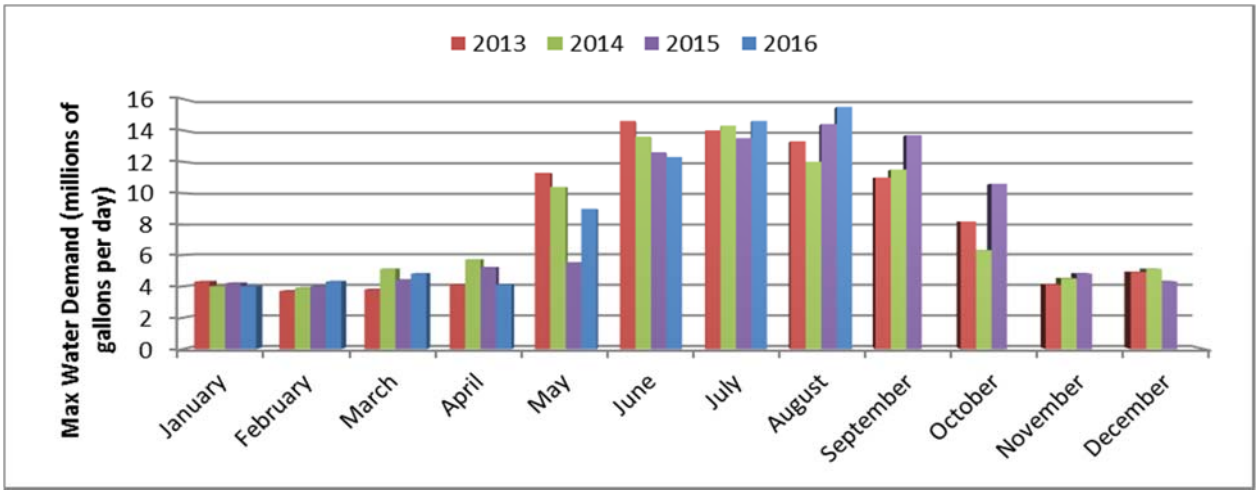
2016 Water Demands

By: Kurtis Cotten Water Resources Program Analyst

The maximum daily water demands are plotted by month from 2013 to the current month. As observed by the data, the maximum demand for the month of August was 15.5 million gallons per day (MGD) which was about 14.5% more 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 August was 407.9 million gallons (MG), which was about a 5.6% increase from the July 2016 total of 386.41 MG, and a 4.5% increase from the August 2015 demand of 390.2 MG.



CR-1, a new surface water diversion located near Plum Creek Water Purification Facility (PCWPF), came online on June 30th and is an important step in transitioning to a 75% renewable water supply. In August, 6.9 MG of renewable water was diverted from East Plum Creek to PCWPF by CR-1. The Town's nine alluvial wells and CR-1 produced a total of 32.7 MG of renewable water during August, which represents 7.6% of the total water supply for the month and 8.5% (153.7 MG or 472 acre-feet) of the water supply year to date. The total renewable water produced since the opening of the PCWPF has surpassed 898 MG, which represents 10.7% of the Town's total water supply since the alluvial wells began pumping in May 2013. Currently, the Town's renewable water rights surpass the capacity of the alluvial wells. The alluvial well projects the Town is currently working on will help close this gap.

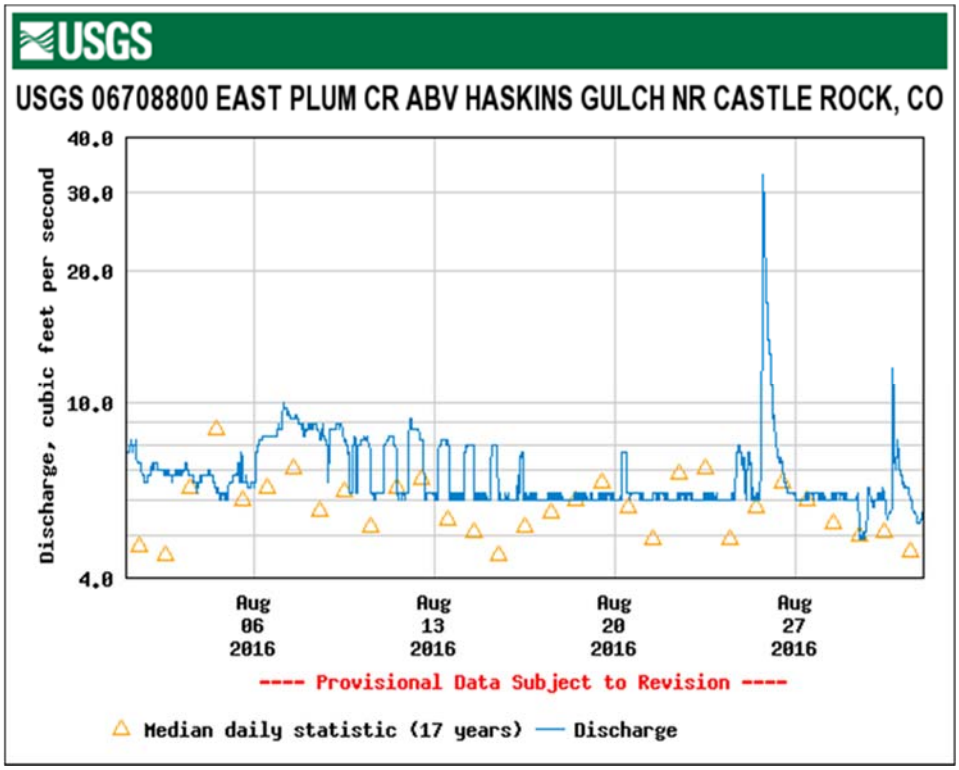


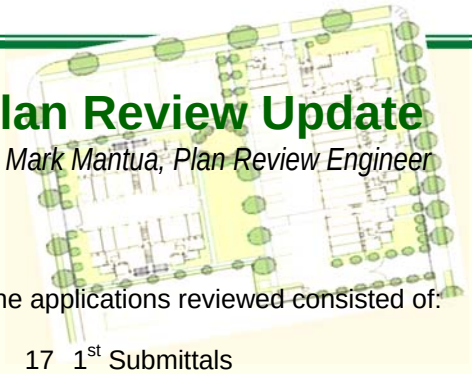
The flow hydrograph (on page 11) represents stream flows in East Plum Creek taken from the stream gauge located at Haskins Gulch. The hydrograph shows that flows in the East Plum Creek basin ranged between 4.8 to 33 cubic feet per second (cfs) during the month of August, with flows averaging around 6 cfs toward the end of the month. Since June 27, the call on the main stem of the South Platte River was changed from free river to active calls. These calls on the South Platte River have a more senior water right than our Meadows Alluvial Wells located in our Central Well Field and the Castle Rock Surface Diversion #1. This means that those diversions are now out-of-priority, so the stream depletions will now be covered by nontributary return flows and/or more senior native water

Continued on next page

2016 Water Demands, continued

rights along East and West Plum Creek. This also means that the Town will now have slightly less reusable water going down Plum Creek. 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, we are no longer in drought conditions.





Plan Review Update

By Mark Mantua, Plan Review Engineer

The applications reviewed consisted of:

- 17 1st Submittals
- 19 2nd Submittals
- 24 Special reviews
- 0 Completed one week early
- 6 Completed late
- 54 Completed on-time as scheduled

Castle Rock Water reviewed 60 applications this month which compares to 93 during the same time period in 2015. The average assigned due date by Development Services was 1.2 weeks, and we completed the reviews in 1.1 weeks, which included:

- 4 Agreements
- 14 Construction Drawings
- 5 Technical Criteria Variances
- 1 Use by Special Review
- 14 Field Change Orders
- 2 Grading, Erosion and Sediment Control (GESC) Plans
- 3 GESC Permit
- 1 Straight Zoning Application
- 2 Planned Development Minor Amendments
- 3 Plats
- 2 Preliminary Project Applications
- 9 Site Development Plans

In addition to completing the above listed applications as scheduled, Castle Rock Water completed 58 building permit reviews and associated system development fees.

Operations and Maintenance

August 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.

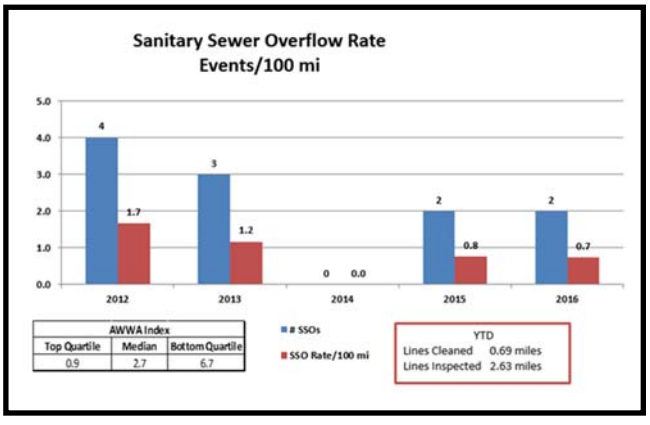
Pressure Adequacy
< 1% of our customers will experience less than 43 pounds per square inch (psi) of pressure at the meter during normal operations.
Pressure has been maintained at or above 43 psi throughout the distribution system.

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

Drinking Water Supply Outages
<5% of our customers will experience water outages for one or more events totaling more than 30 hours/year.
No customers were impacted by a repair to a raw water line leak and break during the month of August.

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 two incidents for the year. There were no issues in August.



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.

Stormwater Update

Stormwater team takes the lead on a sewer line installation in the parking lot at Castle Rock Water

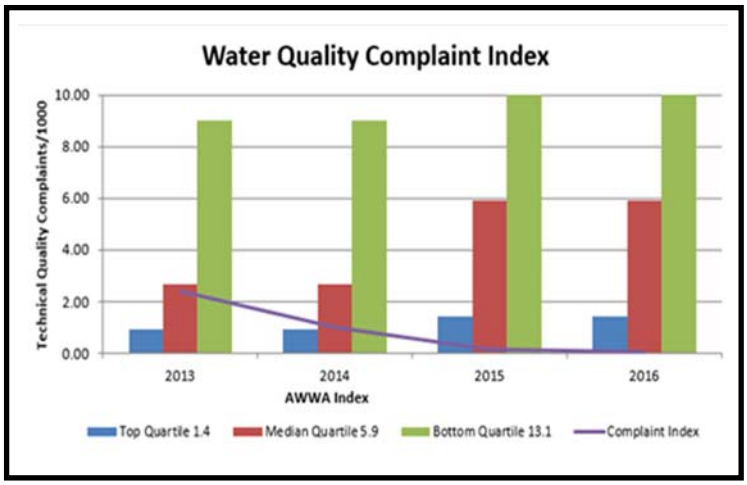
Water Quality Complaints

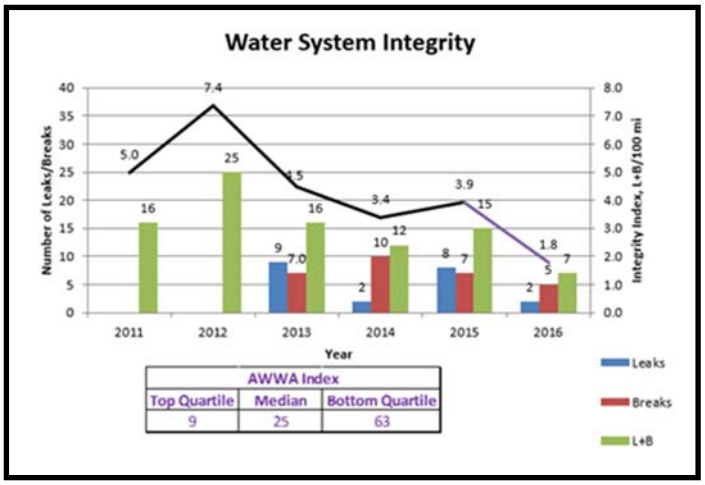
The Water Quality Complaint index shows that we are doing very well in this category; rating in the Top Quartile in 2015 according to the American Water Works Association. We did not have any Water Quality Complaints in August.

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

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 two water system integrity issues in August.





Our team maintains 390 miles of pipe, enough to run from Castle Rock to Kearney, Nebraska.

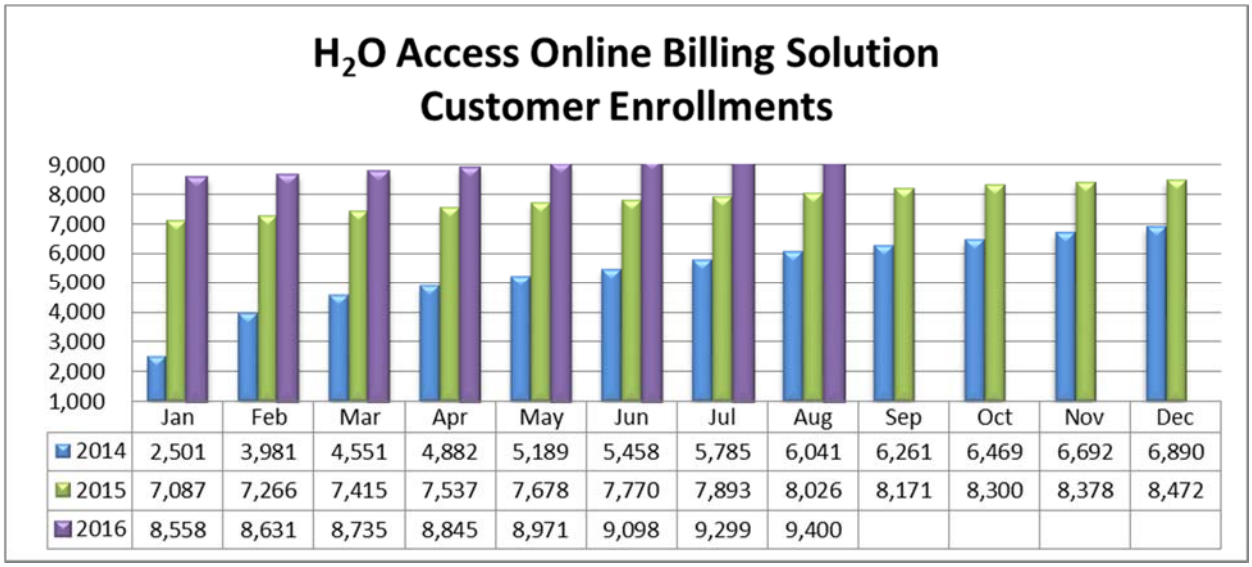
Business Solutions

Customer Statistics

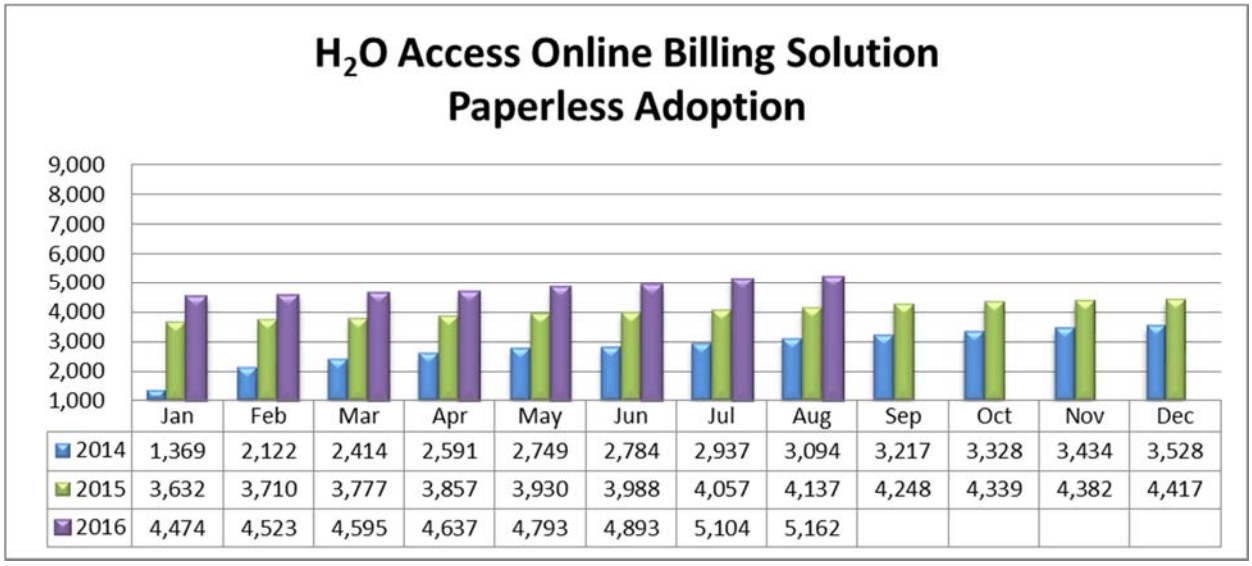
By: Anne Glassman, Business Solutions Manager

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.

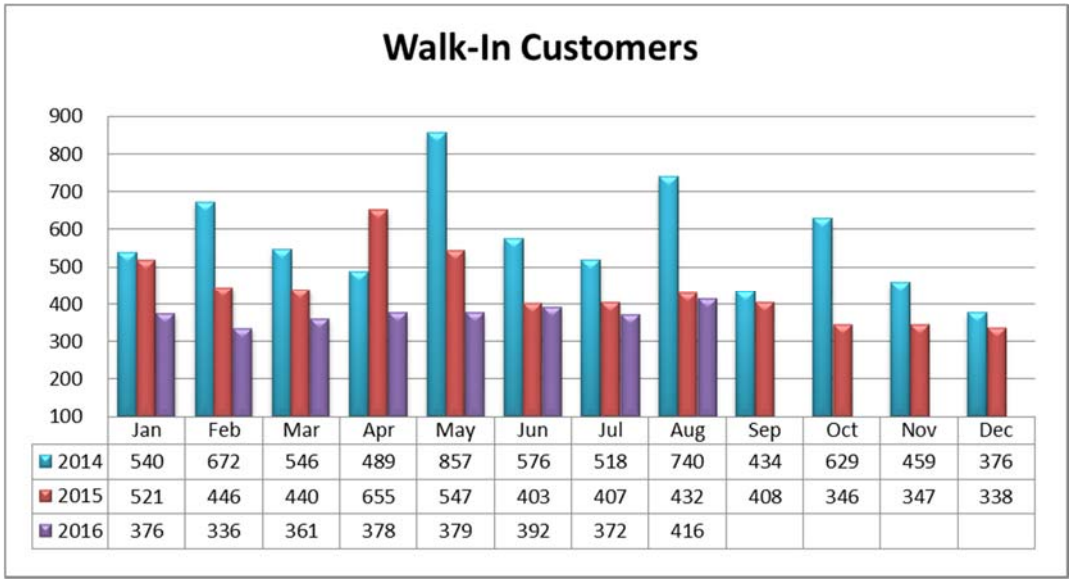
Customer enrollments have continued to increase from launching the H_2O Access Online Billing Solution in January 2014. The number of customers enrolled choosing paperless billing has increased slightly to 55%, with 48% of all customers we serve enrolled with an on-line account.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	2,501	3,981	4,551	4,882	5,189	5,458	5,785	6,041	6,261	6,469	6,692	6,890
2015	7,087	7,266	7,415	7,537	7,678	7,770	7,893	8,026	8,171	8,300	8,378	8,472
2016	8,558	8,631	8,735	8,845	8,971	9,098	9,299	9,400				

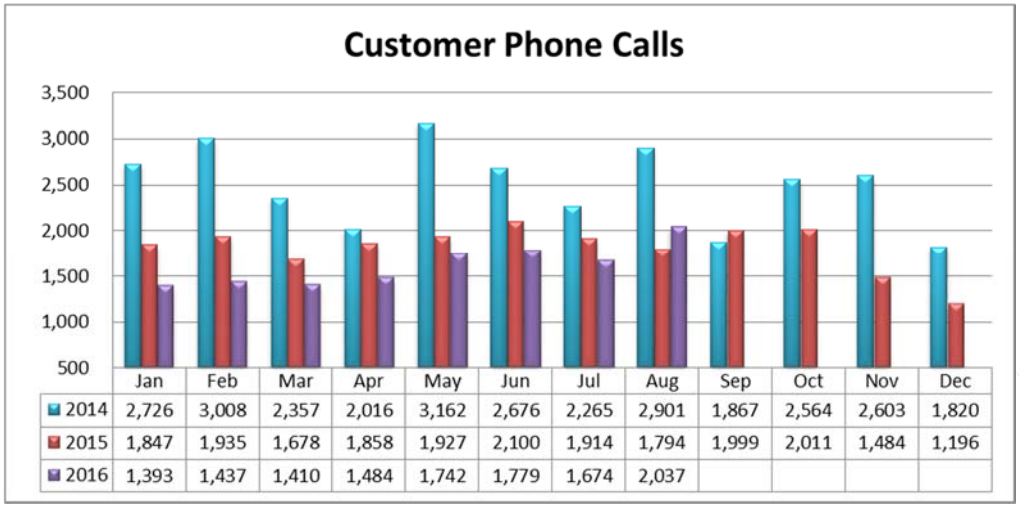


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	1,369	2,122	2,414	2,591	2,749	2,784	2,937	3,094	3,217	3,328	3,434	3,528
2015	3,632	3,710	3,777	3,857	3,930	3,988	4,057	4,137	4,248	4,339	4,382	4,417
2016	4,474	4,523	4,595	4,637	4,793	4,893	5,104	5,162				

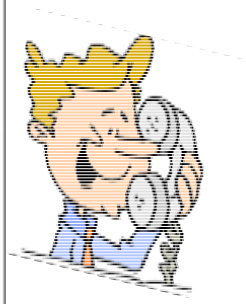


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	540	672	546	489	857	576	518	740	434	629	459	376
2015	521	446	440	655	547	403	407	432	408	346	347	338
2016	376	336	361	378	379	392	372	416				

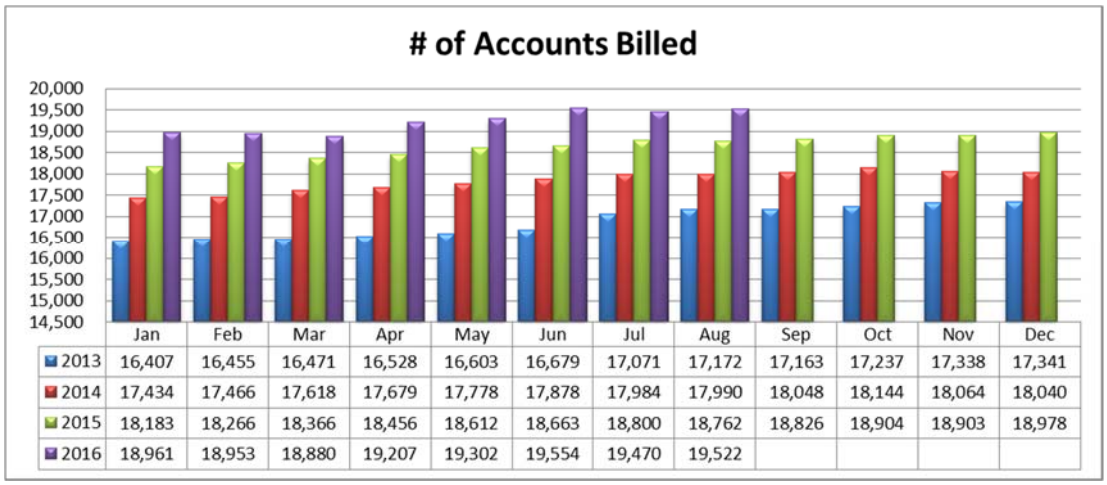
The number of walk-in customers has been consistent in 2016.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	2,726	3,008	2,357	2,016	3,162	2,676	2,265	2,901	1,867	2,564	2,603	1,820
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				



The number of customer phone calls were up in August mostly due to customers with higher usage due to the dry weather, leak adjustments and property transfers.



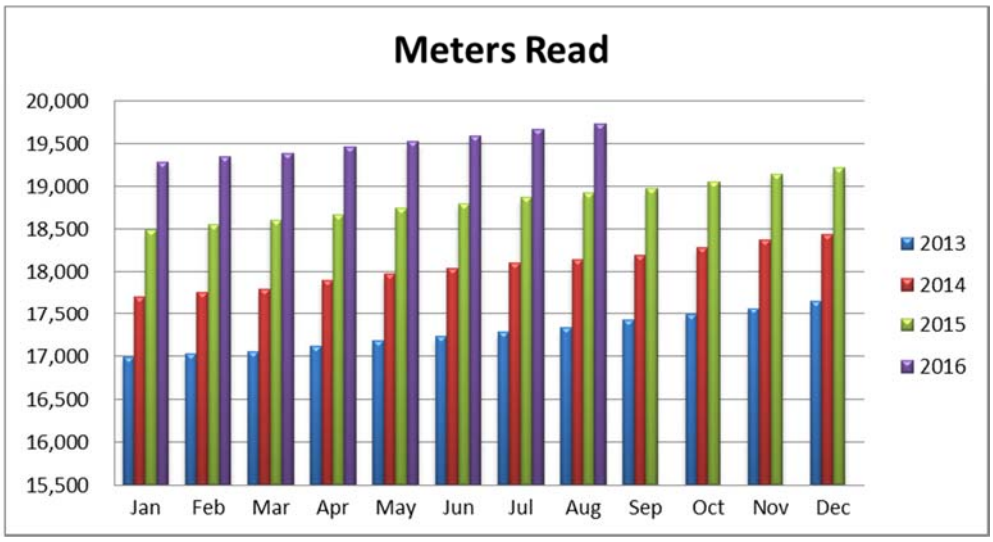
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	16,407	16,455	16,471	16,528	16,603	16,679	17,071	17,172	17,163	17,237	17,338	17,341
2014	17,434	17,466	17,618	17,679	17,778	17,878	17,984	17,990	18,048	18,144	18,064	18,040
2015	18,183	18,266	18,366	18,456	18,612	18,663	18,800	18,762	18,826	18,904	18,903	18,978
2016	18,961	18,953	18,880	19,207	19,302	19,554	19,470	19,522				

The number of accounts billed compared to August last year is up due to new residential and commercial growth.

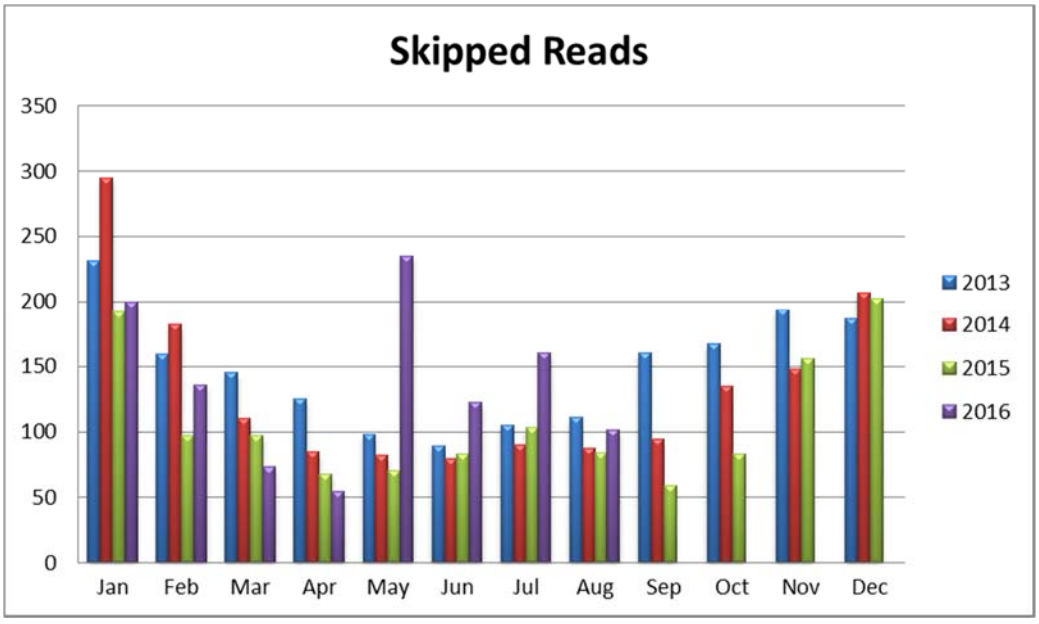
METERS

Meter Sets

Month-to-Date 67
Year-to-date 510



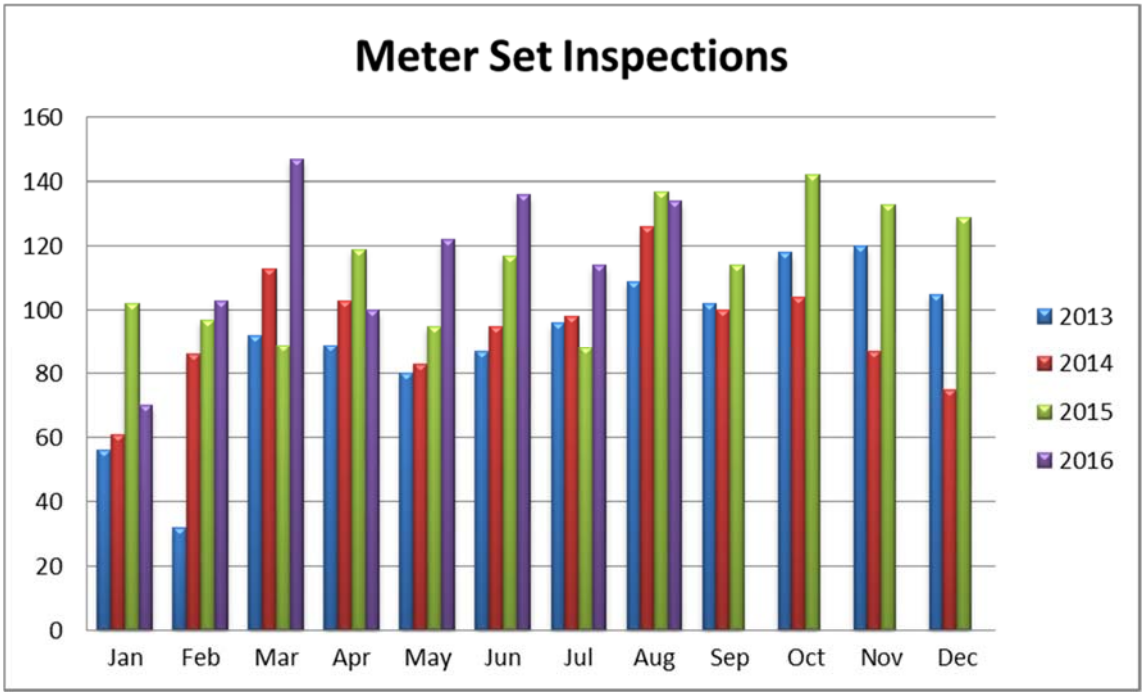
The meters read continues to increase month-to-month due to new residential and commercial accounts, with an increase year over year.



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 meter. Less skipped reads means more properly working meters, which is good for all our customers.

The American Water Works Association (AWWA) standard is 2 percent, so at 0.51 percent, we continue to stay below the industry average. This is a result of continued maintenance and repair efforts on meter infrastructure.



Meter set inspections are up due to new commercial and residential growth.

20,000 meters now in service!

New Certifications

The water, wastewater and stormwater utility business is highly technical and regulated. As such, Castle Rock Water has to maintain an extensive staff of professionally licensed individuals. Most of these licenses require specialized education and the passing of state testing, as well as proof of continuing education. Below is a list of those passing various certifications this month:

Ross Stanley
Distribution I

John Whitesel
Distribution II

John Chrestensen
C2EP Water Distribution
Class III License