



ATTACHMENT 2. DROUGHT IMPACTS

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Drought Impacts

Potential Impact	Discussion
At risk of not meeting existing drinking water demands	<p>The Eastern San Joaquin Groundwater Subbasin is highly reliant on groundwater for drinking water supplies. Depressing groundwater levels in years of low rainfall will exacerbate water level decline, and may fully dewater domestic drinking water wells, particularly along the eastern margins of the basin in the vicinity of Wallace and Burson.² Portions of these rural communities have required water to be trucked in during past drought periods.</p> <p>The City of Stockton and the Stockton District of California Water Service Company (Cal Water) both supply portions of the city of Stockton and rely on groundwater and a purchased surface supply treated and delivered by the Stockton East Water District (SEWD) to meet customer demand. These two sources have been operated in a conjunctive use manner since SEWD first delivered its surface supply in 1977. The City of Stockton completed its Delta Water Supply Project in 2012 which adds a third source of supply to the City. Stockton limits extraction of groundwater to maintain a safe yield of 0.6 acre-feet per acre.</p> <p>There is evidence of past historic groundwater overdraft in the overall basin underlying the region, based on available groundwater level data, groundwater levels in area DWR-monitored wells and the Cal Water Stockton District wells. For example, the ground water level in the 1940s was 20 feet and lowered to 80 feet below the surface by 1975. Since this time to the present, the water level has been fluctuating near 60 feet. This indicates that the portion of the subbasin underlying Stockton is in the process of recovering from the previous overdraft condition. This relatively localized reversal in overall groundwater level trends is primarily attributable to the availability of treated surface water supplies from SEWD.</p> <p>Reductions in surface water availability in 2014 have resulted in an increased use of groundwater to meet drinking water demands. Groundwater pumping by Cal Water has historically ranged from 0.10 to 0.90 af/ac/yr. Current groundwater pumping by Cal Water equates to 0.35 af/ac/yr, significantly lower than the estimated allowable 0.6 af/ac/yr sustainable yield of the basin.</p> <p>Historically dependent entirely on groundwater, the cities of Manteca, Escalon, Lathrop and Tracy now receive treated surface water from the South San Joaquin Irrigation District (SSJID) South County Water Supply Program (SCWSP) which began deliveries in 2005. The drought of 2014 has required these cities put conservation measures into place, and renewed increased reliance on groundwater.</p> <p>Purchased surface water is obtained by the Stockton East Water District (SEWD) from either the New Hogan Reservoir on the Calaveras River or the New Melones Reservoir on the Stanislaus River. SEWD has transfer agreements with the US Bureau of Reclamation (USBR) for water from both reservoirs and another shorter</p>

² http://www.recordnet.com/apps/pbcs.dll/article?AID=/20031014/A_NEWS/310149983

Potential Impact	Discussion
	<p>term transfer agreement with South San Joaquin Irrigation District (SSJID) and Oakdale Irrigation District (OID). Water from both sources is conveyed through an extensive conveyance system owned, operated, and maintained by SEWD. Raw water is treated at SEWD’s treatment plant located on the eastern edge of the Stockton metropolitan area.</p> <p>Finished water is pumped from the plant via transmission mains to Cal Water, the City of Stockton, and San Joaquin County. San Joaquin County has two separate maintenance districts (Lincoln Village Maintenance District and Colonial Heights Maintenance District) within the City of Stockton that are served by the plant.</p> <p>In the past the purchased water from SEWD provided approximately 65 percent of the Cal Water’s water requirements; however, since 2007 Cal Water has placed greater reliance on the purchased surface water supply. In 2013 this source was used to supply 85% of the total annual demand. 2014 surface water supplies are expected to be substantially less.</p> <p>Each year since 2007 Cal Water’s customers in the Stockton District have consistently maintained a reduced per-connection demand, which has resulted in a lower total demand in the District.</p> <p>As a result of the current drought conditions SEWD’s surface supply as provided by the US Bureau of Reclamation (USBR) have been reduced. SEWD has indicated that given the nature of this reduction they should be able to provide, barring any changes from the Bureau, a full water supply to their Urban Contractors.</p> <p>However, the City of Stockton, who with the completion of their San Joaquin River WTP had in the past few years shifted away from use of the SEWD surface supply; found that as a result of reduced flows in San Joaquin River they needed to return to SEWD to augment their supply portfolio. This has a potential impact on Cal Water’s service area in that it may reduce the portion of the SEWD supply available to its customers.</p> <p>With reservoir levels near historical low levels, continuation of drought conditions into 2015 threaten even greater cutbacks in surface water supply delivery for drinking water, and increased reliance on already stressed aquifers.</p> <p>SSJID urban customers (Manteca, Lathrop, and Tracy) have imposed use restriction on their ratepayers due to 2014 drought conditions, and these cities are pumping additional groundwater.</p> <p>If the drought continues into 2015 and the US Bureau of Reclamation (USBR) places further, deeper reductions on the supply available to the SEWD and its urban contractors, then Stockton and Cal Water will have to shift production reliance to the groundwater resources and draw upon the banked groundwater replenished under the conjunctive use operations. Continued and more aggressive conservation measures can assist in minimizing the extent of the impact that this shift to groundwater production will have on the groundwater basin.</p>
<p>At risk of not meeting existing agricultural water demands</p>	<p>The vast majority of agricultural groundwater use is extracted from the deep portions of the subbasin that has plentiful reserves. However, shallow agricultural wells and those along the margins of the basin are vulnerable to dewatering during drought periods. SSJID has imposed delivery limitations on irrigation customers as a result of the 2014 drought.</p>

Potential Impact	Discussion
	With reservoir levels near historical low levels, continuation of drought conditions into 2015 threaten even greater cutbacks in surface water supply deliveries for agricultural users, with increased reliance on already stressed aquifers.
At risk of not meeting ecosystem water demands	Not applicable.
Drinking water MCL violations	Not applicable.
Groundwater basin overdraft	<p>Characterized as “critically overdrafted” in the 1980s, water suppliers in the Eastern San Joaquin Subbasin have invested over \$700 million in water supply projects since 1980³ that, together with more efficient urban and agricultural water use, has now halted groundwater level declines as evidenced by long-term water level measurements. Wells in many areas, particularly those now served by surface water show evidence of water level increase, and the basin is now considered to be “in recovery.”⁴</p> <p>Drought-year reductions in surface water supplies from the Mokelumne, Calaveras, Stanislaus, and Delta threaten to reverse these gains, and begin to once again overdraft the basin.</p> <p>Historical groundwater flow trends from the 1800s indicated groundwater originally flows from east to west. However, with increased development in the Stockton area and groundwater levels now below sea level, saline intrusion has occurred. The eastward flow of groundwater from the Delta area is significant, because of the typically poorer water quality and the migration of saline groundwater with high chloride and TDS concentrations.</p> <p>Groundwater overdraft conditions have existed in the San Joaquin Valley Basin since the 1920s. DWR estimates the annual overdraft from this sub-basin at 70,000 acre-feet in 1980.⁵ Starting in 1993, heavy rainfall improved the availability of imported supplies resulting in a noticeable thirty-foot recovery with a high average elevation occurring in 1999. This trend is illustrated in Figure 19.</p> <p>Even with six of the past seven years having less than normal rainfall the previously discussed two factors; the shift to greater reliance on surface supplies and the reduced overall demand, along with the long term conjunctive use operation of the groundwater and surface water have contributed to an increasing average static water level in the City of Stockton and in Cal Water Stockton District wells.</p> <p>In addition, the potential of continued eastward migration of high-chloride groundwater has been reduced. With a reduction in the surface supply, the potential of saline intrusion can eventually impact Stockton wells in the future. Therefore, any program which would help to increase groundwater levels, such as water conservation, reuse or groundwater recharge programs which would help reduce groundwater pumping will help to slow the easterly movement of this saline intrusion front.</p>

³ 2014 Eastern San Joaquin IRWMP, p. ES-8 – See ATTACHMENT A – Eastern San Joaquin 2014 IRWMP Update

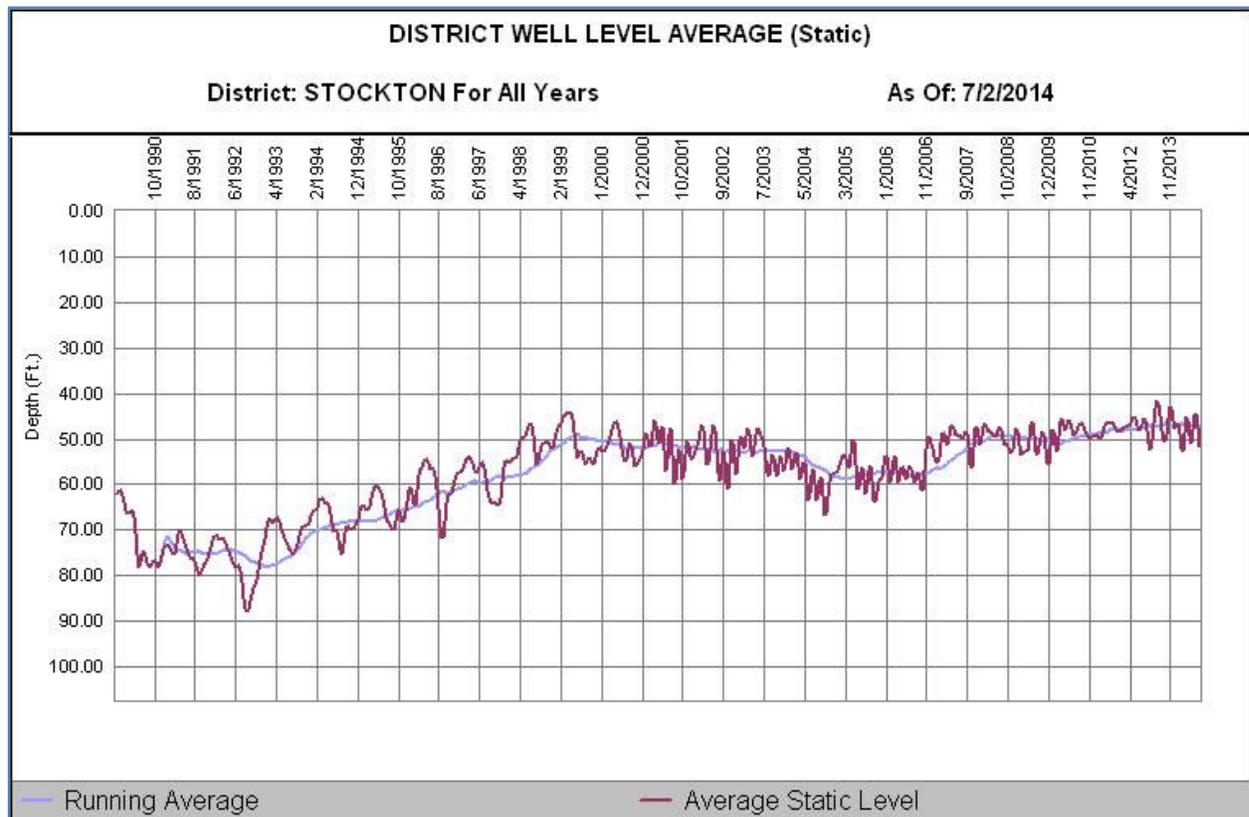
⁴ 2014 Eastern San Joaquin IRWMP, p. 6-19 – See ATTACHMENT A – Eastern San Joaquin 2014 IRWMP Update

⁵ DWR Bulletin 118-80

Potential Impact	Discussion
	<p>Purchased surface water is obtained by the Stockton East Water District (SEWD) from either the New Hogan Reservoir on the Calaveras River or the New Melones Reservoir on the Stanislaus River. SEWD has transfer agreements with the US Bureau of Reclamation (USBR) for water from both reservoirs and another shorter term transfer agreement with South San Joaquin Irrigation District (SSJID) and Oakdale Irrigation District (OID). Water from both sources is conveyed through an extensive conveyance system owned, operated, and maintained by SEWD. Raw water is treated at SEWD’s treatment plant located on the eastern edge of the Stockton metropolitan area.</p> <p>Finished water is pumped from the plant via transmission mains to Cal Water, the City of Stockton, and San Joaquin County. San Joaquin County has two separate maintenance districts (Lincoln Village Maintenance District and Colonial Heights Maintenance District) within the City of Stockton that are served by the plant.</p> <p>In the past the purchased water from SEWD provides approximately 65 percent of the District’s water requirements; however, since 2007 Cal Water has place greater reliance on the purchased surface water supply. In 2013 this source was used to supply 85% of the total annual demand.</p> <p>SSJID urban customers (Manteca, Lathrop, and Tracy) have imposed use restriction on their ratepayers due to 2014 drought conditions, and these cities are pumping additional groundwater.</p> <p>With reservoir levels near historical low levels, continuation of drought conditions into 2015 threaten even greater cutbacks in surface water supply deliveries for municipal and agricultural supply, increased reliance on already stressed aquifers, and resulting water level declines.</p> <p>In the past, the Stockton and Cal Water relied exclusively on groundwater for their water supply. With the availability of the high quality treated surface water from the Stockton East Water District, they have reduced reliance on groundwater. Any curtailment in this surface supply will affect water supply.</p>
Discharge water TMDL violations	Not applicable.
Other drought related adverse impacts	<p><u>Increased Crop Water Demands.</u> Under 2014 drought conditions very little rainfall has been available to meet crop demands. This has required earlier and greater applications of water to meet crop demands. This places additional demands on already stressed surface water supplies and makes scheduling of deliveries more problematic.</p> <p><u>Saline Water Migration.</u> The eastern San Joaquin Delta is underlain at depth by ancient deposits of connate saline water. Prior to the initiation of delivery of treated surface water to urban Stockton in the 1980s, this saline water was moving steadily eastward, resulting in municipal and agricultural wells becoming too salty for use. This eastern migration appears to have halted in recent years, primarily due to increasing groundwater levels in southwest Stockton. Drought conditions that reduce surface water supplies and result in greater use of groundwater threatens to remobilize this saline water and make additional wells unsuitable for beneficial use.</p> <p><u>Surface Water Curtailments.</u> SSJID has been ordered to curtail use of 15 permitted water rights used for municipal and agricultural water supply and for hydroelectric generation purposes. Water supply shortfalls will be made up through use of</p>

Potential Impact	Discussion
	groundwater, and voluntary conservation measures. While non-consumptive use for hydroelectric generation will be still be allowed, reduced flows will result in significantly reduced power production. SSJID’s Curtailment Certification Forms are presented as ATTACHMENT B – Curtailment Order Certification (Att2_DG_Impact_2of2).

Figure 19 - Composite Water Level Trend in Central Stockton



Water Conservation Measures Imposed Because of Drought

City of Stockton - Water Conservation Measures Imposed Because of Drought

The current provisions of the water conservation measures and/or restrictions that the City of Stockton has implemented due to the 2014 drought apply to all persons using water in the City regardless of whether they have a contract for water service with the City. The Urban Water Management Plan calls for 5 stages of conservation. The plan calls for an increase to the next stage based on increments of 6,000 AFY of overdraft. The City is currently in Stage 2, which require a minimum of 10% reduction. If the current drought continues in to 2015 and wholesaler Stockton East has had its allotment curtailed, the City would move to Stage 3 which would require the customers to reduce by 20 – 30% of normal supply.

City of Stockton Water Conservation Rules
It is unlawful during the period May 1st to November 1st of each year for any person to use, permit or allow the use of water in any of the following manners:

City of Stockton Water Conservation Rules

1. Any use of potable water from any fire hydrant is prohibited except by regularly constituted fire protection agencies for fire suppression purposes or by the responsible water agency, when alternate water sources or reclaimed water sources are available. In the absence of alternate water sources or recycled water sources, potable water from any fire hydrant may be used provided a permit for such use is approved by the Fire Department and the responsible water agency.
2. For exterior irrigation except as follows:
 - a. These provisions shall apply to all exterior irrigation including but not limited to public, private and commercial locations.
 - b. Irrigation shall be prohibited between the hours of 11:00 a.m. to 6:00 p.m.
 - c. To conduct exterior irrigation in such a manner or extent that allows water to run off or escape from the premises or to be wasted.
 - d. Exceptions to the above regulations:
 - i. Drip and/or mist irrigation systems.
 - ii. During the initial 21-day period of establishment for new plantings the above regulations shall not apply.
 - iii. Other uses which cannot reasonably comply with the above regulations due to the large size, normal hours of use or type of use of the area to be irrigated may be accepted upon approval by the Director of a water conservation plan which meets the goals of reduction and conservation.
3. To allow the escape of water through leaks, breaks, or malfunction within the water user's plumbing or distribution system for any period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of 24 hours after the water user discovers such break, leak, or malfunction, or receives notice from the City, any water provider or enforcement authority of such condition, whichever occurs first, is a reasonable time within which to correct such condition or to make arrangements for correction.
4. The use of water for washing cars or boats is permitted only with the use of a quick-acting positive shut-off nozzle on the hose.
5. The operation of any non-self-service commercial car wash unless the soap/water solution for such use is reclaimed. If a reclaimed water system cannot be installed, the car wash operator shall submit a plan satisfactory to the Director to modify operation of the facility to reduce its usage of water by at least 20 percent of its usage during the same month of the prior year for comparable business volume. If there is no history of prior use, the operator shall provide to the Director data comparable to such history to establish its base monthly usage.
6. Restaurants shall serve water to customers only upon request.
7. Use of water for cleaning building or mobile home exteriors shall be prohibited except as follows:
 - a. With the use of a bucket and sponge; or
 - b. For the preparation of such exterior surfaces for the purpose of repair or repainting with the use of a pressurized washing device equipped with a quick acting positive shut off.
8. Use of water in publicly displayed ornamental fountains in public and commercial establishments shall be prohibited unless the water is recirculated.
9. Use of water to wash driveways, sidewalks, patios, parking lots, aprons and other similar exterior surfaces is prohibited except with the use of pressurized sidewalk cleaning equipment or for sanitation, public health and safety and fire protection purposes.
10. The draining and/or refilling of all existing swimming pools, whether public, private or commercial, shall be prohibited between June 1st and October 1st except for protection of public health and safety.
11. Use of potable water for dust control purposes except for public health or safety purposes. Reclaimed, recycled or other nonpotable water may be used for such purposes so long as such water is not wasted.
12. The indiscriminate running of water or washing with water not otherwise prohibited above which is wasteful and without reasonable purpose.
13. Exception. The above regulations shall not apply to users or uses when the source of water is other than:

City of Stockton Water Conservation Rules
<ul style="list-style-type: none"> a. A public water system as defined in California Code of Regulations, Section 64555(a) (23); or b. A groundwater aquifer used by a public water system. (Prior code § 9-712)

SSJID - Water Conservation Measures Imposed Because of Drought

SSJID began the water season two weeks later than originally planned. SSJID traditionally provides irrigation water on a 10-day cycle; due to the drought this season, irrigation deliveries started with 14-day rotation, went down to 12-day runs as the season went on, and we are now back to providing 10-day runs for these warmer months. SSJID plans to adjust as needs require. A concerted effort is also being made to minimize District spills. Woodward Reservoir is being kept down to the lowest level possible. Had it not been for previous years' conservation efforts (like those installed through the On-Farm Water Conservation Program, as well as the Division 9 Irrigation Enhancement Project), the District would have had to enforce stricter rules and other limitations. If faced with another year of drought, the District will use the same precautions, possibly with more severe restrictions.

In January 2014, SSJID committed to enabling growers in SSJID's service area to receive enough water to get a healthy crop, and that the cities that receive wholesale treated water would get enough water to assure they would be able to meet the State's drinking water quality standards. The key to SSJID's ability to meet these commitments is the fact that this year it has a hard cap on its water supply out of New Melones Reservoir of 225,000 acre feet (AF). In the past couple of years, the District has made significant gains in its conservation efforts, partly in response to drought conditions. In 2012 the District used 247,070 AF, and in 2013 usage dropped to 239,670 AF.

Despite those savings, the District will implement some additional measures this summer in order to stay within its 2014 allotment. Unfortunately, because of the hot, dry conditions California is currently experiencing, growers' water demands are higher than last year.

SSJID has called for a voluntary 20 percent reduction from the cities' demands of the Water Treatment Plant. SSJID has notified the cities that the District will be curtailing their respective demands of the WTP by 20% in August and September. This means that each individual city will be curtailed by 20% from their 2013 use in August and September.

On the irrigation side, the District is proposing that Woodward Reservoir in Oakdale be held at a 204' elevation, as opposed to its normal 210' level. In addition, the irrigation season will end on September 30th.

In March 2014 SSJID agreed to provide 2,400 AF of water to Tuolumne Utility District as a humanitarian gesture to help the critically water-short Sonora community.

For 2014, shortages will be made up by lowering Woodward earlier than usual, and from an intensified effort to avoid spills from individual grower operations. SSJID will also look to optimize use of its own wells to the greatest extent possible and will ask growers that have wells to rely on those for their last irrigation after harvest.

While these efforts are necessary to stay under the hard cap of 225,000 AF it has this year, the District's looming concern is for the 2015 water year. If next year is dry, and there is a strong chance that will be the case, SSJID could face great challenges meeting its water needs, because New Melones will be pulled down to historic lows this fall. On July 15, 2013 New Melones held 1,208,980 AF. On July 15, 2014 the reservoir had only 669,687 AF, and it is expected to be at 339,000 AF on September 30th. Without significant rain and snow this winter, next summer will be an extremely difficult year across the State.

California Water Service – Water Conservation Measures Imposed Because of Drought

California Water Service Company (Cal Water) has an extensive, on-going conservation program in place, including water-use evaluations, indoor and outdoor rebate programs, high-efficiency device distributions, and school education. Program outreach is conducted through a number of methods including bill inserts, direct mail, print advertising, local presentations, radio advertising, television/movie theater public service announcements and advertising, and billboards.

Cal Water's conservation program has contributed to a 15% reduction in demand among Cal Water customers as measured in gallons per capita per day (gpcd) since 2007. Water use in Cal Water's Stockton District was 151 gpcd in 2013, which is below the 2020 target of 165 gpcd.

In response to the current drought, Cal Water has quickly moved forward on a number of additional measures that are beyond this ongoing program.

Water Shortage Contingency Plan Implementation

Cal Water implemented Stage 2 of its Water Shortage Contingency Plan (WSCP) on March 11, 2014. Consistent with the implementation of Stage 2 of the WSCP, Cal Water is currently requesting 20% conservation from customers. Cal Water's WSCP includes a total of four stages, with Stage 2 including the following elements:

Stage 2 – California Water Service Company – Water Shortage Contingency Plan

Increase or continue all actions from Stage 1
Implement communications plan with customers, cities, and wholesale suppliers
Request voluntary or mandatory customer reductions
File Schedule 14.1 with CPUC approval, if necessary
Request memorandum account to track penalty rate proceeds and other drought-related expenses
Lobby for implementation of drought ordinances
Monitor water use for compliance with reduction targets

The actions continued from Stage 1 of the WSCP are as follows:

Stage 1 – California Water Service Company – Water Shortage Contingency Plan

Request voluntary customer conservation as described in CPUC Rule 14.1
Maintain ongoing public information campaign
Maintain conservation kit distribution program
Maintain school education programs
Maintain incentive programs for high-efficiency devices
Coordinate drought responses with wholesale suppliers and cities
Lobby cities for passage of drought ordinances
Discontinue system flushing except for water quality purposes
Request that restaurants serve water only on request

Rule 14.1 – Water Conservation and Rationing Plan Implementation

In addition to implementation of its WSCP, Cal Water implemented Rule 14.1 with the California Public Utilities

Commission (CPUC), which became effective on May 1, 2014. Rule 14.1 updates the process for activating voluntary and mandatory conservation. Rule 14.1 includes non-essential and unauthorized water uses, enforcement mechanisms, a customer appeal procedure, and required publicity, among other information. Examples of non-essential and unauthorized water uses include, but are not limited to:

- Use of water that results in flooding or run-off into gutters or streets;
- Washing of vehicles, including cars, trucks, buses, boats, aircraft, and trailers, except with the use of equipment, such as a positive-action shut-off nozzle, that avoids wasteful use or to protect the health and safety of the public;
- Use of water for washing driveways, patios, parking lots, tennis courts, or other hard-surfaced areas, except when necessary to protect the health and safety of the public; and,
- Service of water by any restaurant except upon the request of the patron.

The full Rule 14.1 is included for reference.

Enhanced Conservation Plan

In addition to the ongoing district conservation program, Cal Water is implementing an Enhanced Conservation Plan that includes the following elements:

- Direct contact with high water users;
- Direct contact with HOAs;
- Direct mail to 20% of highest-using single-family residential customers;
- Placement of weekly print ads;
- Video PSAs in local movie theatres, cable, and network television;
- Implementation of pilot program to identify leaks for large landscape customers (e.g. parks, HOAs); and
- Distribution of restaurant table tents for service of water upon request.

