DOCKETED

Docket Number:	15-WATER-01
Project Title:	Water Energy Technology (WET) Program
TN #:	205049
Document Title:	Association of California Water Agencies Comments: On Drought Response WET Program
Description:	N/A
Filer:	System
Organization:	Association of California Water Agencies/Lon W. House
Submitter Role:	Public
Submission Date:	6/16/2015 3:21:57 PM
Docketed Date:	6/16/2015

Comment Received From: Lon W. House
Submitted On: 6/16/2015
Docket Number: 15-WATER-01

15-Water-01 WET comments by ACWA

Additional submitted attachment is included below.

Association of California Water Agencies
Leadership Advocacy Information Since 1910

Association of California Water Agencies 910 K Street, Suite 100, Sacramento, California 95814-3577 916/441-4545 FAX 916/325-4849
Hall of the States 400 N. Capitol St., N.W., Suite 357 South, Washington, D.C. 20001-1512 202/434-4760 FAX 202/434-4763
www.acwanet.com

Dockets Unit
California Energy Commission
1516 Ninth Street, MS 4
Sacramento, CA 95814

RE: 15-Water-01, Drought Response WET Program

Dear Docket Office:

Please find the Association of California Water Agencies (AWCA) comments on the proposed Water Energy Technology Program (WET). The Association of California Water Agencies is an Association comprised of approximately 430 public water agencies. Collectively, ACWA members are responsible for over 90 percent of the water delivered in California.

While we understand the need to develop and invest in "innovative technologies" for water savings and encourage such activity, our concern is the immediacy of this program. Specifically, we are in a serious drought, and this program will do little or nothing in the near term (this summer) to reduce water consumption[1].

If the Energy Commission is really interested in implementing programs that result in rapid deployment and demonstrable water savings this summer, it needs to focus on water systems improvements, specifically water loss/leak detection and remediation programs.

Savings Potential. There are huge savings possible from a statewide leak detection effort. The California Department of Water Resources (DWR) California Water Plan Update 2013 reports that statewide water loss from water distribution systems amounts to ten percent of the total

[1] There are existing programs, such as appliance rebate programs, that this proceeding does not appear to deal with and we are not commenting on those here.

volume of water supplied[2], or close to 1 million acre-ft[3] of water per year. These are water losses that could be significantly reduced with a widespread water system leak detection and remediation effort.

Concentrated Water Savings. Water system leak detection/remediation efforts result in large savings at a single location. Fixing one water system leak of 2gpm (gallon per minute) found by a water audit is equivalent water savings to installing 100 High Efficiency Toilets in customer homes.

Demonstrated Water and Energy Savings. In 2007, the California Public Utilities Commission (CPUC) authorized water-energy pilot projects designed to validate claims that saving water can save energy, and to explore whether energy savings may be realized through water conservation measures and can be incorporated into electric utility energy efficiency programs. The reported results of these pilots were informative. Of the ten water conservation pilots reviewed, the water system leak detection program offered the greatest energy savings potential (at relatively low cost) among all the pilot programs[4].

Sample Program. A statewide water system/leak detection effort would the following components:

Leak detection audit. This service will need to be done by approved contractor using approved methodology and technology. As with the existing electric utility pump testing programs, the leak detection audit can be subsidized or paid for partially or entirely via grants and incentives.

Embedded energy determination. The amount of energy embedded in the water system water will need to be determined by the leak audit contractor and will require assistance from the electric utilities and the water system in obtaining water system billing data.

Leak remediation. Remediation and rectification of identified leaks will need to be done under the supervision of the water system. Water systems leak repairs require available funding, and a lack of funding can delay the leak repair for years. This is particularly a problem this year, as reductions in water deliveries have constrained water system budgets. A grant/incentive program that assists water systems in rectifying water leaks would result in immediate, and substantial water and energy savings.

Our comments on the specific questions asked follow. The questions are answered in relation to our recommendation for a water system leak detection/remediation program.

---

[2] California Water Plan 2013 Update, Chapter 3, Urban Water Use Efficiency, California Department of Water Resources, 2013.

[3] An acre-ft of water is 325,851 gallons.

[4] CPUC (2011), "Embedded Energy in Water Pilot Programs Impact Evaluation: Final Report", by Econ Northwest, March 9, 2011.

1. What emerging technologies should be considered that provide direct on-site energy, water, and greenhouse gas savings for each of the identified sectors?
Leak detection is a demonstrated and accepted methodology. There are a variety of technologies that can be/are utilized in leak detection audits:
Listening Devices Listening devices include listening rods, aquaphones, and geophones or ground microphones. Mechanical and electronic listening need to be placed in proximity of the leak to detect the sound produced. Mechanical and electronic geophones are used to listen for leaks from the surface. Modern electronic devices have signal amplifiers and noise filters to attenuate the leak noise signal. The most important factor for success in using listening devices is that the leak detection engineer has good hearing, is well trained and is experienced in interpreting the sounds picked up by the device.
Leak Noise Correlators A leak noise correlator typically consists of a receiver unit and two sensors equipped with a radio transmitter. The sensors are placed on valves or hydrants on each side of the suspected leak. The sensors pick up the leak sound from the water main or pipe being tested. The leak sound travels along the pipe with a constant velocity depending on the pipe diameter and pipe material. The leak noise will first arrive at the sensor closer to the leak. The correlator uses the time difference between the two arrival times, information about the pipe material and size, and the distance between the two sensors to calculate the location of the leak.
Digital Correlating Noise Loggers The recently developed technology of digitally correlating leak noise loggers, which combines acoustic noise logging and leak noise correlation (pinpointing the location of the leak) into one operation, improves the efficiency of leak detection. This technology has the advantage of reducing the time between identifying a leak noise and pinpointing the leak location. While the digital correlating loggers will identify the location of the noise, it is still necessary to verify the exact location of the leak by using ground microphones before excavating for the leak repair.
Leak Noise Loggers Noise loggers are installed at fittings and programmed to automatically turn on at night to monitor system noise and listen for signs of leakage. The usual logging period is two hours, typically starting from 02:00 a.m. Night-time logging has the dual benefits of increased intensity of leak noise due to higher pressures and the absence of interfering ambient or consumption sound.

2. What are some of the main barriers preventing implementation of advanced water and energy saving projects?
The main barriers are cost: both for the leak detection audit and the remediation effort. Water systems rarely have the sophisticated equipment or training to do leak audits, and generally have to rely upon external vendors to provide this service. Leak detection determines where on the system there is a water leak, but does not determine the cause of the leak or the corrective measure necessary. Water audit identified leaks generally require excavation to repair. The cost to repair the leaks found by the leak detection audits depends upon what corrective measure is necessary. With most leaks found by audits, the site will have to be excavated and the proper fix determined. Repair can run thousands of dollars for the excavation alone. After excavation

exposes the site, an evaluation of the leak cause and pipe integrity is done. Simple repairs, like fixing a pipe leak with a clamp or cleaning a valve, are relatively easy to accomplish. However, if the pipe integrity is compromised, it may be necessary to replace lengths of pipe, with resultant increase in cost. If a hydrant has to be replaced, the cost can be a thousand dollars or more.

3. To what extent is broadband or internet availability a factor that prevents implementation of water and energy saving projects, especially on farms and in rural areas?
Broadband/internet availability is not an issue with leak detection. The results of the leak detection are stored on the laptop computer used for the analysis and are available for download or transmission.

4. Are there any operational, regulatory, or other constraints that prevent installing projects quickly?
Operational or regulatory constraints are primarily with the water system in question. If a leak is identified on a major transmission or distribution line, fixing the leak may require taking that line out of service while the repair is being made. That requires scheduling and prior notification to all impacted water customers.

5. What is the capability of obtaining utility data showing pre- and post-energy and water use? If utility data is not available, how will pre- and post-results be documented?
The determination of water system embedded energy is a significant on-going effort in the state and a number of water systems have already determined their system embedded energy values. Identifying a leak, and fixing that leak, will result in quantified water savings. The determination of the water system embedded energy times the water saved will quantify the energy and GHG savings. We do wish to highlight a concern about the "pre- and post-results" documentation. In drought years, many water systems are having to switch to groundwater pumping to replace their curtailed surface water delivers. Switching from surface water to groundwater almost always increases electricity consumption (needed to pump the water out of the ground). Water savings via leak remediation will result in energy savings, but water system energy use will be higher in a drought year for the same volume of water delivered.

6. How can the WET Program best bring benefits to disadvantaged communities?
Water systems in the state serve all communities, including disadvantaged communities. Reducing the water losses in the local water system will benefit all customers served by that water system.

Thank you for your consideration.

Sincerely:

Lon W. House, Ph.D.
ACWA Energy Advisor
lonwhouse@waterandenergyconsulting.com
www.waterandenergyconsulting.com
530.676.8956

June 16, 2015