COMMENTS AND RECOMMENDATIONS FOR DOCKET No 09-AAER-1A, JULY 10, 2009

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Lorraine:

The following comments are recommendations are addressed to the June 30, 2009 minutes regarding the efficiency and labeling requirements for landscape irrigation equipment. Please forward them to the appropriate office for consideration. I wish I had received notice of this meeting.

1. Comments regarding the corrected report by Peter Mayer of Aquacraft:
   a. Mr Mayer's earlier report originally calculated an average of 14.5% water savings with 3112 ET controllers installed throughout California. A calculation error reduced that actual savings to about 6%. We should not be surprised at this disappointing saving. The users were basically given controllers and it was up to them to get them installed and programmed. Most ET smart controllers are difficult to program. Those who had "professional" installation and water audits done did not learn how to program them. Hence, at the first sign of a problem, they either misprogrammed them and wasted water, which may answer how some systems had a higher water usage, or turned them off as a smart controller. Those who learned to programmed them themselves fared somewhat better. However, for the models that required monthly ET service fees, most would probably not renew the fee.
   b. Some would argue that the study did not have a baseline and no control over it. The reality is that this is exactly how it will be when 2012 arrives. The study was trying to see the realistic water savings to be expected. Six million smart controllers will not be installed, programmed, re-programmed, and monitored by the state, city, or water districts in the real world.
2. Describing the type of controllers, existing non smart controllers should be referred to as conventional controllers (not dumb controllers), and any controller that can adjust to daily weather conditions and approximate the plant watering needs as a smart controller.
3. Concerning cost information, the Bureau of Water Reclamation "Weather and Soil moisture Based Landscape Irrigation Scheduling Devices" which will be updated in August provides very good information insofar as list price, number of stations, features, monthly service fees, etc… Currently, I estimate that the current cost (before rebates) of a residential ET based controller with either a weather station or ET service fee, with a water audit, and "professional" programming will be around $500 each. Commercial controllers will be much higher.

4. I agree with Mr Davis' closing comment. A smart controller or add on device that makes an existing controller smart can save water by calculating or estimating the landscape vegetation watering needs. However, it can do little or nothing about the system efficiency or the user. The original design, quality of installation, maintenance, coverage, and operating pressure, use of a rain switch, or the homeowner's capability cannot be controlled by any smart controller. It can be estimated that an older existing system efficiency with nominal maintenance is around 60% at best. Newer systems with properly designed and installed valves and sprinklers using higher efficiency sprays and drippers should have higher efficiencies. We must remember that Bill 1881 only affects the sale and installation of new irrigation controllers starting in 2012, and does not address existing controllers, or older installations.
5. No test procedure or field study is without its shortcomings, and hence criticism. The SWAT testing is meant to establish a standard by which various models can be evaluated as to their potential to replenish the water in the landscape plant root zone. While some may argue that SWAT tests should be performed over a much longer period than 30 days, the reality is that all smart controllers will water little or not at all during the winter, and water virtually every day during the summer. Hence, most of the testing is conducted and completed during the spring. The spring and the fall are the times of the year when most of the water is wasted with a conventional controller primarily because the rapidly changing conditions are not accounted for by the homeowner changing the watering schedules on a daily basis. For those who argue that the Fresno results may not apply in humid areas, a comparison was performed between testing in Fresno at CIT, and testing at other locations. The results indicate very close approximation of results.
6. I wish to emphasize that smart technology need not be necessarily ET based. Ground moisture sensors, for example, are certainly not ET based. Alex-Tronix does not use ET for its smart controller technology. I therefore recommend that environmentally based controllers be described as smart controllers, not ET controllers. I agree with the SWAT and Irrigation Association definition that smart controllers adjust irrigation schedules or run times based on daily weather conditions (without limitation to ET based controllers)
7. On January 1, 2012, six million Californians will not run out and buy a smart controller. Only as their existing controllers go bad will they purchase and install a smart device. It will take 8-10 years before all landscape irrigation controllers are converted in the state. The cost of ET based controllers, their complexity, the requirement of monthly ET service fees, the economy, availability of landscape water are among the factors that will affect the conversion rate. The intent of bill 1881 is to save landscape water as soon as possible. To do this, certain hurdles need to be removed:

a. Cost. If the average cost of a new ET smart controller, installation and programming is $500, even with partial rebates, it will be difficult to convince homeowners to spend those funds to save 6% of their landscape water, which is about 3% of their residential water bill.
b. Most people will not want to pay an ET monthly service fee
c. Most ET controllers are difficult to program
d. Landscape contractors would have to train their personnel on dozens of these new controllers, an expensive exercise during poor economic conditions
e. Contractors do not want call backs to reprogram or re-explain the programming of controllers to homeowners.
f. Smart controller rebates may not be available due to economic conditions
g. There is an incompatibility between the way a smart controller operates and limited (rationed) watering. For example, in the LAWP region, watering is limited to Mondays and Thursdays, and for limited hours of the day. A smart controller calculates when watering is required by the root zone. That watering time will probably occur either during a non watering day, or a non watering time of day. I recommend that either water rationing be used, or smart technology-not both at the same time. Until this incompatibility is resolved, no smart controller will work properly.
h. One way to remove most of the hurdles is to allow add-on smart devices (other than rain switches or ground moisture sensors) that work with existing controllers. Add ons have the following advantages:

   1). Homeowners keep their existing controller-they are used to programming them and will not need professional help to install them or program them

   2) Some add ons have no monthly service fees

   3) No installer call backs if professionally installed
   4) Easy to program
   5) Less expensive than smart controllers-rebate (if available) may cover the entire cost
   6) Likely to save more water because if the add on is easy to install and program, without fees, it is more likely to be used and used correctly.

8. Insofar as capabilities, first the devices need to be divided into four categories:
   a. Smart controllers- ET or non ET based, stand alone with wireless ET data for a service fee, or a nearly dedicated weather station.
   b. Ground moisture sensors-installed in the field to measure the ground moisture

c. Add on devices (not rain switches) that can work with only certain models of conventional controllers (for example the Hunter Solar Sync)
d. Add on devices that can work with any conventional controller to make them smart. It should not be limited to ET based smart technology. It is critical that add on devices be allowed to be sold after Jan 2012 to take start saving water immediately to care of the millions of existing controllers that will not be converted for years to come.

For labeling purposes, I suggest a prefix "C" to identify smart controllers, "M" for moisture sensors, "AL" for an add on limited to operating with a specific series of existing controllers, and "AU" to identify the device as an add on that can work with any (U for universal) existing controller to make it smart. The Rain Bird ET Manager and the Alex-Tronix Universal Smart Module are examples of the latter.

Next, the label should indicate that the device or controller has been SWAT tested with a posted efficiency rating averaging irrigation adequacy and efficiency. A 95% average controller should be rated C- 9.5. A universal add on device with an average of 92% would be labeled AU-8.7.

It is important to realize that an add on device does not operate valves by itself, nor does it replace a controller program. In that sense, it would be meaningless to have minimum programming features and functions such as number of programs, number of start times, and flexible duration, cycle and soak cycles, etc… The add on either modifies the controller irrigation schedule or modifies the run times based upon current environmental conditions. Typically, the conventional controller is programmed with its summer irrigation schedule any time of the year. The add on modifies the run times or alters the irrigation schedule to approximate the plant watering needs in terms of ET or an equivalent method. A rain switch typically prevents irrigation during rainy periods. In terms of wiring, it either breaks the electrical common line from the controller to the valves, or interrupts the individual station lines at the appropriate times.

Properly designed add ons that are simple and inexpensive would encourage and empower the user to efficiently convert immediately to water conservation. Because ET based controllers are complicated, the real water saving results did not come close to the savings possible as was noted by the Aquacraft study. As Mr Davis noted near the end of the technical session, it was very difficult in Orange County to get user participation with ET based controllers. We should not limit smart technology to ET and not forbid the sale of add on devices that can offer immediate and more effective participation and water saving efficiency.