
MEMORANDUM

TO: BARYOHAY DAVIDOFF AND MANUCHER ALEMI
FROM: JULIET CHRISTIAN-SMITH
SUBJECT: DRAFT REGULATIONS
DATE: 9/29/2011
CC: DAVE CEPPOS

These comments address the draft agricultural water measurement regulation. Overall, it is clear the Department of Water Resources (DWR) listened to the stakeholders present at the Agricultural Stakeholders Committee meetings. However, it is also clear that some of the vague language in the current draft inadvertently creates loopholes that must be closed in order to carry the intent of the legislation. I will briefly describe four main areas of improvement to create a more effective regulation. I thank the DWR staff and consultants for their time and effort.

1) Accuracies must be reported in terms of volume (not indirect measurements used to calculate volume).

Agricultural water suppliers may choose devices that measure flow or velocity rather than volume. Districts then use calculations to estimate volume based on these indirect measures. However, in so doing, additional error is introduced, and the range of the estimated volume may be much larger than the range of the measured flow or velocity. Therefore, it is far more statistically and mathematically robust (and defensible) to require that all accuracies be in regard to volume, as the legislation only requires that the “volume” of water be measured with sufficient accuracy. Therefore, I suggest the following edits to Section 597.3:

“a) Options Applicable to Measurement at the Locations of Transfer to Delivery Point of a Customer:

Agricultural water suppliers shall measure water delivered to each customer delivery point using one of the following:

- 1) Measurement devices installed after the effective date of this article using a laboratory certification shall be certified to be accurate at least within $\pm 5\%$ by ~~flow rate, velocity or~~ volume in the laboratory.
Or,
- 2) Measurement devices installed after the effective date of this article using non-laboratory certification, shall be certified to be accurate at least within $\pm 10\%$ by ~~flow rate, velocity, or~~ volume when installed in field.
Or,

- 3) Measurement devices installed prior to the effective date of this article that are certified to be accurate at least within $\pm 12\%$ by ~~flow rate, velocity, or~~ volume. After replacement of an existing measurement device, the new or replacement device must meet the requirements of paragraphs (a)(1) or (a)(2) of this section.

b) Options Applicable to Measurement Upstream of the Locations of the Delivery Points of Multiple Customers

Agricultural water suppliers shall measure water delivered to each measurement location upstream of more than one customer delivery points using one of the following:

- 1) Measurement devices installed after the effective date of this article using a laboratory certification shall be certified to be accurate at least within $\pm 3\%$ by ~~flow rate, velocity or~~ volume in the laboratory.

Or,

- 2) Measurement devices installed after the effective date of this article using non-laboratory certification, shall be certified to be accurate at least within $\pm 6\%$ by ~~flow rate, velocity, or~~ volume when installed in field.

Or,

- 3) Measurement devices installed prior to the effective date of this article that are certified to be accurate at least within $\pm 10\%$ by ~~flow rate, velocity, or~~ volume. After replacement of an existing measurement device, the new or replacement device must meet the requirements of paragraphs (b)(1) or (b)(2) of this section.”

2) Requirements for choosing a measurement point upstream must be fair and meet the intent of the law.

Section 597.3 lists the requirements that must be met for agricultural water suppliers to choose a measurement point upstream of the turn-out or customer level. At the moment, this list is both too strict in some ways and too lenient in others. Option A) ii), inappropriately singles out difficulties related to measuring water supplied for rice cultivation (by focusing solely on flow fluctuations). There are a variety of other technical challenges that should be included as grounds for moving to upstream measurement, such as high sediment loads or turbulence. However, all of these technical challenges should be reviewed by a Professional Engineer in order to identify potential solutions. Therefore, I suggest removing subsection ii) and amending subsection iii) to apply to a wider variety of technical difficulties, beyond those primarily related to rice cultivation.

On the other hand, the regulation wrongly asserts that one measurement device is all that is required by the law. An objective reading of the law makes it clear that the law does not restrict the method of water measurement to one device, in fact it’s intent clearly suggests that it is not the number or type of device that matters but the ability of the device or devices to: “(1) *Measure the volume of water*

delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2). (2) Adopt a pricing structure for water customers based at least in part on the quantity delivered.”

Below, I suggest the following changes to Section 597.3:

A) Customer delivery points meet any of the following:

- (i) The agricultural water supplier does not have legal access to the customer delivery point to install, measure, maintain, operate, and monitor the measurement device, or;
- ~~(ii) The agricultural water supplier determines that through a customer delivery point varies during the calendar year, either due to crop agronomic requirements or the capabilities of the supplier’s distribution system, such that no single measurement device is capable of meeting the accuracy standards under §597.3(a) for the year as a whole, or;~~
- (iii) ~~The agricultural water supplier~~ A REGISTERED PROFESSIONAL ENGINEER determines that it is not technically feasible to measure and meet the accuracy standard of 597.3(a) FOR REASONS SUCH AS ~~the~~ LARGE FLUCTUATIONS IN THE flow rate or velocity, HIGH SEDIMENT LOADS OR TURBULENCE. ~~where the finding of technical infeasibility has been reviewed and certified by a registered Professional Engineer.~~

3) Certification of measurement devices should follow established statistical procedures to ensure a “statistically representative sample.”

Currently, Section 597.4, subsection a) iii) requires a statistically representative sample but does not require that a district use statistics in its sampling procedure. This is extremely confusing and misleading. Therefore, I suggest the following revisions:

~~“iii) Existing device–field testing of a sample of existing devices, selected randomly to be statistically representative, shall be performed by individuals trained in the use of field testing equipment. It is recommended the sample be no less than 10% of existing devices, with a minimum of 5, but not to exceed 100, individual devices for any particular device type. Alternatively, The supplier may shall develop its own sampling plan using accepted statistical calculations for determining a sample size required to achieve a 95 percent confidence interval of +/-0.1 on the proportion of devices meeting the accuracy standard.”~~

4) Performance requirements should be reported in agricultural water management plans.

Section 597.4, subsection b) currently requires water suppliers to document compliance with the requirements in Section 597.3, however, it provides no way for the DWR or the public to access these records. Since agricultural water management plans are also a central part of this legislation, it makes sense to report on the performance of water measurement devices in agricultural water management plans. Below, I offer these final edits:

“b) Performance Requirements- All measurement devices, shall be correctly installed, maintained, operated, inspected, and monitored as described by the manufacturer, laboratories or individuals certifying the device and pursuant to best professional practices. Water measurement device testing protocols and frequency of testing shall be according to manufactures or design specifications and following best professional practices.

If, as part of an agricultural water suppliers maintenance and operations protocols, an installed device is determined by the agricultural supplier to no longer meet the performance requirements in §597.3(a) or §597.3(b), then the agricultural water supplier shall take appropriate corrective action, including but not limited to repair or replacement to achieve the requirements of this article.

Records to document compliance with the requirements in §597.3 shall be maintained by the agricultural water supplier IN AGRICULTURAL WATER MANAGEMENT PLANS ~~for at least 10 years~~. The records shall include at a minimum: documentation of certification for an individual device or type of device as necessary to indicate compliance with §597.3, and additional device-specific data where warranted including date of inspection, maintenance, repairs, calibrations, and adjustments to measurement device.