

WQ Consultants

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Progress Report

In the fall of 2016 when the Consortium was organized I believed that siphon measuring, reporting and recording would be an easy task. Now, some twenty months later I fully realize just how wrong I was and how much more difficult the task is. Looking on the positive side, after many false starts we now have much clearer view on how to move forward. So, to bring you up to date.

First, the measuring issues: After lengthy consultations with leading sensor manufacturers we have developed a Mark 1 model that uses only one pressure sensor plus an algorithm to determine siphon flow, whether the siphon is fully open, closed or in between. Streamflow, for determining the head loss, will be measured by a separate Mark 1, an independent USGS gauge or another currently available stream gauge.

We are planning a study in order to determine the length of the reach that can provide accurate data from one measuring device. Using an independent gauge makes it possible to share data with adjacent siphons and owners.

Next, reporting. Extensive field testing in the Delta has shown that reporting from the farm to the grower's office is not well served by a cellular network. Cellular transmission, in the Delta, which is, at best, spotty and often unreliable is not an effective tool. The cost of the transmission at \$25, \$15 or even \$10 per month can be expensive for growers with multiple siphons.

The cellular issues motivated us to research low power, long range radio in the unlicensed spectrum (no charge for transmission). The radio transmission goes from the measuring device to a gateway and then on to the Internet. Range to the gateway is about ten miles. Additional gateways to extend reception range can be added. A gateway device cost in is the \$500 range. We are currently seeking a nonprofit organization to support a field test Proof of Concept study for the Measuring Consortium.

In the interim, and as a data back-up, we have added, in our improved model Mark 1, a secure digital data storage chipset. The chipset records all measurements taken and can be accessed and transferred to a USB flash drive.

Our Mark 1 software supports the downloading of data either directly to an Excel database on a laptop or to a third party database server. All measurements are graphed for convenient viewing.

For those who have already purchased our Mark 1, or do so within the next forty five days, a no charge upgrade to the new model is offered. The new model cost is \$2,495 and includes LoRa radio transmission.