

Flowmeters Turn Water into Wine by Karin Grinzel & Craig Pfaff

If you're going to need a sophisticated water metering system, it may as well serve a growing industry and be located in a beautiful setting. Who needs walls of cement and steel when you can go to work in lush, picture-perfect rolling hills surrounded by rows of colorful beauty? Some people get all the breaks...



Washington State hosts some of the most arguably beautiful country in the United States, with the wetter Seattle metropolitan area offset by the more arid country east of the Cascade Mountain range. The dryer, rugged topography has encouraged scores of vineyards occupying land framed by the Columbia River to the west and the city of Walla Walla to the north.

Wine in itself is nothing new...it's been around for what seems like forever. But its presence and contribution to a specific region in Washington State has been growing. The Walla Walla Valley of southeastern Washington was recognized as an independent American Viticultural Area (AVA) in 1984 when it supported just 4 wineries and 60 acres of vineyards and has since evolved into over 1,500 acres homing over 100 vineyards and wineries. These collectively provide over 200 full-time jobs and generate over \$100 million annually. The area is a wine-grower's paradise where the northerly latitude provides a lengthy growing season and the contrast in temperature from morning to night allows the grapes to develop their flavor and complexity slowly while retaining their natural acidity. The soil mixture in Walla Walla also contributes to the utopia. Historical lava flows brought in thousands of feet of dense basalt which were processed through the elements of time and married with windblown deposits of loess, resulting in a soil recipe perfect for drainage. Finally, there's the location, location, location aspect. The Walla Walla region lies to the east of the Cascade mountain range which means rainfall is limited thus allowing growers to control precisely the amount of water a plant receives through irrigation. This combination of conditions makes this territory ideal for growing grapes.

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“Walla Walla” is a Native American term that means “Place of Many Waters.” It’s the perfect name in our situation because a growing wine industry means a growing need for irrigation water. However, geography has placed this region’s water source 1,000 feet beneath thick basalt layers and therefore a complex metering system is required to collect and distribute this precious commodity in the most economical of ways.

The Walla Walla region is home to SeVein Vineyards, an association of individually-owned vineyard properties supported by a common water source. One of the first commercial vineyards in the Walla Walla Valley AVA and the cornerstone of the SeVein properties, Seven Hills Vineyard was first planted in 1980 and then expanded in 1989. Another expansion occurred in 1997 and 1998 into three partnering wineries covering over 200 acres which collectively utilize 50 percent of the vineyard fruit, selling grapes to more than 25 other premium wineries. Vineyard varieties include Cabernet Sauvignon, Merlot, Syrah, Sangiovese, Cabernet Franc, Semillon, and Sauvignon Blanc, to name a few.



Larry Wondra is the SCADA System Manager for North Slope Management LLC and has been tasked to oversee the efforts of the Seven Hills Properties Water Association LLC. This Association was formed to own, operate, and maintain the wells, pumps, motors, and portions of the system responsible for delivery of water to each owner’s property line. Easements are retained throughout member properties in order to provide maintenance and capital improvements on the water delivery system and primary road network. An elected Board of Directors manages the Association, including determination of monthly assessments to cover electricity, operation and maintenance costs. Membership in the Water Association is based on the number of water right certificate acres attached to each property.

No expense was spared in creating the advanced flow metering system utilized to accomplish the task of managing the entire process of water collection and distribution to these properties. The Association is bold enough to describe it as one of the finest agricultural water delivery systems in the Northwest. Three deep basalt wells are interconnected with five lined reservoirs/bulges and nearly ten miles of buried pipeline to provide a total capacity of over 7,500 gallons per minute. Telemetry-controlled variable-frequency speed pumps, booster pumps, and motors are designed to deliver 5 GPM per irrigated acre to each vineyard. According to Larry, “the lifeblood of the vineyards is a state-of-the-art water delivery system, tied together with miles of pipe to each property. When you are talking about seven square miles of prime vineyards, failure to deliver is not an option so durable, quality-driven solutions are a must”.

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The system works like this -- the water supply for SeVein Vineyards is provided by Seven Hills PWA via three wells over 1,000 feet deep. Two of these basalt wells function as primary water sources, and one of the wells is fully maintained as a backup source.

A single PC SCADA system monitors the output of three well pumps, two of which produce 850hp, and one which produces 350hp. The pumps are driven by variable

frequency drives, whose speed is determined by flow monitoring via three Seametrics EX-series insertion electromagnetic meters. The water obtained from the wells is discharged into five reservoirs at up to 4,200 GPM, and remains there pending demand by the vineyard irrigation system.

As the vineyard irrigation systems on each individual client property place a request for water, up to five bulge pump stations and three booster stations pull water from the appropriate bulge, delivering the water to one of sixteen irrigation zones. Again, the SCADA PC controls water distribution by obtaining flow information from multiple Seametrics AG1000 and AG2000 inline electromagnetic meters. The pulse output of each AG meter is routed to a companion FT420W Flow Computer from Seametrics.

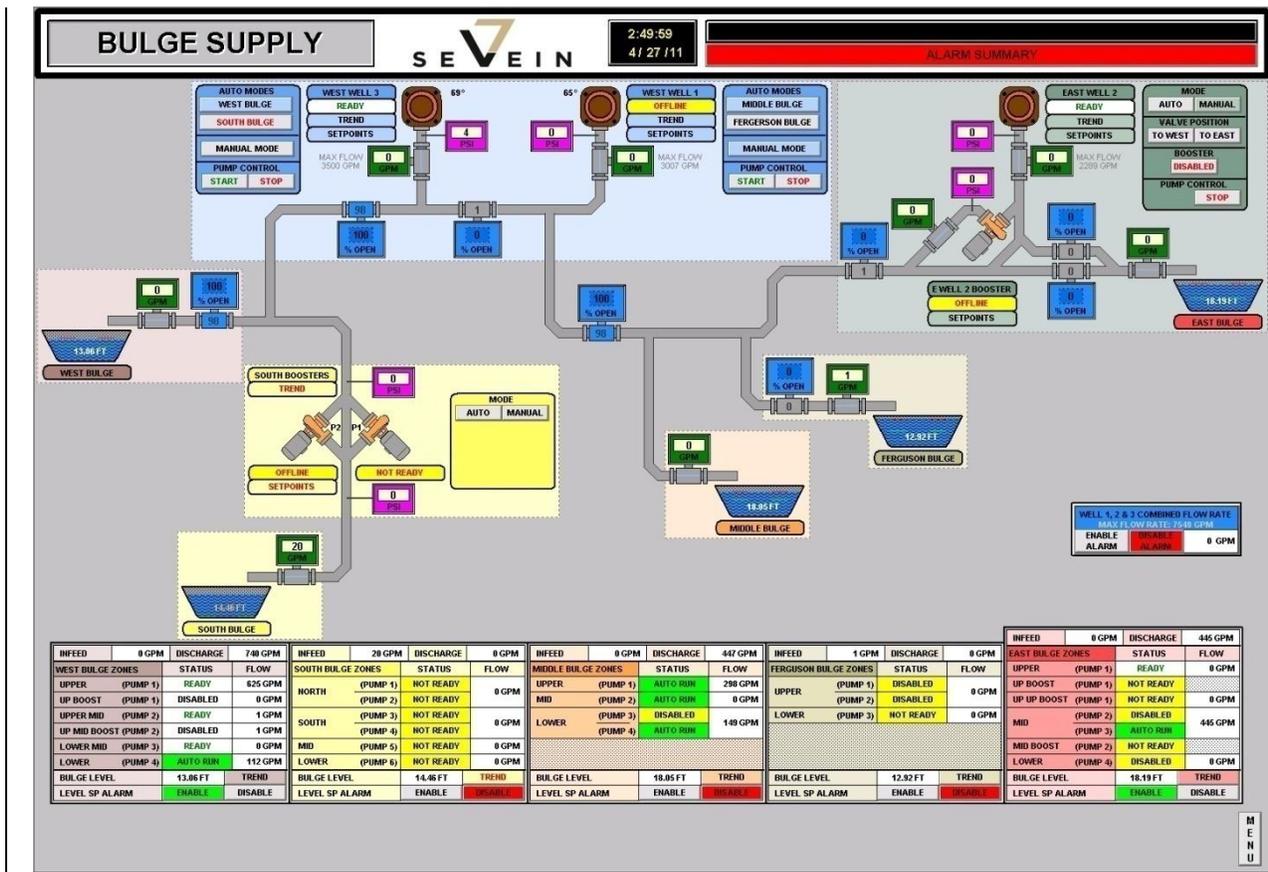


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The FT420W Flow Computer processes the digital information, and resends the raw pulse output and an analog equivalent via 04-20ma loop outputs to the SCADA system, offering a smooth level of control for each VFD pump. In addition, the Flow Computer supplies a localized Flow Rate and Accumulated Total output for the site operator during inspection or troubleshooting. The distributed water is then filtered at each vineyard site and delivered to the vines via drip irrigation.

SCADA Screen Image



We applaud the Seven Hills Properties Water Association and the North Slope Management team for developing and maintaining this highly valuable water management system that can stand as a flagship for other associations.