Surprise, Surprise

By Jeff Swanson, OAWU Circuit Rider

Is water everywhere here in the Northwest? Can you guarantee a daily supply for your customers? What shape is your well in – right now? Are your pumps going to be able to give you the same yield that they have done in previous years? These are just a few questions that I know all of you could answer in mere minutes….or could you? How would you be able to make definite and precise answers to any or all of these questions? Tired of questions? I know I am. The only way I can make any sense of these questions is to recognize the importance and prudent use of historical data. My crystal ball has failed so many times…gee, I wonder why. I think I'll put it in my time capsule, if I can just remember where I buried it!

During a recent visit to a public water system on the Oregon coast, I was told by the system owner that the groundwater source had gone 'south' for the season and he would have to go back on the alternate surface water source. Well, what's wrong with that? The only reason the well had been drilled in the first place was to allow for discontinued use of the surface water supply – this due to the high costs of filtering the water to meet the Surface Water Treatment Rule (SWTR). Yet, it was an unwelcome surprise when the newer alternate groundwater source began to contribute generous amounts of air into the system – certainly a reasonable indicator that the well source had some problems. Sure, it could have been from a leak in the system or pump piping, but it happened to be due to declining water levels in the well. He proceeded to show me to a recent article in the local newspaper. I would like to refer to parts of that article because it seems to shed some 'real time' insight to issues already facing water systems in Oregon. I have also talked with a pump company in the Northern Willamette Valley and was given similar insight to the declining water levels. This isn't necessarily unique to the west side area either. In just recent days in August, I visited another public water system in Central Oregon that had to start using an alternate (deeper) well source for the 70 connections.

The following information has been taken from the Newport "News-Times" in an article titled "Local wells drying up as rain stays away" by Joel Gallob:

Water problems that often arrive in late August or early September have been surfacing much earlier this year in Lincoln County. "We've been getting more and more calls," said Jay Whisler of Pumpro in Toledo. "In the good old days, you'd see minimum flows start happening in late August or September. Now we're seeing it in June." "Last year was the worst I've seen, and I've been in the business 12 years," he continued. "This year is worse." Water levels have been lower, earlier in the summer, for each of the past four years, Whisler said. He said that most years, he could get 5 or 10 gallons per minute from a well, and that might go to 2 to 3 gallons per minute in September, at the end of the dry season. "It's already like that now," he said. As a result, Whisler has been installing a lot of reservoirs - tanks that can hold up to 2,800 gallons and take a 2 gallons per minute (gpm) flow and hold it for use as needed. "Two gpm is enough to get by," he said.

While the source of water for most cities and water districts are surface flows - streams - and continue to flow in dry weather, wells rely on ground water, and that depends on rains that soak into the ground. The rains in western Oregon usually fall from mid-October to late July. "This (rainy) season, they stopped in May (2002) and didn't begin again till December," Whisler said. "It quit again in May (2003)."The growing dryness poses fire dangers, Whisler added. Normally, rains soak into the ground and recharge the aquifer, or underground water region, and push up the water table. Without enough rain, the water table drops, and that is what has been happening in Lincoln County - leading to the drilling of new wells, deepening of existing wells, and purchasing of reservoirs.

Rod Erler of American Well Drilling in Salem said his company has also been deepening wells in the county. "We got three more to do because the wells went dry," he said. "I'm seeing more drilling that anytime since 1969." While most of his work is in the Willamette Valley, Erler said he has been doing more and more work on the other side of the Coast Range in the last few years. Erler said a lot of coastal wells were drilled to the first aquifer, 40 or 50 feet down. "That's not real stable now," he said. "That's connected to the rain water." In the

Willamette Valley, with three or four aquifers, the average well is 200 feet, Erler said. The coast, however, has just two aquifers. "On the coast, if you drill too deep, you run into salt water," Erler said. "It's not a panic, but a lot of people are going deeper. Some are putting in reservoirs."

Mark O'Malley, a meteorologist at the Portland office of the National Weather Service, said the drought has little to do with the cycle of El Niño, and everything to do with a long, strong high pressure region of air that has been sitting over the western United States.

The article doesn't seem to differentiate between 'private' residential or public water sources. It merely provides general information that some changes are taking place and resulting trends are requiring attention as well as related and required solutions in any event. Some water systems take measurements of static, pumping, and drawdown levels (i.e. air lines, sensors, etc.) on a regular basis. Then again some do not. In one of my previously written magazine articles titled, "A Deep Subject", I mentioned the importance of logging periodic data to help support both short and long range decision-making processes regarding the 'health' of groundwater sources. Some of the questions raised involved whether or not there may be enough water available with existing pumping rates and additional related water quality concerns.

Maybe the pump is not pumping to its full efficiency. Has the motor been periodically 'megged' to show its insulation resistance and compare that with original readings? Has there been a change in amperage draw and comparisons made with original and subsequent monthly or annual readings? Is current pumping and flow rates consistent with those of previous readings? Is the pumping frequency increasing over time yet does not show a relationship with the demand. Does the system have a master meter and if so is it calibrated periodically? Should any or all of these tolerances have changed over time, the results of such data can be valuable to help identify the problem and provide a course for solutions. Could it be due entirely to pump age or has there been a change in the well construction (bore holes, casing, seals, perforations, etc.)? Is it time to pull the pump and send a camera down for inspection? Or is the aquifer being slowly depleted or destroyed, never to return to its original capacity to supply water? Have there been long-term climate changes? Perhaps a neighboring water user has substantially altered their water use practices. What does the well log say (or can it be found)? The problem with trying to answer any of these questions is either supported by historical data or the lack of. Data allows us to 'trend' the information – that is to say provide us with some kind of specific direction and guidance based on comparing and contrasting data. The data may show that virtually nothing has changed – and that's great – so be it. Then again, it may reveal the 'grim reaper' is lurking just around the corner, coming to take away our precious water supply and we need to take immediate and un-hesitated action. I often refer to an airplane pilot's ability to fly is based on both visual flight readings (VFR) and instrument flight readings (IFR). In the event that he/she cannot 'visually' see what is in front of them (i.e. fog as thick as pea soup), they will invariably have to rely on the instruments. The instruments supply useful 'data' that will help keep them on their flight plan and sometimes save their lives from some extremely adverse conditions. The data we depend on is information in the form of numbers, dates and times, temperatures, pressures, flows, losses and gains, lab reports, etc. that we are able to turn into useful actions (or reactions) that actually operate and make our systems function. But data doesn't come without some kind of discipline and diligence. We may have to take the statistical information by writing it all down by the hour, day, week, month, and year using lots of ink and note paper. Then again, we may be fortunate enough to have a modern SCADA (Supervisory Control and Data Acquisition) operated system. Data acquisition will help to collect, interpret, report, and eventually trend the data helpful in the decision making process. In any event, having to deal with varying degrees of decreasing water supplies, some of the solutions could include acquisition or transfer of alternate sources, water restrictions, conservation measures and a timely plan for implementation.

All in all, the 'bottom line to this story is – if it ain't done, we get to 'guess and by golly' and trip over our own feet for the lack of record keeping abilities on our way to the local board of directors to tell them, "Well folks, we're out of water!" Crystal balls are also a dime-a-dozen and only make great friendship gifts. Please keep in mind, this information is not to scare or otherwise intimidate

you. It may begin to rain more – much more – maybe way-too-much-more, and the galosh will be on the other foot. In any event, there is no substitute for good and efficient data or do you *like* surprises? Surprise, surprise, Mother Nature has many tricks in her bonnet, so I believe it is indeed in our best interest to keep track – to stay on track!