



Agriculture and Energy Efficiency in Sisters Oregon

For the past few years Marc Thalacker, General Manager of the Three Sisters Irrigation District (TSID), has been facing a challenge.

Thirty irrigating farmers along Hurtlely Ranch Road in Sisters have not been receiving irrigation water for their crops on a consistent basis. There were times when nineteen couldn't get any water at all. And they weren't happy about it.

"We were getting about six complaints a day from landowners during the irrigation season," said Thalacker. The complaints mainly involved inconsistent water flow from the existing irrigation pumping and piping system which had been installed many years ago by a private landowner in the area.

The flow problem was the result of incorrect sizing on two of the pumps combined with pipe sizing and locations that were inconsistent throughout the system. Four landowners, located south of the pumping plant, were on a 30hp pump; twenty-six, north of the pump station, were on a separate 30hp pump. And pushing water north meant an uphill climb for the water before reaching the twenty-six properties.



Before System Improvements—Hurtlely Ranch Road irrigation pumps and electric meters. View is facing north, pump/meter on left in photo serviced 26 landowners; right serviced four to the south.

"We even tried putting the landowners on a rotation system but it wasn't working. Rotation only works if people will honor the system," said Thalacker.

So Thalacker had Greg Smith, owner of Thompson Pump and Irrigation Inc., come out and analyze the total system. Smith quickly determined that the problem was one of system design and equipment.

"The basic pumps were incorrectly sized, the pipe size to the landowners was inconsistent, and there was a clear need for variable frequency drives which would even-out the energy usage required to deliver water consistently to all landowners," said Smith.

Marc Thalacker was not surprised to hear this assessment from Smith. His concern, however, was how to fund the needed system improvements. The landowners had already been through a contentious law suit in the late nineties with the previous system owner and Thalacker wasn't keen to re-ignite those hard feelings.

No stranger to seeking out state, federal, and granting agencies, Thalacker has shepherded many water and energy conservation projects since joining the TSID. Assembling a broad coalition of partner agencies, Thalacker is about half-way through completing the three-year Whychus Creek piping project.



Before recent improvements roughly 55 percent of the Whychus Creek water that entered the irrigation system was lost to evaporation and leakage.

The piping project will provide substantially more water for TSID users and will eventually reintroduce runs of summer steelhead and spring Chinook salmon.

“From a conservation measure, it is the ultimate; you are not only conserving water, but you are also conserving electricity,” said Thalacker a few years ago.

For the Hurltley Ranch Road project, Thalacker reached out to a variety of partners for both technical and funding assistance.

The Natural Resources Conservation Service supplied system design services through their Environmental Quality Incentives Program (EQIP) program. Thompson Pump supplied two new pumps, a 20hp for the southern properties, and a 40hp for the northern ones.

Thompson Pump also installed two Variable Frequency Drives which monitor and adjust the energy usage of the two new pumps. A Variable Frequency Drive acts like a “transmission” for an electric motor. It automatically adjusts a motor’s speed up or down. Motors often run at full speed when only partial speed is needed. With the varied flow and pressure requirements of the Hurltley Ranch farmers, the new Variable Frequency Drives will reduce electric usage; improve motor life, and overall system life.



After System Improvements—White cabinets are the two Variable Frequency Drives. Two new pumps installed above the VFD’s. VFD/pump on the right services northern 26 landowners, left side services 4 southern landowners.

Additionally, using a sophisticated computer analysis, Thompson Pump provided the energy savings analysis required by the Central Electric Coop’s (CEC) “Save Water – Save Energy” program, allowing CEC to provide the TSID with a substantial incentive rebate for the Variable Frequency Drive purchases.

Commenting on the ability of the Variable Frequency Drives to reduce energy usage, Marc Thalacker said “I don’t have the exact numbers but I can tell you that overall energy usage on the system is way down for May (2011 compared to previous months.)”

“And the beauty of Variable Frequency Drives is that they will extend the life of the new pumps,” added Greg Smith.



And maybe best of all, the Oregon Department of Energy (ODOE) provided funding for the Variable Frequency Drive purchases using State Energy Program Recovery Act (stimulus) funds. The Wy'East Resource Conservation & Development Council, working with ODOE and CEC, provided energy savings calculations and project documentation.

New system piping costs were substantial, accounting for 79 percent of the total project. The Deschutes River Conservancy, with assistance from the National Fish & Wildlife Foundation, the National Forest Foundation, the Oregon Governor's Fund, and the Pelton Fund contributed 84 percent of the total grant monies received.

With the new system up and running, landowners are now receiving irrigation water when and where they need it. "Regardless of when people turn on their water now they get consistent flow – and we're not getting any complaints!" said Thalacker.

Here's a summary of how the Hurtley Ranch Road project breaks-down cost and funding-wise:

<u>Equipment & Labor Costs</u>	
Two new pumps (one 20hp, one 40hp) and two new Variable Frequency Drives	\$37,172
New Pipeline Costs	<u>\$138,925</u>
Total Costs	\$176,097
<u>Funding Sources</u>	
Bonneville Power Administration/Central Electric Coop	\$4,800
Oregon Department of Energy	\$12,000
Deschutes River Conservancy (and partners)	<u>\$89,600</u>
Total Funding	\$106,400

Funding sources contributed 60 percent of the total project costs! The water and energy savings, over time, will be realized by both the TSID and landowners.

Vern Rice, Energy Services Supervisor with CEC, commenting on how other irrigation districts and agricultural operations can benefit from the installation of variable frequency drives, said "I encourage anyone that has significant variables of flow or pressure in their pumping operation to learn from the TSID experience. CEC's agricultural energy efficiency rebate program is very simple and everything you need to know is on our website www.cec.coop."

John Gloeckner, a landowner on the south end of the new pumping station, is much happier this irrigating season. "It's been a long time coming. We're getting all the water we need so far. I raise cattle and bucking bulls and if I can't get water consistently throughout the (irrigating) season it costs me money because I have buy hay to feed. This project has really been a blessing," said Gloeckner.