

## PROJECT OF INTEREST

June 2016

### Innovations in Agriculture in Oregon: Farmers Irrigation District Improves Water Quality, Maximizes Water Conservation, and Generates Clean, Renewable Energy

#### CHALLENGES

Farmers Irrigation District (FID) is located in Hood River, Oregon, in the scenic and culturally rich Columbia River Gorge. Founded in 1874, FID provides water to over 5,800 acres of land, both residential and agricultural. The Hood River Valley is a national producer of pears, apples, and wine grapes, generating an average of \$260 million annual in agriculturally driven revenues. These prime farm and orchard lands are irrigated via FID's Lowline Canal constructed over a century ago of open earth ditches and wooden stave pipes.

Climate and weather patterns in the Hood River valley can be extreme with severe wind, snow, seasonal flooding and periods of prolonged drought. Major flood events in the 1990's resulted in structural damage and canal failures, causing an average of 45,750 cubic feet of sediment to pour into the Hood River Basin, impairing water quality and harming sensitive cold-water aquatic life such as trout and salmon. In 2015 Oregon experienced several years of drought and the rivers in the Hood River Basin reached record low flows. These impacts represented multiple years of significantly reduced water deliveries to farmers, diminished crop quality and yields, and regional economic hardship.

These drivers motivated FID to pursue innovative solutions to create sustainable infrastructure capable of supporting a thriving agricultural economy, while also increasing water conservation, improving water quality and habitat for endangered fish for years to come.

#### SOLUTIONS AND OPPORTUNITIES

FID used just over \$36.2 million in Clean Water State Revolving Fund (CWSRF) loans for a multiple-year endeavor to convert the open canal system to a piped, pressurized irrigation system suited to maximize water conservation and restore reliable water delivery to crops. The CWSRF program is administered through the Oregon Department of Environmental Quality (ODEQ), and through the combination of federal capitalization grants and CWSRF loan repayment dollars, FID has been successful in restoring in-stream flow by converting 96% of the existing open irrigation canals, thus allowing farmers to convert to highly efficient water delivery systems and dramatically reduce the water and energy use per acre.



A canal prior to piping



New pressurized irrigation pipe

This project presented another opportunity that FID was quick to seize. By also using the CWSRF loans to purchase equipment to generate clean, renewable energy using micro-hydroelectric technology, FID saw the potential to generate additional year-round revenues enabling them to attain the financial capacity to borrow the funds necessary to implement these innovative capital improvements. FID rehabilitated two existing hydroelectric repowering stations. These generating stations were optimized to work in tandem with the new micro-hydroelectric turbines in the new pressurized irrigation pipes, which now generate approximately 26 million kWh of electricity annually, representing about \$200,000 in additional revenues due to improved efficiencies.

## BENEFITING THE TRIPLE BOTTOM LINE

FID’s visionary leadership in investing in capital improvements supports the triple bottom line economic, environmental and social results.. The new pressurized pipe system has effectively conserved 6 billion gallons of water annually (when compared to the 1995 baseline), a result so impressive and representing such a surplus that some 2,000 excess water right acres have been sold for instream habitat to protect endangered fish. At the same time, farmers are realizing a greater economic sustainability with improved crop quality and yields which means greater economic prosperity. FID sells the 26 million kWh of power generated from the small-hydro installations to a regional investor owned utility. All of the proceeds from the sales are used to repay the CWSRF loans, as well as capital for future infrastructure investments within the local community.

Stakeholder partnerships and a collaborative working relationship with local, state, and federal resource agencies and tribes continues to be a key element in FID’s ability to effectively manage waters for the mutual benefit of growers and the watershed alike. Such innovations in agriculture serve as inspiring models of efficiency and resiliency in times of water scarcity for other communities and regions around the country experiencing similar struggles. This is particularly relevant in areas impacted by drought, water losses due to evaporation, where many permanent crops such as orchards, vineyards, and nuts are produced.

## IMPRESSIVE RESULTS

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| 6 billion gallons of water conserved annually                                      | Ability to power 2,000 homes by micro-hydroelectric energy  |
| 7,800 trees planted in riparian corridor   | New state of the art fish screens   |
| 2 minimum flow agreements adopted  | 1,451 individual irrigation pumps eliminated  |
| 2,000 supplemental water right acres abandoned, left instream for endangered fish. | 2.3 million kWh production increase<br>1.45 million kWh conserved annually due to eliminated irrigation pumps<br>Excess energy produced fed into local grid, sale of energy used to pay off CWSRF loans |



**FOR MORE INFORMATION, PLEASE VISIT:**

<http://www.fidhr.org/>

<http://www.deq.state.or.us/wq/loans/loans.htm>

<https://www.epa.gov/cwsrf>

<https://www.youtube.com/watch?v=kcvR9bx2D6E>