

Automatic Irrigation Water Management Controls

RETURN ON INVESTMENT



Pump shutoff logistics modeling – 21 well Study

Preliminary Results

• Irrigation management window: 7 am to 10:00 pm daily

Thus, wells not shutoff by 10:00 pm would run until 7:00 am even if optimal shutoff was at, say, 2:00 am.

In this example, an excess runtime of 5 hours (2:00 am – 7:00 am) would be tabulated.

This calc. was done for each well-field combination for the 2021 irrigation season.



Pump shutoff logistics modeling – 21 well Study Preliminary Results

Irrigation Parameter	Estimated Value	Comment
Total over-pumping time (1,138 hours) Diesel: 675 hours Electric: 463 hours	Diesel: \$8,100 Electric: \$737 Total: \$8,837	Diesel burn rate: 4 gal per hr @ \$3.00 per gal Electric use rate: 16.2 kWh per hr @\$0.10 per kWh
Total no. of well shutoffs	175	Season-long for all three crops
Total distance driven during season	963 miles	HQ = reference point
Distance to shutoff wells during season	316 miles	
Shutoff costs associated with driving 316 miles	\$50 (fuel cost) \$450 (labor cost) Total: \$500	Fuel cost @ 20 mpg @ \$3/gal \approx \$50. Labor cost @ 15 h driving + 15 h shutoff Labor rate = \$15/h => \$15 x 15 x 15 \approx \$450
Total value of remote well shutoff	\$8,837 + \$500 = \$9,337	Energy costs of over-pumping >> cost to shutoff in this setting and with no QOL considerations.



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Irrigation Parameter	Estimated Value	Comment
Total value of remote well shutoff	\$8,837 + \$500 = \$9,337	
Savings per well	\$9,337 ÷ 21 wells = \$444	
Cost per Electric well	\$795	Cellular subscription: \$6.50/month - \$75/year
Electric Payback period	\$870 ÷ \$444 ≈ 1.9 years	
Cost per Diesel well	\$495	Cellular subscription: \$6.50/month - \$75/year
Diesel Payback period	\$570 ÷ \$444 ≈ 1.3 years	



Save Power/Fuel/Water

Only run when needed

- Stop pumping tailwater
- Save Diesel Fuel
- Save Electric Power

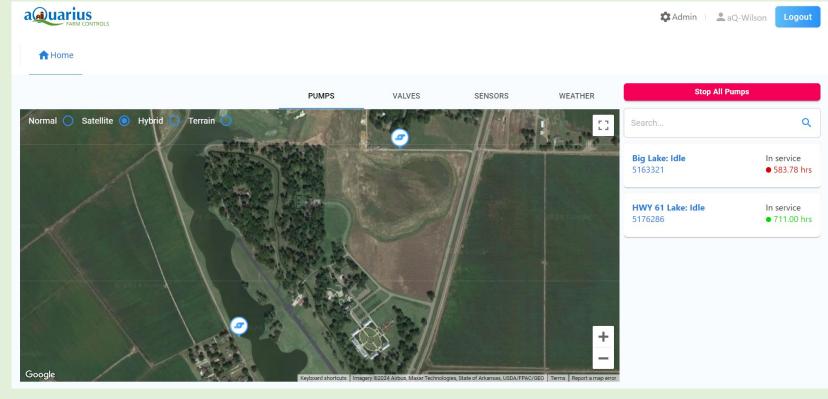


Reduce labor costs

Fewer visits to the wells

Remotely Monitor

- Pump Status
- Fuel Levels
- Maintenance Hours





Quality Of Life - \$xxx?

What is it worth to you or your help to:

- Get to go to your kids ball game
- Time with your family
- Not Going out in the bad weather to shut down wells
- Not getting up in the middle of the night to change sets or turn off wells



Telemetry

- Flow Metering
- Weather Station
- Water Level
- Soil Moisture
- Soil Temperature
- Canopy Temperature





Thank You and Credit To

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We at Applied Digital, Inc., the designers of aQuarius Farm Controls, have a passion for this project.



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