

aquafficiency®



Cascade**Energy**®

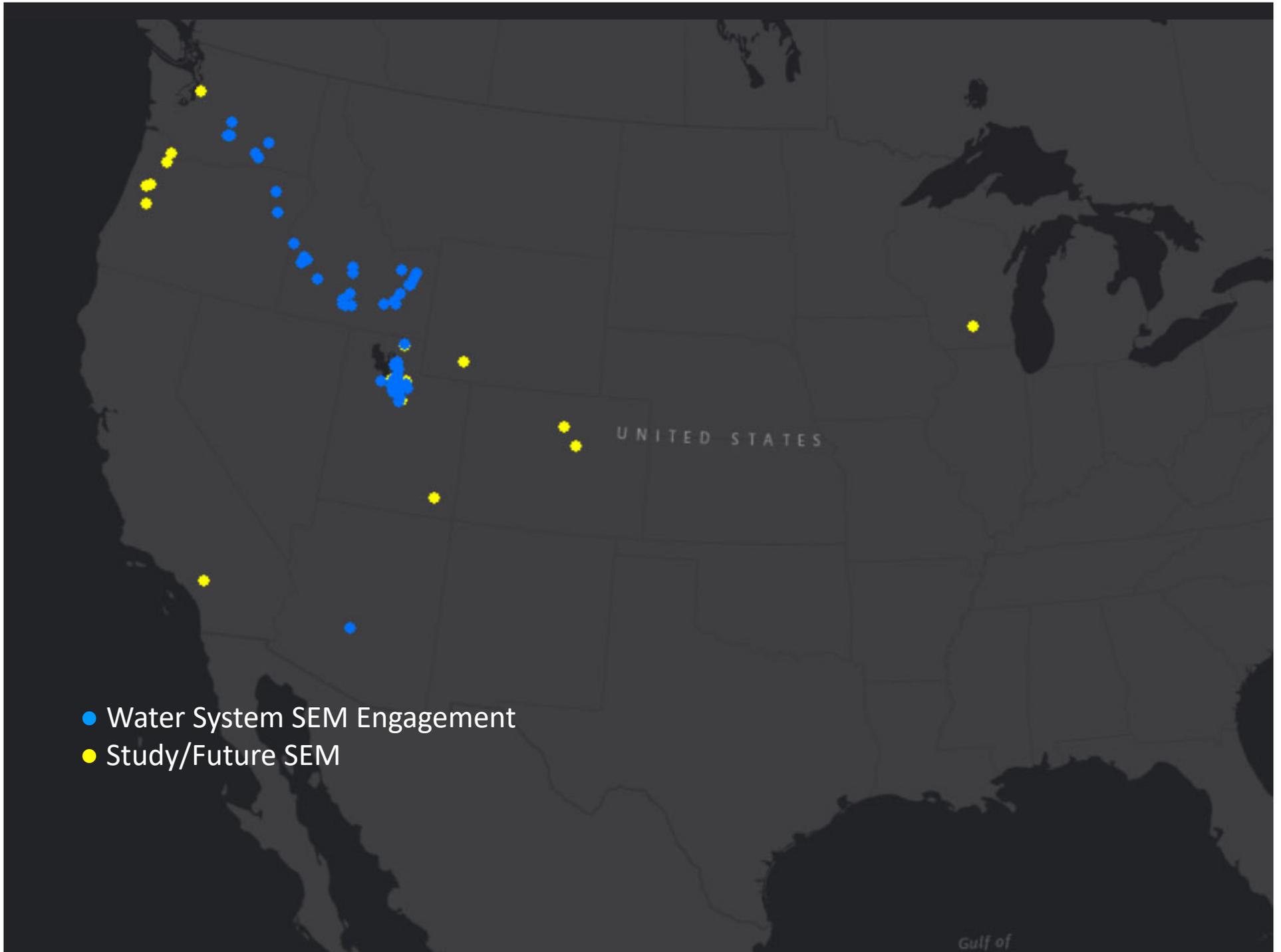
**HANSEN
ALLEN
& LUCE** inc
ENGINEERS

Success Stories From Implementing Common Low/No Cost Energy Saving Projects

PNWS-AWWA Quarterly Training
Resilience Strategies
February 25, 2021

Katie Jacobsen, P.E.
Hansen, Allen & Luce

Wendy Waudby, P.E.
Cascade Energy



Big Picture Examples

WATER WAYS

Idaho Power's
Water Supply Cohort
Success Story



“The cohort will make your system better because you’ll understand your system better. It forces you to ask, ‘is this system as efficient as it could be?’ And the answer is, ‘probably not.’”

~ Bill Carr,
former Suez Water
Production Manager





WATER WAYS

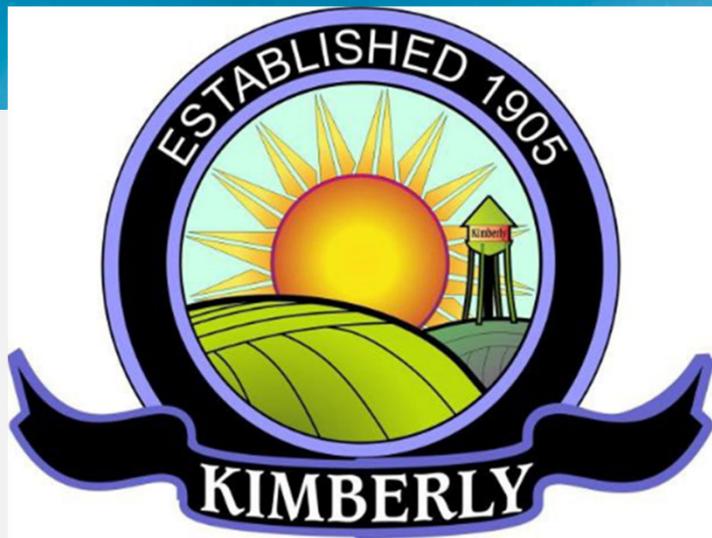
Idaho Power's
Water Supply Cohort
Success Story



Google

WATER WAYS

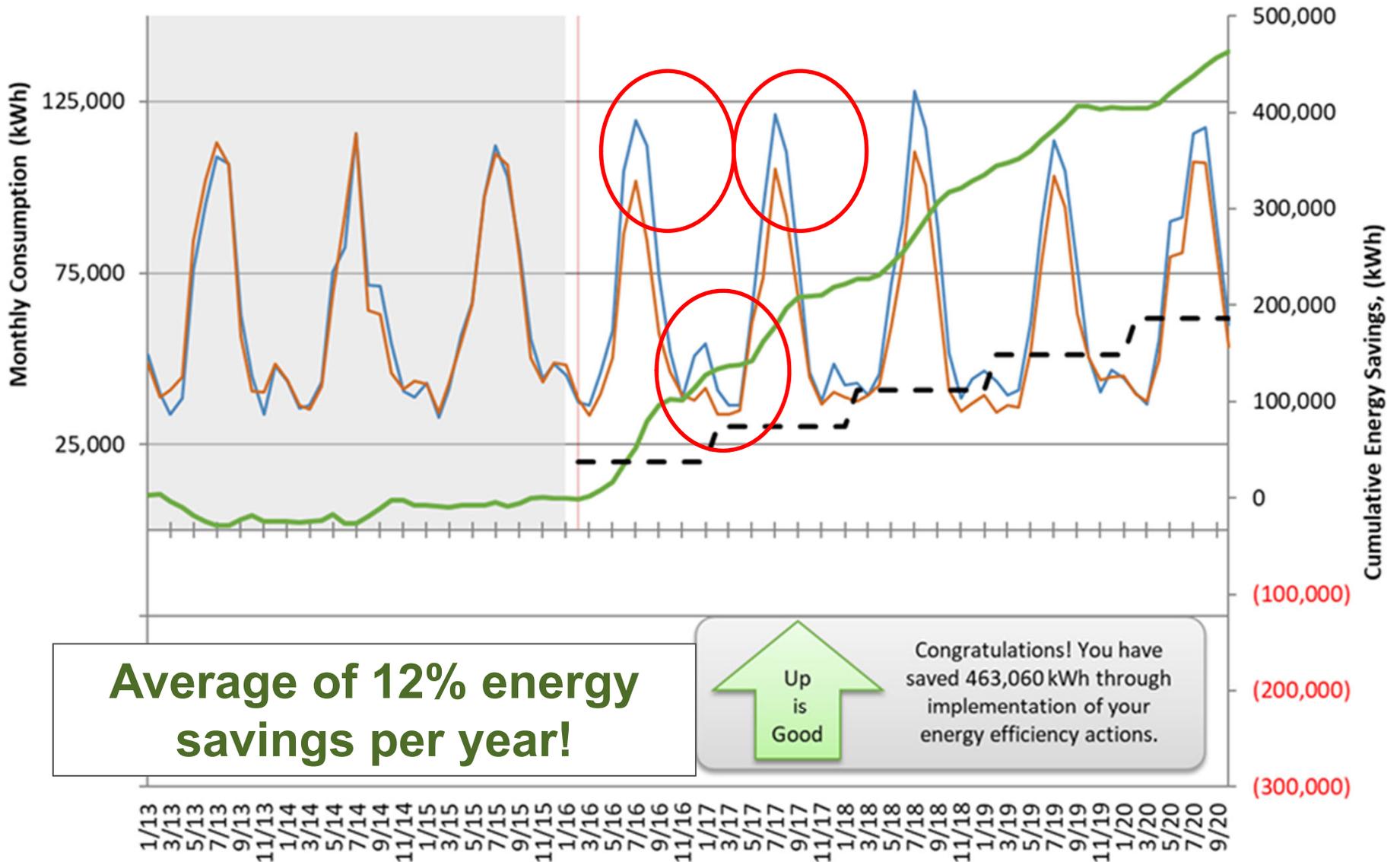
Idaho Power's
Water Supply Cohort
Success Story



“You have to put the effort into it. But once you get going, we found it’s just as easy to operate efficiently as it is to not.”

- Jed Kloer,
City of Kimberly
Public Works Foreman

City of Kimberly - Energy Performance



Average of 12% energy savings per year!



Congratulations! You have saved 463,060 kWh through implementation of your energy efficiency actions.

Baseline Period

Program Start

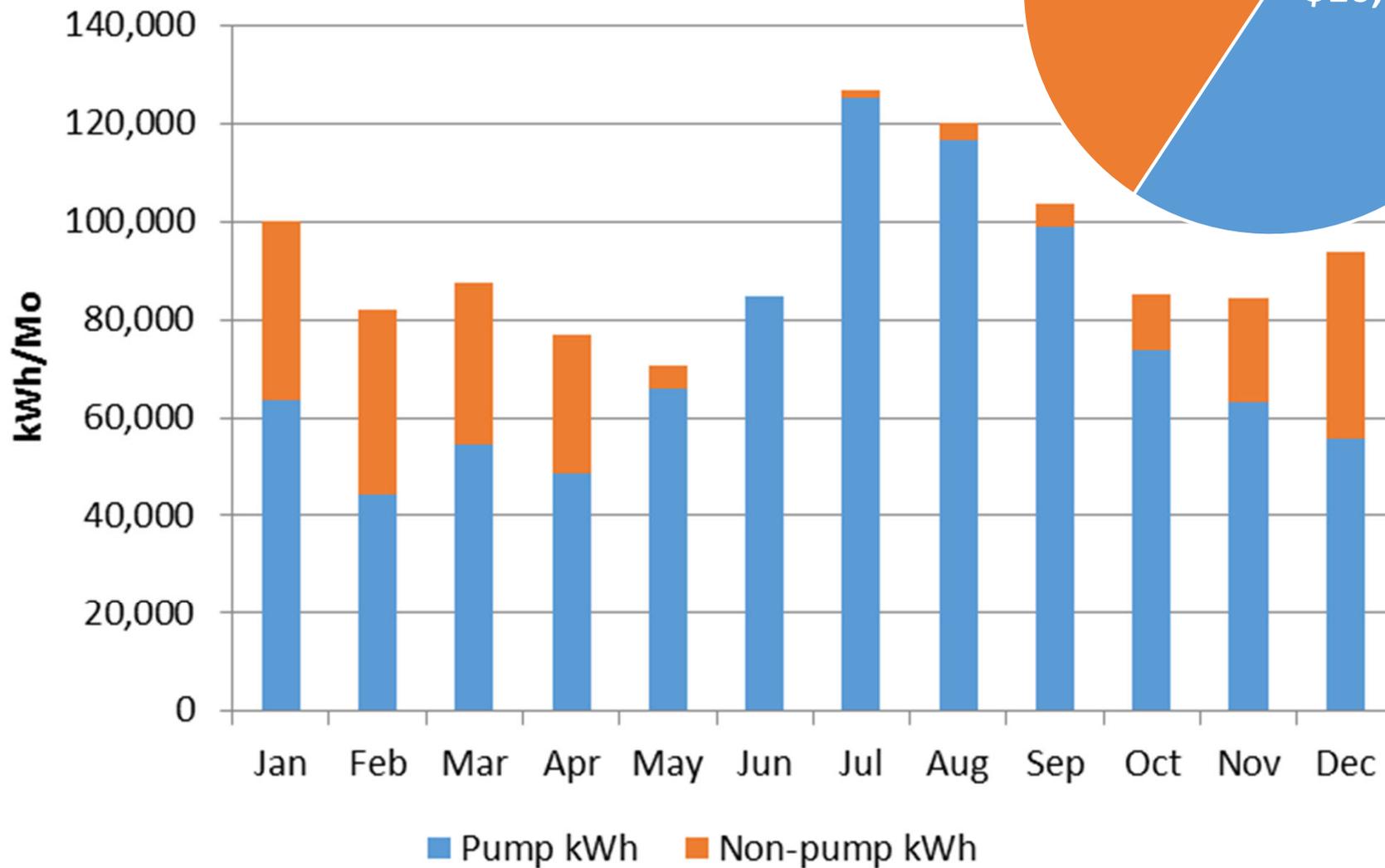
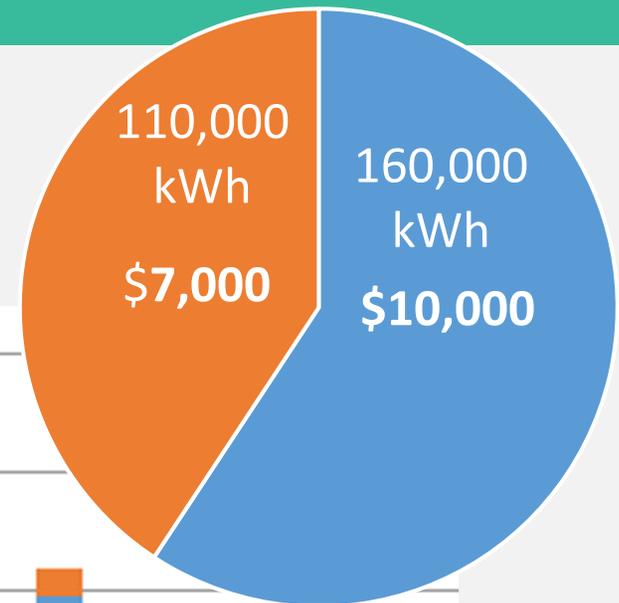
Predicted Energy w/ no Action, (kWh)

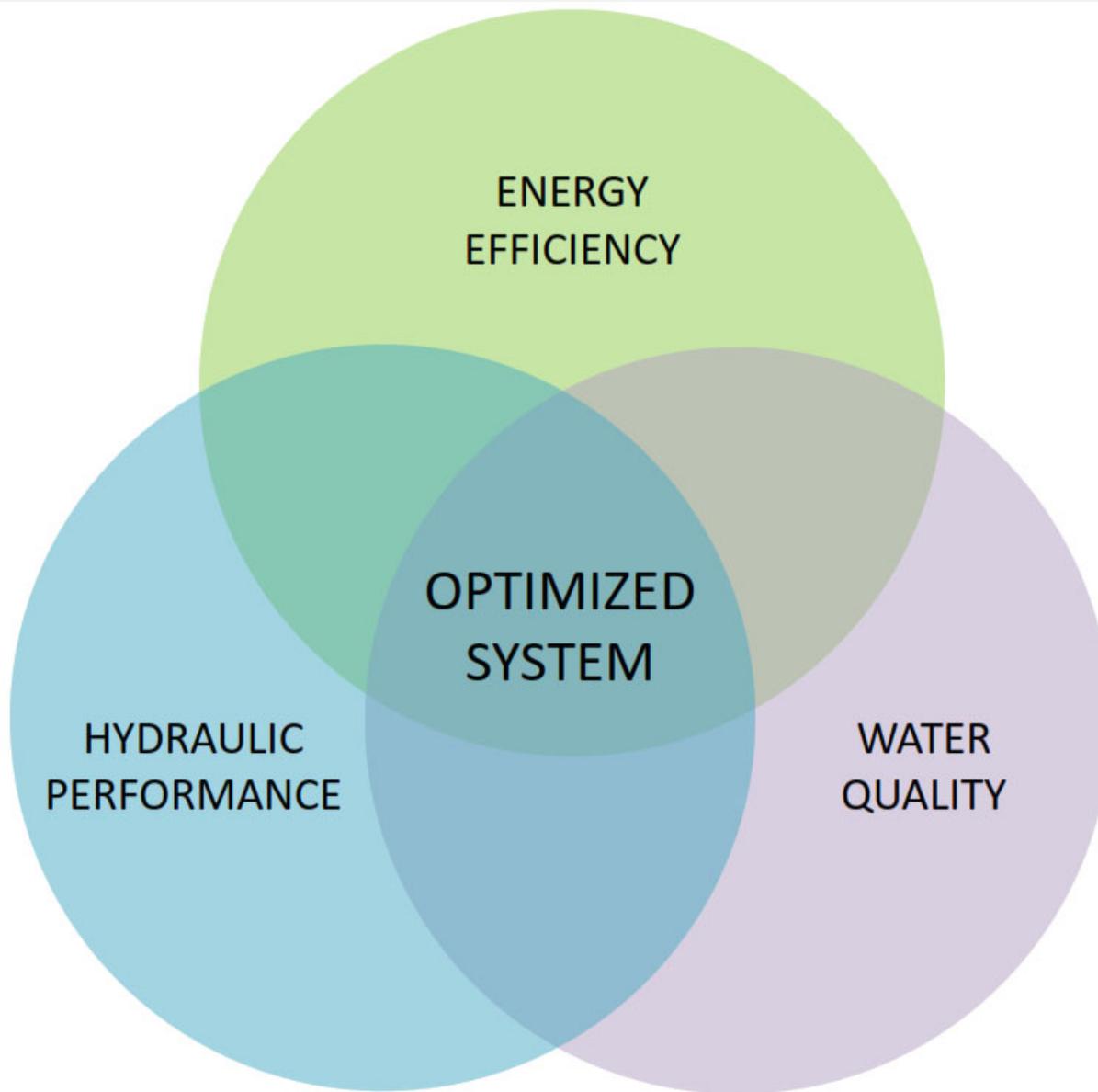
Actual Energy, (kWh)

Cumulative Savings, (kWh)

5% Annual Target, (kWh)

Heating is Expensive

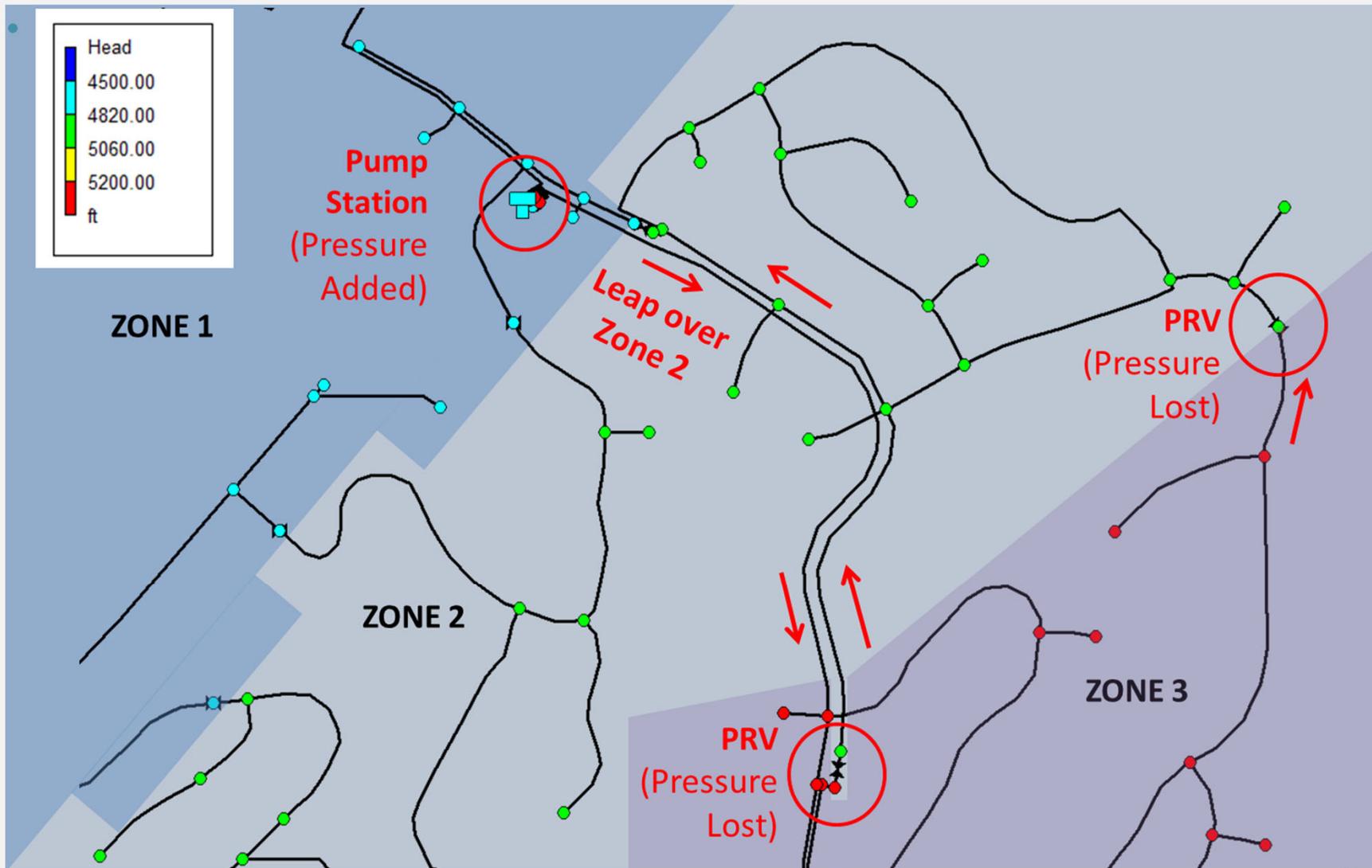




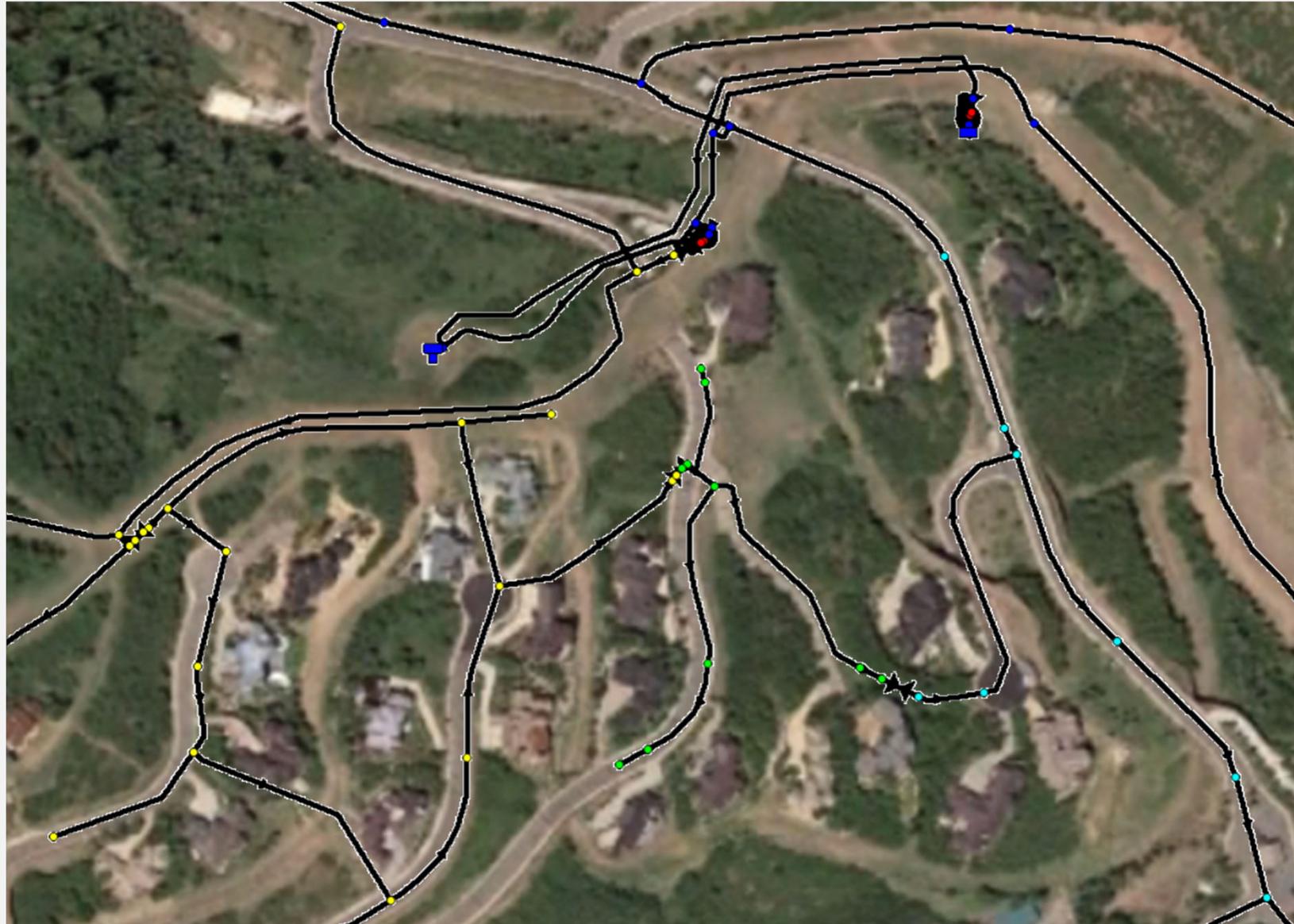
Jones and Sowby, "Water System Optimization" (*Journal AWWA*, June 2014)

LEAPING AND LOOPING

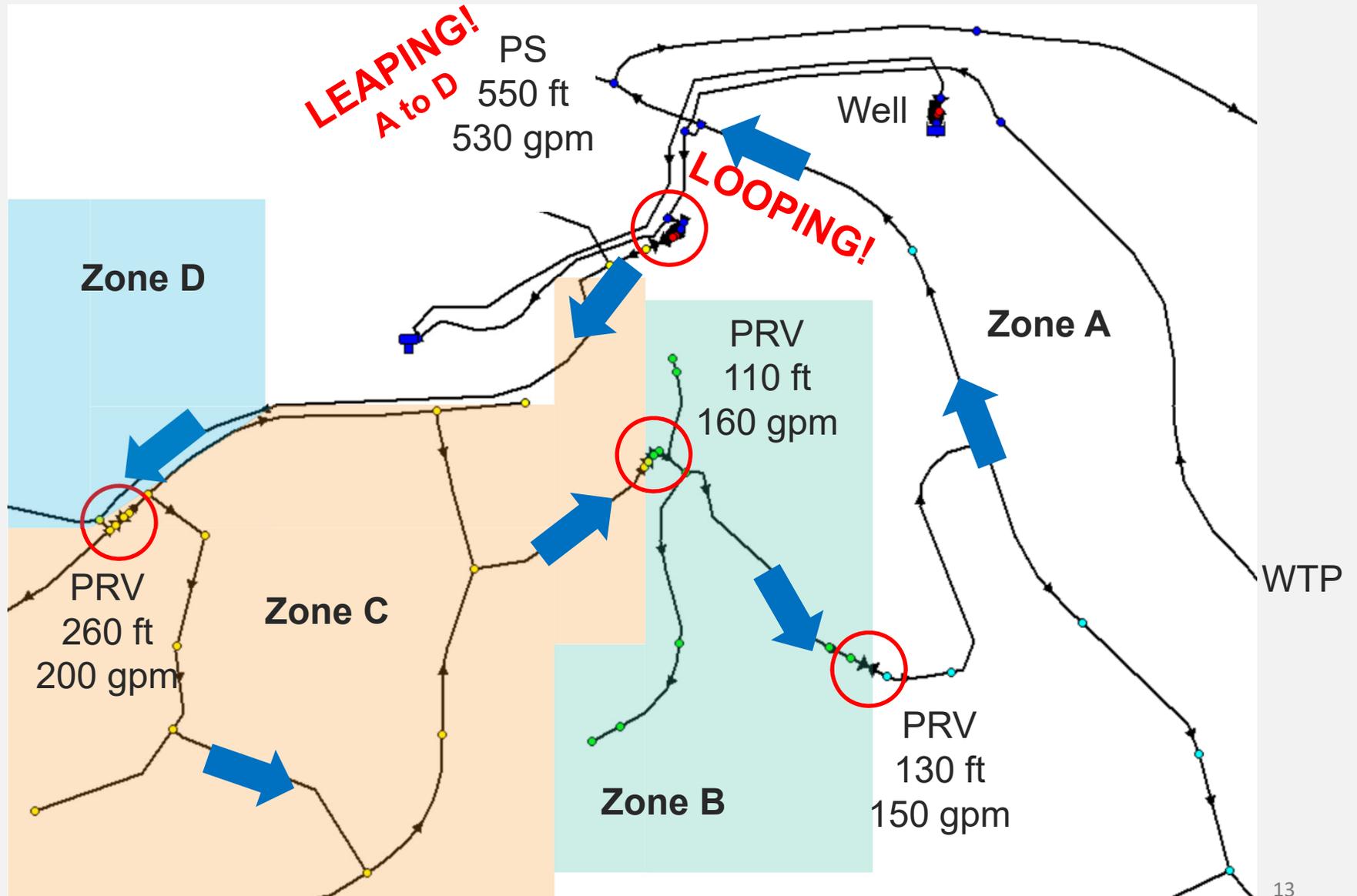
Leaping



Leaping and Looping



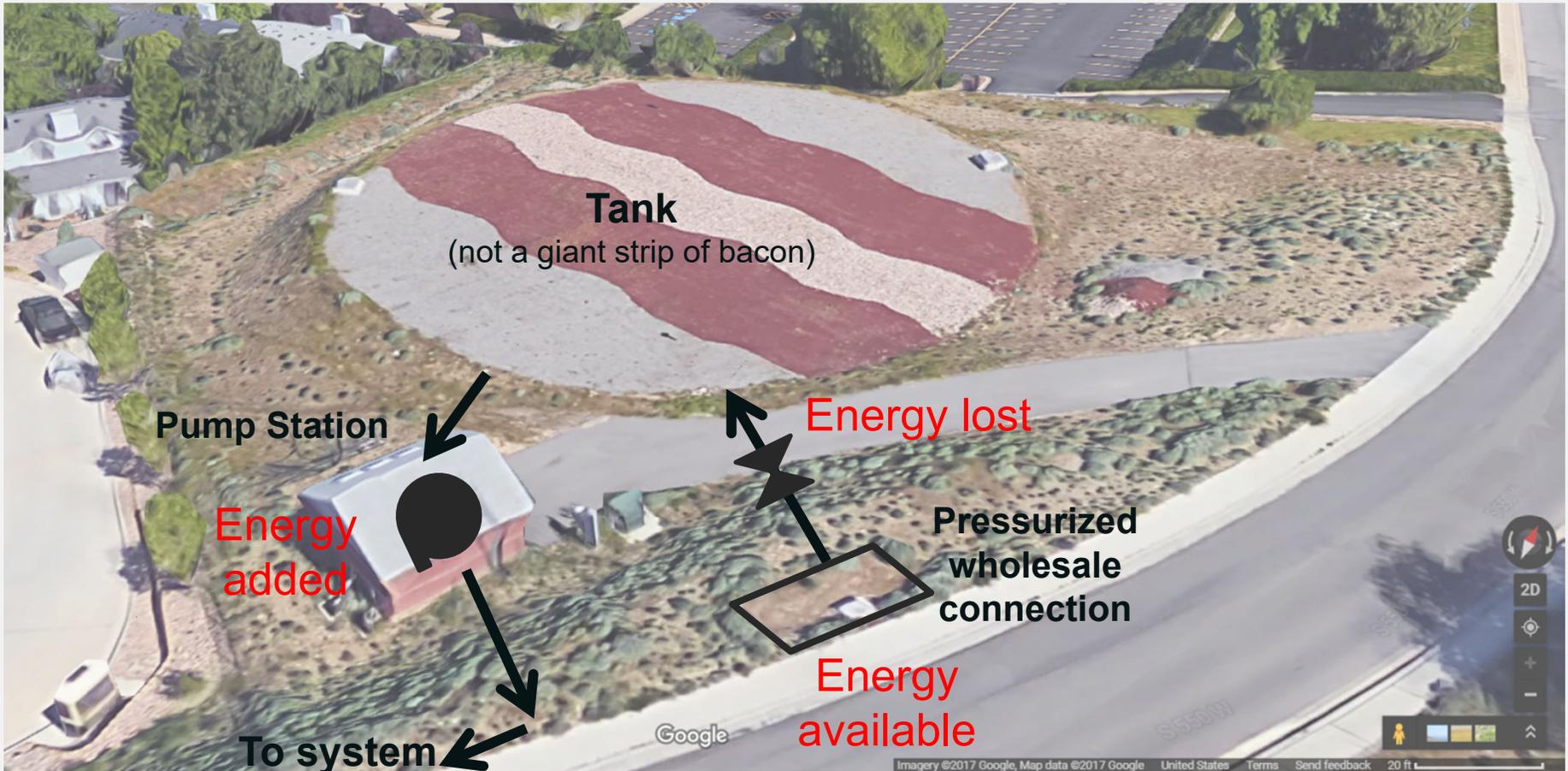
Leaping and Looping



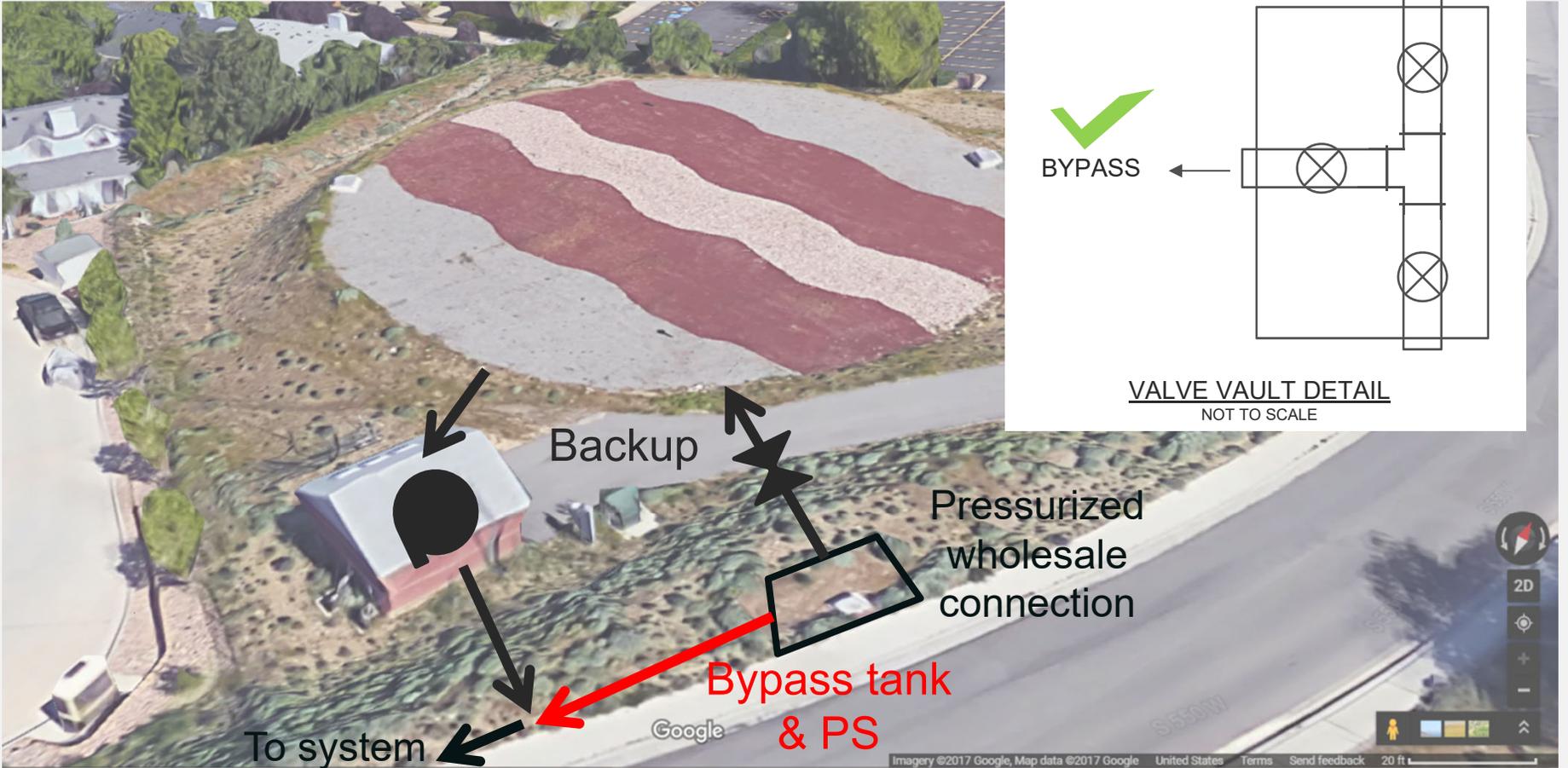
LOSING

Losing

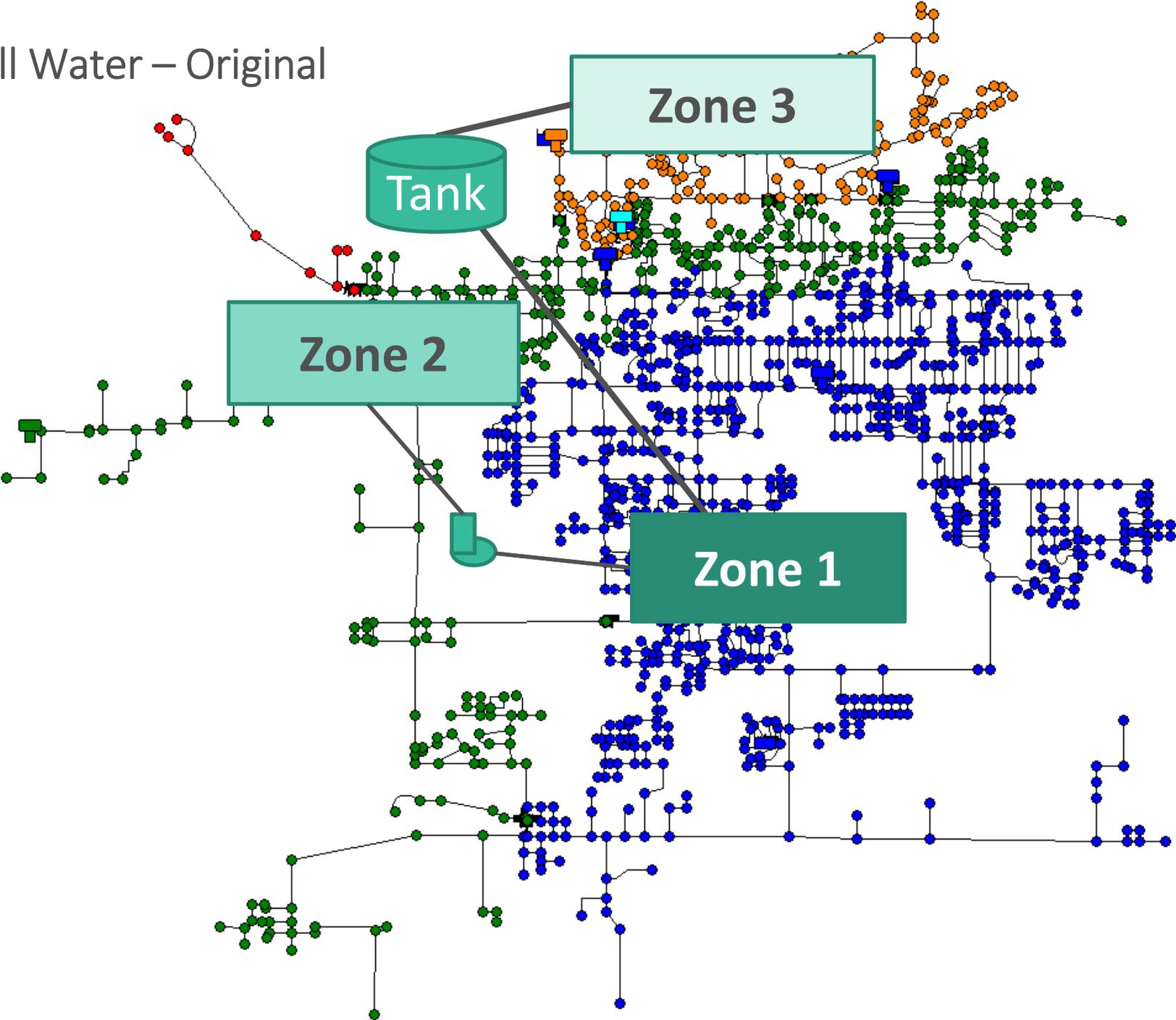
EXAMPLE



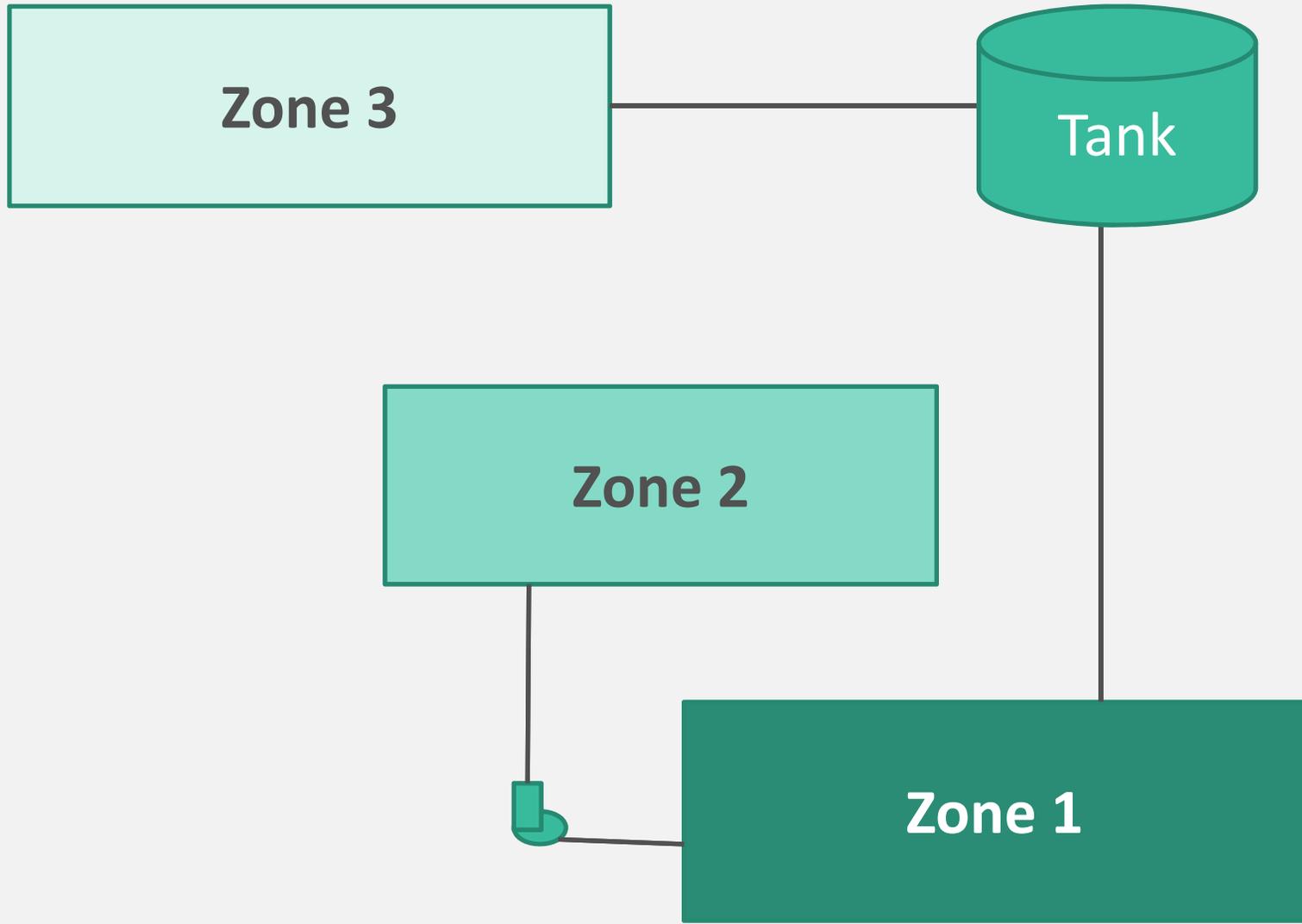
Losing



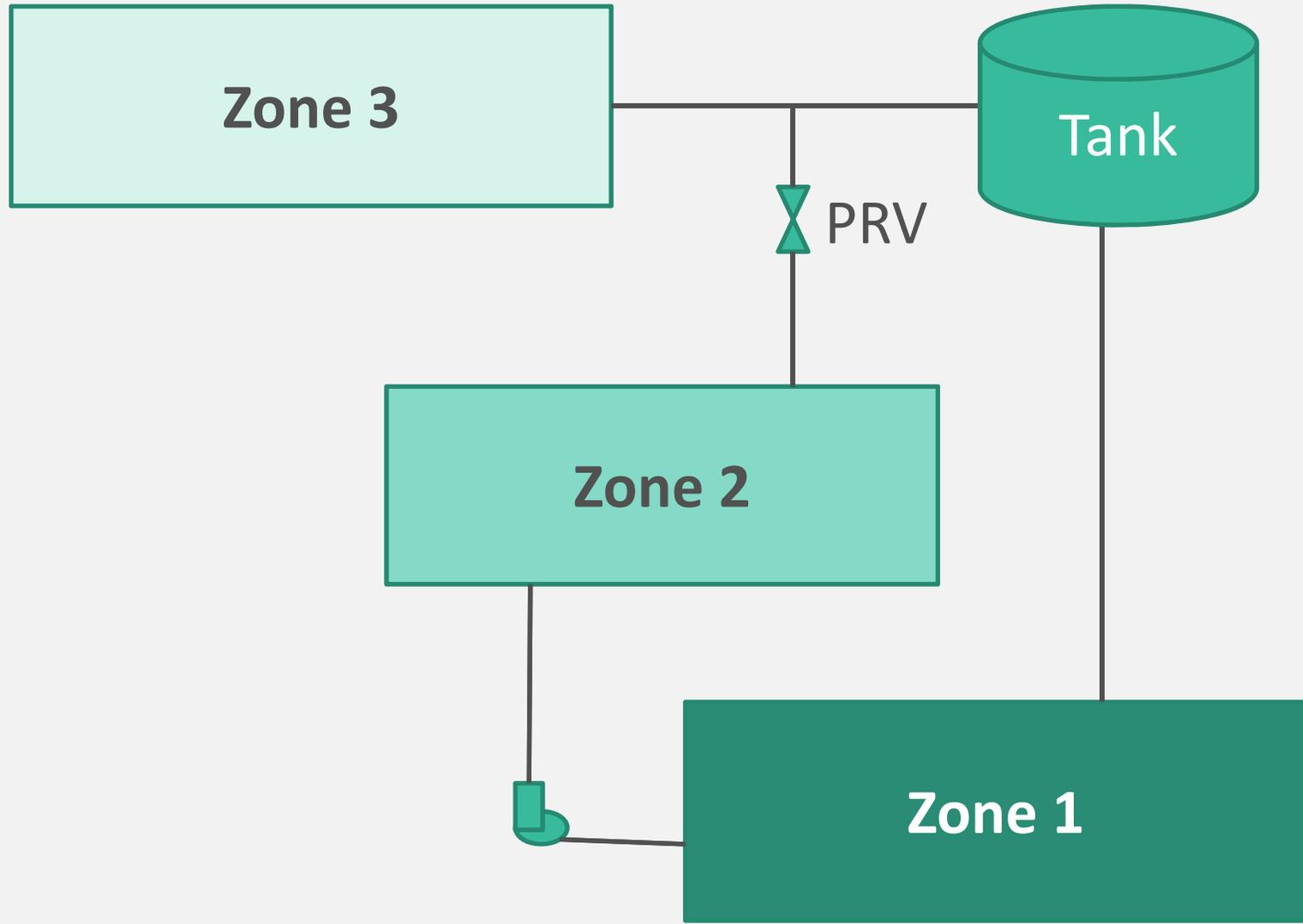
Nob Hill Water – Original



Nob Hill Water – Original



Nob Hill Water – Original



Leaking

Leaking

High-Pressure Leak



Low-Pressure Leak



WATER LOSS IS ENERGY LOSS!

Tim Waldron, "Success Techniques in Applying Water Loss Strategies for Financial Benefits,"
Workshop on Water and Energy/Water Loss (International Water Association, 2014)

Nob Hill

Annual Energy Savings

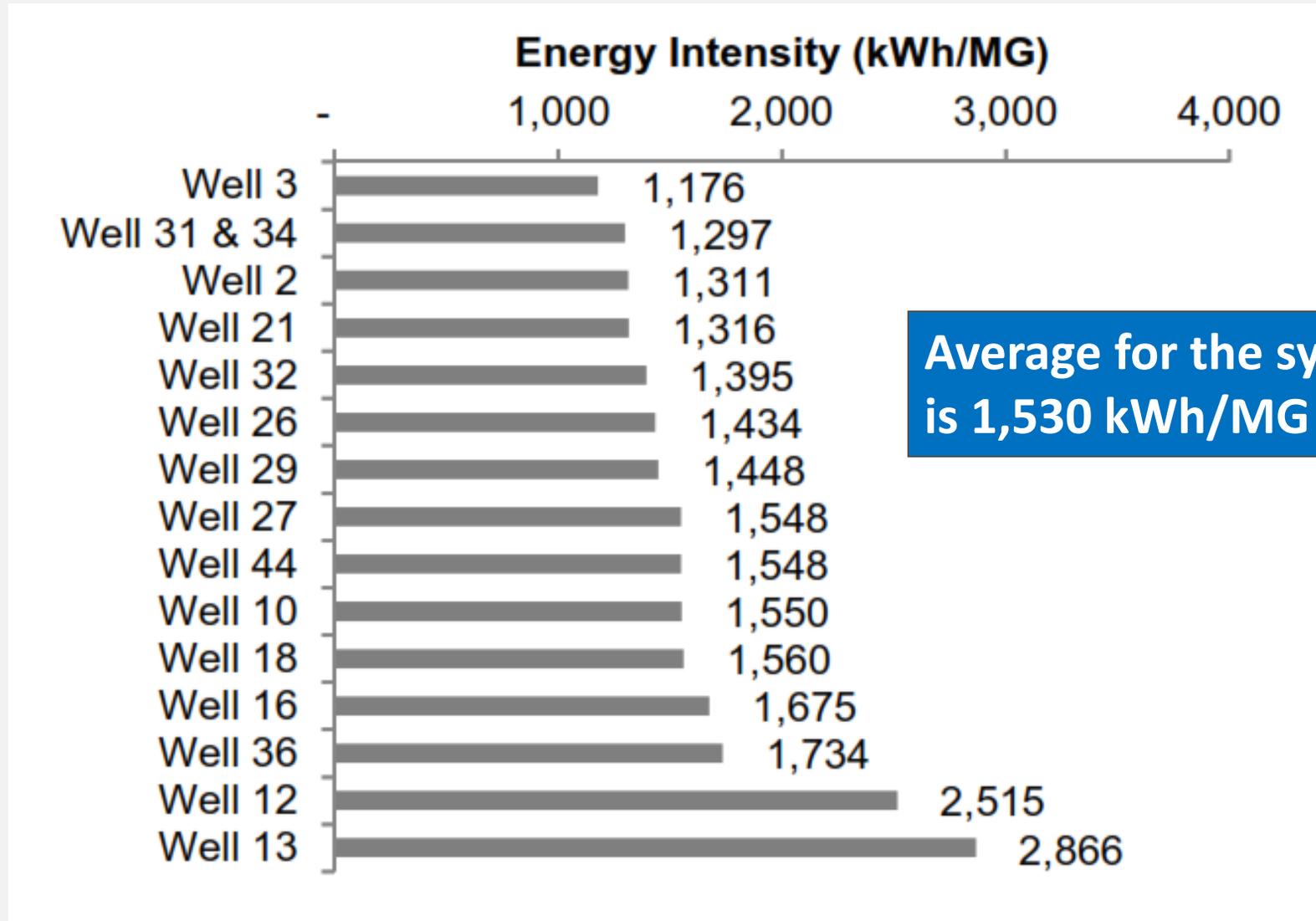
7%

- **Reduced the number of pumps running**
- **Adjusted HVAC settings**

Nob Hill – Leak Detection and Repairs

	January - October		Reduction	
	2018	2019		
Total Metered to Customers (MG)	1,174	1,127	47	4%
Total Produced (MG)	1,446	1,331	115	8%
Wells and Boosters Energy (kWh)				9%

How much energy is saved from fixing leaks?



How much is the incentive for fixing leaks?

- Leak 1 = 1 gpm
- Leak 2 = 5 gpm
- Leak 3 = 5 gpm

Total leaks = 11 gpm = 5.8 MG per year

Average for the system is 1,530 kWh/MG

$$\frac{5.8 \text{ MG}}{\text{year}} \times \frac{1,530 \text{ kWh}}{\text{MG}} = \frac{8,900 \text{ kWh}}{\text{year}}$$

$$\frac{8,900 \text{ kWh}}{\text{year}} \times \frac{\$0.05}{\text{kWh}} = \frac{\$440}{\text{year}} \text{ energy savings}$$

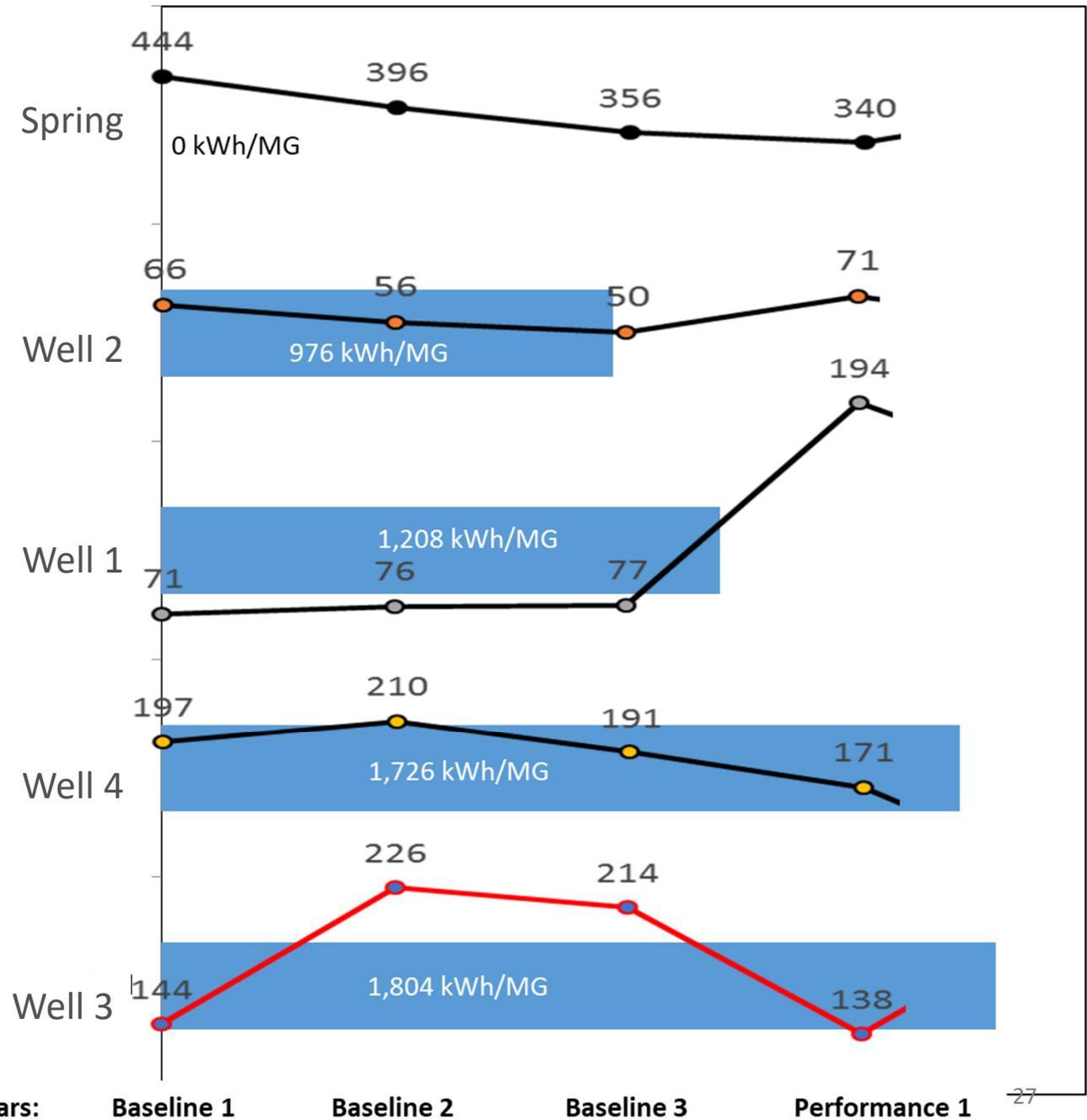
$$\frac{8,900 \text{ kWh}}{\text{year}} \times \frac{\$0.18}{\text{kWh}} = \$1,600 \text{ incentive}$$

Repair cost = \$7,000 (\$5,400 after incentive)

Energy Savings from Source Selection

Idaho Example

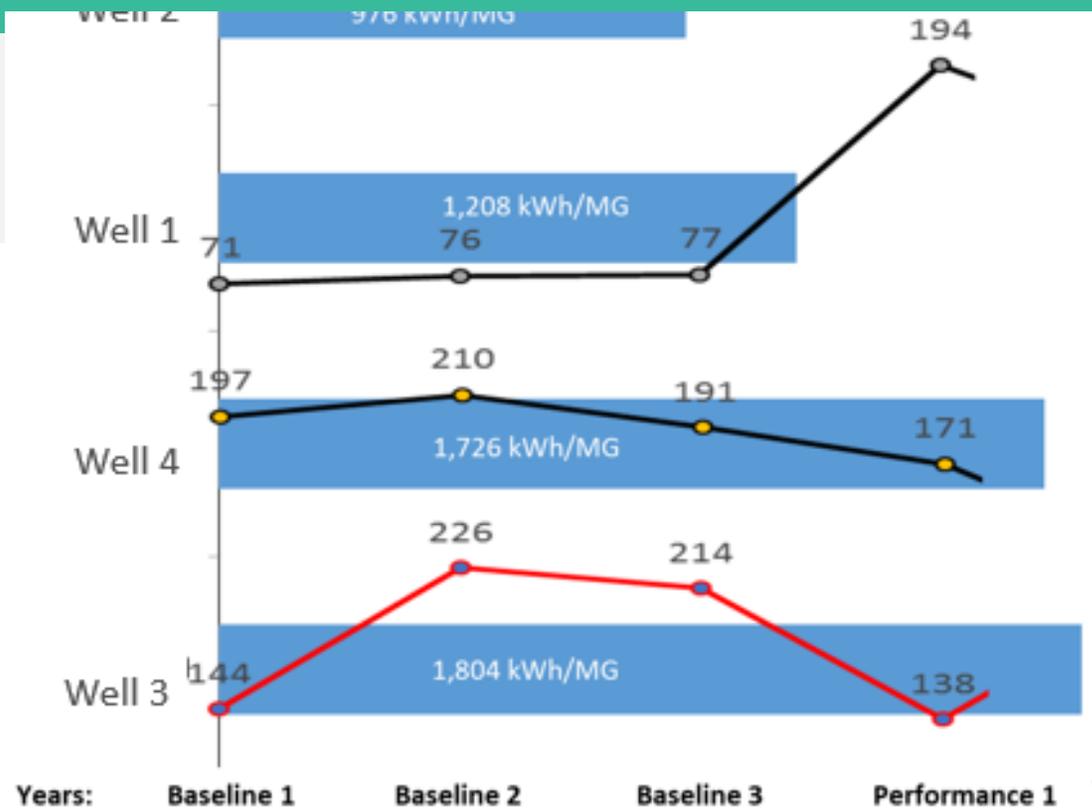
MG per Year for each Source and Energy Intensity (kWh/MG)



Idaho Example

Energy savings from using Well 1 more and Well 3 less

- Reduced Well 3 by 76 MG
- Assume Well 1 produced extra 76 MG



$$\frac{1800 \text{ kWh}}{\text{MG}} - \frac{1200 \text{ kWh}}{\text{MG}} = \frac{600 \text{ kWh savings}}{\text{MG}}$$

$$\frac{600 \text{ kWh savings}}{\text{MG}} * \frac{76 \text{ MG}}{\text{MG}} = 45,600 \text{ kWh savings}$$

$$\frac{45,600 \text{ kWh}}{\text{year}} * \frac{\$0.05}{\text{kWh}} = \$2,280 \text{ in energy (kWh) savings}$$

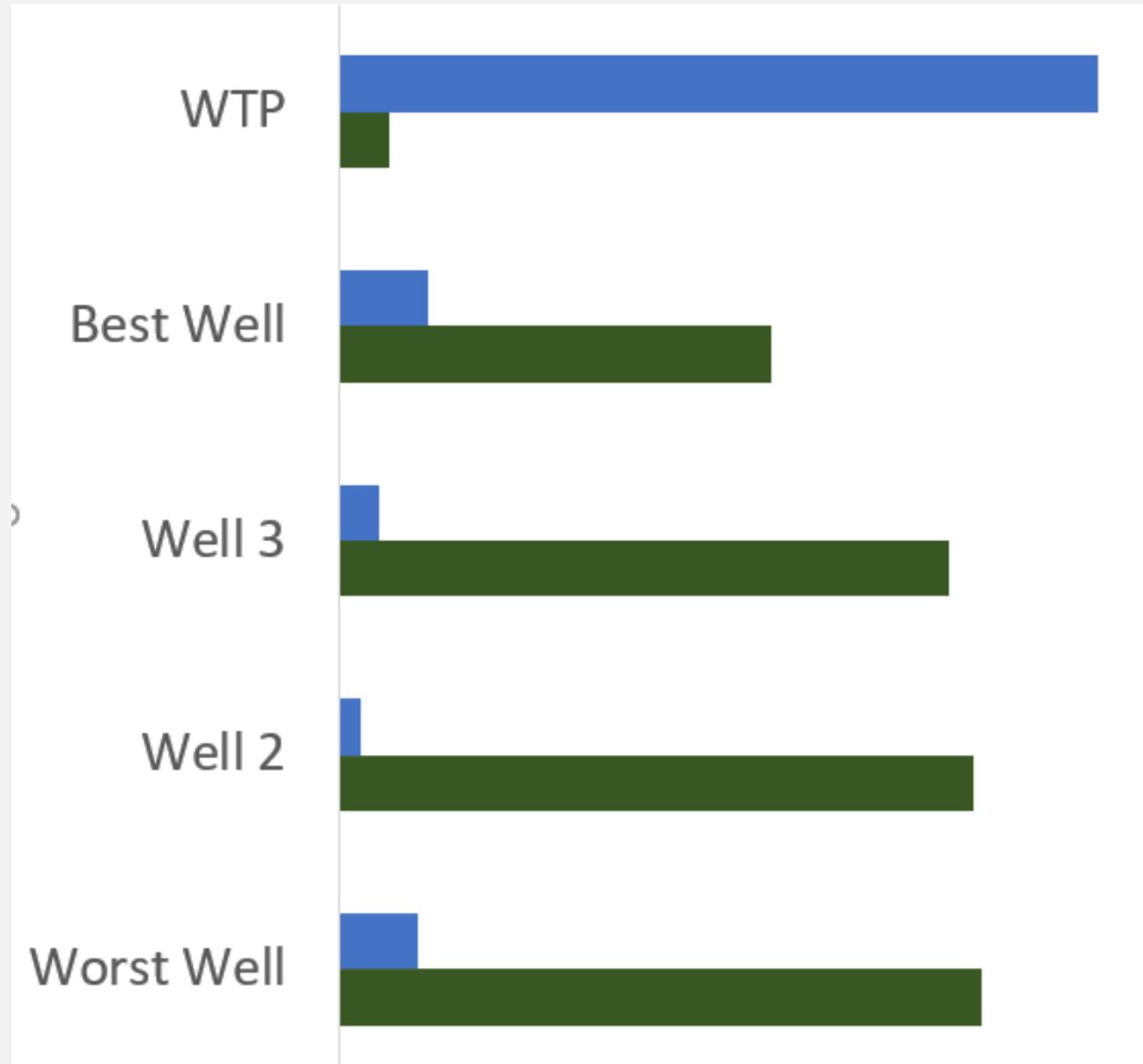
City of Yakima

Annual Energy Savings

15+%

- **Fixed compressed air leaks**
- **Fixed water system leaks**

City of Yakima



Loading

Inefficient

More efficient

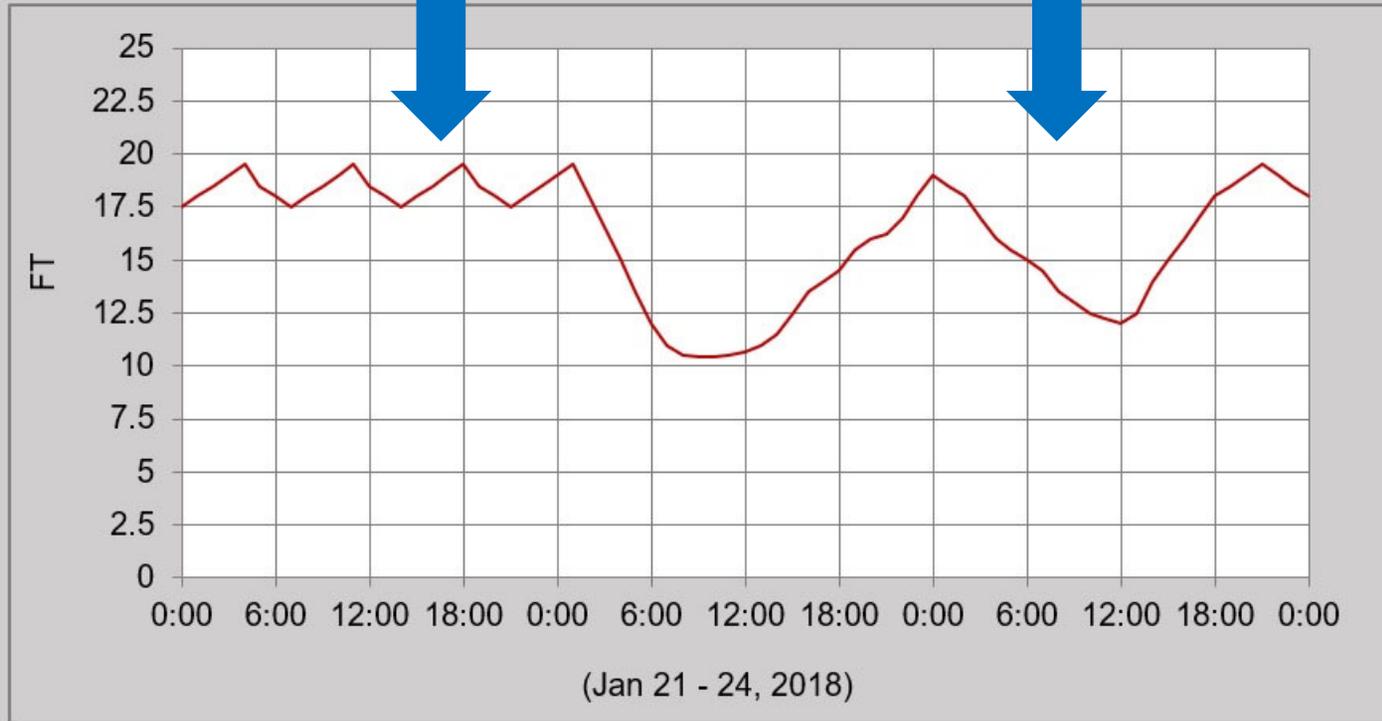
Reservoir 2 Level Sensor A (0338)

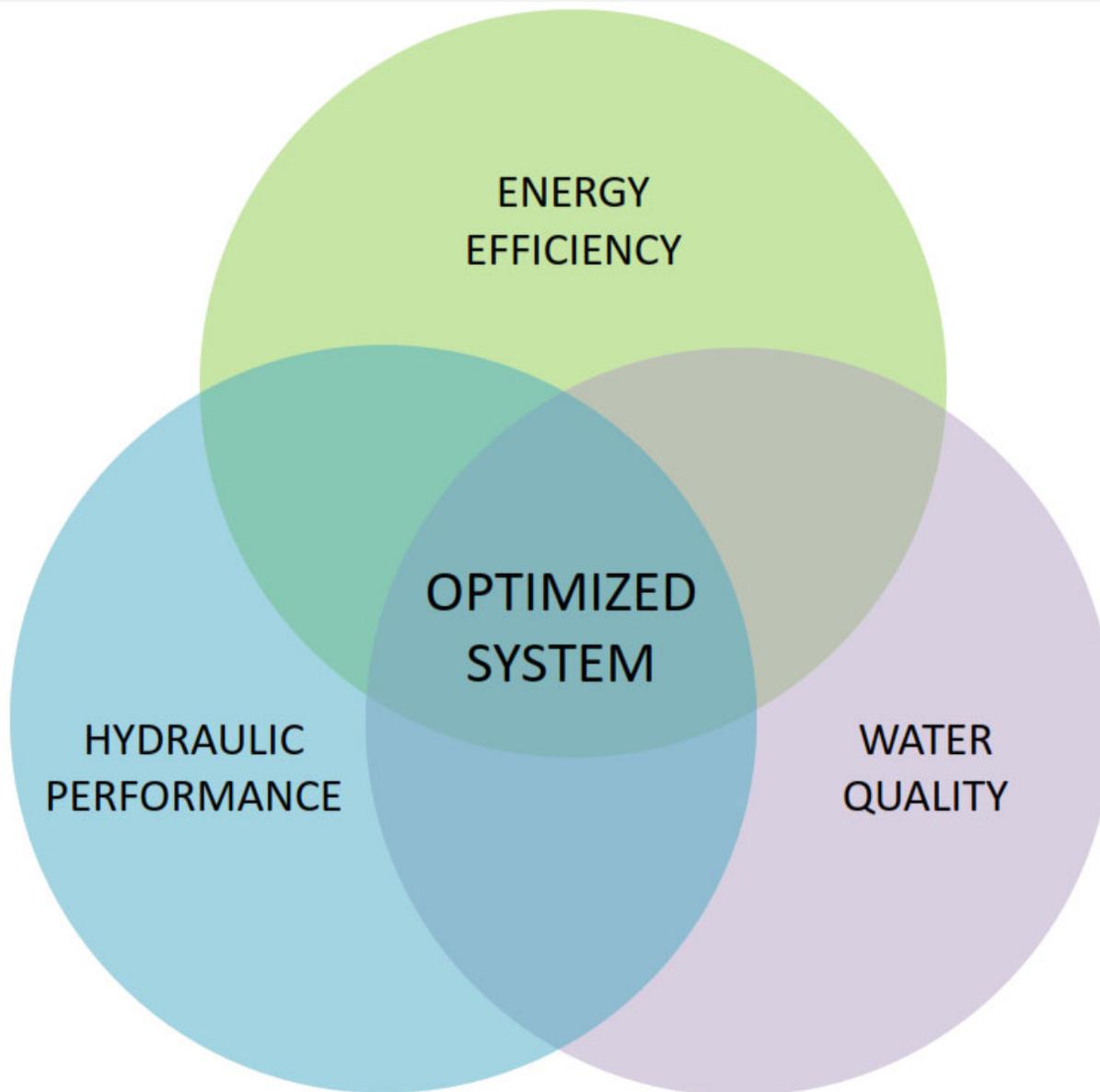
Sensor A

Last Hours

Reset

Apply





Jones and Sowby, "Water System Optimization" (*Journal AWWA*, June 2014)

Recap

-  Write down your energy saving ideas
-  Look at your water system with fresh eyes
-  Contact your power provider about incentives
-  Implement changes to save energy
-  Share your success!

Thank you!
Questions/Comments

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