

Evaluating Efficiency and Predicting Maintenance with Existing Data Using PI AF and Asset Analytics

SNWA, LVVWD, and the SCADA Support team



- Southern Nevada Water Authority (SNWA)
 - Wholesale side of water delivery
 - Acquire, Treat, and Deliver, to the regional water purveyors.
- Las Vegas Valley Water District (LVVWD)
 - Distribution throughout the system
 - Retail water delivery billing to each meter
- SCADA Support team
 - Data stewards for collection and safe storage
 - Create and distribute operational reports and information



MONEY



Our 3 Major **MONEY** items.



Power

- Energy cost to move water (\$'s Out)

Flow

- Water Sold (\$'s In)

Compliance

- Water Delivery rules (\$\$\$'s Out)

Goals



- 1. Determine the most and least efficient pumps to run per station**
- 2. Determine what is the best combination of pumps when selecting multiple pumps.**
- 3. Give Asset Management a diagnostic tool to evaluate the need to schedule maintenance.**

Wire 2 Water ratio



How much power (W)
does it take to move (2)
1000 gallons of water (W)?

$$W2W = kW / Mgal$$

Existing Raw Data



1. Station Flow

Generally the best quality flow measurement

2. Pump Flow

Not normally enough room to measure reliably

1. Pump Power

Individual motor protection measurement

2. Station Power

Includes building A/C, utility power, lighting

Pump Run Status

To count the number of pumps running at the time

PI System Explorer



\\his1q\aum_pump_efficiency - PI System Explorer

File Search View Go Tools Help

Database Query Date Back Check In Refresh New Element New Attribute Search Elements

Elements

- Elements
 - 2055-Campbell
 - 2150-Stewart
 - 2300-Charleston Heights
 - 2420-Broadbent
 - 2420-Charleston Heights
 - 2538-Carlton Square
 - Test 2538-CRLT
 - Element Searches
- Event Frames
- Library
- Unit of Measure
- MyPI
- Notifications
- Contacts
- Analyses

2055-Campbell

General Child Elements Attributes Ports Analyses Version

Filter

	Name	Value
Category: <None>		
	PumpPowerTotal	0 kW
	PumpVolumeTotal	0 US Mgal
	Site	CAMP
	StationPowerTotal	0 kW
	StationVolumeTotal	0 US Mgal
	W2W	0 kW/MG
	Zone	2055
Category: PumpRunState		
	PumpRunStateTotal	0

Group by: ☒ Category ☐ Template

Name: W2W

Description: Wire To Water Efficiency

Properties: <None>

Categories:

Default UOM: Pumping Efficiency

Value Type: Single

Value: 0 kW/MG

Data Reference: Path Roll Up

Settings...

Calculation=Average;Negate=False

W2W

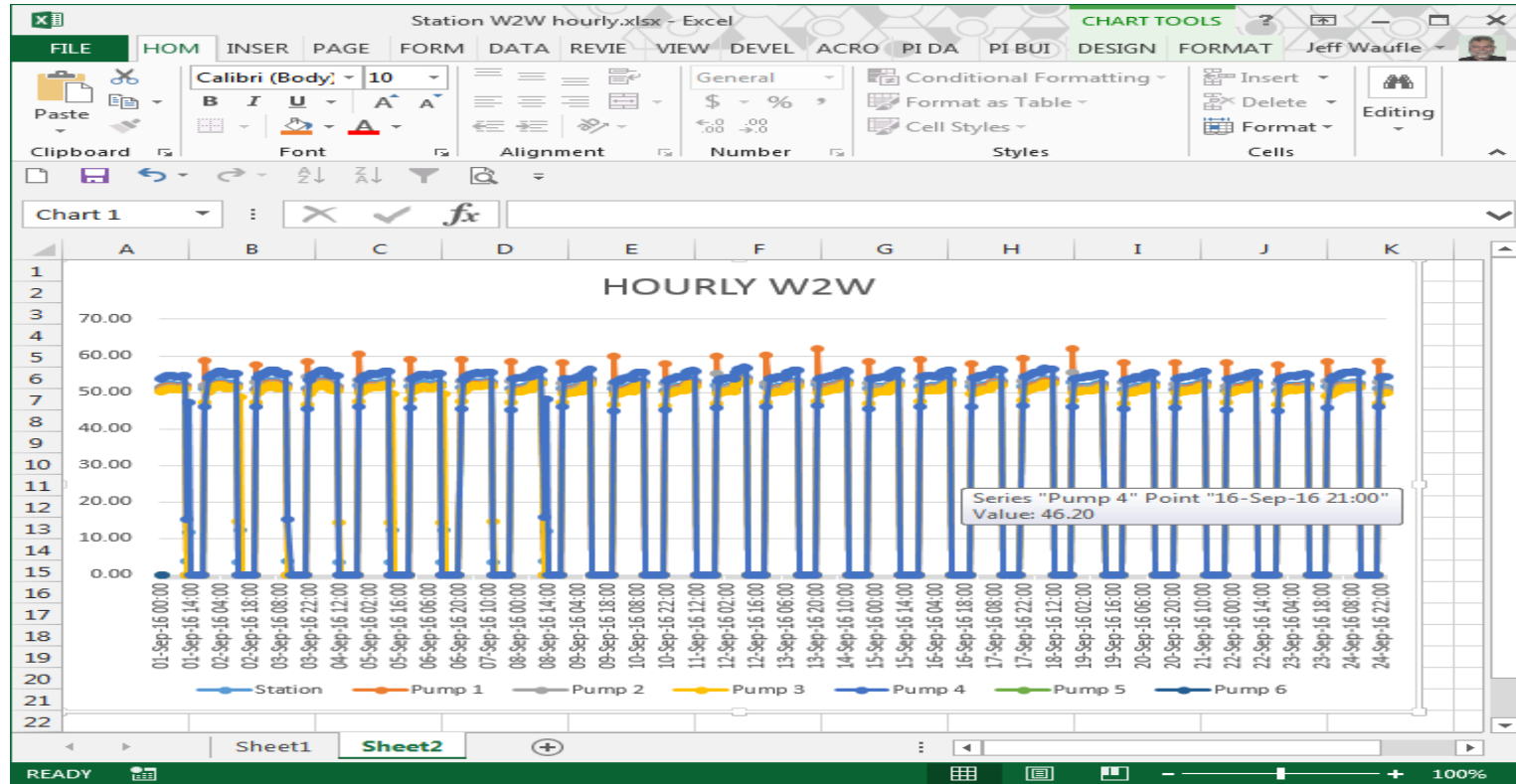


After prototyping as Attributes:

Transfer the calculations to an Analysis to backfill hard values into a PI Point

Have Asset Analysis create and backfill a PI point with hourly data

Wire 2 Water Chart



Future plans



Analyze results

Run “In Place” individual pump tests

Improve on Calculations

Add upstream and downstream pressures

Complete a hydraulic model

Add Pump curves in Tables

Add Notification

WireToWater (W2W) at LVVWD using PI AF and Asset Analytics

COMPANY and GOAL

The Operations and Maintenance Departments at LVVWD wanted to **identify and validate pumping efficiency and strategy.**



CHALLENGE

Identify best and worst pumps and what combination worked best.

- Uncertain if current plan is working
- Difficult to test and prove
- Hundreds of pumps to evaluate

SOLUTION

Used PI-AF templates to gather the required data and used Asset Analysis to deal with the many variations

- Roll-up per pump data to station level
- Evaluate available data
- Select best model
- Backfill historical W2W by pump

RESULTS

Created value added intelligence by leveraging existing historical data using elements and Asset Analytics in PI-AF

- Identified most efficient pumps
- Identified most efficient pumping combinations
- Identified least efficient pumps for maintenance evaluation

Contact Information

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Questions

Please wait for the
microphone before asking
your questions



State your
name & company

Please don't forget to...

Complete the Survey
for this session



The **Power of Data**

DECISION READY IN REAL-TIME

Evaluation Form (Seminar Location - Date)

Name: _____

Company: _____

Email: _____

Quality and content of the presentations

Poor Good Excellent N/A

Welcome	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Journey To Real-Time Operational Intelligence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Power of Connection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tank Level Management System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using the PI System to Aid in Troubleshooting Operational Aspects of Oil and Gas Well Drilling and Completion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unleash your Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information on the Spot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wrap-up/Seminar Conclusion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Quality and organization of the seminar

Choice of date	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time allowed for lunch/breaks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choice of presentations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Break and time allowed for the presentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado