

# What to do with all this Data?

Automated analysis and reporting of data from  
two WTP pilot studies

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# Agenda

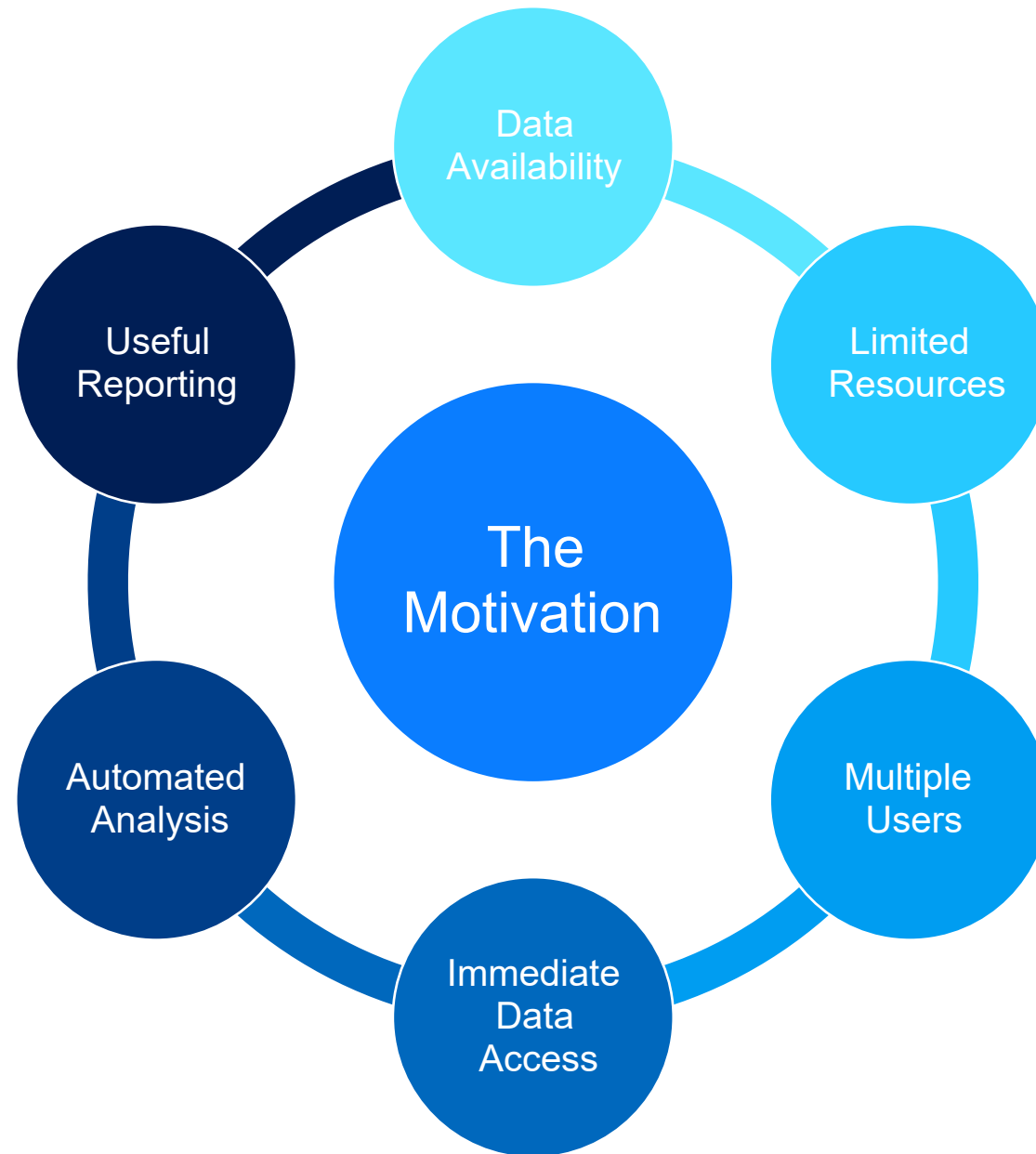
## The Motivation

## The Projects

- McCarron's Water Treatment Plant, Saint Paul, MN
- Duff Water Treatment Plant, Medford, OR

## The Solution

## The Opportunities



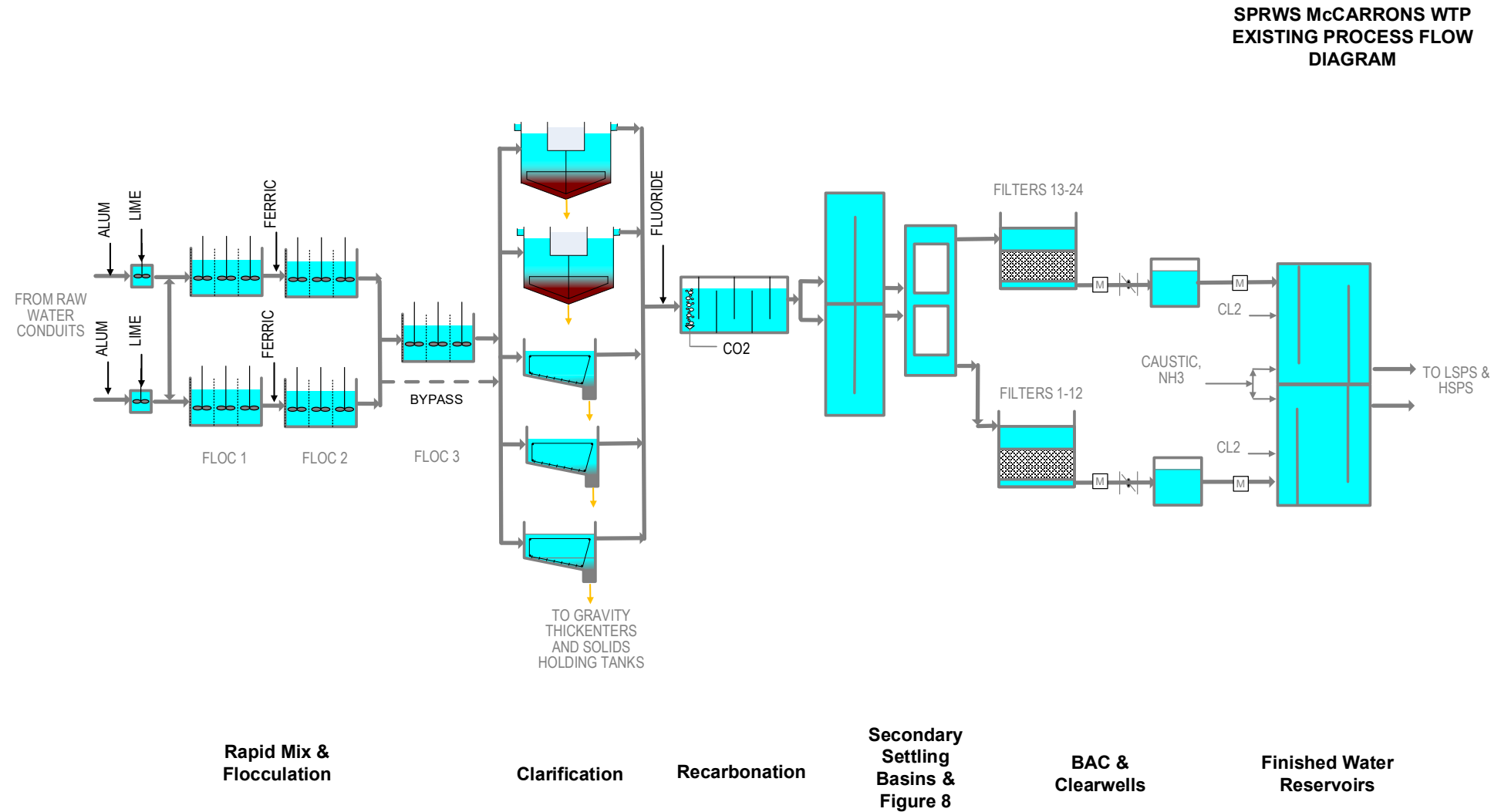
# The Projects

## Pt. 1

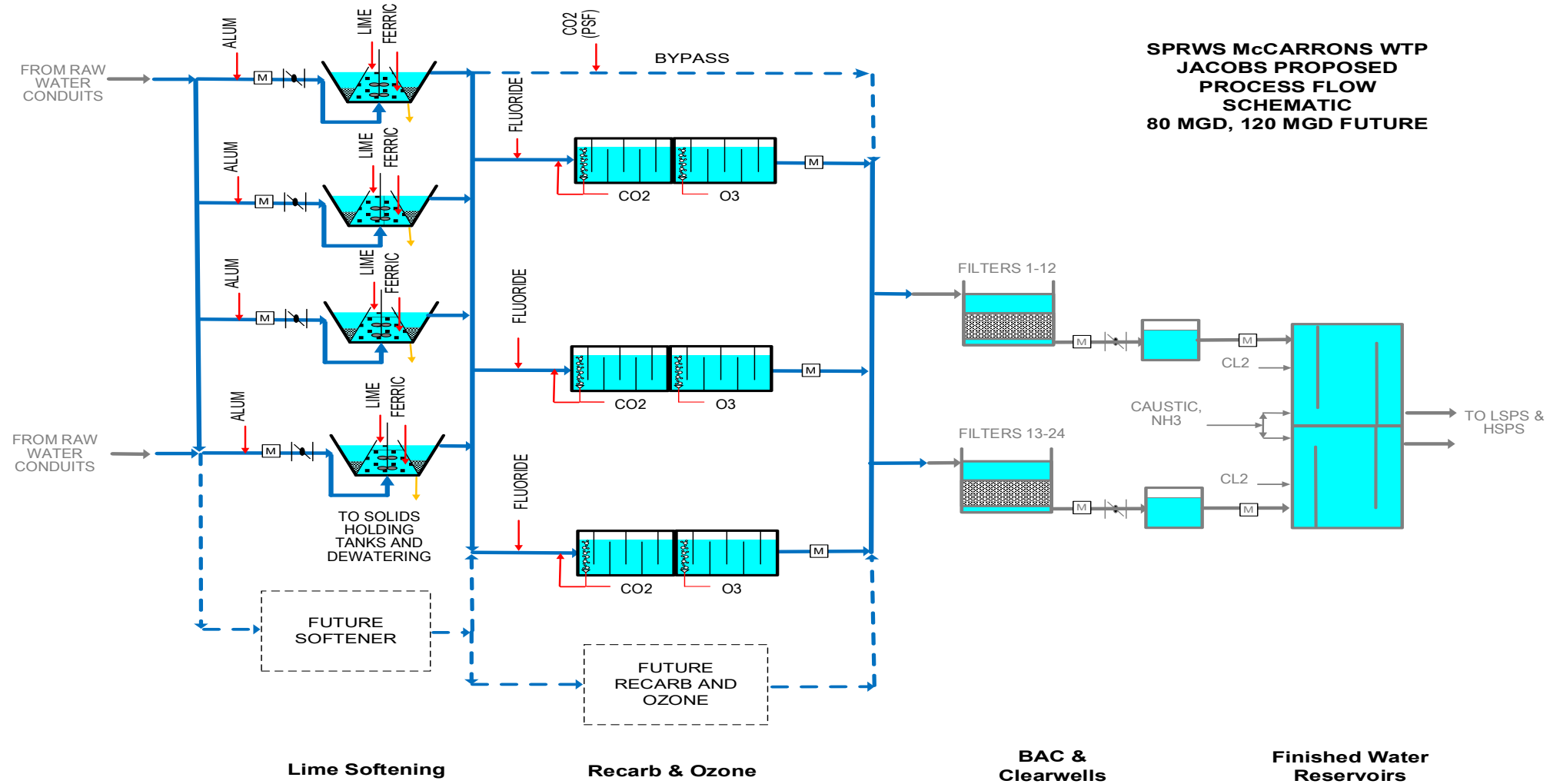
### Saint Paul Regional Water Supply



# McCarrons WTP PFD- Existing

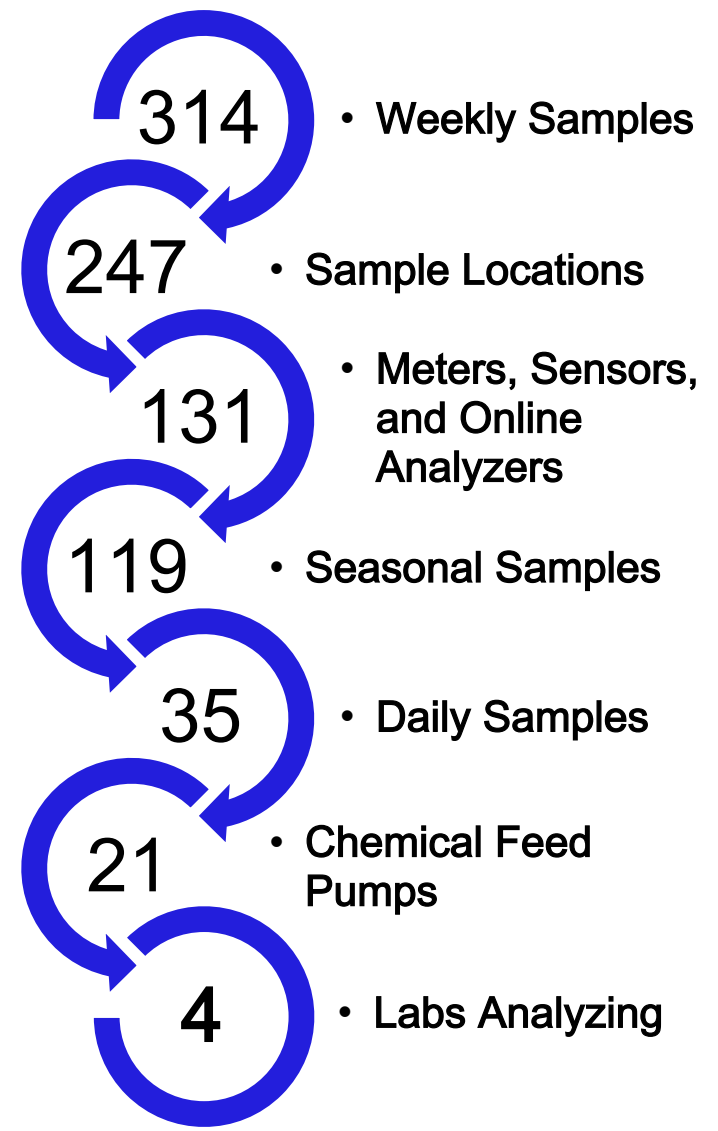
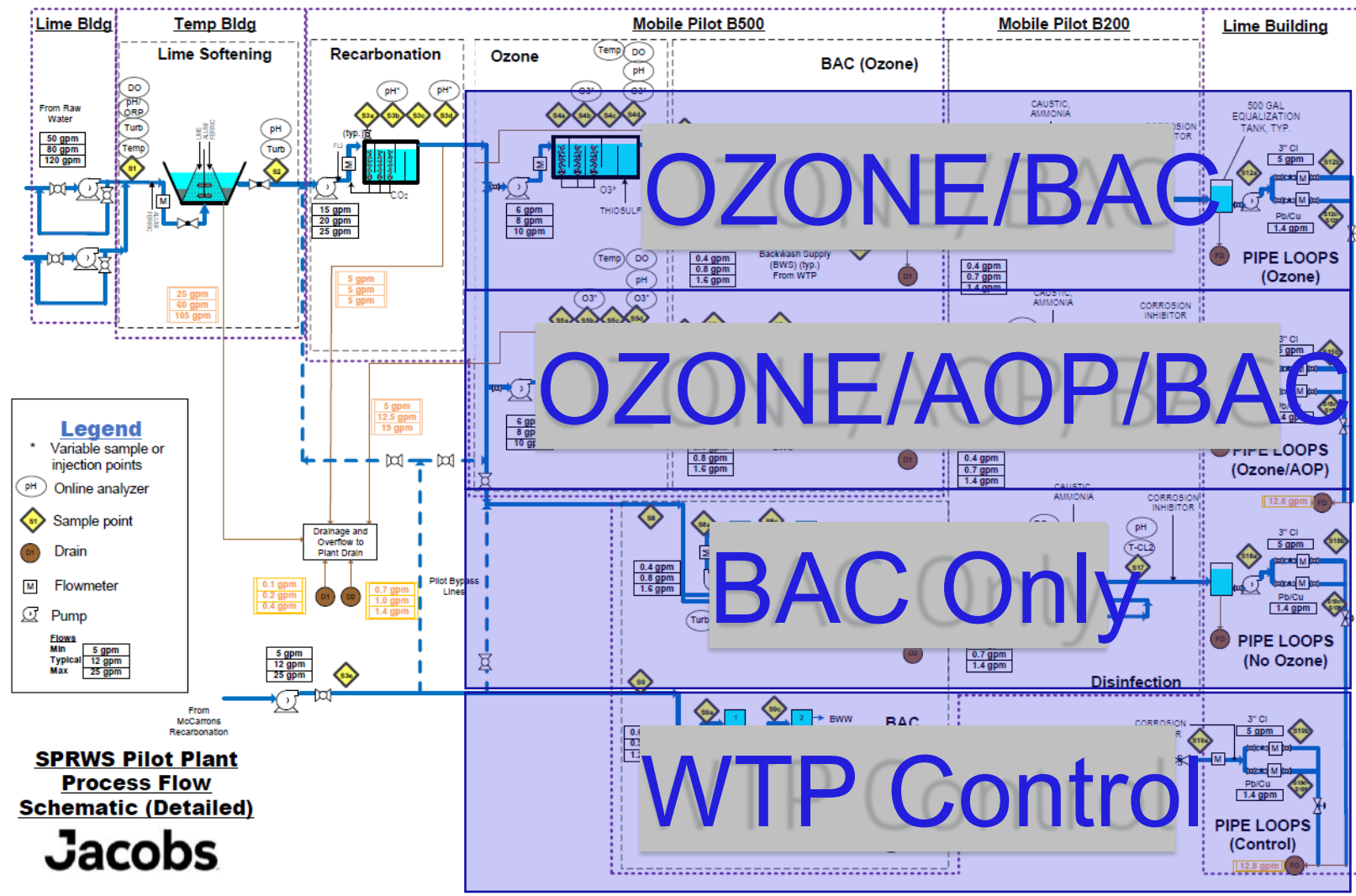


# McCarrons WTP PFD- New





# Pilot System



# Pilot Analytical Samples

SPRWS Lab	U of M Lab	External Labs	Pilot On-Site
Metals	Taste and Odor Geosmin, 2-MIB	Bromide/Bromate	pH
Ortho-P	Neonics	Advanced Organics	Turbidity
Color	1,4- Dioxane	Aldehydes	Temp
Alkalinity	Microcystins	Haloacetonitriles	ORP
TOC/DOC	SDS NDMA, TTHM HAA5	Pipe Scale	DO
UV254	CECs	Nitrosamines	Ozone
Streaming Current	AOC	Particles	Chlorine (Free+Total)
Hardness	HPC		Free Ammonia
Solids	ATP		Monochloramine
	Chloride/Sulfate		UV254
			Ortho-P
			Alkalinity
			Hardness





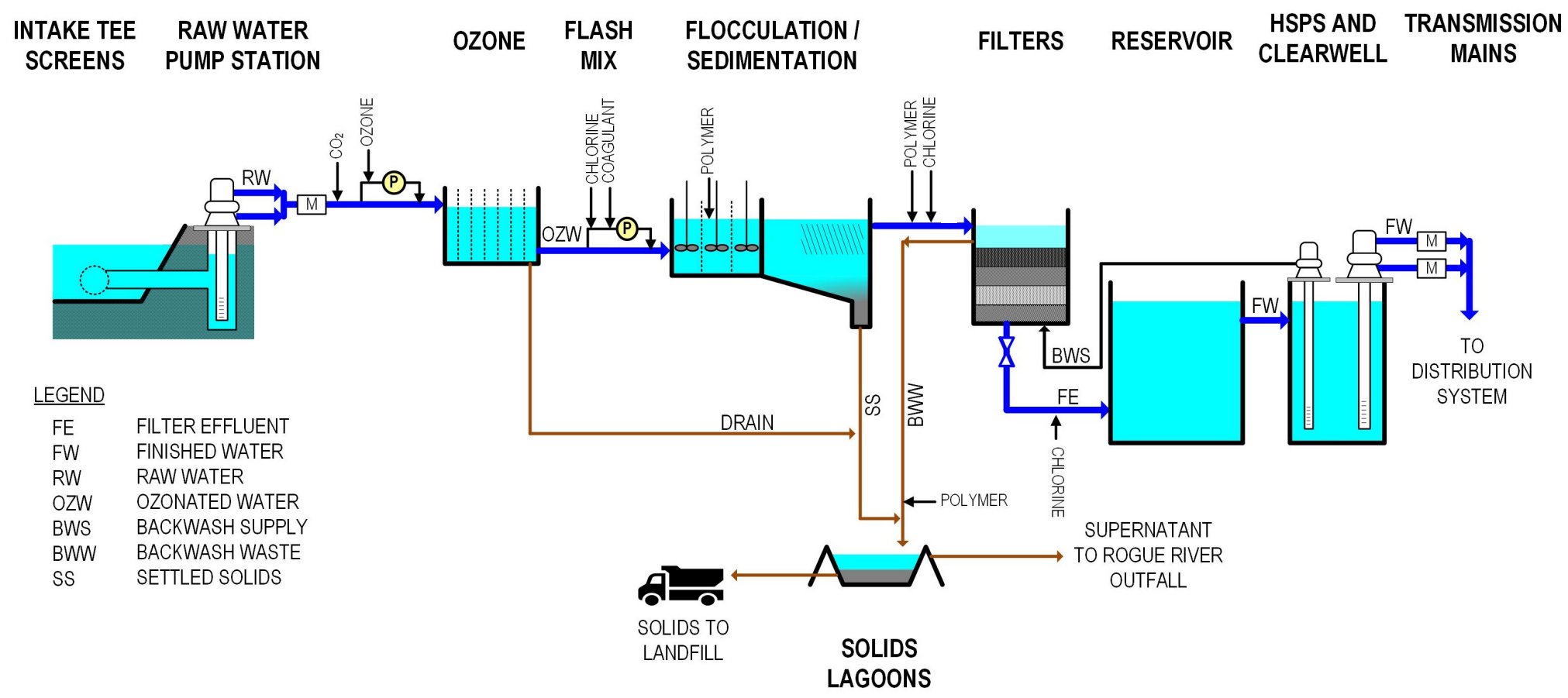
# The Projects

## Pt. 2

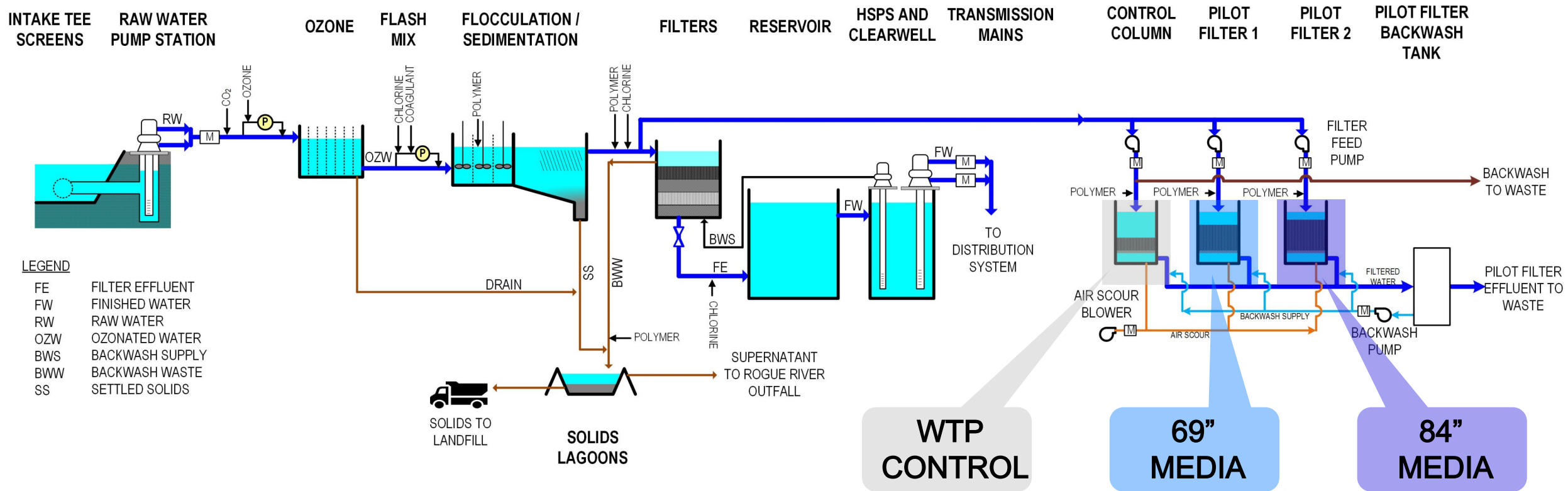
Medford Water Commission  
Duff Water Treatment Plant Expansion



# Overview: Medford Water Commission Duff WTP



## Overview: Pilot Process Flow and Details





# Overview: Pilot Analytical Measurements

## Media Configurations

	PF1 – Control (Tri-Media)	PF2: 69" Dual Media	PF3: 84" Dual Media
Anthracite	1.0-mm @ 18"	1.4-mm @ 60"	1.5-mm @ 72"
Sand	0.5-mm @ 9"	0.6-mm @ 9"	0.6-mm @ 12"
Garnet	0.3-mm @ 3"		
L/d	1,168	1,470	1,727

## Online Sample Streams

Parameter	Raw Water	Settled Water (Filter Influent)	Full Scale Filters	Pilot Filter Effluent
Headloss	n/a	n/a	Plant SCADA	Pilot SCADA
Turbidity	Plant SCADA	Plant SCADA	Plant SCADA	Pilot SCADA
Filter Run Time	n/a	n/a	Plant SCADA	Pilot SCADA
Flowrate	Plant SCADA	n/a	Plant SCADA	Pilot SCADA
Water Temperature	Plant SCADA	n/a	n/a	Pilot SCADA

# The Solution



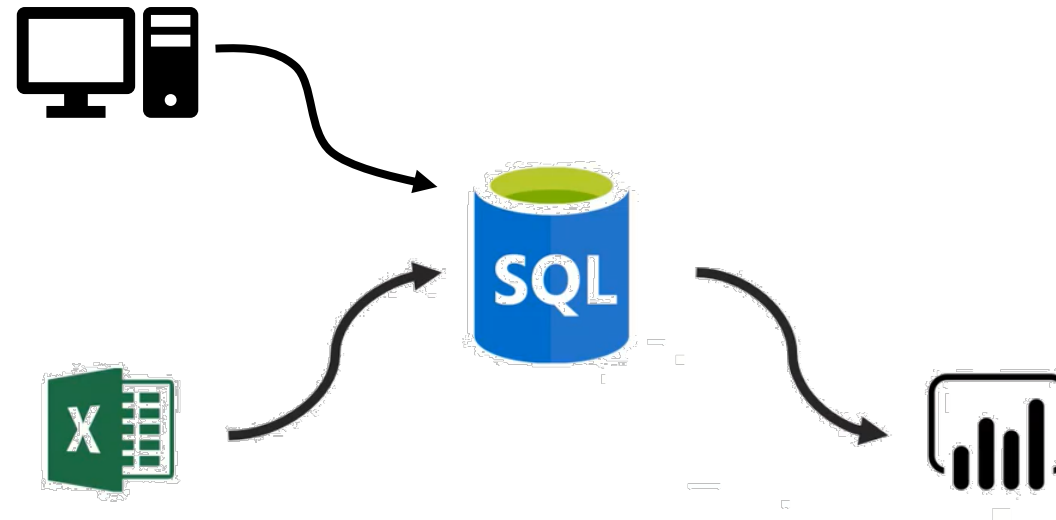
- Secure Cloud Database Platform
- Serverless Azure App Service
- Jacobs Custom Identity Model



- Embedded RShiny  
Containerized Analytics
- Really Amazing  
Programmers



**Data visualization  
and analysis easily  
customized to  
each application**

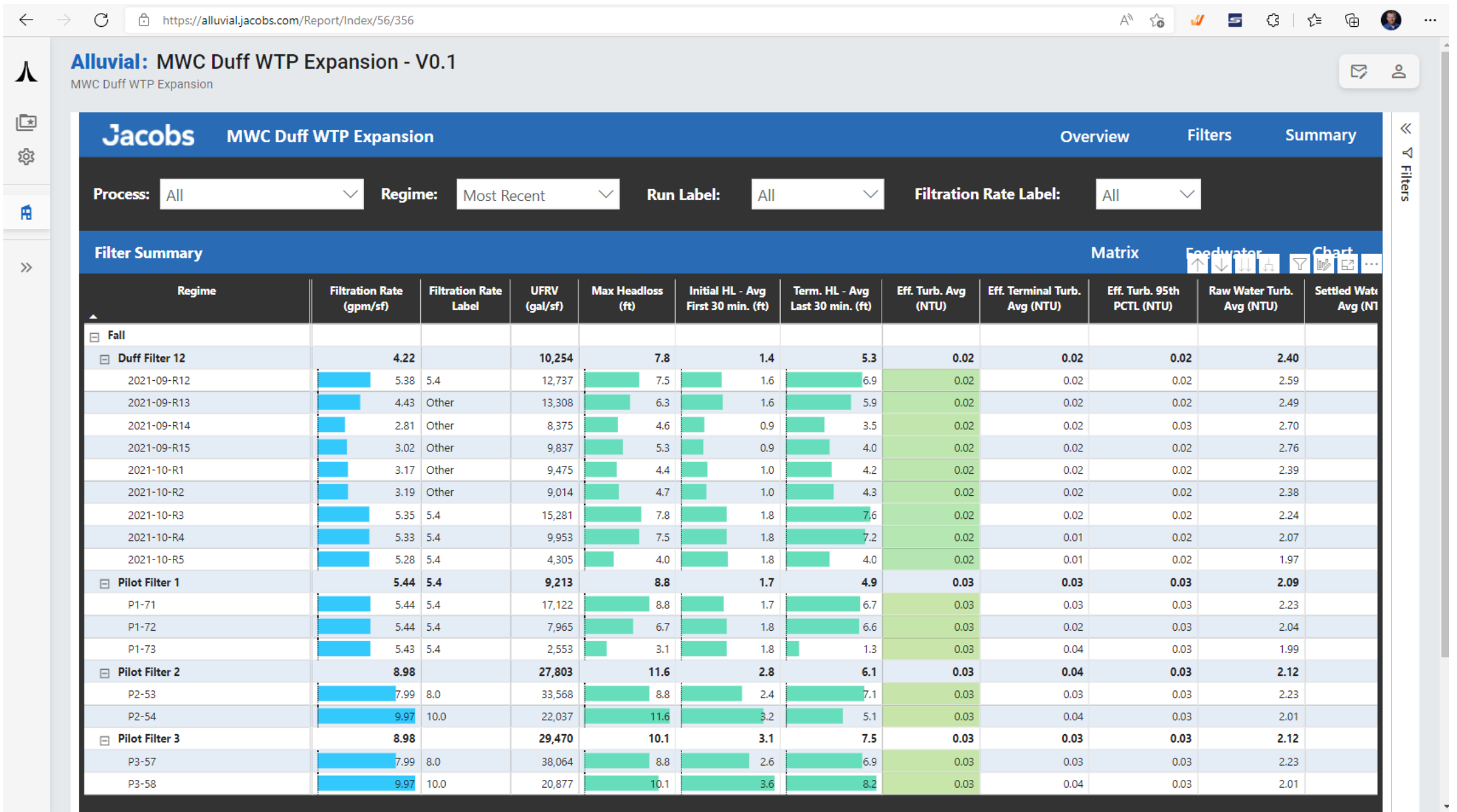




# Dashboard Overview



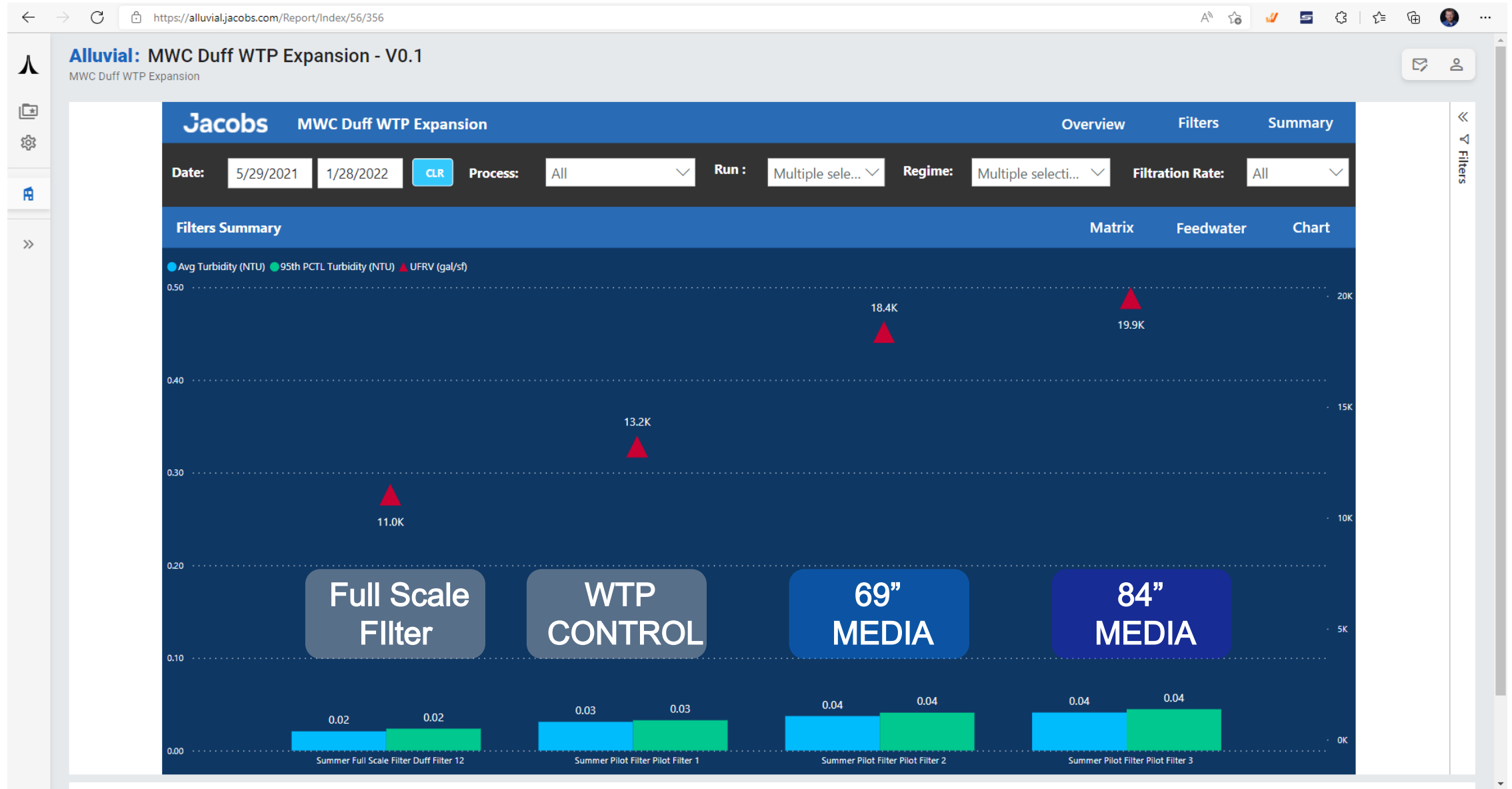
# Filter Run Summary Matrix



# Filter Run Summary Matrix



# Filter Performance Summary

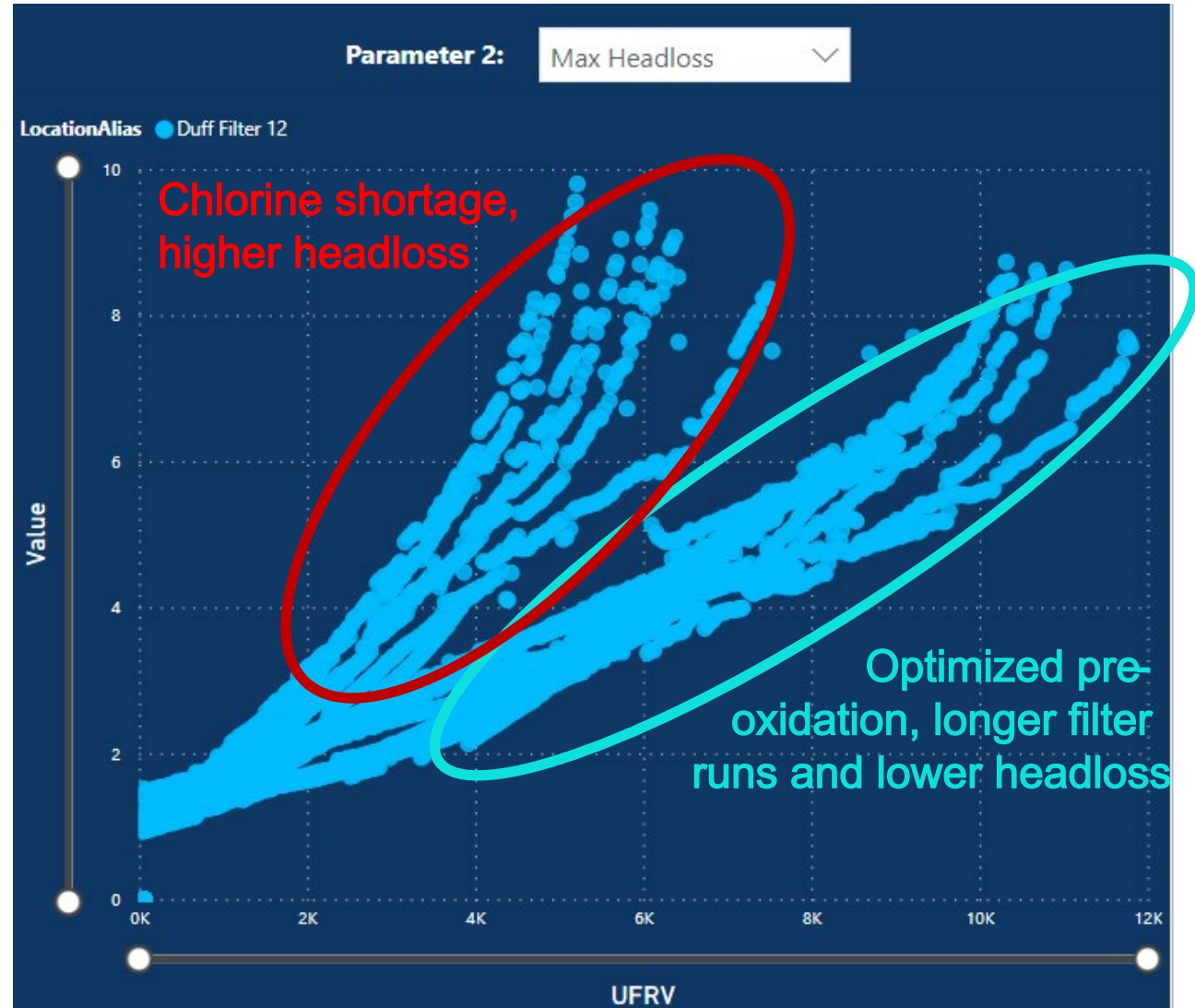


# Quick Filter Run Comparisons

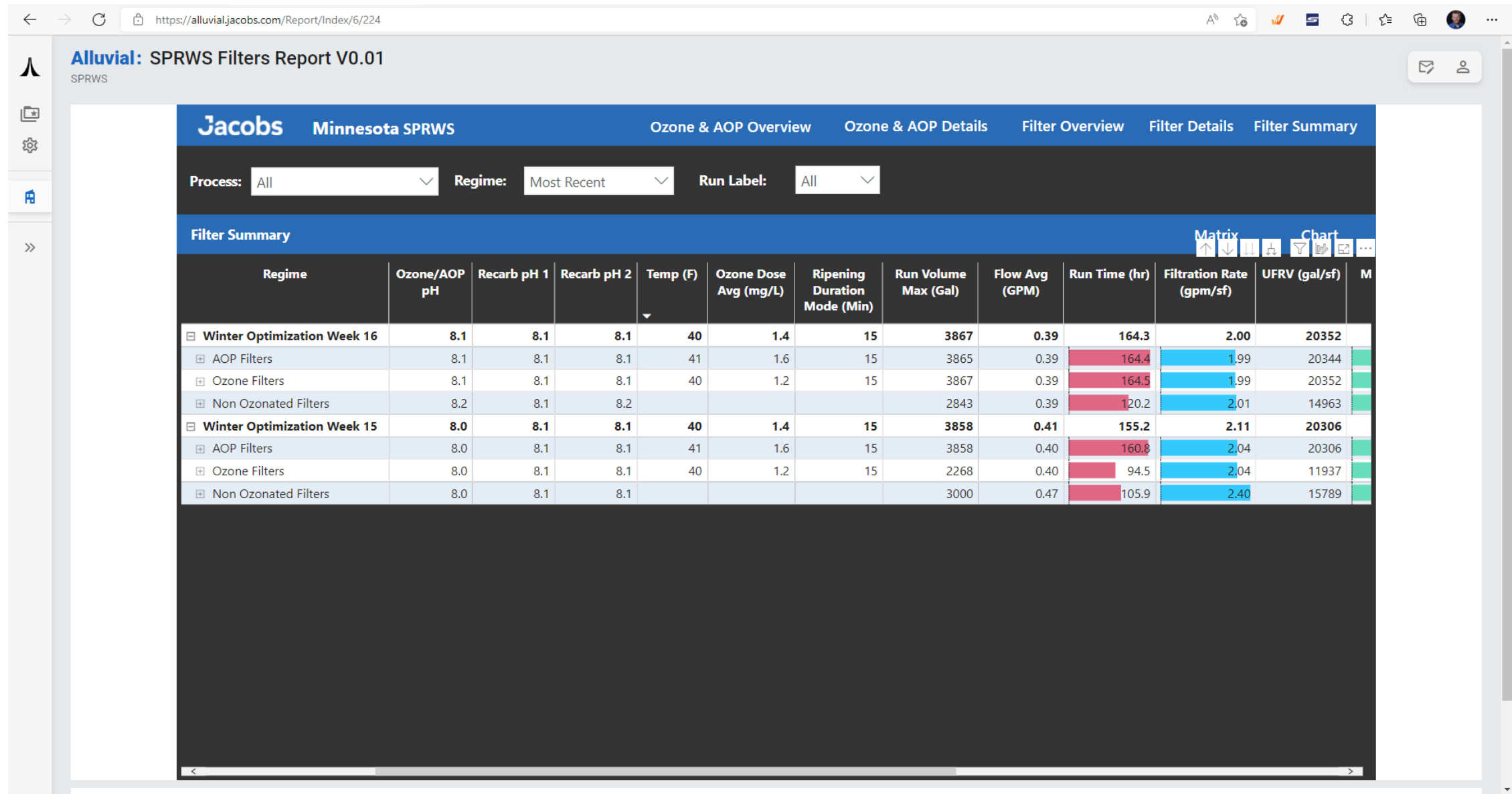


# Rapid Analysis

- Apples to apples comparisons allow for rapid analysis of abnormal data
- Pre-chlorine dose reduction during the great chlorine shortage of 2021 resulted in significant filtration impacts







# The Opportunities

## Data dashboards beyond pilot testing

Automatically process online and grab sample data



Create easy to view dashboards and reports



View apples-to-apples comparisons



Real time data for better optimization



Provide access to all people that need it

# Questions?

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Challenging today.  
Reinventing tomorrow.

