

PNWS AWWA SPRING CONFERENCE

# Cascade Groundwater Alliance – Constructing the Largest Iron and Manganese Treatment Plant in the PNW

Jeremy Hudson, Heather Pina, Jeff Fuchs, and Pat Van  
Duser  
May 2025



# SECTION #1

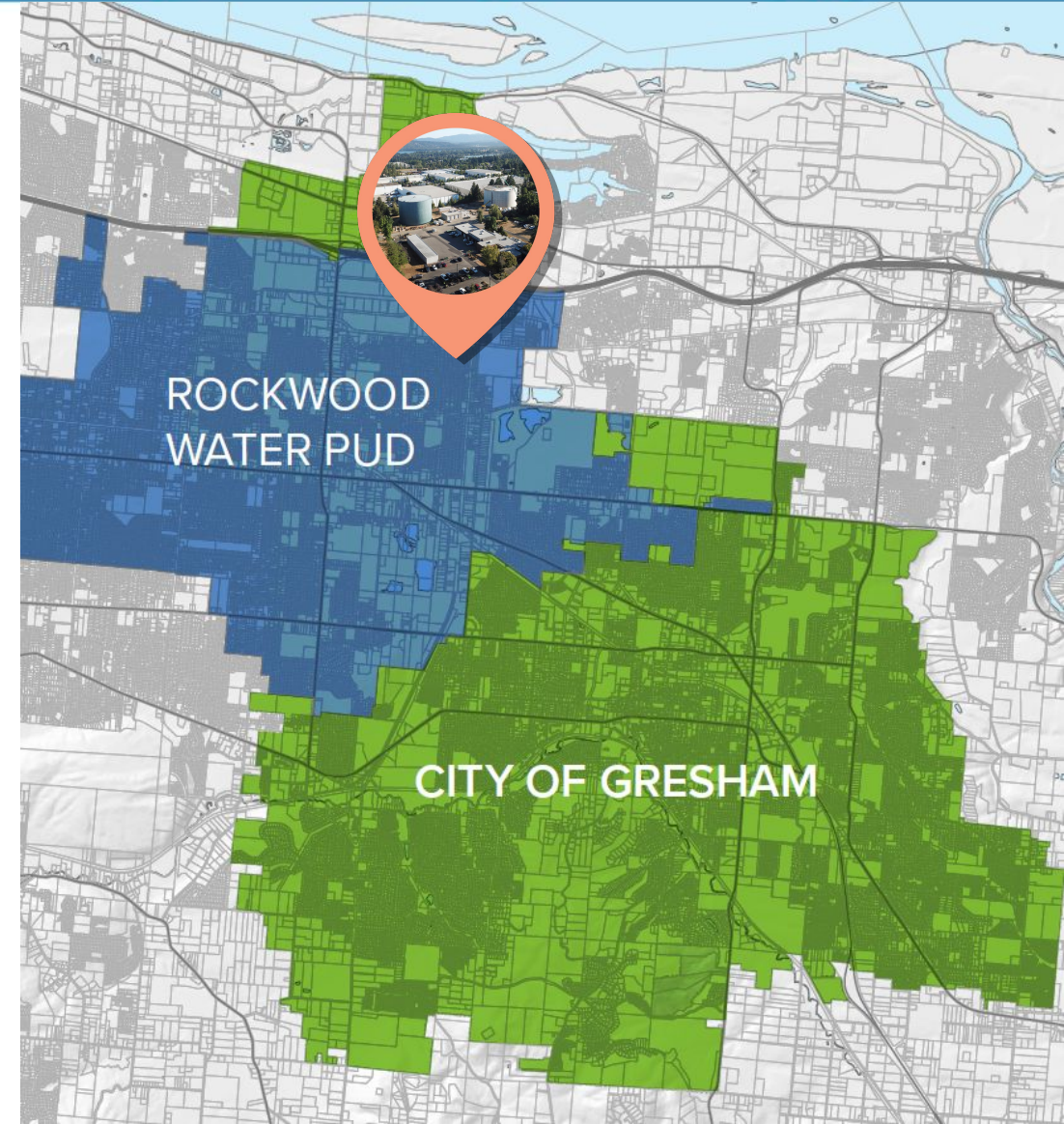
## Introduction & Project Overview





# Big Picture – Our Water Our Future

- **Customer Base** - 140,000 people
- **Water Demands** - Max Day Demand (MDD) 21.7 MGD
- **Water Source Transition** - Primary water supply from the City of Portland and supplement with our groundwater source
- **Partnership – Cascade Groundwater Alliance**
- **Funding** - WIFIA, bonds



# Big Picture – The Whole Program

*New water delivered before June 2026*



1

Water storage  
tank  
rehabilitation



2

New  
water tanks



3

Groundwater  
treatment  
plants



5

New wells  
(4 existing)



2

New pump  
stations



10.8

Miles of  
large diameter  
water pipe



# This Project - Key Features

## Iron & Manganese Treatment Plant

- 30 MGD
- 7 filter banks, 140 ATEC filters
- Onsite Sodium Hypochlorite production – Microclor
- Backwash to sanitary sewer
- Plan for future backwash recycle
- Operations space (office/meeting)



*Clark PUD – Paradise Point Treatment Plant*

# More Key Features

- **New pump station** –  
30 MGD with six 400 hp VT Pumps
- **Upgraded onsite well** –  
Replace Submersible Pump with  
Vertical Turbine
- **New equipment storage building**  
– 7,600 SF, ten vehicle bays
- **New offsite sewer connection** –  
alternatives analysis





# (Even) More Key Features

- **Yard piping** – new and reconfigured
- **Seismic** – software and hardware improvements
- Two new **power supply** transformers
- **Emergency Power Supply** – new 2 MW generator
- New **I&C** – Owner procured
- **Surge protection** on raw water and finished water
- **Revised site improvements** – site access, circulation, fire supply, grading, stormwater, etc.





# SECTION #2

## Collaborative Approach to Design & Procurement





# Collaboration and Communication (Design Process)

- From conceptual design to bid documents in **12** months with parallel design processes
- Facility planning and layout, Land Use permitting, design, building permits, OHA approval, bid documents
- **7** Key Players – RWPUD, Gresham, Consor, Jacobs, AKS, S&B, GSI
- **2,300** pages of specifications, **365** drawings



# Collaboration and Communication (Design Process)

## 6 Workshops

*Key to making good decisions quickly!*

12/5 [Workshop 1](#) – Concept Confirmation

12/19 [Workshop 2](#) – Site Planning

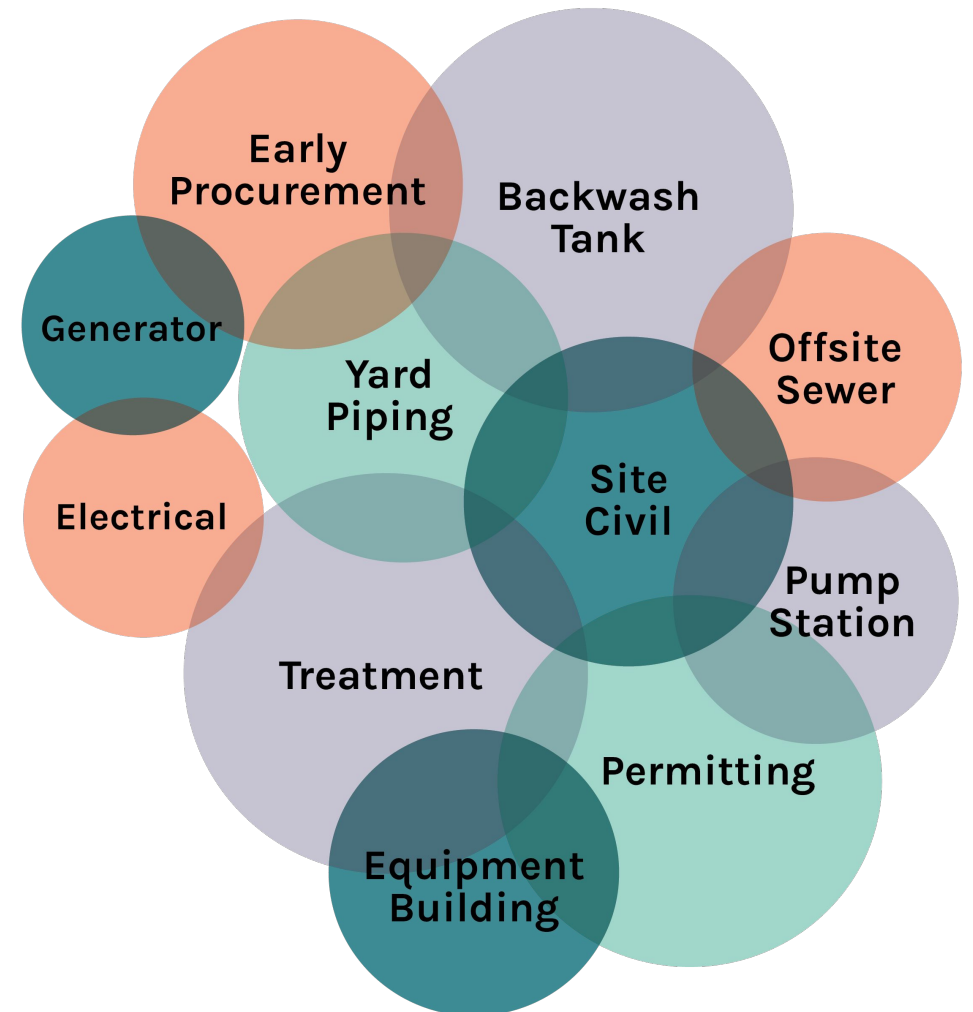
1/04 [Workshop 3](#) – Water Quality & Treatment

1/31 [Workshop 3.5](#) – SCADA Planning

3/07 [Workshop 4](#) – Operations & System Controls Integration

5/23 [Workshop 5](#) – Design Confirmation & Cost Risk Mitigation

7/23 [Workshop 6](#) – Distribution Supply Planning & Transition





# Procurement Strategy for Long Lead-Time Items

- Early Procurement Process – Generator, ATS, some I&C components
- Owner Selected Contractor Provided
- Impact to overall construction schedule
- AIS requirements (WIFIA)
- Steel pipe pre-procurement challenge: no bidder response — need to reassess market engagement.

# Collaboration and Communication (Design Process)

- Operators involved throughout process
  - Equipment Selection, facility and site layout
- Weekly meetings with design team and owners
- Pre-selected Filtration and Hypochlorite Equipment ATEC and MicroClor
- Owner supplied equipment – generator, I&C components,

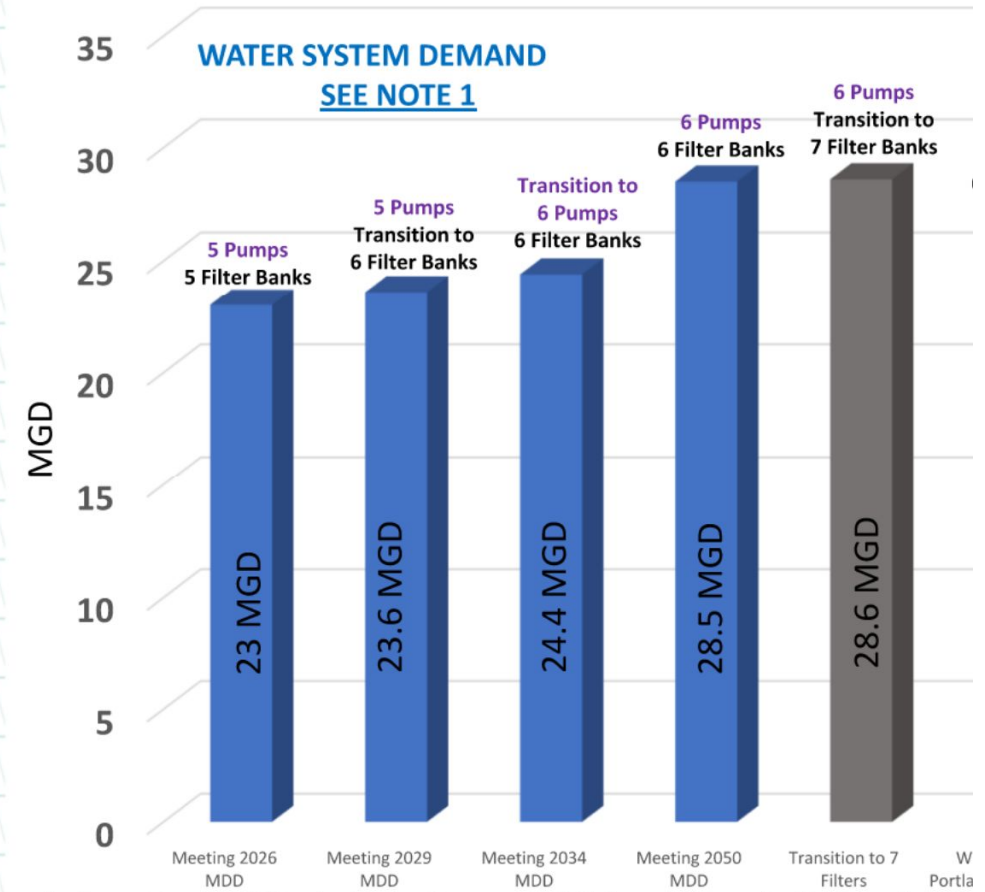




# Supply Analysis & Operational Planning

- Designed for 2050 demands and provided for future capacity
- 23 MGD at start up
- 28.5 MGD in 2050
- 32 MGD available

CASCADE CAPACITY



Notes:

1) Total system demands shown. Pump and filter bank quantity assumes full demand is supplied by Cascade WTP wells (Wells 3, 4, 5, 7, & 9) and no others in the system.

2) # of pumps based on firm capacity.

3) Proposed pump sizing matches existing pumps, 400 hp.

# Design

- Planning for the future
- Stay in service during construction
- Integrate new elements into existing constrained site
- Integration with other packages
- Produce chlorinated water, stop buying Chloraminated water
- Make decisions collaboratively and stay aligned throughout design





# SECTION #3

Construction Constraints,  
Site Challenges, & Adaptability





# Construction Constraints & Site Challenges



- **Maintain Operations** during construction
- **Multiple projects** bundled into a single package
- **Major Existing Infrastructure**
- **Dense underground infrastructure:** existing, replaced, and new
- **Limited space** requiring tight coordination





# Adaptability During Construction

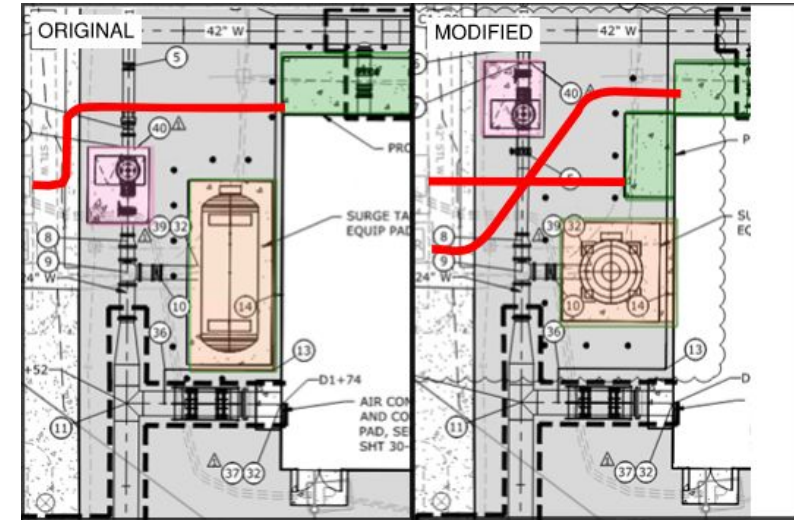
- Sewer installation through adjacent industrial property
- Agreement w/ Property owner on timeline
- Unanticipated storm line crossing
- Reconfiguration of storm was not easy to solve in the field, took collaboration b/w team
- Ongoing involvement of design team = quick response to unexpected site conditions





# Adaptability During Construction

- Existing conduits uncovered in the field, adjustments needed to surge system infrastructure
- Surge tank orientation changed
- **Demonstrates adaptability** via design team involvement in construction to quickly resolve cascading issues from small project changes.





# Creative Solutions During Construction

- Two 42-inch steel pipes beneath WTP slab
- Long pipe lead times risked significant schedule delays
- Early procurement effort was unsuccessful
- Contractor proposed 3-part slab pour to allow phased construction
- **Saved months of delay**



1. WEST SLAB  
POURED

2. EAST SLAB POURED



3. STEEL PIPE  
INSTALLED; CENTER



# SECTION #4

Closing & Q&A





# Q&A and Discussion



<https://app.truelook.cloud/dashboard/17399/20892/live?code=86c80h2ugurdntdnqhab4ea3>



**Thank You**  
Flowing with new ideas

