

# We're Running Out of Space

Presented by:

Adam Blair, PE – Murraysmith

Adam Bjornstedt, PE - Clackamas River Water



Clackamas River Water

***murraysmith***





# Introduction



***murraysmith***



**Adam Blair, PE**



*Clackamas River Water*

**Adam Bjornstedt, PE**



# Agenda

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02

CRW Infrastructure Improvements Program

03

152<sup>nd</sup> Ave. Site Considerations

04

Reservoir Design

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06

Q&A



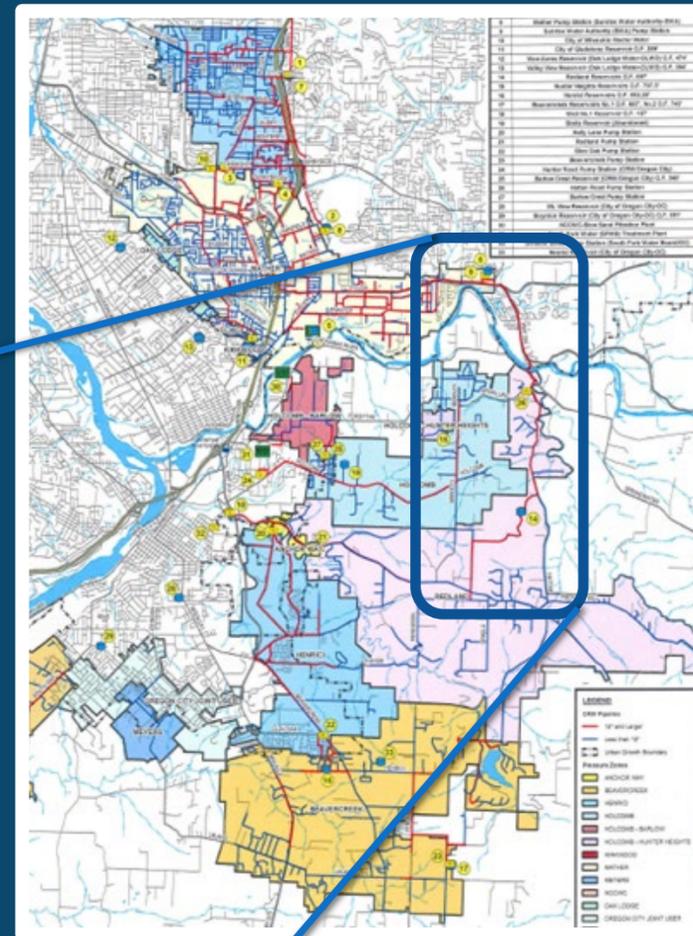
# CRW resiliency projects

## CRW Distribution System:

- North (urban/suburban) and South (suburban/rural) of Clackamas River, serving unincorporated Clackamas County communities in 42 square mile service area
- 272 miles of pipe, 2" to 36", multiple materials
- 14 reservoirs, 12 pump stations
- Approximately 12,000 service connections serving nearly 50,000 population (not including wholesale)

# CRW resiliency projects

CRW "Backbone" Phase 1



CRW District Map

The District funded Phase I of its “Backbone” program in 2016 with the goals of:

- Maximizing the number of customers directly receiving CRW-treated water
- Building capacity, redundancy, and resilience; and
- Replacing some outdated infrastructure

# CRW resiliency projects

## 152nd Project Goals:

- Allow for improved storage and water distribution within CRW's service area along Highway 212
- Create redundant storage for our north service area that allows us to inspect, maintain, and repair our Mather Reservoir
- Expand storage for distributing water to our south service area (across Carver Bridge)
- Improve our ability to supply water purchased by our neighboring water provider, Sunrise Water Authority (SWA, project partner)

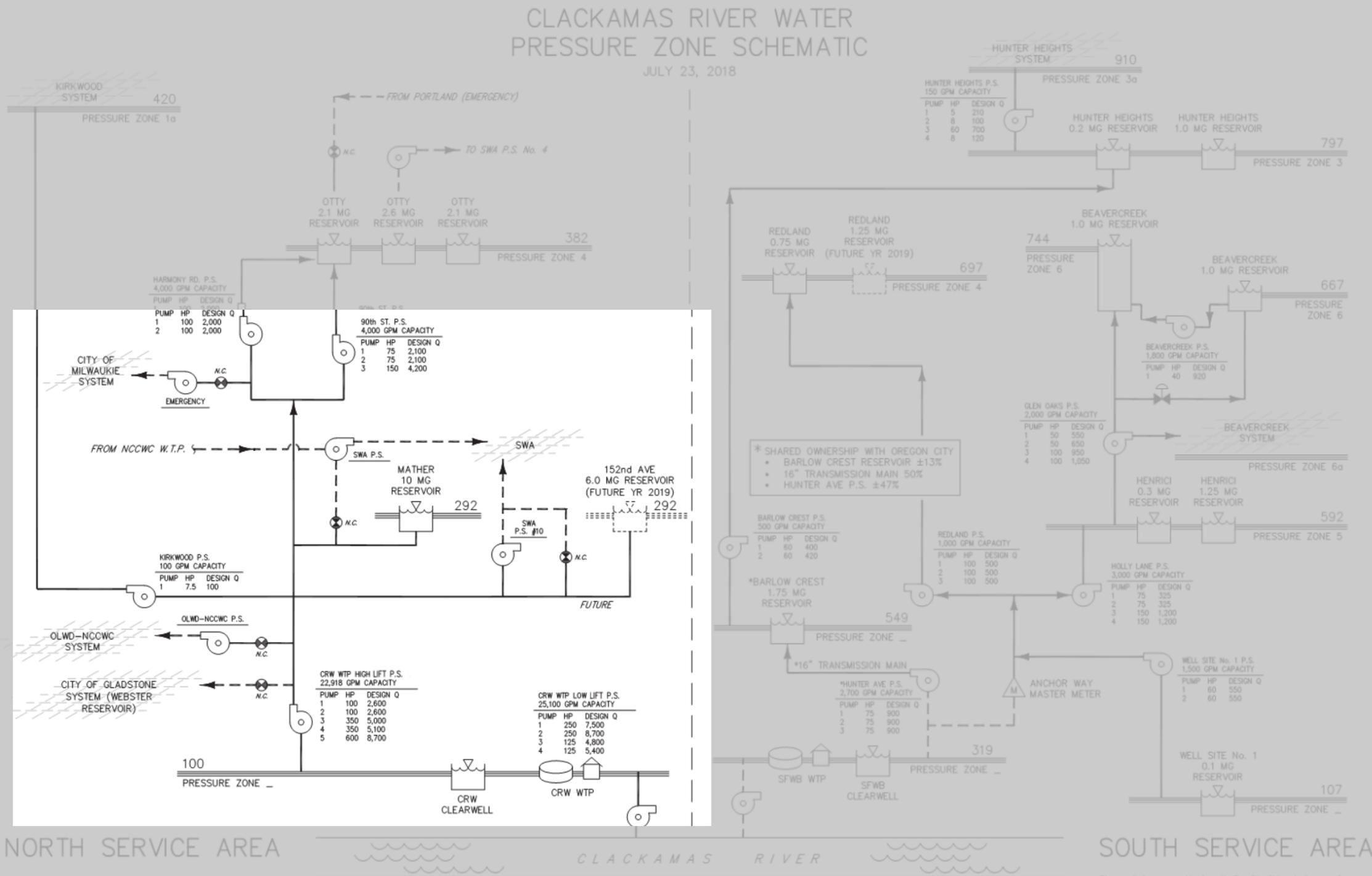


Figure 2.2 Hydraulic Profile (North System)

# North System

PWSID: 4100187



## Water System Master Plan



## CRW Resilience Planning

CRW has completed recent planning activities for the typical 20-year planning horizon. These planning efforts define system deficiencies and improvement needs, through the common criteria of **age, capacity, water quality, and hazard resilience**:

- **2018 Water System Master Plan**
- **2020-21 Water Treatment Plant Facility Plan**
- **2020 Emergency/Resilience Planning- RRA/ERP** developed to address AWIA defines additional infrastructure needs

**Additionally, CRW's 2020-21 Strategic Planning effort** includes an objective linked to capital planning.

CRW's current standards require all restrained-joint pipe, at a minimum.

# 152<sup>nd</sup> Avenue Site

## Design Considerations from Owner perspective:

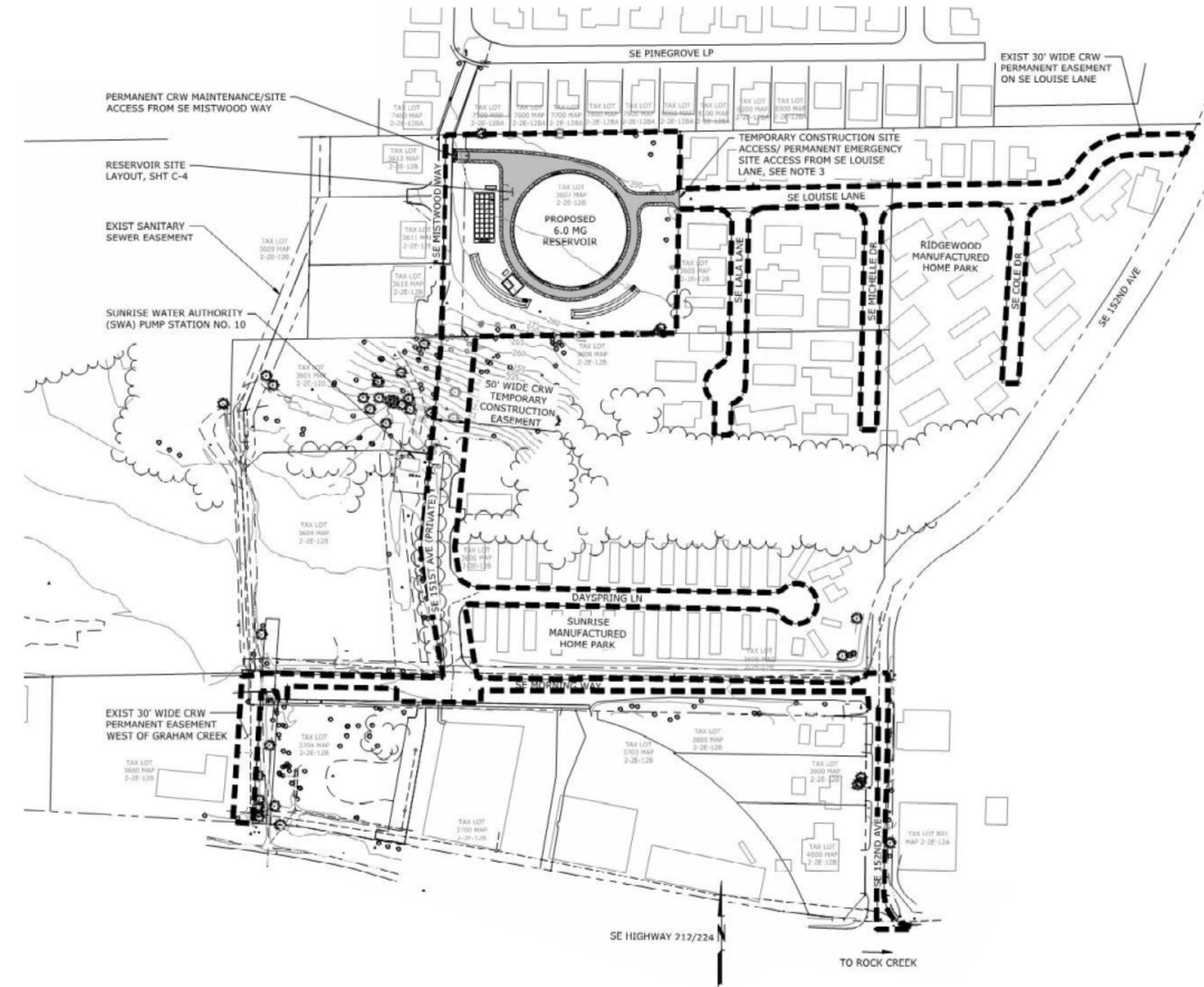
- Tank sizing
- Storage sharing with SWA
- Developed an IGA with SWA for project cost share based on storage component
- Easements/construction access
- Residential neighborhood considerations
- Community outreach



# 152<sup>nd</sup> Avenue Reservoir Reservoir Design

## 152<sup>nd</sup> Avenue Project Elements

- ✓ 6 MG Reservoir with passive mixing system inlet/outlet, dedicated outlet.
- ✓ Transmission Main Piping
- ✓ Storm improvements
- ✓ 21' x 25' x 31' D Seismic Valve Vault with actuators and controls.





# 152<sup>nd</sup> Ave Reservoir

## Reservoir and Site Design

### Key Project Issues

- Site Layout for constructability:  
Spoils and Concrete truck access
- Dry weather work coordination
- Stormwater and Reservoir  
Overflow Management
- Steep hillside construction
- Restoration & Improvements to  
nearby roadways
- Adjacent residential neighborhoods
- Vibration monitoring & home  
inspections

# 152<sup>nd</sup> Avenue Reservoir

- AWWA D110 Prestressed Reservoir
- 66,000 CY of Excavation
- Over 3,500 CUYD of poured concrete

- 3,000 LF of 24-inch and 36-inch diameter
- Prestressing involved over 40 miles of 3/8" galvanized strand pulling at approximately 14,950 lbs.



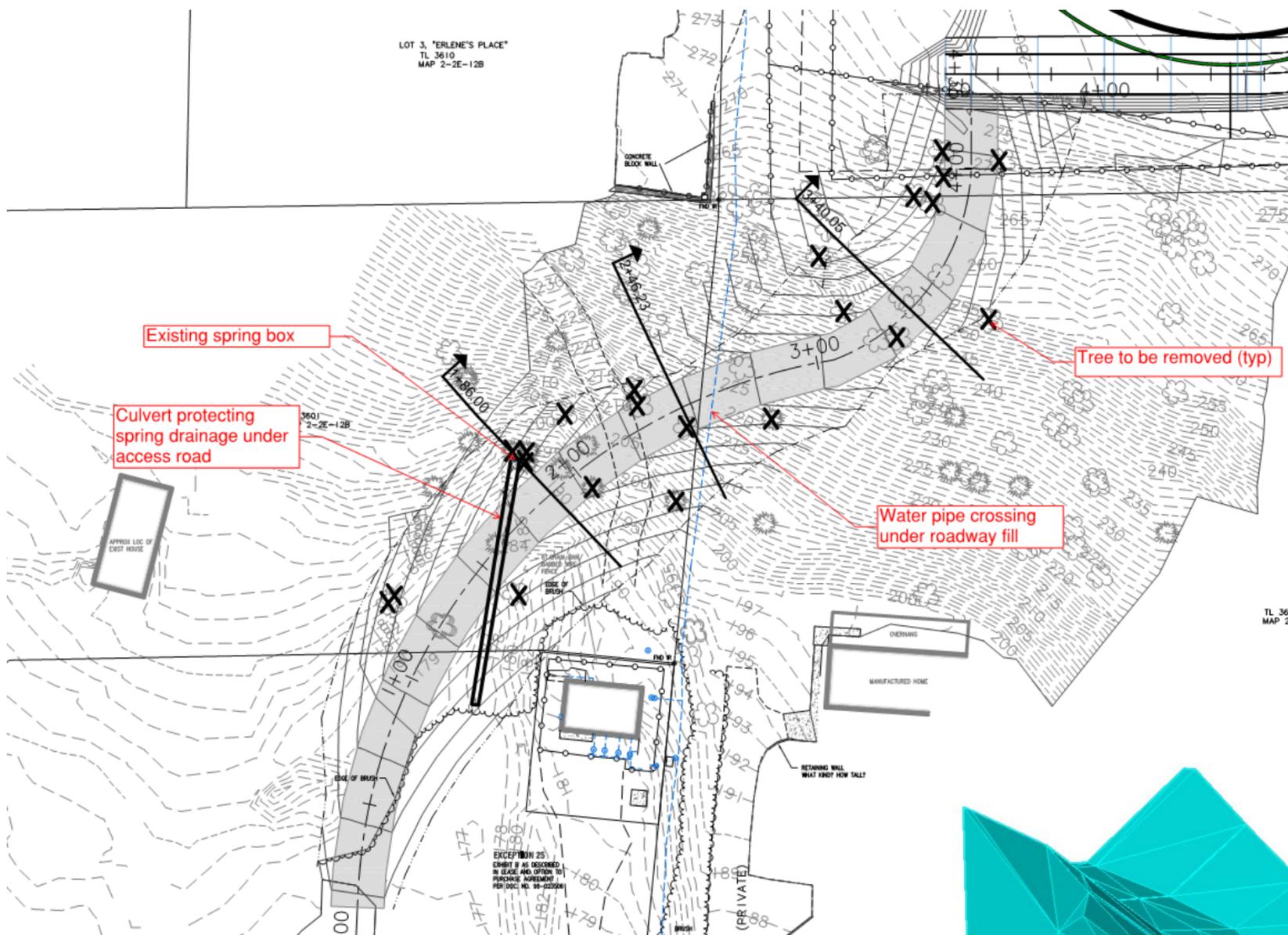
# 152<sup>nd</sup> Ave Reservoir

## Reservoir and Site Design

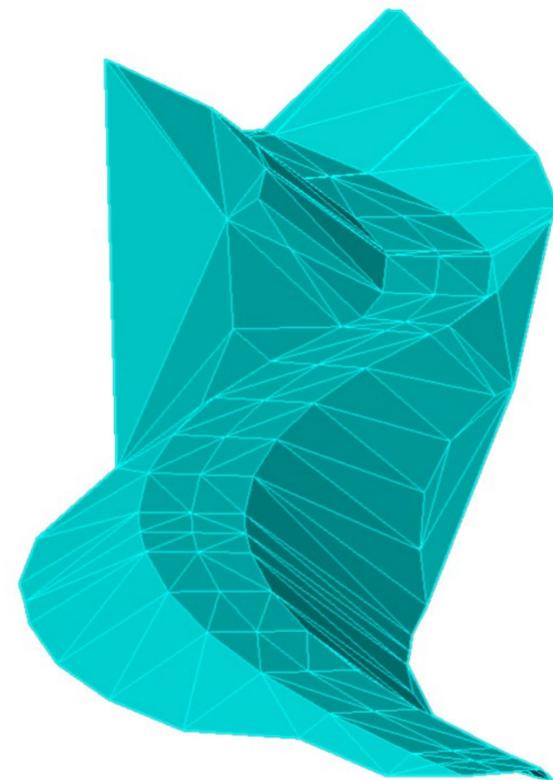
### Geotechnical concerns:

- Anchor walls for large diameter pipe installation on Hillside
- 12,000 SF of shoring around reservoir
- 15,000 CUYDs of rock backfill around reservoir





**SE Morning  
Way Access  
Road 3D  
Rendering**



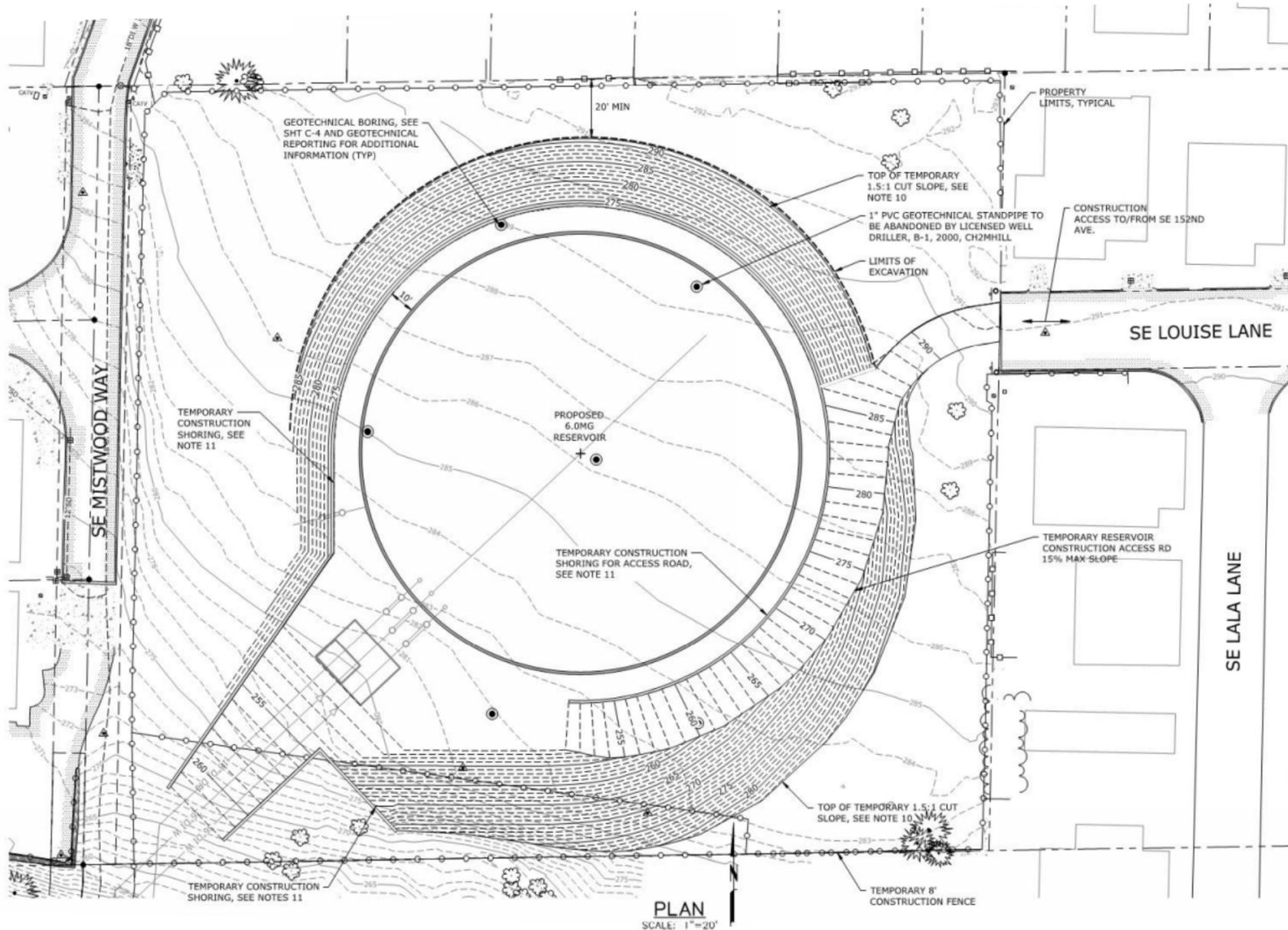
# 152<sup>nd</sup> Avenue Site

## Construction access alternatives

- From SE Morning Way via 152<sup>nd</sup> Ave
- Spares most neighbors from construction hauling
- 19.5% grade
- Haul trucks to stockpile
- Wetland and private property issues
- \$500K estimated construction cost

# 152<sup>nd</sup> Avenue Site

- Site Orientation and Challenges for Construction
- Construction access selected alternative:
  - Access through SE Louise Lane via 152<sup>nd</sup> Avenue
  - Intrusive - Over 13,000 concrete and dump truck trips in the middle of small mobile home community
  - No sidewalk for pedestrians
  - Direct access to site via roadway with existing easement





### 152nd Avenue Reservoir Impact Consideration Items for the Ridgewood and Sunrise Manufactured Home Parks

Clackamas River Water recognizes there will be impacts to the surrounding neighborhood construction of the reservoir. After talking with neighbors and the manufactured home parks, we developed the following action items to help alleviate concerns and abate construction impacts as much as possible for the neighborhood. We want to work together moving forward to address these concerns.

For questions or more information about the impact considerations for the Ridgewood and Sunrise manufactured home parks, please contact Karin Holzgang, Clackamas River Water, kholzgang@crwater.com.

For more information on the project, visit [www.152ndavenuereservoir.info](http://www.152ndavenuereservoir.info)

CONSIDERATIONS	ACTION ITEMS	STATUS / ADDITIONAL INFORMATION
<b>Roadway Improvements</b>	Repair and repave Louise Lane	Will be included in project
	Repair and repave 151st Avenue	Will be included in project
	Perform crack and spot repairs as required, and apply slurry seal to LaLa, Michelle, Cole and Dayspring	Will be included in project
<b>Offsets to Tenant Housing Costs</b>	Provide offset to annual rent increases	Cash contribution to tenants worth of rental rate increase
	Provide offset for tenant water usage	Cash contribution to tenants worth of average water usage
<b>Total cash contribution to tenants: \$800</b>		
<b>Tenant Property Protection</b>	Provide pre- and post-construction surveys of tenant homes/property	Will be provided as part of project
	Level manufactured homes in immediate vicinity of construction work/haul routes	Will be provided as part of project
	Wash manufactured homes/properties as required	Will be included in project
	Monitor construction vibration	Will be included in project
	Temporarily remove speed bumps on Louise Lane to reduce vibration/construction disturbance, then replace as part of road restoration work	Will be included in project
<b>General Construction Coordination &amp; Safety</b>	Mitigate construction noise and dust	Will be included in project
	Develop and implement erosion control plan	Will be included in project
	Provide daily quality assurance and control services by project management staff	Will be included in project
	Install security fencing and screening of construction site	Will be included in project
	Limit general construction activity to 7 a.m. – 5 p.m., Monday–Friday	Will be included in project
	Limit heavy materials/equipment hauling on roadways to 8:30 a.m. – 4:30 p.m., Monday–Friday	Will be included in project
<b>Traffic Control &amp; Safety</b>	Provide frequent construction schedule updates	Will be included in project
	Provide traffic control on Louise Lane, 152nd Avenue, Morning Way, 151st Avenue, and side streets	Will be included in project
	Install a traffic mirror at the intersection of Louise Lane and 152nd Avenue	Further research re: Clackamas County these types of devices
	Provide temporary radar speed limit signs on Louise Lane	Will be included in project
	Maintain access for residents, emergency vehicles, utility services, school buses, etc. (Traffic coordination will take place. There will be intermittent delays due to construction traffic flagging; however,	Will be included in project



# 152<sup>nd</sup> Avenue Site Public Outreach

## Be A Good Neighbor - Long term

- CRW dedicated property negotiations:
  - Acquired additional easements
  - Negotiated payments to mobile park owner and tenants
- Public outreach subconsultant
  - Project specific website developed
  - Public “Open houses”
  - Public input encouragement
- Partner agencies assisting with message/support
- CRW Board support and sensitive to community support/perception

## Public Engagement Practices

- Negotiated Mitigation Options
- Site Landscaping design and layout
- Neighborhood Improvements
- Sell the positive
  - Quiet neighbor
  - Not a residential/commercial development in YOUR backyard





# 152<sup>nd</sup> Avenue Site

## Be A Good Neighbor - Construction

- How can you be a good neighbor when you plan on driving in excess of 13,000 dump and concrete trucks and a 2-year construction project through a small residential community?
- **Planning** – Contractual requirements for construction that included:
  - Contractor PCM – On site Public Coordination Supervisor
  - Radar speed signs set at 10 mph
  - speed bump removal – removed existing speed bumps to reduce noise ( 3 speed bumps x 13,000 trips in each direction (x2) = 78000 thuds of a truck going over a speed bump.
  - Private residence power washing
  - Contractor pre-qualifications
- **Reacting-** address concerns as they arise.
  - Be available for residents- Owner, Contractor, and Engineer all on board to react promptly to concerns
  - Have a good Contractor- planning work around dialysis appointments, Construction crew access agreements, trucking arrangements.

# 152<sup>nd</sup> Avenue Site Public Outreach

## 152nd Avenue Reservoir Construction Timeline



SE 152<sup>ND</sup> AVENUE  
RESERVOIR  
PROJECT

MAR – APR 2018	APR – JUL 2018	AUG 2018 – APR 2019	APR – JUL 2019	AUG – SEPT 2019	OCT 2019	OCT – DEC 2019
<b>Site preparation:</b> erosion control, job trailer placement and removing topsoil. On-site excavators.	<b>Site excavation &amp; foundation preparation:</b> excavate large hole for the reservoir, removal of soil, off-site storage of some soil for later backfill, place foundation rock, drains and piping under the reservoir. On-site excavators.	<b>Reservoir construction:</b> concrete reservoir and valve vault construction. On-site crane and heavy equipment.	<b>Off-site pipe installation (151st, 152nd, Morning Way):</b> water and storm/drain piping installation in the roadway to include temporary trench patching.	<b>Reservoir backfill:</b> return stored soil and place soil to create a partially buried reservoir. On-site excavators and compactors.	<b>Final roadway resurfacing:</b> a mix of grind and inlay, slurry seal, and full depth reconstruction.	<b>Site work:</b> small control building construction, reservoir site roadways, final grading, stormwater management facilities, landscaping and fencing. On-site graders and small excavators.
<b>Light truck traffic:</b> Dump trucks on roadway	<b>Heavy truck traffic:</b> Dump trucks on roadway daily	<b>Moderate truck traffic:</b> Concrete trucks on roadway	<b>Light truck traffic:</b> Roadway lane closures, excavators, and loaders on the roadway	<b>Heavy truck traffic:</b> Dump trucks on roadway daily	<b>Moderate truck traffic:</b> Roadway lane closures, paving machines, compactors and asphalt trucks on the roadway	<b>Light truck traffic:</b> Dump trucks on roadway

TRUCK TRAFFIC KEY: LIGHT FREQUENCY (10-20 TRIPS PER DAY) MODERATE FREQUENCY (20-50 TRIPS PER DAY) HEAVY FREQUENCY (50-100+ TRIPS PER DAY)

### FOR QUESTIONS DURING CONSTRUCTION

**Danielle Woodard**  
Immediate/Day-to-day  
Construction Inquiries  
Rotschy Inc.  
971.506.8484  
danielle.woodard@rotschyinc.com

**Adam M. Bjornstedt, PE**  
CRW Project Manager  
Clackamas River Water  
503.722.9246 (office)  
503.729.1600 (cell)

**Adam Blair, PE**  
On-Site Engineer  
Murraysmith  
503.225.9010  
adam.blair@murraysmith.us

**General On-Site  
Construction Hours**  
7:00 a.m. - 5:00 p.m., M-F

**Truck & Site Access**  
8:30 a.m. - 4:30 p.m.

[www.152ndavenuereservoir.info](http://www.152ndavenuereservoir.info)

## • Be A Good Neighbor - Construction

- **Outreach** – neighborhood meetings, open houses, mailers, signage, manage expectations, open communication.
- **Specific Neighborhood Concerns during construction-**  
Traffic, dust, kid's safety on road with trucks, access, noise, lights, speeding, Parking.
- **Sign of success** – I still receive phone calls from residents with questions/ concerns.

# Construction Time Lapse





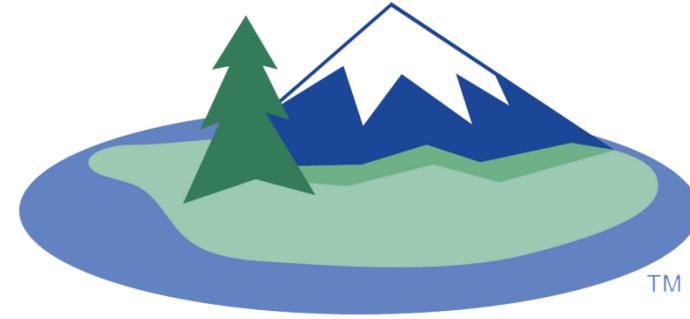
# Q&A

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**Thank you!**