HRGreen®

Building Communities.
Improving Lives.

Wilmes Lake Alum Treatment Facility

South Washington Watershed District

City of Woodbury - Minnesota

2024 MESERB Summer Conference
June 13, 2024

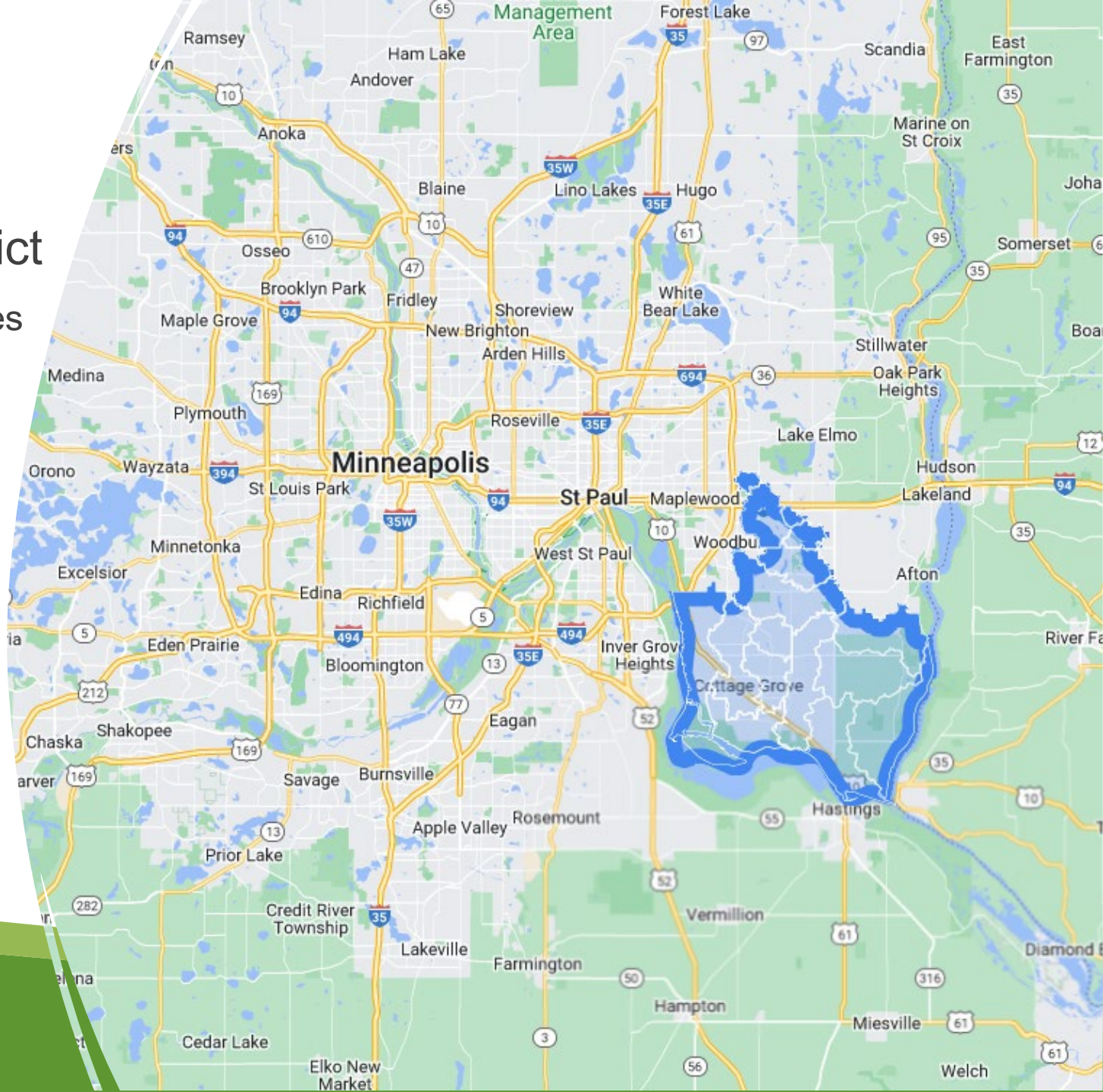
Agenda

- Location & Background
- Project Description
- Project Goals
- Recommended Improvements
- Construction Status

Location

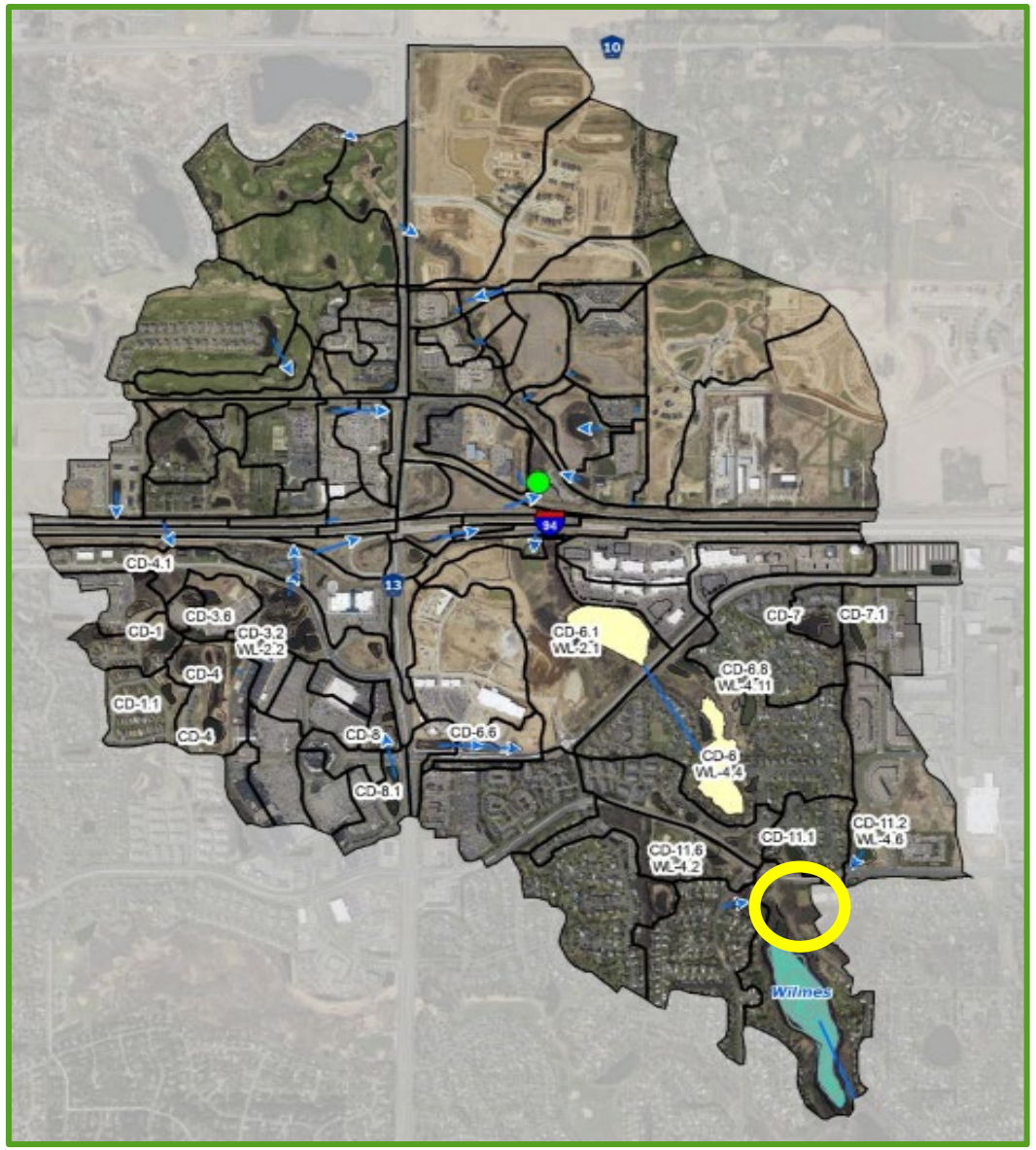
South Washington Watershed District

- Established in 1984 to manage the resources of the watershed
- Located in Washington County
- Southeast of St. Paul, MN
- Intersects 10 municipalities



Background

- Watershed area of 3,242 acres
- North Wilmes Lake is listed on Minnesota's 303d list as impaired for TP
- 2018 lake management plan set a TP reduction goal of 153 lbs/yr
- 2019 regional alternative analysis identified regional treatment facility



Background

- Previous study considered alternative methods for achieving the desired TP reduction.
- Alum treatment was recommended
- 2020 HR Green alternatives analysis for implementing chemical treatment
- Treat 1-3 cfs of inflow resulting in expected removal rates of 95-283 lbs TP/yr

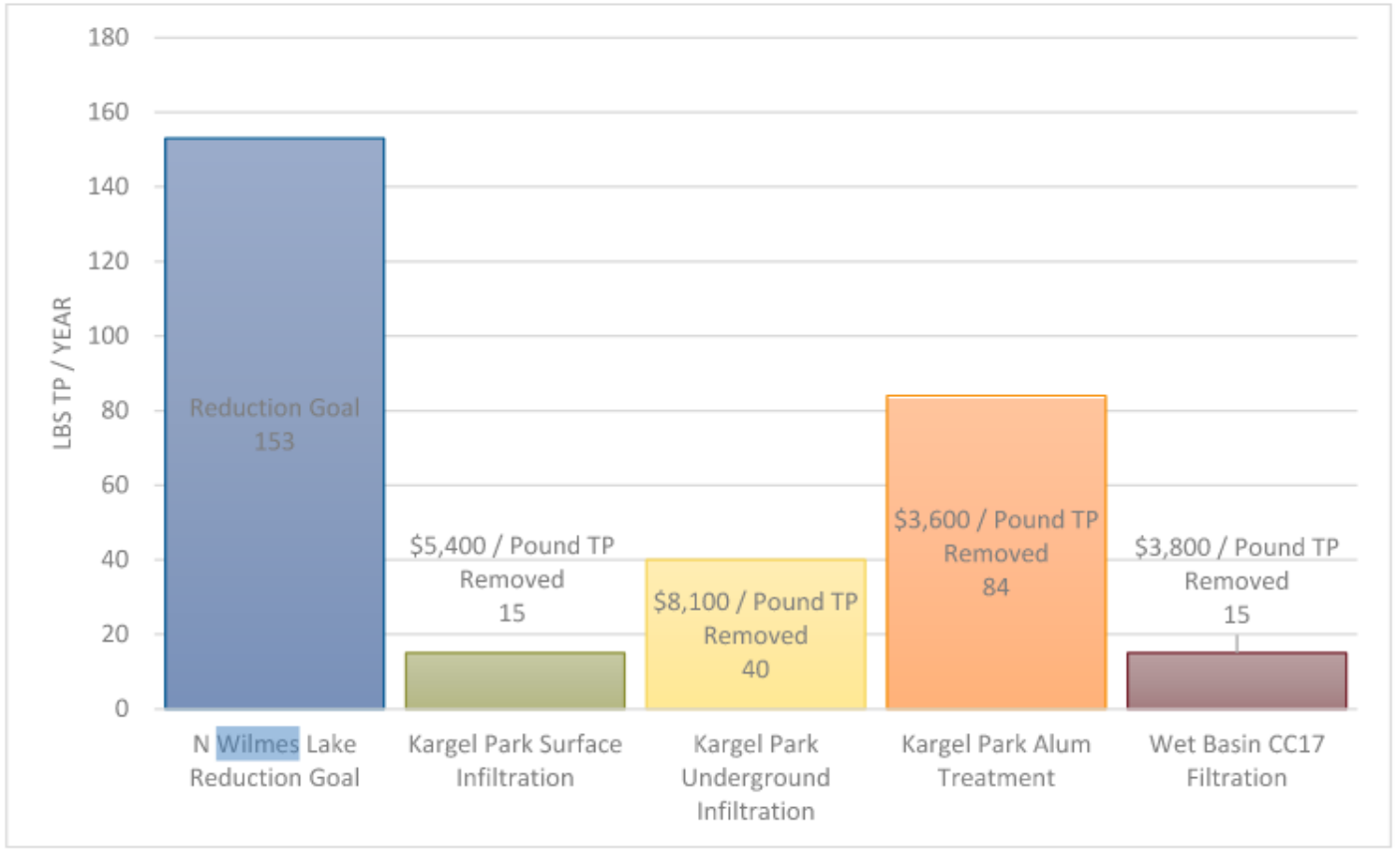
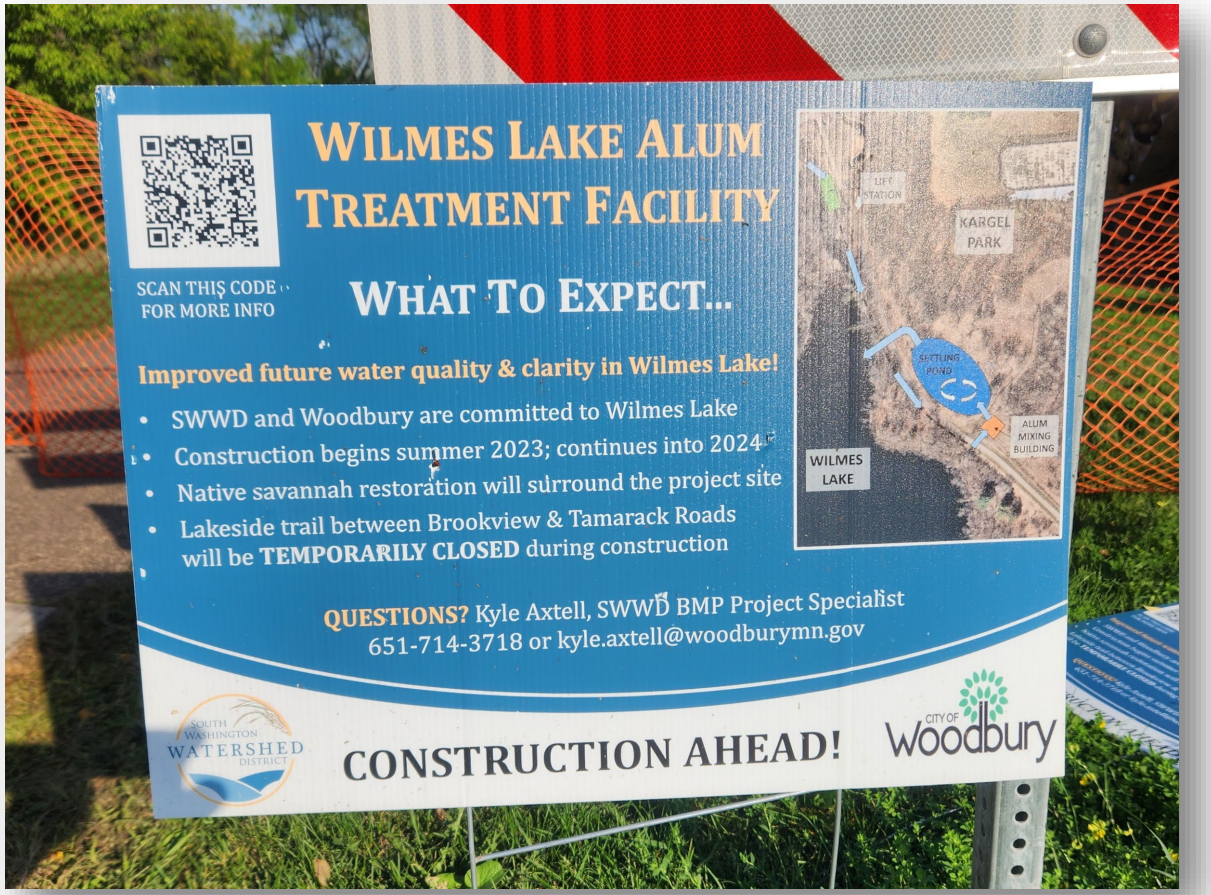


Figure 4: Kargel Park TP removal options compared to the North Wilmes Lake reduction goal

Project Goals

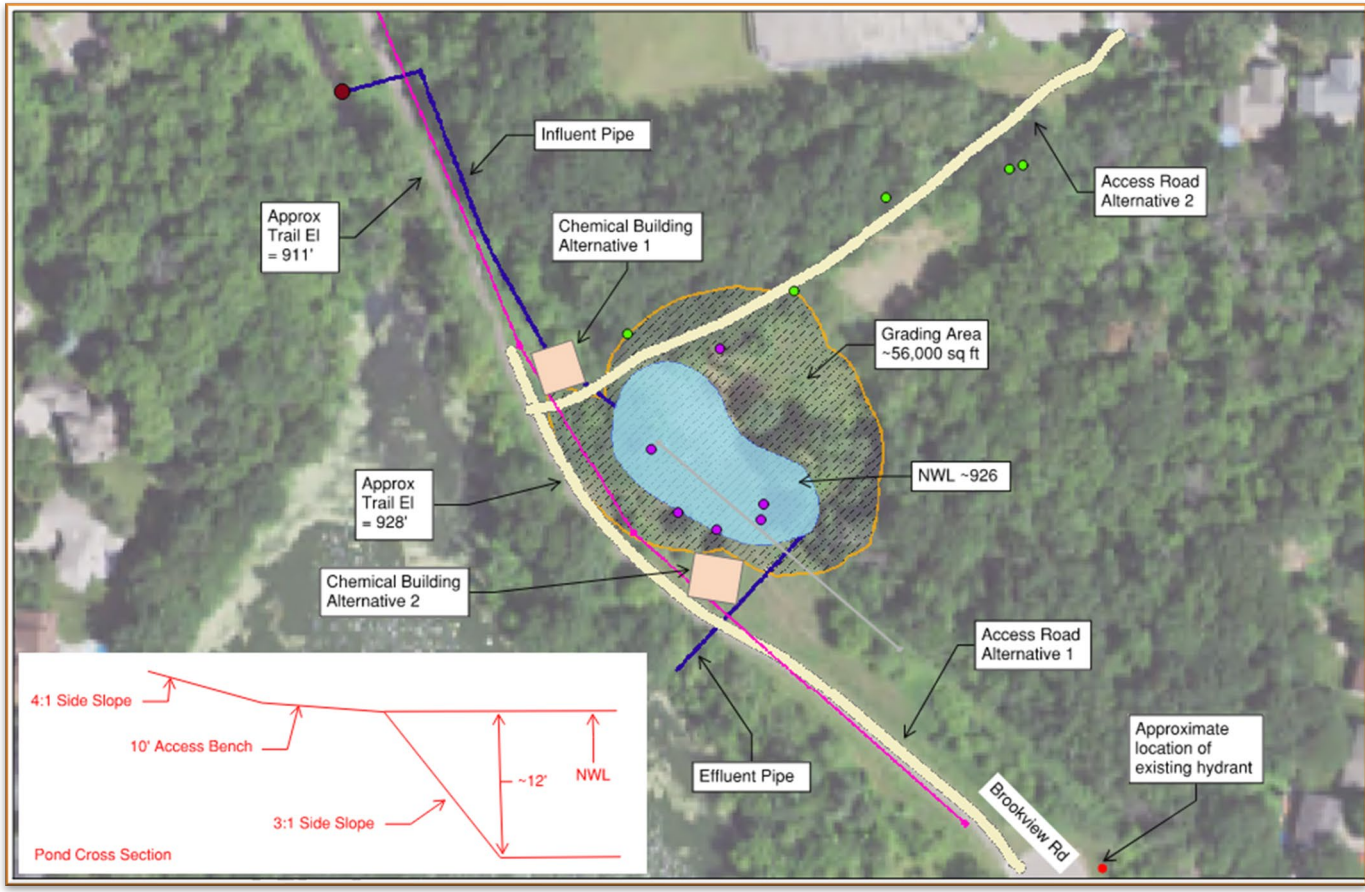
- Improve water quality of Wilmes Lake
- Blend into park's natural setting
- Provide natural habitat
- Maintain pedestrian connectivity
- Partner with the City for operations and maintenance



Project Description

Considerations:

- Ferric Chloride vs. Aluminum Sulfate
- Site layout
- Treatment facility with a lift station, forcemain and settling basin



Project Description

How does it work?

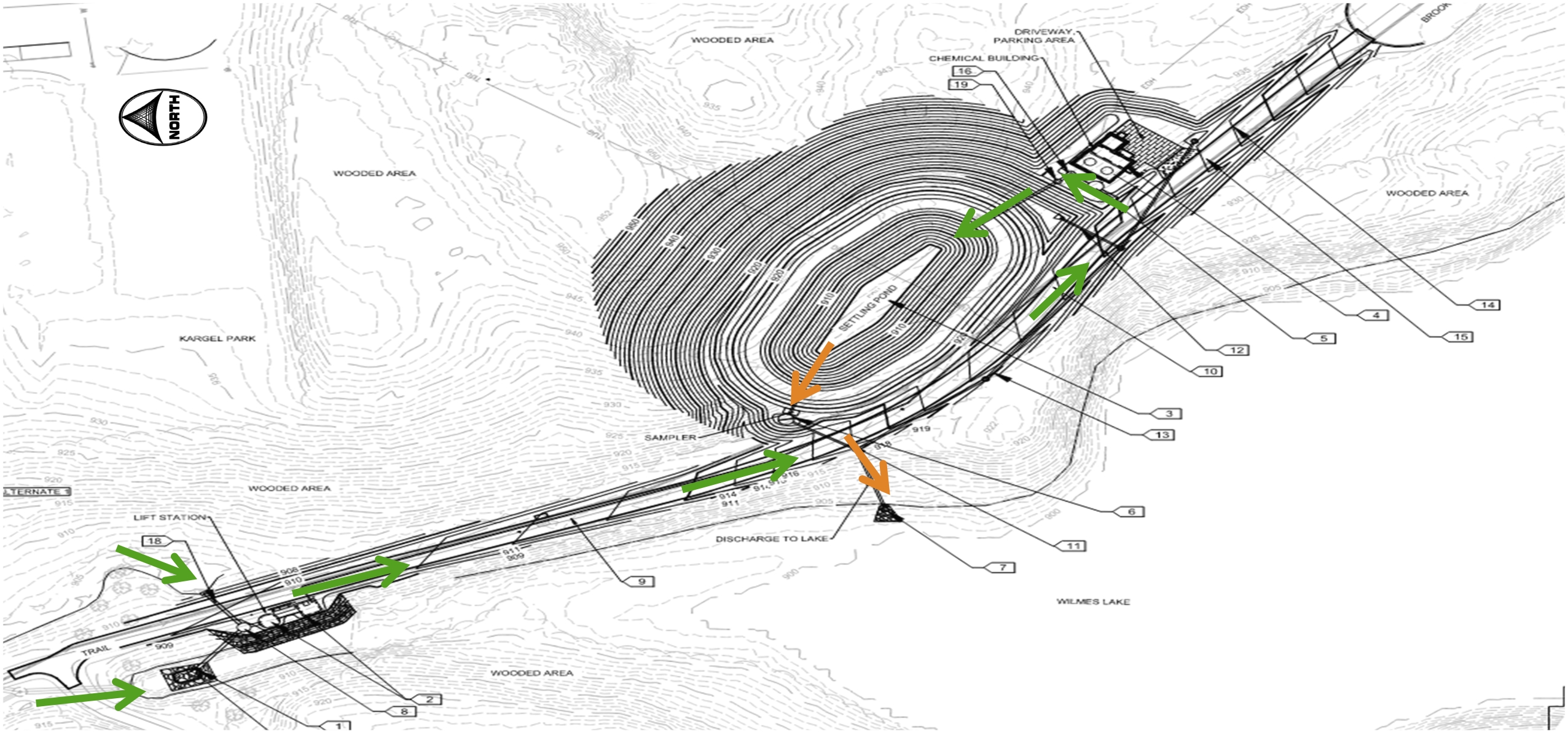
- Coagulation
- Flocculation
- Sedimentation

$$Al(SO_4)_2$$

$$Al^{+3} + 6\ H_2O \rightleftarrows Al\ (H_2O)_6^{3+}$$

$$Al^{3+} + H_2O \rightleftarrows intermediate\ reactions \rightleftarrows Al(OH)_3(s) + H^+$$

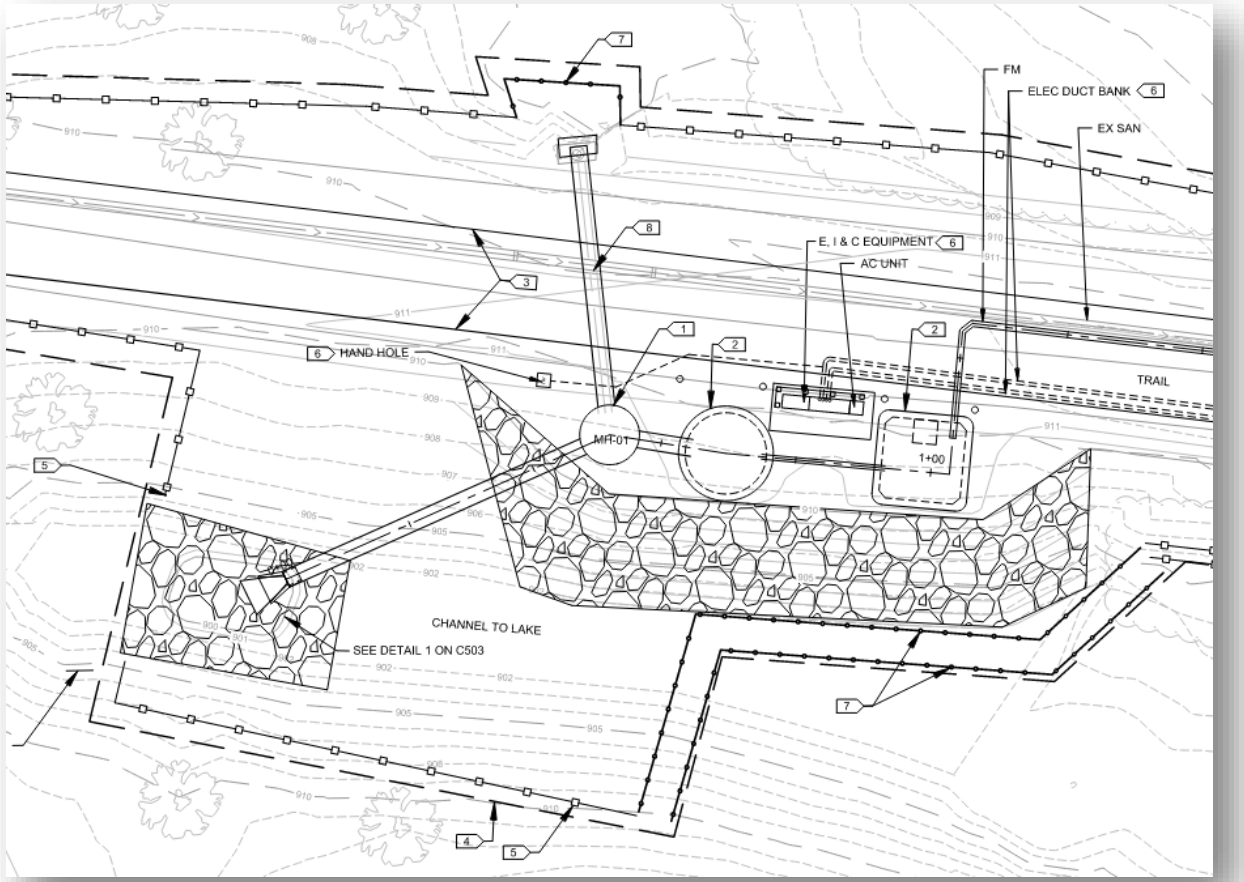
Recommended Improvements



Recommended Improvements

Lift Station

- Triplex submersible station
- Each pump rated for 1cfs (448gpm)
- Median flow within channel: 1.3 cfs
- Mean flow with channel: 3.2cfs
- Flows monitored by SWWD
- SAFL Baffle installed upstream of pumps



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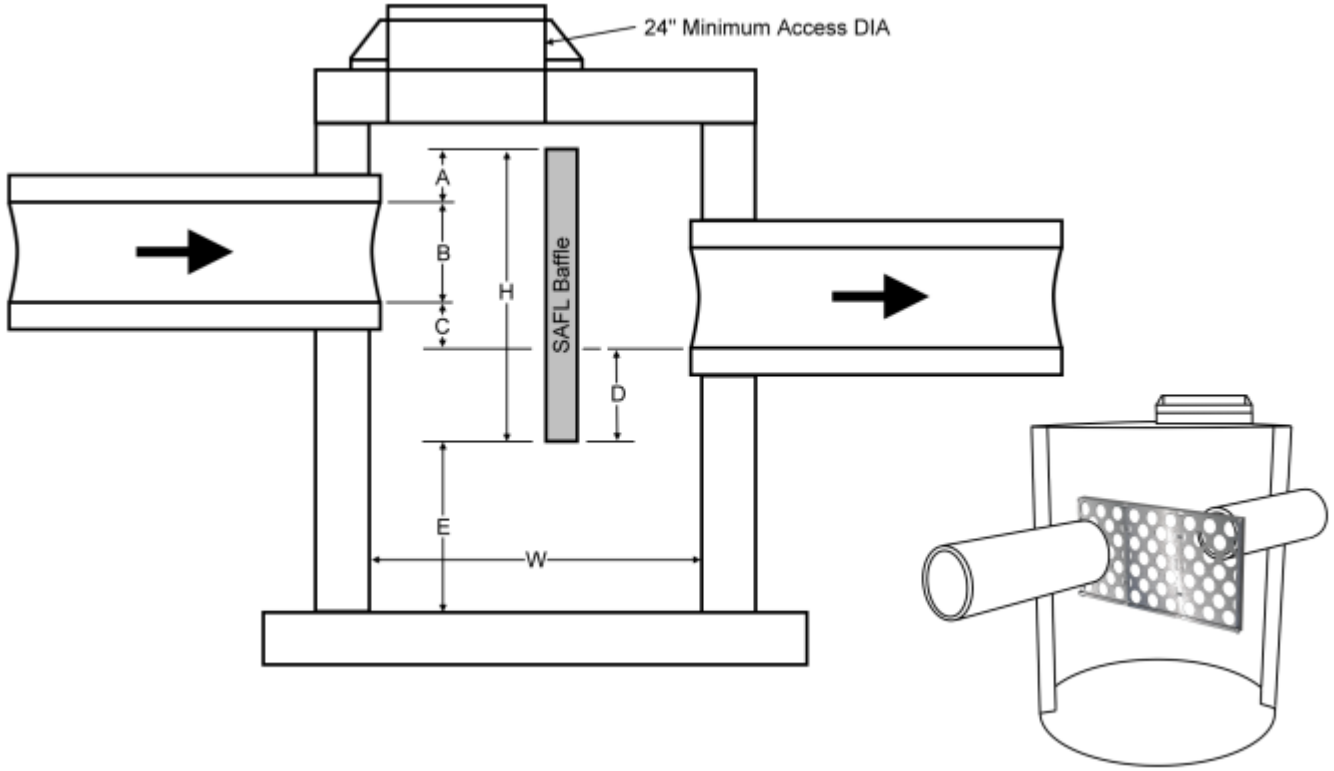

Photo Credit: Upstream Technologies

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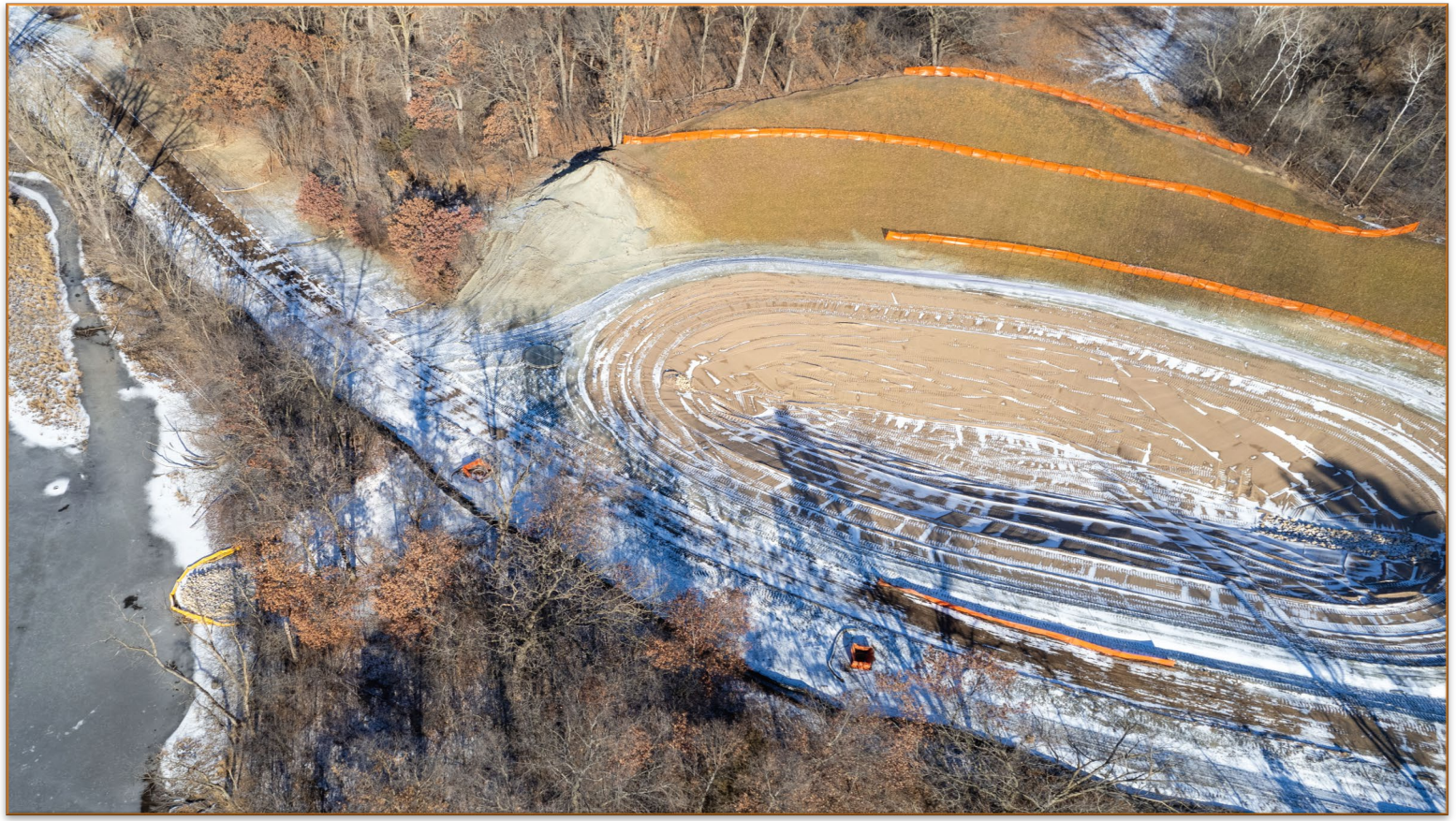
Recommended Improvements

Settling Basin

- ~130,000 CF storage
- 37 hours detention time @ 1cfs
- 2’ clay liner required



Recommended Improvements

Chemical Building

- Needed to be visually pleasing
- Blend into park setting
- Low lighting for wildlife
- Permeable pavement
- Non-reflective tin roof

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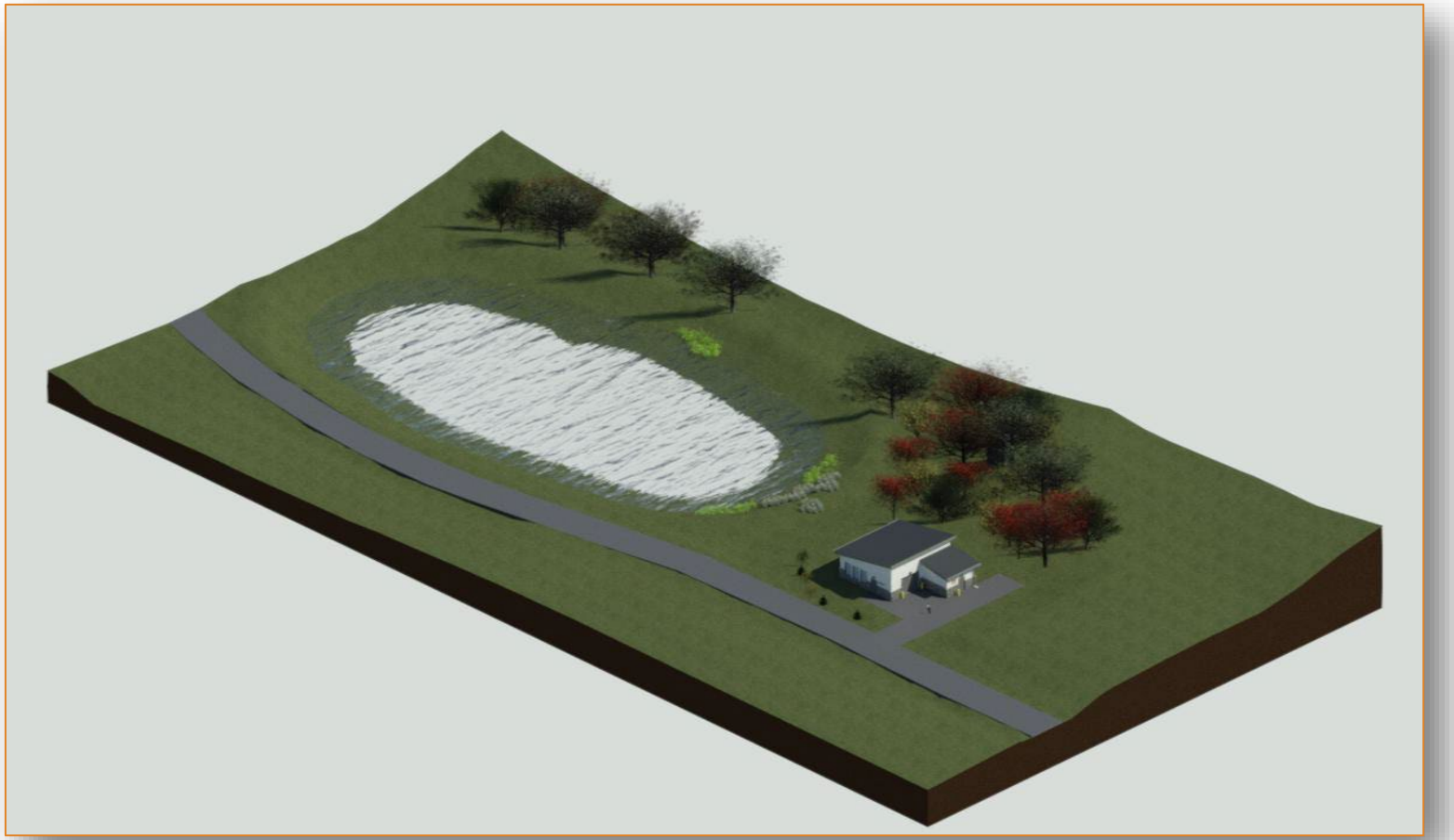

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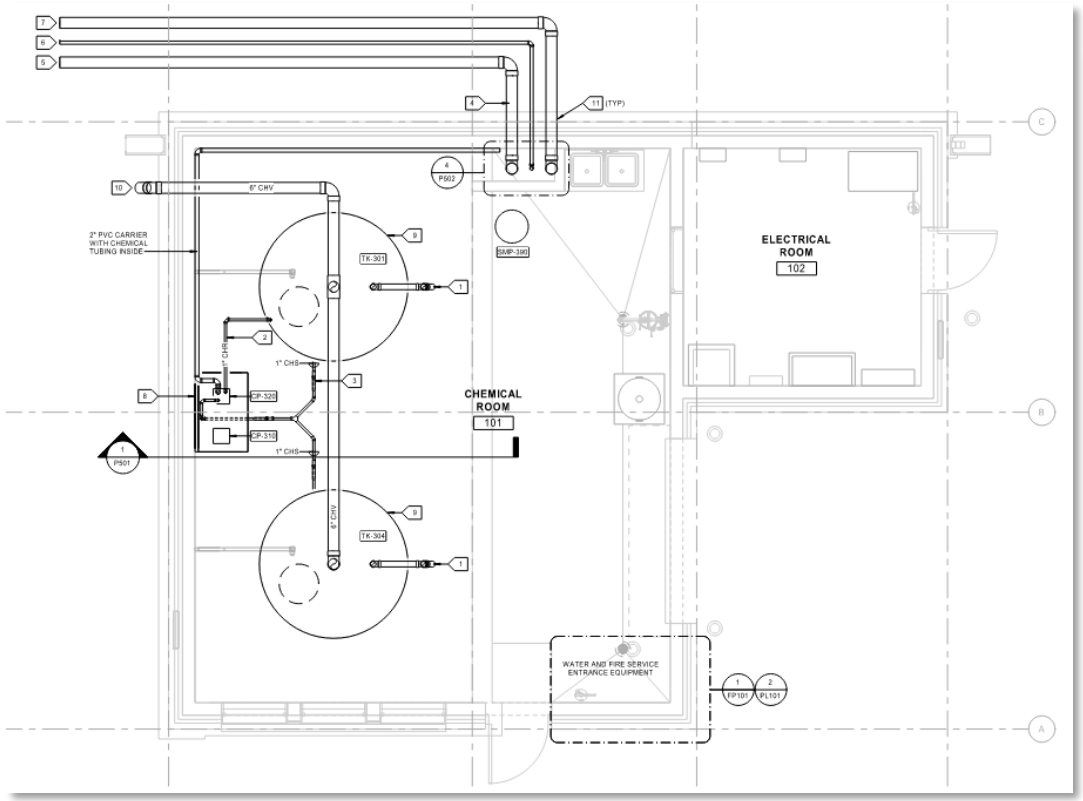

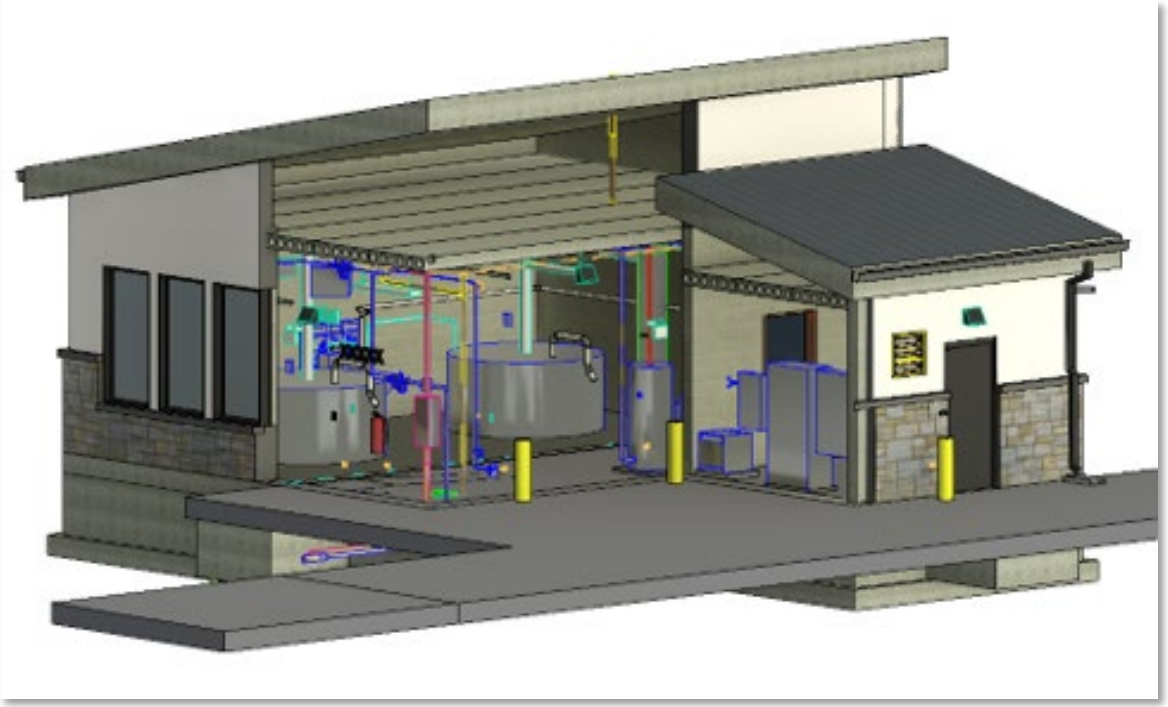

Construction Status

How are things going?

- Lift station constructed awaiting pump installation
- Basin grading complete
- Building foundation complete
- Storm sewer piping is in
- Landscaping to be completed in spring/summer 2024

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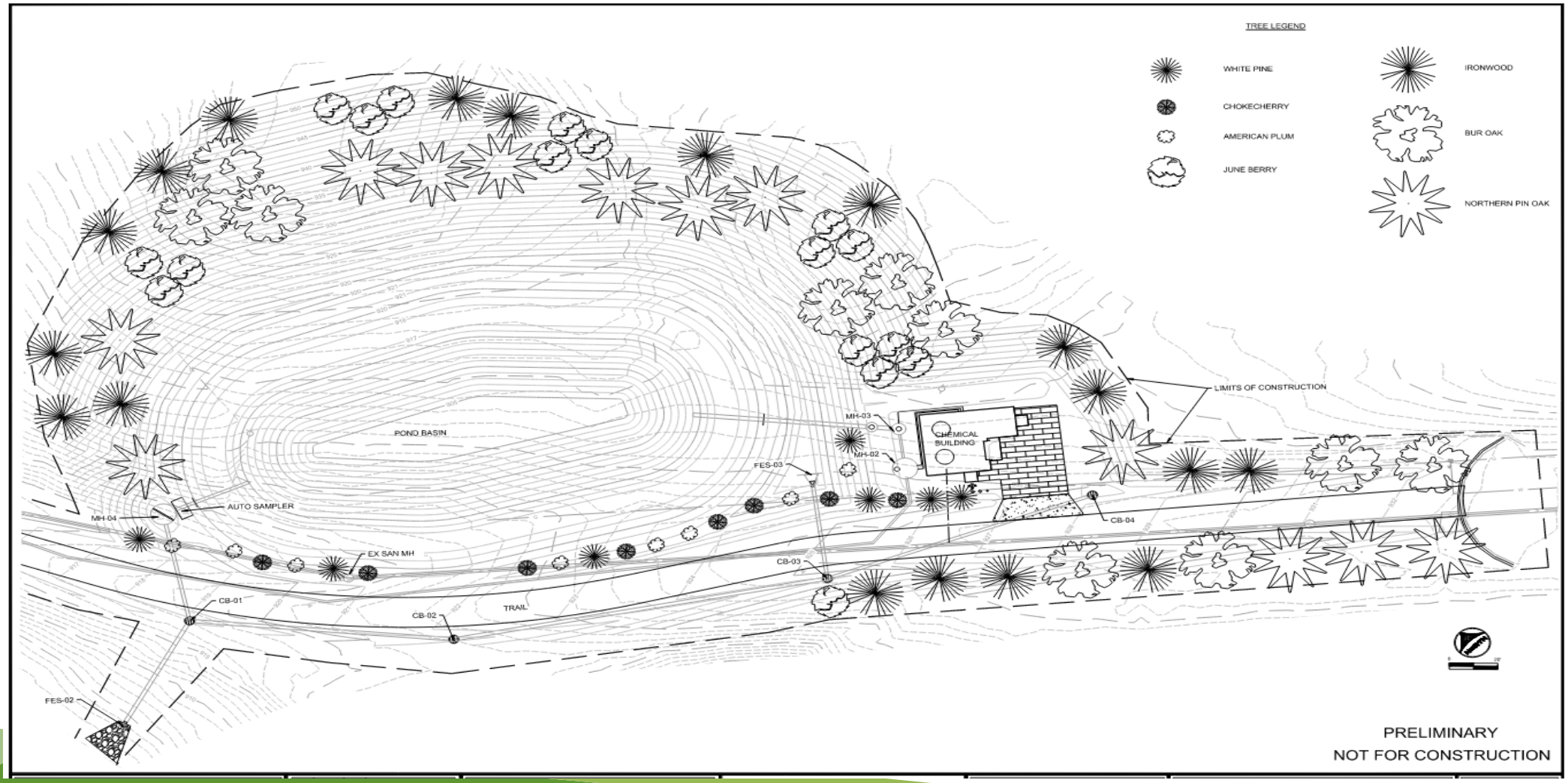
https://www.senserasystems.com/public/embed/3M8823288783

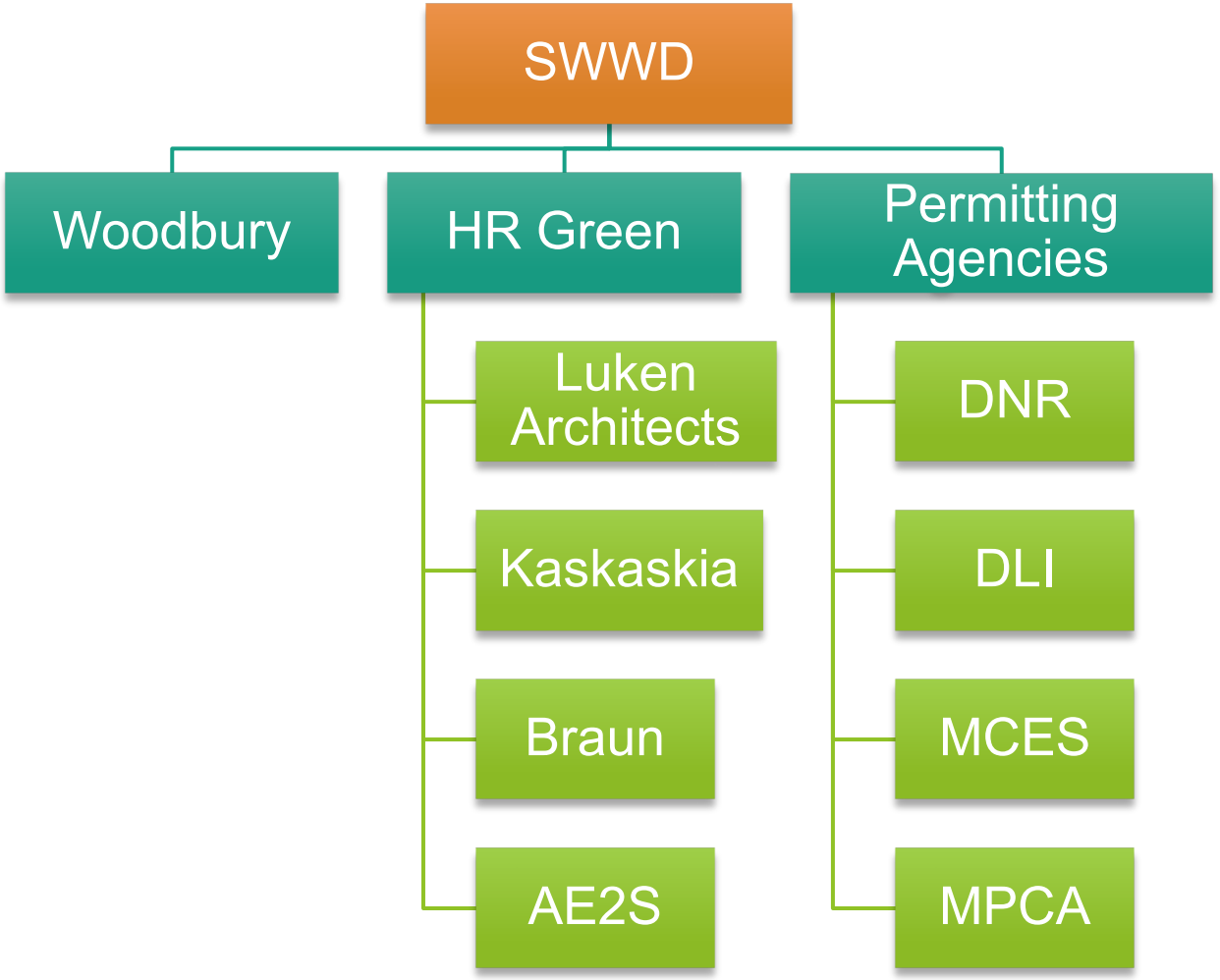
Site Restoration



System Operation

- Dredging will be required in the future
- Sludge to be monitored
- Public notices will be posted explaining the process
- Sampling
  - TSS
  - pH
  - Total Phosphorus

Design Collaboration



Permitting

- DNR – considered a public water – need public waters permit – applies to improvements below OHWL
- DLI – building, plumbing and site permit review
- MPCA – NPDES Permit - waste water discharge permit
- MCES – sludge disposal

Questions

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