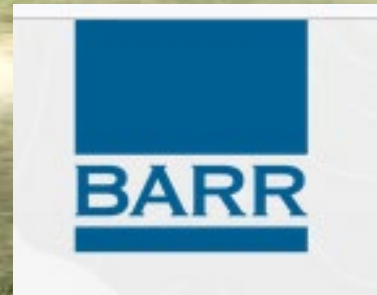


**Oak Knoll Pond/Wood Lake
February 1, 2023
Community Meeting
Spent Lime Study Results
for Oak Knoll Pond/Wood Lake**



VLAWMO
Vadnais Lake Area
Water Management Organization



Sign in for meeting



- Sign-in sheet passed around
- Please include your name, home address, and email



Project Partners and Agenda



Project Partner Representatives:

- Phil Belfiori: VLAWMO Administrator
- Dan Jones: VLAWMO Board member
- Dawn Tanner: VLAWMO PDC
- Connie Taillon: WBL Environmental Specialist/Water Resources Engineer
- Greg Wilson: Barr Engineering Senior Water Resources Engineer

Agenda:

- Introduction
- Background
 - Basic science
 - Recent watershed project
- New study (scaling up)
- Questions and considerations for Oak Knoll Pond/ Wood Lake
- Requests to residents
- Next steps; Q&A

Introduction: Prior communication, small pond demonstration project, and resumed communication with residents around Oak Knoll Pond/Wood Lake?

- Prior contact by VLAWMO, WBL, and Barr regarding possible treatment of Oak Knoll Pond/Wood Lake (2018/2019)
- Landowners around the pond were surveyed, with 100% in favor (Mailed May 24, 2018)
- At that time, pond was too large because of multiple access locations needed and too costly because of grant funding limit
- So the switch was made in locations, with a plan to pursue a feasibility study to scale up and include Oak Knoll Pond if results were positive in Ash Street Pond



Introduction: Recent postcard communication

Spent Lime effort continues at Oak Knoll Pond/Wood Lake

Preliminary spent lime studies have shown positive results for water quality improvement in small ponds. VLAWMO, the City of WBL, and partners are building upon recent projects and looking at slightly larger waterbodies to continue learning about the best ways to use this emerging tool.

This fall we're conducting a follow-up investigation to determine if Oak Knoll Pond/Wood Lake is suitable for a larger-scale spent lime project. **Staff and project partners may be onsite accessing the pond by foot or boat during business hours.**

If the investigation shows promise and the project appears to be suitable, we will share more information and updates with you.

Contact VLAWMO with questions at dawn.tanner@vlawmo.org

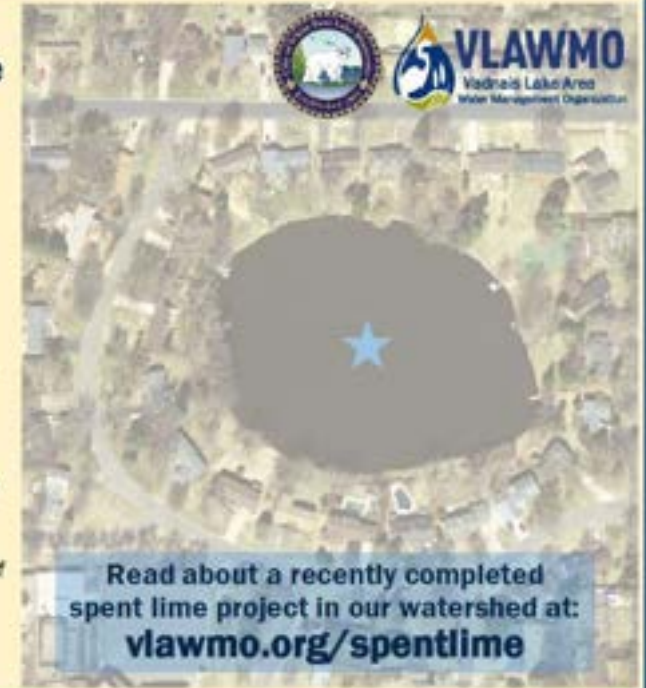


Spent Lime Study Results for Oak Knoll Pond/Wood Lake

Public meeting
Feb. 1 6:30-7:30 pm
WBL City Hall Council Chambers
4701 Highway 61

VLAWMO, the City of WBL, and Barr Engineering conducted a study in 2022 to determine if Oak Knoll Pond/Wood Lake is suitable for a possible spent lime demonstration project to improve water quality.

Attend the public meeting to learn about the results of this study and next steps toward potential implementation.



Background: Basic science

What is spent lime, and where does it come from?

- Drinking water treatment residual; many water utilities use **lime softening**, including St Paul Regional Water Services (SPRWS) and the City of WBL
- **Lime softening** is a water treatment process that uses calcium hydroxide, or limewater, to soften water by removing calcium and magnesium ions
- Byproduct is **spent lime** that still has the capacity to remove phosphorus from water

City of White Bear Lake
spent lime slurry



Background: Basic science

What is spent lime, and where does it come from?

- Filter cake (shown top left) trucked to agricultural fields and used as soil amendment
- Total cost per year to SPRWS \$1,000,000
- ❖ Safe for use in the environment
- ❖ Can change pH when added to water, so monitoring is needed

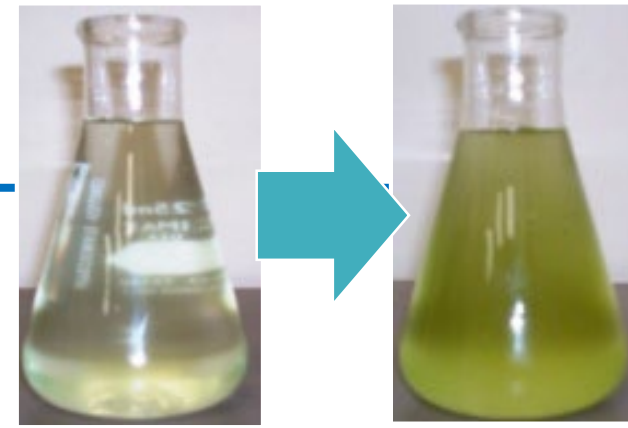


City of White Bear Lake
spent lime slurry

Background: Basic science

Why is it important to remove excess phosphorus in stormwater and waterbodies?

- Excess phosphorus means poor water quality
- Phosphorus feeds algae and causes algal blooms
- Algae decrease water clarity
- Can cause fish kills, bad odors, and unsightly conditions

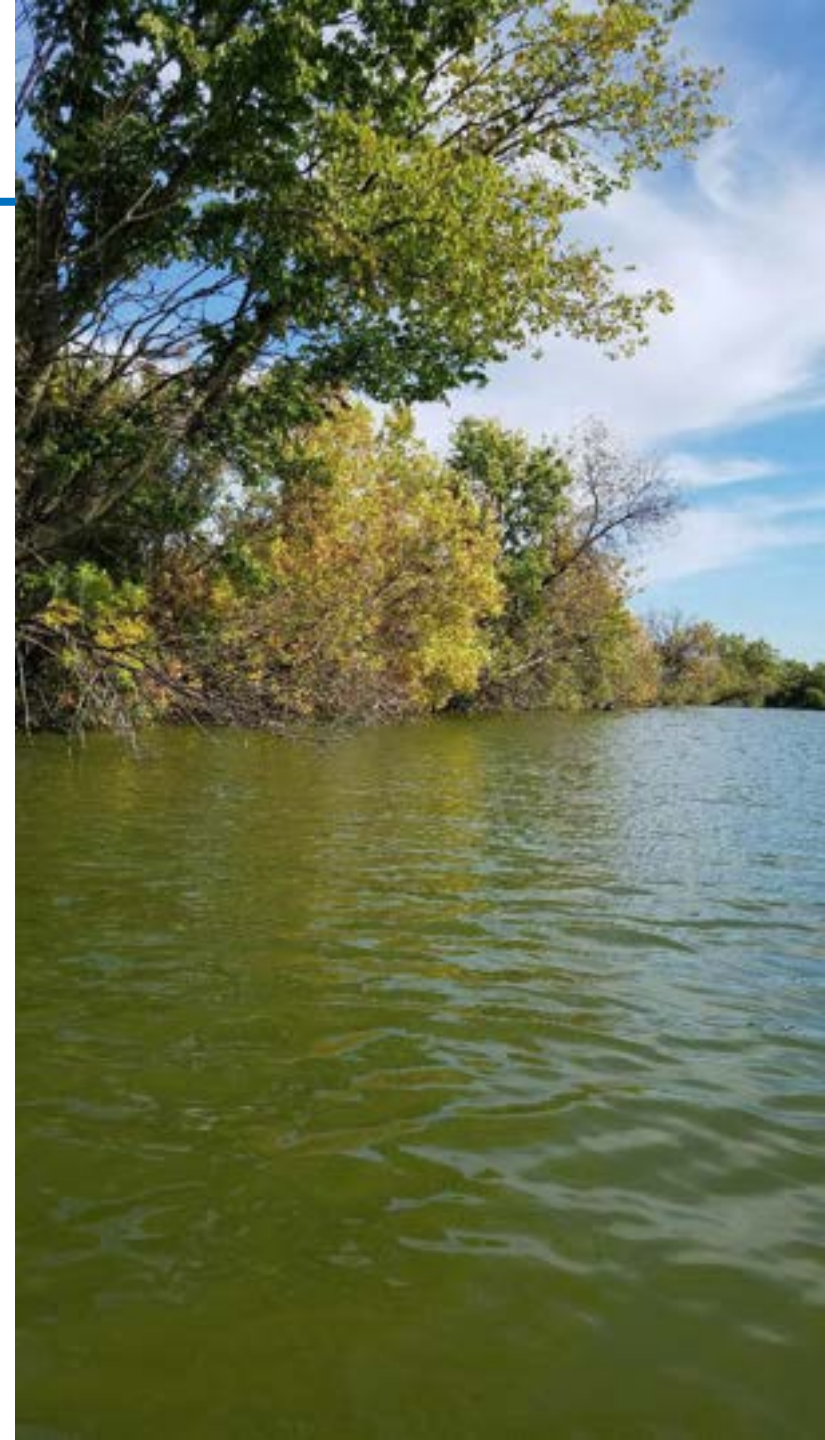


Background: Basic science

Where does excess phosphorus in waterbodies come from?

2 main sources:

- External
- Internal



Background: Basic science

Where does excess phosphorus in waterbodies come from?

External sources

- Storm water runoff from hard (impervious) surfaces
- Leaves & grass clippings
- Fertilizers
- Pet/animal waste
- Soil erosion
- Septic systems

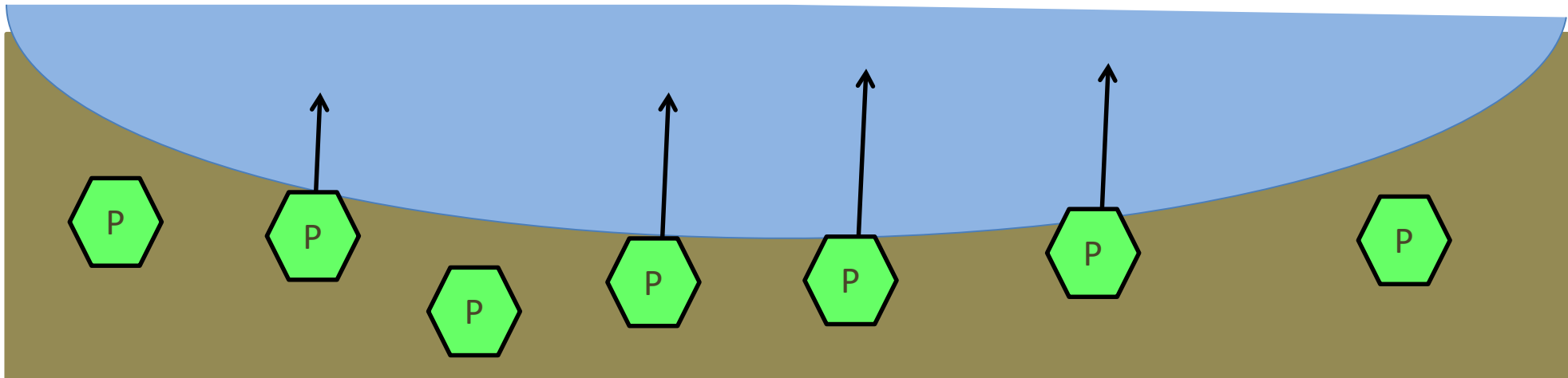


Background: Basic science

Where does excess phosphorus in waterbodies come from?

Internal sources

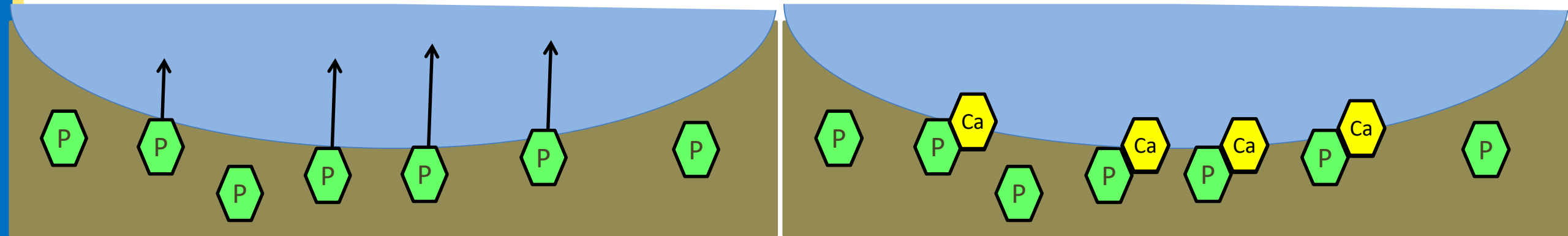
- Stored in lake bottom sediments and released when oxygen levels are low
- Decay of organic phosphorus also occurs



Background: Basic science

How might spent lime be useful in removing phosphorus from the water column?

- Alum (aluminum sulfate) treatments are normally done to bind phosphorus
- Calcium from spent lime could substitute for aluminum



Background: Recent watershed project at Ash Street Pond

- Small (~0.5 acre), private pond in Lino Lakes
- Treated with spent lime during summer 2021
- Single access point was sufficient
- Treatment involved 2 days of spraying spent lime dose with a hose
- Spent lime slurry brought in a tanker truck
- Water quality improvement was seen

During and immediately after application



6 hours later

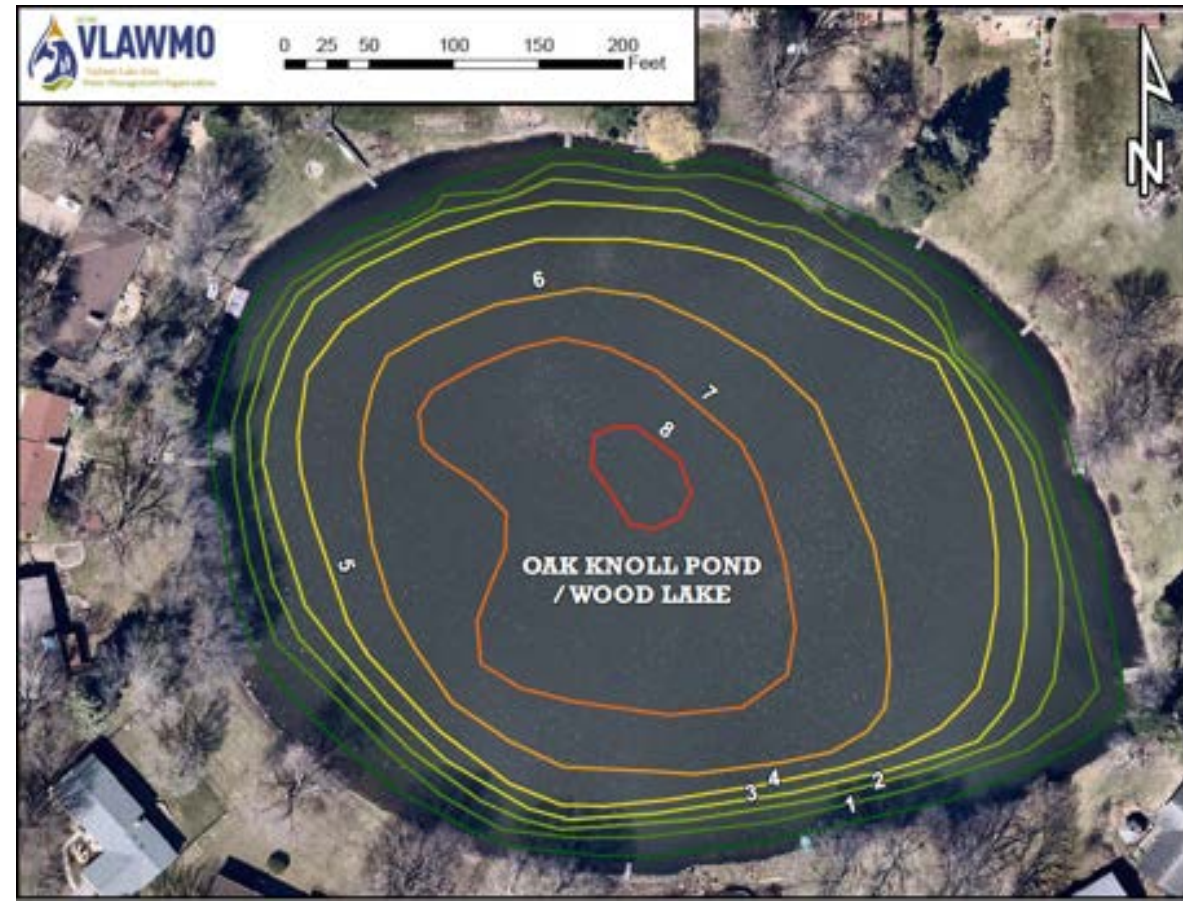


~ 30 hours later



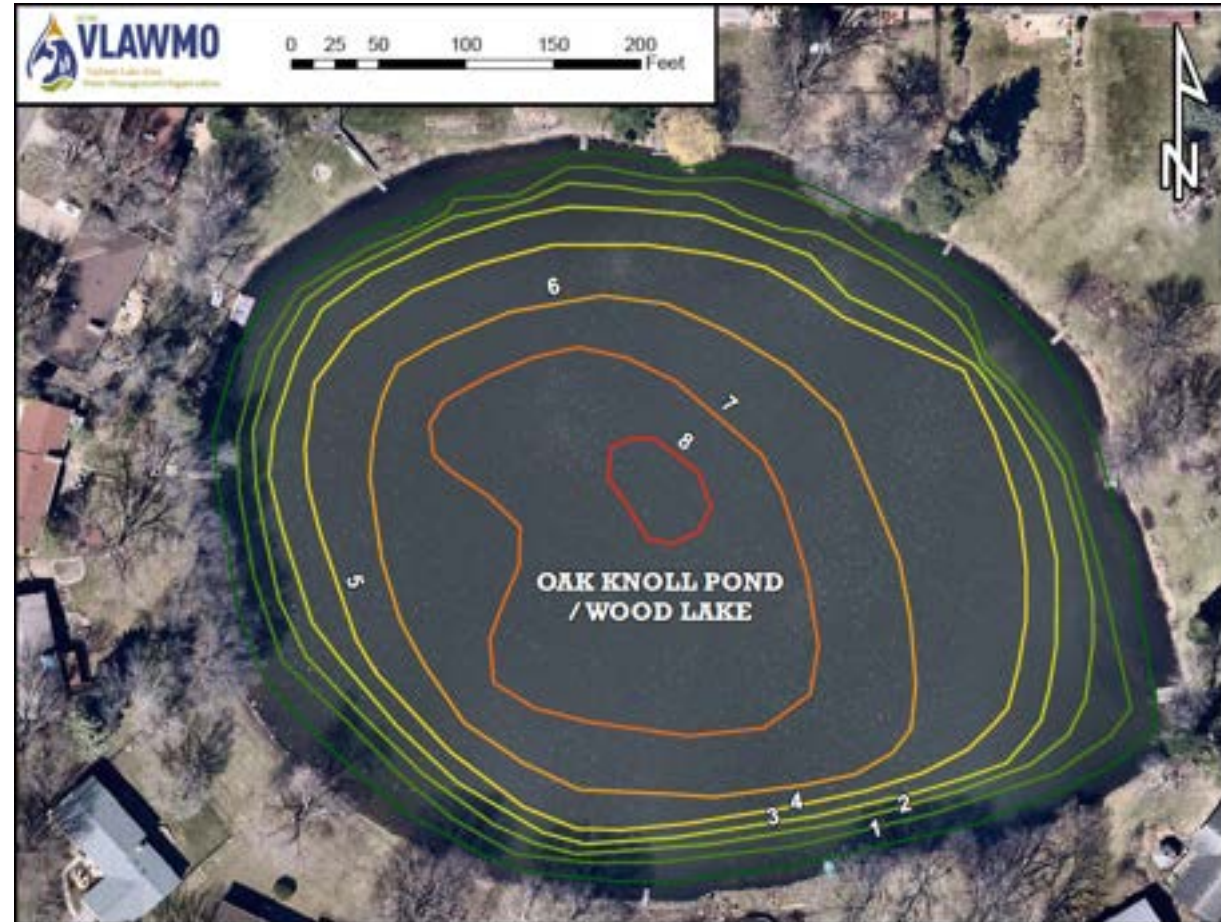
New study: Can spent lime treatment be effectively scaled up?

- Oak Knoll Pond/Wood Lake ~4.4 acres (nearly 10x increase) compared to Ash Street Pond



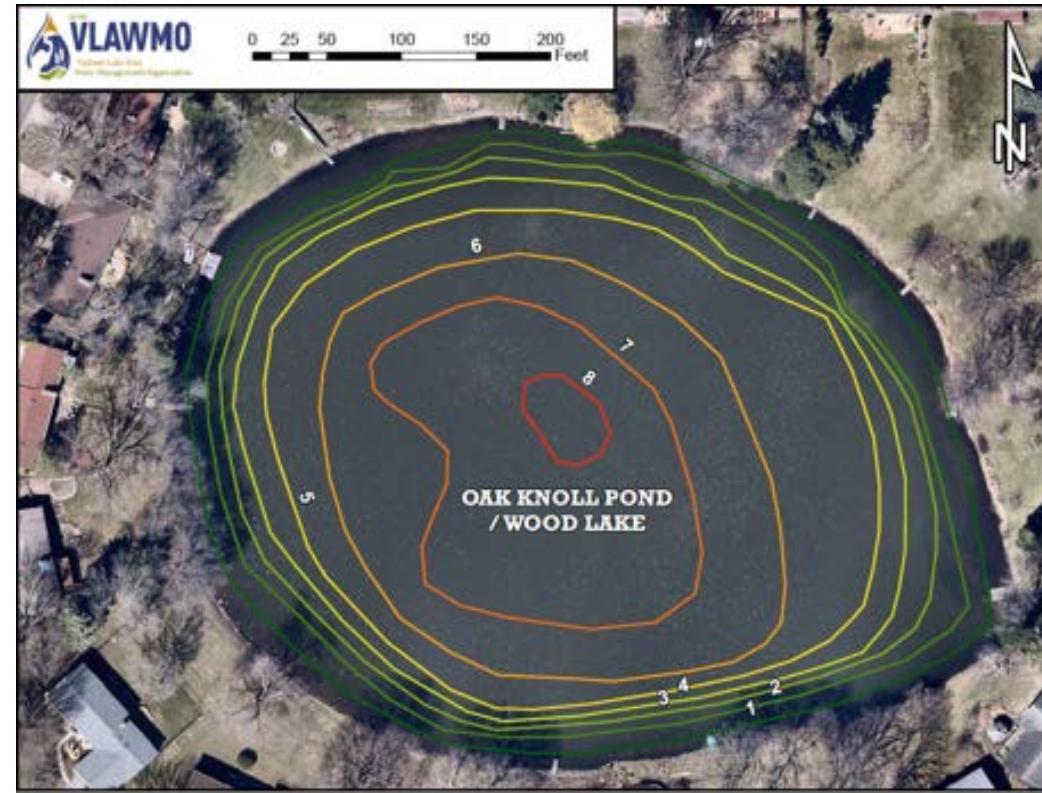
Questions for Oak Knoll Pond/Wood Lake

- Can re-use of spent lime reduce sediment-phosphorus release in larger ponds?
- Is a larger project feasible due to chemistry (pH and sediment of pond)?
- Is the cost reasonable for VLAWMO and the City of WBL to fund?
- Will MPCA permit this demonstration?
- Do landowners adjacent to the pond support the project?
- Do we have neighbors' support to access the pond at multiple locations?
- How long does a spent lime treatment last? (Post-treatment monitoring to show if phosphorus release is controlled and determine if water quality is improved)



Considerations for Oak Knoll Pond/Wood Lake

- MPCA has approved permit for demonstration project
- As part of permit, MPCA determined:
 - 1) Spent lime does not represent a concern for release of contaminants
 - 2) Spent lime does not result in unwanted toxic conditions
- Because of experimental nature, permit requires continuous pH monitoring during application



Considerations for Oak Knoll Pond/Wood Lake



Early draft concept for Oak Knoll Pond/Wood Lake

- (No timeframe currently identified for project implementation)
If the project moves forward:
- During treatment, 1 load (4,000 gals) of spent lime is applied each business day (8-5, M-F); application should take ~1-2 hours with a truck and pump running
- Treatment would take approximately 1½ to 2 months, depending on pond pH, weather conditions, possible storm events, and is limited by amount of slurry available each day
 - Treatment would be suspended if pH is high
 - Treatment would be suspended under high stormwater flows
- 25-30 loads to build up dose needed
- Multiple applications will occur at each access point
- May require use of a platform to reach middle



Early draft concept for Oak Knoll Pond/Wood Lake

- (No timeframe currently identified for project implementation)

If the project moves forward:

- Document treatment costs and monitor water quality benefits
- Compare post-treatment monitoring to pre-treatment conditions
- Did application method(s) optimize treatment costs and benefit?
- Report back to VLAWMO Board, White Bear Lake City Council, and public



Considerations for Oak Knoll Pond/Wood Lake

- Multiple access locations needed
- Social feasibility depends on project support and receiving temporary easements from residents living around Oak Knoll Pond/Wood Lake
- We're going to need your help
- Attorney preparing temporary easements for landowner signatures



Request to residents

- What questions do you have?
- Are you supportive of this project?
- If not, do you have concerns that we can address tonight?
- Are you willing to allow access for spent lime application?
- We will be following up with a request to sign a written access form



Next steps: Accessibility determines cost & timing



- Obtain permission from landowners for access (needed to determine feasibility and project cost)
- Time required to obtain permissions will determine possible schedule for consideration
- If permission from all necessary landowners is successful, bring forward engineering design scope for consideration by the VLAWMO Board and City Council



Q & A



Cost-share grants to restore your shoreline



- Healthy shorelines with native plants help improve water quality
- Contact VLAWMO if interested: www.vlawmo.org

The screenshot shows the VLAWMO website's 'LANDSCAPE GRANTS' page. The header includes the VLAWMO logo (Est. 1984, Vicksburg Lake Area Water Management Organization) and navigation icons for Residents, Schools, Government, and Developers. The main navigation bar lists: Home, About - Board - TEC, Waterbodies, Get Involved, Grants, Projects, WCA & Rules, and Resources. Below the navigation is a search bar and a 'GO BACK' button. The main heading is 'LANDSCAPE GRANTS'. The text below reads: 'Interested in reducing stormwater runoff and flooding, preventing erosion, and reducing pollutants entering waterways? A VLAWMO Landscape Grant may be available to support installing a water quality improvement project, or Best Management Practice (BMP), that will benefit our lakes, streams, and wetlands.' It also includes a link to an 'interactive web map' and a note that the grant programs have been renewed for 2023, including Soil Health, Landscape Level 1, and Landscape Level 2 programs.

