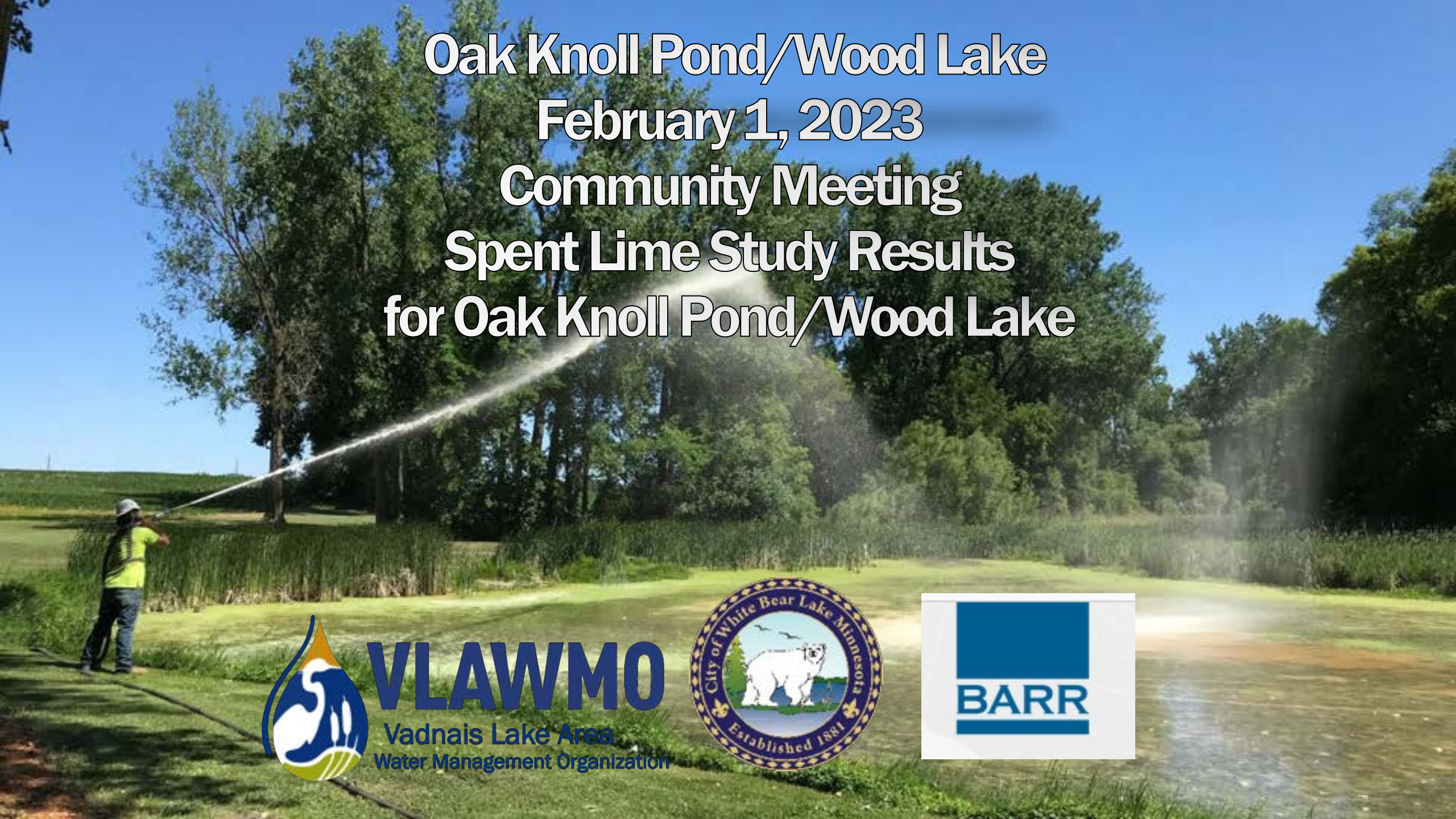
Oak Knoll Pond/Wood Lake
February 1, 2023
Community Meeting
Spent Lime Study Results
for Oak Knoll Pond/Wood Lake



VLAWMO
Vadnais Lake Area
Water Management Organization

City of White Bear Lake Minnesota
Established 1881

BARR

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

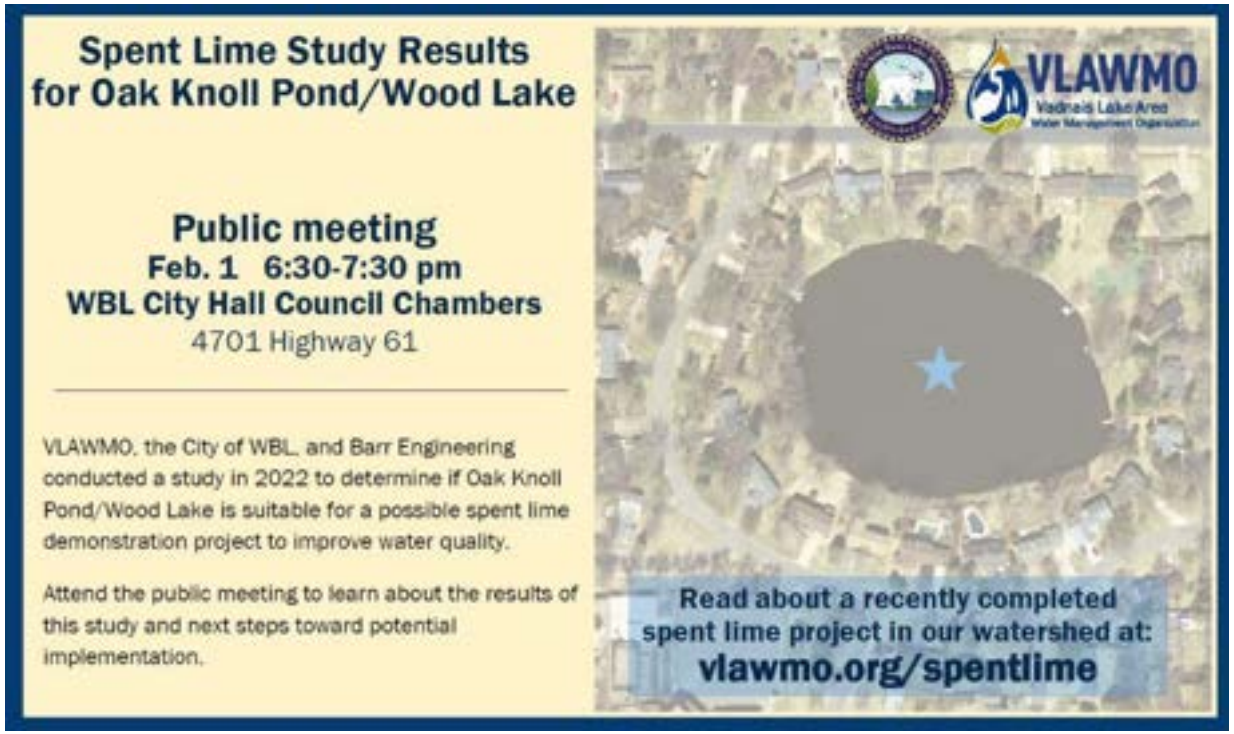
Agenda:

- 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



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

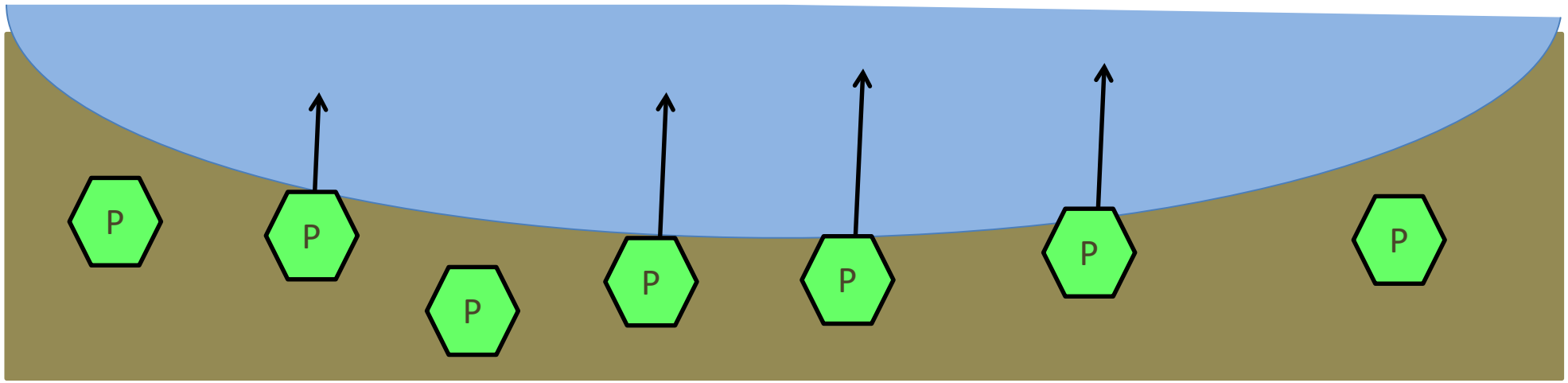
- Storm water runoff from hard (impervious) surfaces
- Leaves & grass clippings
- Fertilizers
- Pet/animal waste
- Soil erosion
- Septic systems

Background: Basic science

Where does excess phosphorus in waterbodies come from?

Internal sources

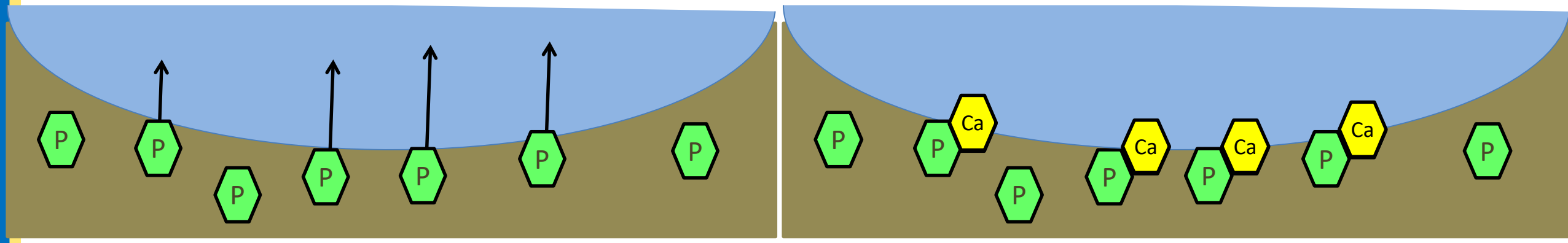
- Stored in lake bottom sediments and released when oxygen levels are low
- Decay of organic phosphorus also occurs



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

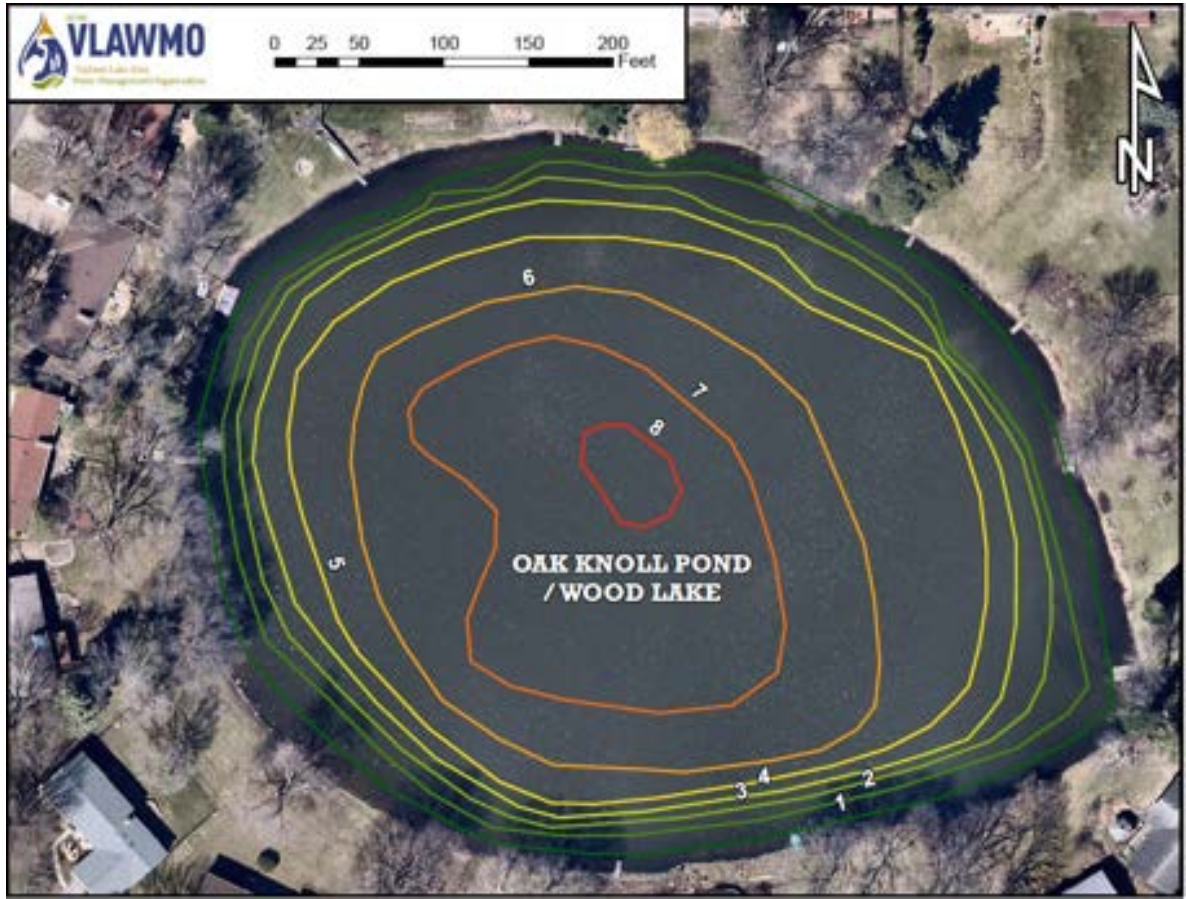
During and immediately after application

6 hours later

~ 30 hours later

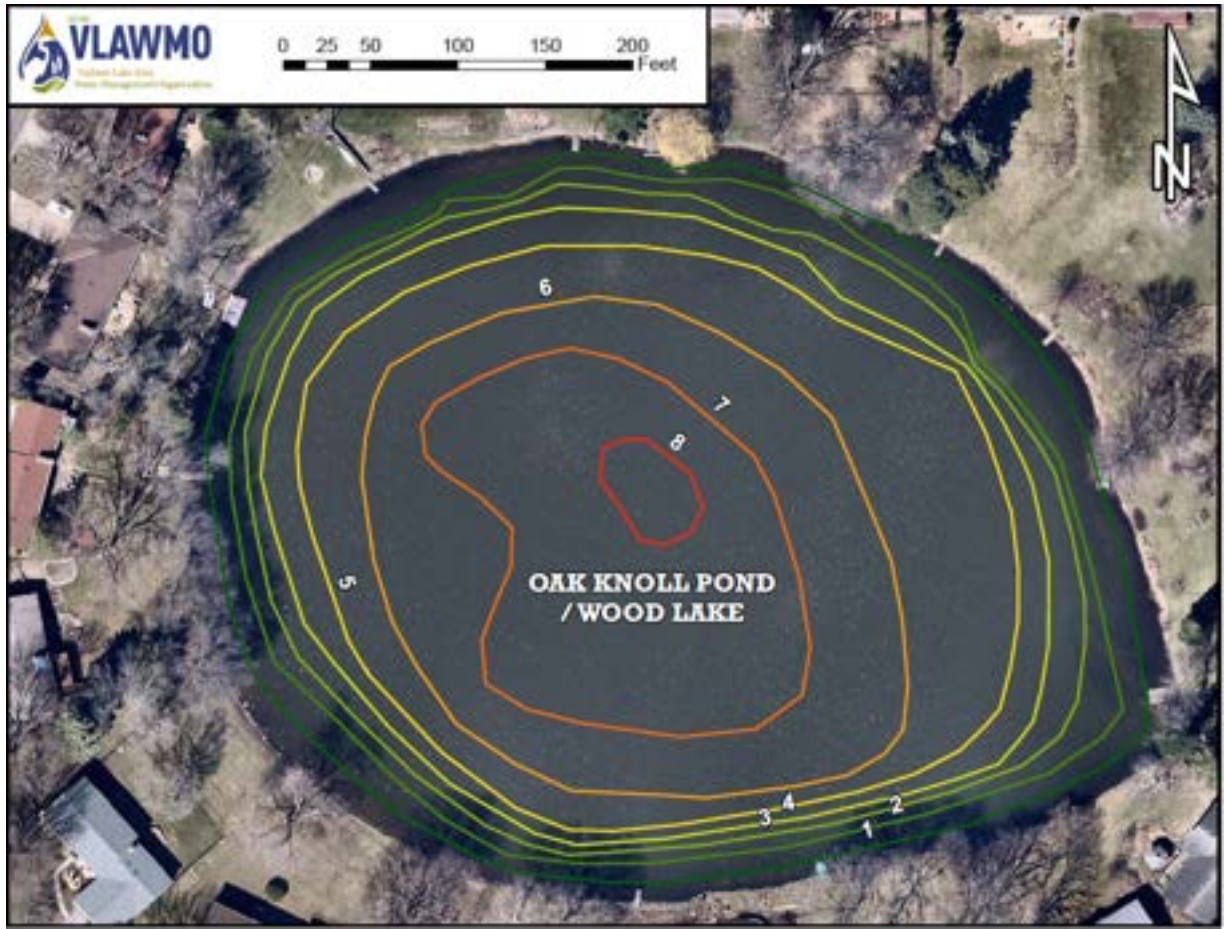
New study: Can spent lime treatment be effectively scaled up?

- 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)

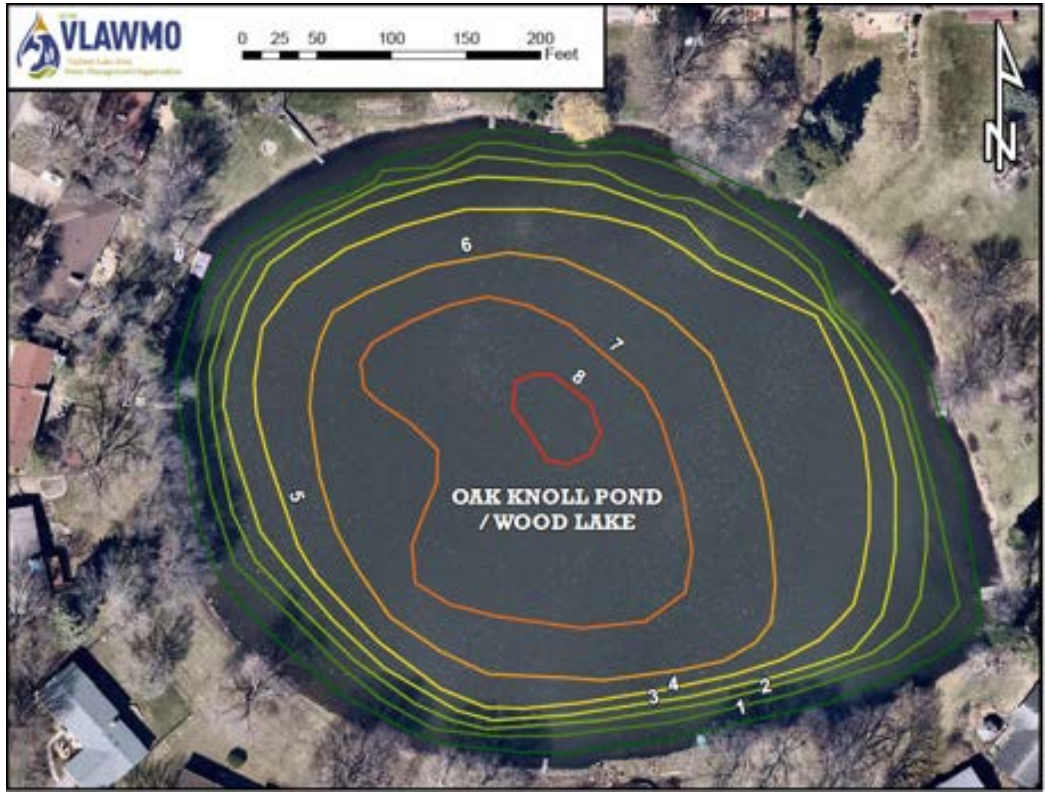


Considerations for Oak Knoll Pond/Wood Lake

- 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

VLAWMO

Cost-share grants to restore your shoreline

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