

TO: Vadnais Lake Area Watershed Management Organization Board of Directors
SUBJECT: West Vadnais Lake (WVL) Management
DATE: April 20, 2022

This letter is a follow-up to the discussion that the RWMWD Board of Managers had at its regular meeting on March 2, 2022, with a subcommittee of the VLAWMO Board of Directors. After that discussion, RWMWD indicated we would provide information to the full VLAWMO Board of Directors regarding the management of WVL to date and the rationale for a boundary change. The RWMWD board again discussed this at their April 6 meeting. It directed me to contact you regarding the next steps in pursuing a potential boundary change for the West Vadnais Lake subwatershed from VLAWMO to RWMWD.

WVL is unique in that it is in the middle of a significant RWMWD drainage way. This situation was created when the RWMWD incorporated the Grass Lake Area Water Management Area in 2013.

Water from RWMWD comes into WVL from Grass Lake from the west and exits WVL back into RWMWD to the south. The attached map shows those two points with red arrows. The flow from Grass Lake into WVL is near the end of a chain of lakes drainage from Bennett Lake in Roseville through Lake Owasso and Wabasso and then into Grass Lake. You'll see on the map that the direct drainage to WVL is small, and most of the drainage coming to WVL during normal to wet years comes from Grass Lake.

For much of 2014-2020, Grass Lake and surrounding areas experienced record precipitation levels, and the outlet of WVL is small, which caused water to be backed up and held in WVL and Grass Lake. Because of the prolonged nature of those high water levels, flooding of surrounding areas occurred, including the Snail-Vadnais Regional Park, Rice Street, Gramsie Road, Crestview Addition, and Twin Lake.

In July of 2019, the RWMWD Board of Managers considered the role WVL plays in managing flow in the watershed (attached memo dated July 2, 2019) and elected to continue the cooperation model with VLAWMO and not pursue a boundary change at that time. However, since then, the RWMWD has made several investments in the WVL area and the areas up and downstream of WVL to help manage flood risks. These improvements to the inflow and

outflow from WVL caused us to reexamine the role of WVL in our flood control strategy, along with the issue of water quality feeding the water bodies downstream of WVL.

Below is an accounting of much of the work that RWMWD did during those years to address flooding concerns in the area. This information includes a description of the work the RWMWD board has deemed necessary to manage the flood risk in this area. We have also included the ongoing inspection and maintenance needs. You can reference the map for the locations of this work.

Map ID 1 – In-Lake Vegetation Clean-Out

Why: To encourage positive drainage from Grass Lake to West Vadnais Lake and lessen the flood risk to Rice Street. It included excavating and removing cattails in front of the pipe under Rice Street and into WVL—needed to bring in an aquatic harvester due to unsafe conditions for an excavator.

When: Last completed in 2018

Cost: \$18,000

Inspection and Maintenance: This area is inspected several times a year, but a subsequent cleanout has not been necessary to date. Cattail growth may become more prevalent with the lowering of the outlet (see below), exposure of sediment and lake bed material, and future cleanouts may be recommended. The cost to remove that material is expected to go up based on the need to hire specialized equipment to reach this difficult location. This project is entirely in the VLAWMO area.

Map ID 2 – Vadnais Blvd Twin Pipes

Why: Previously, one 12-inch pipe connected the main WVL to the triangle wetland to the south, which contains the lake's outlet. There was a water level difference between the two water bodies. The one pipe was replaced with two 22" x 13" pipes to encourage sufficient flow between the two water bodies.

When: Completed in 2018

Cost: \$25,000

Inspection and Maintenance: These pipes are inspected several times a year to ensure no blockage in the pipe. To date, no blockages have been found, and no extra costs have been incurred. It should continue to be inspected. As long as it stays clear, maintenance costs are low for this project. This project is right on the border between VLAWMO and RWMWD.

Map ID 3 – West Vadnais Lake Overflow Bypass System

Why: When water levels were extremely high in WVL in 2019, the overflow found its way to a pipe system under Five Star Estates and into Twin Lake, causing concern for a low home on the lake and water quality in Twin Lake. A permanent sump area was placed between the triangle wetland and Five Star Estates to collect potential overflow water from West Vadnais Lake. A pump and pipe system would be in place to take that water from the sump to ponds along the I-694 right of way and into the Owasso Basin/Gervais Creek system. This overflow water would then bypass Twin Lake, where it ultimately reached before the bypass system was in place. Along with the sump system, the berm along the triangle wetland was re-established, and some trees were removed to keep the water in the wetland at the 884 elevation. A swale from the triangle wetland to the sump area was also established. After construction, water levels have been low enough not to require pumping from this sump, but it is in place for future needs.

A water level monitoring station (Map ID 5) was installed in WVL to monitor the water levels remotely and put into action a pumping plan if needed.

When: Completed in 2020

Cost: Berm Re-establishment and Swale: \$84,000
Bypass System Sump: \$25,000

Inspection and Maintenance: The water level station is monitored frequently to determine if bypass pumping will become necessary. Alerts in the system will also alarm staff of a need. The berm and swale are inspected annually. This project (except for the water level monitoring station) is entirely in the RWMWD. The water level monitoring system is located on the main part of WVL, north of Vadnais Blvd.

Map ID 4 – West Vadnais Lake Outlet

Why: This part of the system is the ultimate outlet of WVL and the Owasso Chain of Lakes system. Due to high flood levels in WVL and Grass Lake, the district performed many studies to look at the possibility of removing floodwaters from the lake through pumping or gravity flow between WVL and East Vadnais Lake. Those projects were deemed infeasible. But to provide future flood storage, it was determined that lowering the outlet of WVL would provide flood storage in the lake after water levels return to a more normal state (as it did in 2021). As part of this project, vegetation was removed from the flow path in the triangle wetland that leads to the outlet. Vegetation removal and a new flared end structure on the outlet was installed in 2018, and the lowering of the outlet by 0.8 foot was completed in 2020. Before the outlet lowering, VLAWMO requested an Environmental Assessment Worksheet (EAW) to determine the impacts on the lake and adjacent wetland areas due to the lowering of the outlet. Since the outlet lowering, we have experienced average and below-average rain years, and the level of

WVL reached the new lowered outlet elevation. Also, in this area, natural resources staff have partnered with VLAWMO to complete a fish survey and install a carp barrier to prevent carp migration through the system and remove fish from the system to improve water quality.

When: Completed in 2018 and 2020

Cost: 2018 West Vadnais Lake to East Vadnais Lake Water Quality Treatment Study: \$26,000
2018 West Vadnais Lake to East Vadnais Lake Gravity Flow Feasibility Study: \$48,000
2018 Triangle Vegetation Removal: \$18,000
2018 Flared End Size Increase + Engineering: \$67,000
2019 WVL Outlet Lowering EAW Engineering Process: \$44,000
2020 Triangle Vegetation Removal and Outlet Lowering + Engineering: \$160,000
2020 West Vadnais Lake to South of I-694 Conveyance Feasibility Study: \$56,000
Total Cost: \$393,000

Inspection and Maintenance: The outlet structure for WVL is on a rotation of inspections of trash racks throughout the district that is needed to ensure positive drainage of our systems. It is inspected for blockages, and blockages are removed if discovered. This project is entirely in the RWMWD.

Various studies were pursued in 2018 to determine if projects could be completed to remove water from West Vadnais Lake to lower water levels in the entire system. One particular study of importance to this continued conversation was the West Vadnais Lake to East Vadnais Lake gravity flow feasibility evaluation. I have sent this memo to VLAWMO staff, and it is also attached here for your information.

This study aimed to determine if enough subsurface flow was occurring between WVL and EVL that the purposeful lowering of EVL would encourage gravity flow from WVL. The evaluation showed insufficient subsurface flow between the lakes to make that a feasible option to reduce flood levels. After this study, the RWMWD determined the most feasible project to pursue was lowering the West Vadnais Lake outlet.

Boundary Change Rationale

The RWMWD also views this study as verifying that WVL and EVL are not highly hydrologically connected. Therefore, WVL plays a more significant role in the RWMWD watershed, and because of the flood risk issues, we will need to actively manage the drainage through WVL. This is the main reason why the RWMWD board of managers would like to pursue a boundary change with the VLAWMO board.

The second reason is the water quality of WVL. As you know, WVL is on the state's impaired water list and is due for a TMDL study in the next several years. Again, because of the unique position of the lake, a large external load contributing factor is coming from the Grass Lake

drainage path (in RWMWD), into WVL, and then out again upstream of our Phalen Chain of Lakes. We appreciate the steps taken by VLAWMO to study the lake's characteristics and work with our staff on rough fish management. With a potential boundary change, the RWMWD assumes future responsibilities for water quality improvement in WVL. This is an appropriate role for RWMWD, considering the inputs and location of the output of the lake. It seems fair and reasonable for RWMWD to manage that work.

Because of the above situation, it makes sense to our board to pursue this boundary change. The scope of this is narrow. We propose including the subwatershed area tributary to WVL and the lake area itself. There are approximately 180 parcels in the whole subwatershed to WVL. Of those 180 parcels, approximately 47 of them are outside of RWMWD and in the VLAWMO legal boundary. A review of those 47 parcels shows that eight of them are in public ownership, five of them are commercial properties, and 34 parcels are residential properties. Further evaluation will be done by staff on the impact on those property owners. We would propose a joint outreach process to those affected properties.

The RWMWD Board of Managers has considered the options for the most effective management of our watershed district, including WVL. We appreciate the ongoing partnership between the two watersheds in many different program areas. We believe that our administrative staff can work with yours to continue that work and provide the best outcome for both watersheds. We look forward to your response to this request to pursue a boundary change and establishing the next steps in this process.

Sincerely,



Lawrence Swope, RWMWD Board President, on behalf of the RWMWD Board of Managers

cc: Tina Carstens, RWMWD Administrator
Phil Belfiori, VLAWMO Administrator



Ramsey-Washington
Metro Watershed District

Vadnais Lake Watershed Management Organization

GRAMSIE RD

Grass Lake

East
Vadnais

Vadnais Heights

Shoreview

RUSTIC PL

RICE ST

West
Vadnais

HARRIET AVE

694

RUSTIC PL

SUCKER LAKE RD

Lake Wabasso

COUNTY ROAD E

VADNAIS BLVD

GRAND AVE

STAR CIR

SKYLINE DR
MAYFAIR RD

OWASSO BLVD N

4

3

5

Lake Owasso

TWIN LAKE BLVD

Blacktern
Pond

Twin
Lake

JERROLD AVE

COUNTRY DR

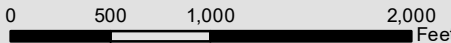
Little Canada

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West Vadnais Lake Management Discussion



- Points of Interest
- RWMWD/VLAWMO Boundary
- Water Bodies
- West Vadnais Lake Drainage Area (DNR8)
- Cities
- ➔ Major Flow Arrows



Map ID	Location
1	In-Lake Vegetation Clean-Out
2	Vadnais Blvd Twin Pipes
3	West Vadnais Lake Overflow Bypass System
4	West Vadnais Lake Outlet
5	West Vadnais Lake Auto Lake Level Monitoring Station



TO: Board of Managers and Staff
FROM: Tina Carstens, Administrator
SUBJECT: **Boundary Change with Vadnais Lake Area Watershed Management Organization (VLAWMO)**
DATE: July 2, 2019

At the June 6, 2019 board of managers meeting, the board requested that I prepare information for discussion regarding the process of adding West Vadnais Lake (WVL) into the district by way of boundary change. I provided information on the two Minnesota state statutes that govern watershed management organizations and how they request boundary changes from the Board of Water and Soil Resources (BWSR). There was a question of how long a boundary change would take to go through the process. The process includes; preparing a petition with the data required of the statute including the production of the change in boundary legal description and a letter of concurrence from VLAWMO. BWSR also has a process which includes the publication of notice and invitation to request a hearing and then either a public hearing or a decision by the BWSR board at a meeting at least 30 days after the last publication of notice. If all went as planned, I would anticipate the process taking 6 months to complete.

As for the decision on whether or not to pursue a boundary change, I see that we have three options:

1. VLAWMO continues to manage West Vadnais Lake in their watershed.
2. RWMWD pursues a boundary change and incorporates West Vadnais Lake.
3. A joint management plan is developed for West Vadnais Lake between the two watersheds but the lake stays in VLAWMO's jurisdictional boundary.

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1. VLAWMO continues to manage West Vadnais Lake in their watershed.

OR

2. RWMWD pursues a boundary change and incorporates West Vadnais Lake.

VLAWMO staff have indicated to me that they would like to keep WVL in their watershed due to the historical significance of the waterbody to their watershed. I have attached some information from VLAWMO's website regarding West Vadnais Lake to this memo for your information. (Please note that I did discover some misinformation on the website that I will work with VLAWMO to correct)

WVL is an impaired water body. VLAWMO accelerated their plans to complete a TMDL on WVL from 2022 to 2020. They started the pre-work this year in collecting the bathometric data that we are then using to support the EAW work for the outlet lowering. If VLAWMO continued to manage WVL, following the TMDL report and implementation plan, their board would make decisions on timing for implementation of the recommended actions in their plan. I would expect VLAWMO staff to still work with us on managing the lake and we would certainly be part of the process to develop a plan for the lake but the ultimate management decisions would be on the VLAWMO board only. VLAWMO has more limited funding and likely higher priorities than the management of WVL and therefore the actions may not come as quickly as we would like to see for the benefit of our District.

Conversely, if WVL were in RWMWD, we would be inheriting an impaired water body and would then need to complete a TMDL study, an implementation plan, and do a plan amendment to incorporate the new area and information into our management plan. RWMWD board would also need to make management decisions on priorities across the district for managing the water quantity and quality levels of the lake. The subwatershed area of WVL is small if you look at what directly drains to WVL (outside of what comes from Grass Lake), likely the internal load of phosphorus is the major driver of water quality and therefore we can make some assumptions for what it might take to address the internal load reduction needs. The board may also choose not to act on managing the internal load of WVL based on district wide priorities. Typically, the district has first sought out projects that address the external load before taking steps to address internal load as was done in Kohlman Lake as well as Wakefield and Bennett.

Making some (big) assumptions for how the district might manage WVL based on similar impaired water studies and implementation in the district the following are potential

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costs to managing WVL in RWMWD. These are gross estimates assuming that management of West Vadnais Lake would take a similar path to the one we took with Kohlman Lake, requiring the same level of treatment for macrophytes and internal load, scaled up for size.

- Incorporation of WVL into the RWMWD Watershed Management Plan - \$25,000 (one time cost)
- TMDL and Implementation Plan: \$100,000 (one time cost)
- Water Quality Monitoring - \$4,500 a year
- Carp Management (WVL and Grass system) - \$100,000 for at least a few years
- Macrophyte management plan, Internal load treatment and in-lake modeling - \$150,000 (mostly one time cost except for updates as needed)
- Internal load lake treatment (spring/fall, permitting, documentation and assistance)- \$760,000
- Macrophyte management (applications, permitting, documentation and assistance) - \$560,000 (spent over 10 years)

As for water level management, the district already has control and ownership over the outlet to WVL and it is located within our jurisdiction. We worked with the property owners to manage and maintain flow paths to and from the lake. Even if WVL would have been in the district, the information we are completing for the outlet lowering EAW is required through the DNR permitting process. The EAW process adds some extra steps and time but as of now we are in the middle of that process and will be completed before a boundary change would be.

I understand the logic in having WVL incorporated into the district based on the hydrologic connection as well as the impact (real or potential) to other district resources, but I also think there could be another option as described below.

3. A joint lake management plan is developed for West Vadnais Lake between the two watersheds but the lake stays in VLAWMO's jurisdictional boundary.

If VLAWMO is not interested in handing over the jurisdiction of WVL to RWMWD, a potential option is to develop a joint lake management plan. This could be a formal joint powers agreement or a memorandum of agreement that recognizes the combined interests of the two watersheds and formalizes the goals of both entities. In this case, we would jointly determine the goals for the lake through the TMDL process as well as

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share in the financial responsibility in the implementation plan. This would take significant coordination between staff, consultants and both entities boards but it doesn't seem out of the realm of possibility. Certainly, both entities will have different goals but the agreements could be spelled out specifically to which entity would complete which project or in some cases, they would be completed jointly and paid for together. Once the TMDL and implementation plan was in place, each entity would amend their watershed management plan with the activities moving forward.

As was discussed at previous board meetings, a joint meeting between the VLAWMO and RWMWD's boards would provide a nice opportunity to discuss the outlet lowering EAW, a potential boundary change and also our concerns and potential goals for WV. If a joint management plan is appeals to you, this would also be a good venue to discuss that option. The VLAWMO board has indicated they have availability in the evening of July 30th or 31st. We can discuss at our meeting if that will work for you.