PRIOR LAKE SPRING LAKE WATERSHED DISTRICT

# AGENDA

Tuesday, January 21, 2025

**6:00 PM**

Council Chambers
Prior Lake City Hall

**BOARD OF MANAGERS:**
**Bruce Loney, President; Frank Boyles, Vice President;**
**Christian Morkeberg, Treasurer; Ben Burnett, Secretary; Matt Tofanelli, Manager**
Note: Individuals with items on the agenda or who wish to speak to the Board are encouraged to be in attendance when the meeting is called to order.

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**Board Workshop 4:00 PM – *Parkview Conference Room***

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|---|---|---|
| 4:00 – 4:05 PM | W.1 | 2025 Board Officer Appointments Discussion (Bruce Loney) |
| 4:05 – 4:10 PM | W.2 | 2025 Board Liaison Appointments Discussion (Bruce Loney) |
| 4:10 – 4:35 PM | W.3 | Upper Prior Lake Carp Goal Met – Priorities for 2025 (Jeff Anderson) |
| 4:35 – 5:00 PM | W.4 | Approach for Alum Treatment Assessments (Jeff Anderson) |
| 5:00 – 5:30 PM | W.5 | Administrator Report (Joni Giese) |
| 5:30 – 5:50 PM | W.6 | Liaison Updates |

- District Partners in Attendance
- Managers' Summary of other Meetings Attended

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6:00 – 6:01 PM 1.0 **BOARD MEETING CALL TO ORDER & PLEDGE OF ALLEGIANCE**

6:01 – 6:03 PM 2.0 **PUBLIC COMMENT**

If anyone wishes to address the Board of Managers on an item not on the agenda or on the consent agenda, please come forward at this time. Go up to the podium, turn on the microphone and state your name and address. (The Chair may limit your time for commenting.)

6:03 – 6:05 PM 3.0 **APPROVAL OF AGENDA** (Additions/Corrections/Deletions)

6:05 – 6:20 PM 4.0 **OTHER OLD/NEW BUSINESS**

4.1 Programs & Projects Update (Discussion)
4.2 Ferric Chloride System Assessment (Vote)
4.3 2025 Board Officer Appointments (Vote)
4.4 2025 Board Liaison Appointments (Vote)
4.5 Termination of Watershed Development Agreement, Doc. No. A 816076 (Vote)

6:20 – 6:30 PM 5.0 **TREASURER'S REPORT**

5.1 Monthly Financial Reports (Discussion Only)

- Financial Report
- Treasurers Report
- Cash Flow Projections
- Cost Analysis

6:30 – 6:35 PM 6.0 **CONSENT AGENDA**

The consent agenda is considered as one item of business. It consists of routine administrative items or items not requiring discussion. Items can be removed from the consent agenda at the request of the Board member, staff member, or a member of the audience. Please state which item or items you wish to remove for separate discussion.

6.1 Meeting Minutes – December 17, 2024, Board Workshop
6.2 Meeting Minutes – December 17, 2024, Board Meeting
6.3 Meeting Minutes – January 9, 2025, Special Board Meeting
6.4 Meeting Minutes – September 26, 2024, CAC Meeting
6.5 Claims List and Bank Purchase Card Expenditures Summary
6.6 Schedule of 2025 Regular Board Meetings
6.7 Schedule of 2025 CAC Meetings
6.8 Approval of 2025 CAC Members
6.9 Selecting the 2025 Official Newspaper
6.10 Selecting the 2025 District Depository Banks
6.11 Quarterly Investment Summary
6.12 CLA 2025 Outsourcing Preparation Statement of Work Agreement
6.13 District Engineer Master Services Agreement: 2025 Rate Schedule
6.14 2025 WSB Carp Management Services Contract
6.15 EOR Work Order: Sediment Coring on Upper Prior Lake

6:35 – 6:40 PM 7.0 **UPCOMING MEETING/EVENT SCHEDULE:**

- Farmer-Led Council Meeting, Thursday, January 23, 2025, 12:30 pm (Spring Lake Town Hall)
- CAC Meeting, Thursday, January 30, 2025, 6:00 pm (Prior Lake City Hall – Parkview Conference Room)
- Tentative Special PLOC Cooperators Meeting, Tuesday, February 11, 2025, 2:00 pm (virtual, link on website)
- Board of Managers Workshop, Tuesday, February 18, 2025, 4:00 pm (Prior Lake City Hall – Parkview Conference Room)
- Board of Managers Meeting, Tuesday, February 18, 2025, 6:00 pm (Prior Lake City Hall – Council Chambers)
- PLOC Cooperators Meeting, Thursday, February 20, 2025, 12:00 pm (Prior Lake City Hall – Parkview Conference Room)

6:40 PM 8.0 **ADJOURNMENT**

# JANUARY 2025 PROGRAMS AND PROJECTS UPDATE

| PROGRAM OR PROJECT | LAST MONTH'S STAFF ACTIVITIES | NEXT STEPS |
|---|---|---|
| ***Upper Watershed Projects***<br>**Buck Stream Stabilization, Spring West IESF, MB CD-13 IESF, Swamp IESF, Fish Lake Mgmt Plan, Sutton IESF, Swamp IESF, Buck Chemical Treatment, Potential Flood Storage Projects**<br>*Project Lead: Emily and Danielle* | **Buck Stream Stabilization**<br>• Prepared for 2025 invasive management.<br>• Project closeout activities.<br>• Received first reimbursement from Scott SWCD.<br><br>**Spring Lake West IESF**<br>• Discussed options for flow backup which is preventing monitoring.<br>• Presented easement estimates, scenarios for consideration at alternate site.<br>• Attempted to schedule meeting with alternate landowner.<br><br>**MB CD-13 IESF**<br>• On hold for appropriate staff responsiveness capacity.<br><br>**Swamp IESF**<br>• EOR conducted survey and prepared for soil boring to inform final design.<br><br>**Fish Lake Management Plan (FLMP)**<br>• Remit payment to farmer on West side of Fish Lake for field nutrient reduction sampling.<br><br>**Potential Flood Storage Projects**<br>• SWCD completed surveying for Project 10 and data was uploaded to be shared to EOR. | **Buck Stream Stabilization**<br>• Obtain recorded consent and nondisturbance from final bank.<br>• Obtain final reimbursement via Scott SWCD.<br>• Conduct tour in 2025.<br>• Complete site maintenance in 2025/2026.<br><br>**Spring Lake West IESF**<br>• Monitor two rain events when flow back up is addressed.<br>• Assess ideal and feasible IESF or BMP for implementation.<br>• Follow up with alternate site landowners to assess interest and feasibility of access options.<br><br>**MB CD-13 IESF**<br>• Staff visit to landowner to be scheduled.<br>• Understand landowner willingness to proceed in investigation.<br><br>**Swamp IESF**<br>• Progress design work.<br><br>**Fish Lake Management Plan**<br>• Progress 200 St Pond design in winter.<br>• Review Lake Ridge Pond Study models and technical memo deliverable<br><br>**Potential Flood Storage Projects**<br>• EOR to analyze survey data on Project 10 in winter. |
| ***Carp Management***<br>***Rough Fish Management (Class 611)***<br>*Project Lead: Jeff* | • Checked ice conditions and tracked carp.<br>• Received reporting on mark and recapture study on Upper Prior Lake<br>• 2025 contractor planning<br>• Under ice netting trial<br>• 2025 Research and Class-C Permitting<br>• Update IPM Plan for 2025 | • Continue tracking radio-tagged carp for removal opportunities<br>• Complete radio-tagging of 5 carp in Upper Prior Lake. |

# JANUARY 2025 PROGRAMS AND PROJECTS UPDATE

| PROGRAM OR PROJECT | LAST MONTH'S STAFF ACTIVITIES | NEXT STEPS |
|---|---|---|
| ***Ferric Chloride System Operations***<br>*Project Lead: Jeff and Emily* | • Winterized FeCl system<br>• Worked in Tier 2 Emergency and Hazardous Chemical Inventory reporting.<br>• Completed contracting with building contractor. Worked with driveway contractor to progress contracting.<br>• Issued notice to proceed for building contractor, held meetings to address pump and garage door specs.<br>• Initiated permits and received building permit.<br>• Work with landowners on easement, construction, and future project items. | • Progress site improvement construction.<br>• Begin planning Highway 13 wetland excavation project timeline.<br>• Continue working with Highway 13 wetland landowners on project timing, access, and other project details.<br>• Quarter 4 Discharge Monitoring Report.<br>• Submit for NPDES permit renewal including 5-year monitoring and maintenance reporting. |
| ***Farmer-Led Council***<br>*Project Lead: Emily* | • Continued coordination with Scott SWCD.<br>• Planned winter FLC meeting for January 23, 2025. | • Continue to support and review FLC projects.<br>• Hold winter FLC meeting. |
| ***Cost Share Incentives***<br>*Project Lead: Emily* | • Provided feedback on potential cost share projects. | • Review cost share applications with Scott SWCD as needed.<br>• Present non-traditional cost share project types for Board approval as applicable.<br>• Present proposed 2025 Docket to Board for approval. |
| ***Sutton Lake Outlet and Lake Management Plan***<br>*Project Lead: Emily* | **Lake Management Plan**<br>• None | **Lake Management Plan**<br>• Plan landowner communications.<br>• Analyze drone survey. |
| ***Website and Media***<br>*Project Lead: Danielle* | **Social Media**<br>• Ice-on dates and historical trends<br>• Happy holidays and carp population updates<br>• Share SWCD Tree Sale<br>• Share chloride information to stories<br>• Respond to comments and messages as needed<br>**Website**<br>• Keep calendars and news up to date. Repair issues as they come up.<br>**Articles**<br>• Write and share articles for Prior Lake Association Newsletter (Prior Lake Level Dynamics and PLOC Grant Funding)<br>• Share BWSR article on Emily's employee award to SCENE | **Social Media**<br>• Continue updating Facebook and Instagram with relevant topics<br>• Respond to comments and messages as needed<br>**Website**<br>• Update website as needed<br>**Articles**<br>• Write an article for Spring Lake Association Newsletter |

# JANUARY 2025 PROGRAMS AND PROJECTS UPDATE

| PROGRAM OR PROJECT | LAST MONTH'S STAFF ACTIVITIES | NEXT STEPS |
|---|---|---|
| ***Citizen Advisory Committee***<br>*Project Lead: Danielle* | • December 19 CAC Meeting<br>• Prep for January 30 CAC Meeting | • January 30 CAC Meeting |
| ***Education Program***<br>*Project Lead: Danielle* | • See Website and Media section.<br>• Begin planning for 2025 Education and Outreach program<br>• Order logo hats | • Complete 2025 Education and Outreach Plan |
| ***Monitoring Program***<br>*Project Lead: Jeff and Zach* | • Uploaded 2024 stream and lake data to WISKI<br>• Validating and assigning quality codes to data uploaded<br>• Continued load calculations | • Continue QA/QC in WISKI.<br>• Sediment analysis and technical memo deliverable by March 2025. |
| ***Aquatic Vegetation Management and Surveys***<br>*Project Lead: Jeff* | • Submitted DNR Aquatic Plant Management grants. | • Renew invasive aquatic plant management permits for District Lakes planned for CLP treatments. |
| ***AIS***<br>*Project Lead: Jeff and Zach* | • None | • Continue coordinating with DNR on CD3 station installation agreement.<br>• Install CD3 station at Sand Point boat launch, once approved. |
| ***Rules Revisions***<br>*Project Lead: Joni* | • No activity this month. | • Finalize City of Prior Lake equivalency MOA.<br>• Finalize City of Savage interim equivalency agreement.<br>• Finish review of Scott County rule updates to confirm equivalency. Continue working with Scott County to finalize equivalency MOA. |
| ***BMPs & Easements***<br>*Project Lead: Joni* | • Held monthly coordination meeting with SWCD.<br>• Continue to work with landowners and City of Prior Lake on development agreement termination and easement amendment.<br>• Obtained, signed and recorded encroachment agreement approved by board at November meeting | • Address outstanding issues associated with:<br>o Development Agreement and Conservation Easement establishment process and document templates.<br>• Continue to resolve outstanding easement violations.<br>• Complete easement sign installs in Spring |
| ***Permitting***<br>*Project Lead: Joni* | • Provided permit review comments to LGU partners on two projects.<br>• Worked to close old permit (22.02).<br>• Reviewed outstanding permit application submittals (24.02) | • Continue construction inspections in Spring.<br>• Continue to close out old permits.<br>• Continue to provide permit review comments to LGU partners. |

# JANUARY 2025 PROGRAMS AND PROJECTS UPDATE

| PROGRAM OR PROJECT | LAST MONTH'S STAFF ACTIVITIES | NEXT STEPS |
|---|---|---|
| ***Planning Activities***<br>*Project Lead: Joni and Emily* | • Continued compiling a master project spreadsheet to aid in TMDL, website, and future maintenance tracking needs.<br>• Scheduled and held meeting with Spring Lake Township regarding land being re-guided.<br>• Met with City of Prior Lake development staff to discuss expected development activity and potential opportunities for collaboration.<br>• Held bi-monthly coordination meeting with City of Prior Lake public works staff. | • Continue to participate in Scott WMO plan update process. |
| **Outlet Channel Projects and Administration**<br>*Project Lead: Emily/Jeff* | • Held Special Cooperator and Technical Advisory Committee (TAC) meeting early January.<br>• Approved scope amendment for WSB work on pipelining project.<br>• Advertised pipelining project on QuestCDN.<br>• Inspected high priority channel crossings and performed maintenance where needed.<br>• Completed large tree removals impacting flows directions leading to bank erosion in segments 7a and 7b.<br>• Continued work on 2024 Prior Lake Outlet Channel Annual Report. | • Continue channel inspections and maintenance activities.<br>• Post bid documents on QuestCDN once finalized.<br>• Open pipelining bids on February 7, 2025.<br>• If needed, hold Special Cooperator meeting to seek authorization to award the pipelining project.<br>• Completed large tree removals impacting flows directions leading to bank erosion in segment 1n. |
| ***General Administration***<br>*Project Lead: Joni/Emily* | • Marked and installed signposts along property boundaries for district-owned Ducks Unlimited parcel.<br>• Requested surveyor to mark District's Spring Lake Demonstration parcel.<br>• Continue to work on file archiving.<br>• Continue to work on cleanup of electronic file organization. | • Order no trespassing signs for installation at select locations for district-owned parcel.<br>• Continue to participate and learn more about potential Scott County coordinated benefits plan.<br>• Develop electronic file organization protocols. |

**PLSLWD Board Staff Report**
January 10, 2025

| | | |
|---|---|---|
| **Subject** \| | FeCl System Assessment | |
| **Board Meeting Date** \| | January 21, 2025 | **Item No:** 4.2 |
| **Prepared By** \| | Emily Dick | |
| **Attachments** \| | FeCl System Assessment Report | |
| **Proposed Action** \| | Motion to accept the 2024 FeCl System Assessment Report. | |

## Background

The District's Ferric Chloride Treatment System is an essential part of the District's efforts to reduce phosphorus reaching Spring Lake, and therefore Prior Lake. The District contracted EOR to conduct the Ferric Chloride System Assessment in 2023 in order to recommend system updates, equipment lifetimes, and optimization of the system. The majority of the report, which focused on the evaluation of system components, was completed and reviewed by the Board in September 2023 and February 2024. The evaluation and recommendations of the report informed the Board vote in February 2024 to pursue Building Alternative A and Driveway Option 4. The building and driveway improvements are currently under contract and are proceeding to be completed by Spring 2025. The report is not intended as a living document, rather a reference for engineering recommendations at the time of evaluation. All system updates that are made are tracked in the internal Operations and Maintenance Manual.

Unfortunately, due to drought and no flow into the ferric chloride system, the dosing and chemical analysis could not be completed in 2023. Dosing and chemical analysis was completed in 2024, and was inserted into the Ferric Chloride System Assessment report in Section 4 and Appendix I. Upon presentation of the full report to the Board in December 2024, Board managers requested that some discrepancies be addressed before report acceptance.

## Discussion

The bulk of the report is comprised of the system components which the Board has already reviewed and utilized to direct construction. Since the remaining dosing and alternative chemical analysis has now been completed, the full report is presented to the Board for acceptance. After review at the December board meeting, some refinements were made to the report. A brief summary of the edits are made below:

- Repaired table references that corrupted in the PDF version
- Corrected all recommendations to Alternative A
- Added a paragraph of advancements to the Executive Summary
- Minor edits of typos

Acceptance of the FeCl System Assessment Report allows the District to cite the report in grant applications and planning documents. Acceptance of the document does not commit the District to any action.

## Recommended Action

Motion to accept the 2024 FeCl System Assessment Report.

## Budget Impact

There is not a budget impact associated with this agenda item.

Prepared by: EOR & Purpose Associates
For the Prior Lake - Spring Lake Watershed District

# Ferric Chloride Treatment System Assessment and Recommended Updates

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## EXECUTIVE SUMMARY

The ferric chloride ($FeCl_3$) dosing system was initially installed in 1997 (Montgomery Watson) to provide a chemical injection to the tributary watershed and adjacent ditch, as the water flowed toward a settling pond, within a wetland, before then discharging to Spring Lake. The system was updated in 2013 (Bolton & Menk) with new operating controls and dosing equipment to move the discharge point of the $FeCl_3$ downstream to where the water is diverted from the ditch into the desiltation pond. Again in 2019 (WSB), the weir near the dosing station/tank was updated as well as fish barrier configuration added.

The $FeCl_3$ facility, i.e., discharge location, the main facilities, the $FeCl_3$ storage tank, secondary concrete containment structure, piping/valves, building, and feeder piping and injection components at the new location near the desiltation pond, has not been replaced or had a major assessment of their condition and expected lifespan.

This report serves as a centralized document to inform future decision making for the ferric chloride system. This report presents a thorough review of each component of the system to provide:

- An evaluation of the current system
- An assessment of the existing access and potential improvements
- A summary of improvements with alternatives and cost assessment
- An evaluation of alternative chemicals for phosphorus removal potential

**Table E1** summarizes the age, expected life, deficiencies and recommendations for the equipment described in this report. Several improvements are recommended in the immediate future. These items were sized and selected on a preliminary basis in order to estimate project costs. These improvements include:

- Replace the pump's pressure switch.
    - The existing switch is aged and may possibly malfunction. The switch is a requirement of the MnDOT's right-of-way permit. A replacement switch is relatively low cost.
- Replace the storage tank's ultrasonic level sensor with a radar level detector.
    - The existing level sensor is past its expected service life.
    - A radar level detector can sit outside the tank, extending the detector's life and allowing for easier maintenance, whereas the existing ultrasonic sensor must be inside the tank to work.
    - Radar level detectors on average also have a longer service life than ultrasonic systems.
    - The unit can be purchased directly from the manufacturer to reduce the costs of purchasing through a manufacturer's representative.
- Replace the ultrasonic level sensor and datalogger at the weir.
    - The sensor and data logger of the ultrasonic system have failed. Replacement with a radar system would provide updated equipment and standardization with the radar level detector that is recommended for installation on the chemical storage tank.

- Replace the poly-vinyl chemical feed tubing. Convert most of the poly-vinyl tubing within the building to PVC.
    - The existing tubing is past the manufacturer's recommended life.
    - The tubing inside the building has had multiple leaks with spot repairs.
    - Changing to PVC will avoid requiring frequent future replacement.
    - For any tubing that must remain poly-vinyl to preserve its functional operation (i.e., around the pump), it is recommended to establish a maintenance plan to replace the tubing every 2 years.
- Purchase Personal Protective Equipment (PPE) to be kept at the chemical feed building.
    - This is essential for ensuring all personnel (whether PLSLWD staff or from outside) have access to safety equipment needed for chemical feed systems.
    - This includes an insulated jacket for the existing eyewash system to avoid the potential of freezing in late fall months.

***Table E1: Summary of Existing Equipment.***

| Item | Estimated Age | Typical Life | Deficiencies | Recommendations |
|---|---|---|---|---|
| Chemical Feed Pump | 10 years | 8-12 years | Advanced age. | Replace it when the pump fails. |
| Valves | 10-20 years | 10-20 years | Advanced age. | Test/exercise valves regularly. Replace when fails or at owner's discretion. |
| Pressure Switch | Unknown | 5-10 years | Advanced age. Reports of possible malfunction. | Replace unit. |
| Chemical Feed PVC Line | 10 years | 20-30 years | No significant deficiencies | Continue regular maintenance. Repair as needed. Re-evaluate conditions in the future. |
| Chemical Feed Flexible Tubing | 10 years | 2 years | Manufacturers recommend replacing it every 2 years | Replace all. Convert most to PVC inside building. Create regular replacement plan for any remaining tubing. |
| Chemical Storage Tank and Containment | 25 years + | 15-30 years | Aged tank. Incompatible Lid. It is difficult to replace it with long delivery times.<br>PVC pipe in pump containment area drains to ditch. | Replace the tank with one of alternatives.<br>Seal PVC pipe in pump containment area.<br>Move chemical fill points to inside containment. |
| Building | 25 years + | 25-50 years | Does not allow for ease of replacement of tank. Rodents present. | Modify the building by adding large garage doors and modifying the west wall of containment.<br>Seal holes for rodents. |
| Weir Level Sensor | 10 years | 5-7 years | Sensors and datalogger have both failed and are non-functional. | Replace with radar level system and associated controls. |
| Tank Level Sensor | 10 years | 5-7 years | Aged. It is installed inside of the tank. | Replace with radar level system (that matches system at weir) |
| Chemical Feed Culvert Screening | Not Present | N/A | N/A | It can be feasible but involves significant additional maintenance and cost. |
| Chemical Feed Mixing | Not Present | N/A | N/A | Not recommended from engineering and cost standpoint but can be optionally added based on Owner's preference. |

The driveway access to the $FeCl_3$ tank and dosing facility is a gravel drive and relies on coming through a private property, albeit with an easement. The current layout is barely workable, as it is a difficult-to-maneuver turn for the delivery tanker trucks that are used to fill the tank. Four alternatives are presented which range in scope and price. Alternative 1 represents the existing route with proposed stabilization along the driveway. Alternative 2 includes the truck pulling into the private driveway and backing into the access road. Alternative 3 was suggested by the trucking company, based on a desire to minimize maneuvering on Highway 13. Alternative 4 proposes using a single framed truck with no trailer (40 feet length) approaching from East to West on Highway 13.

The existing tank could fail at any time. It also does not currently have a lid that fits. To solve this, two facility alternatives for modifications to the tank and building and drive access were developed and are as follows:

Alternative A:

- Replace the existing tank with a double wall polyethylene tank.
    - This double walled tank provides containment while also allowing the system to continue running if the inner tank fails.
    - A 3,150-gallon tank was preliminarily selected to meet chemical feed needs as well as fit into the existing building.
        - This may cause higher chemical and delivery costs due to being smaller than a full tanker size of 4,000 gallons.
- Install the garage door on the west side of existing building and modify the west wall of the concrete containment.
    - This allows the storage tank to be easily replaced both now and, in the future, in the event that the tank fails. Allowing for replacement of the tank is critical to maintaining the system in the future.
    - The concrete containment can be demolished because the double walled storage tank provides containment. A small curb will remain for small spills.
    - Optional removable waterproof barriers can be used to provide additional containment, if desired.
- Update drive access with Alternative 4 with minimal modification to the driveway.

Alternative B:

- Replacing the existing tank with four single-wall polyethylene tanks
    - The additional number of tanks provides redundancy, allowing for the system to continue running in the event that a tank fails.
    - 1,100 gallons tanks were preliminarily selected to fit into the existing building. The total volume of 4.400 gallons maintains the existing capacity and allows for delivery of a full tanker, potentially reducing chemical and delivery costs.
    - The smaller tanks reduce the required containment volume.
    - This alternative will require more piping and valving within the building as well as additional level sensing equipment. This alternative includes 4 radar level sensors (purchased directly from the manufacturer for a reduced cost).

- Install the garage door on the west side of existing building and modify the west wall of the concrete containment.
    - This allows the storage tanks to be easily replaced both now and, in the future, in the event that a tank fails. Allowing for replacement of the tank is critical to maintaining the system in the future.
    - The smaller tanks can also more easily be brought in and out of the building, over a containment wall, allowing for a short concrete containment wall to remain in place.
- Update drive access using Alternative 1 with proposed stabilization along the driveway.

Equipment costs, installation, general project costs, engineering, legal, and a contingency that is typical of this stage in the project are included in the costs below, **Table E2**.

To take into account potential differences in operation cost, primarily due to differences in chemical and delivery costs, as well as replacement of level sensors on the tanks, the net present value of Alternatives A and B were calculated to develop Life Cycle Costs, **Table E3**.

Alternative A is a simplified singular system and few operational elements that multi-sensors and multi-tanks involve and has a lower cost. Alternative B provides benefits of redundancy, allowing for system operation in the event of tank failure, and reduced risk during spillage. Alternative B can also make it easier to maintain the required containment and to replace tanks in the future. With staff input and in consideration of the benefits of simplification, Alternative A is recommended.

The hydraulics of the flat system and lake tailwater during higher flow periods do appear to be affecting the performance of the system and bypass of untreated flow. Further detailed investigations into how to address this interference are recommended.

PLSLWD expressed interest in evaluating the potential benefit of utilizing alternative chemicals to ferric chloride (ferric) as well as reviewing the existing dosing and looking to see if optimizing the ferric dosing is possible. Due to drought conditions in 2023, water samples were not representative of typical conditions. The project timeline was extended, and samples were taken in 2024 during flowing conditions. As in the past, there was significant variability in the results and not all samples sent out for jar testing correlated well with the district's monitoring. Nevertheless, some conclusions were drawn from the data available, and a modified dosing curve is suggested that provides seasonal differences, with higher dosing during June to September, when phosphorus concentrations are often higher.

Several technological advancements are proposed for the system. There are various sensors and controls proposed for the updated system that are more reliable than the past configuration, such as the tank level sensor, water level radar sensor, and pressure switch. The sensor and control systems are also proposed to be brought together into a modern integrated system, since the control and sensor equipment is outdated and experiencing compatibility issues. Additional technologies were discussed, but not included in the recommended alternative, but could be considered for future upgrades include remote telemetry monitoring for level sensors and real-time dosing based on water quality monitoring data.

***Table E2: Recommended Improvements, Project Cost.***

| Improvement | Estimated Project Installed Cost* | |
|---|---|---|
| | Alt. A | Alt B. |
| Replace Tank (Including all appurtenances) | $35,400 | $40,600 |
| Install Garage Door and Demolish West Wall of Containment | $15,400 | $12,100 |
| Replace Tank Ultrasonic Level Sensor with Radar Level Detector(s) | $1,000 | $4,000 |
| Replace Ultrasonic Level System at Weir with a Radar Level System and Controls | $10,000 | $10,000 |
| Replace Pressure Switch | $300 | $300 |
| Replace Chemical Feed Tubing (With Mostly PVC) | $3,600 | $3,800 |
| Personal Protective Equipment | $2,100 | $2,100 |
| Seal Building Holes from Rodents | $500 | $500 |
| Heated, Insulated Eye Wash | $2,000 | $2,000 |
| Driveway Improvement | $15,300 | $136,600 |
| General (mobilization, demobilization, etc.) (10%) | $8,600 | $21,200 |
| **Total Construction Cost** | **$94,200** | **$233,200** |
| Permits and Legal Fees (10% Construction) | $9,400 | $23,300 |
| Design and Construction Engineering (30% Construction) | $28,300 | $70,000 |
| Contingency (20% of Construction, P&L, Design & Const. Eng.) | $26,400 | $65,300 |
| **Total Capital Investment** | **$158,300** | **$391,800** |

*All costs have been rounded up to the nearest $100

***Table E3: Operation and Management Life Cycle Costs.****

| Item | Alt. A | Alt. B | |
|---|---|---|---|
| **Chemical Cost Calculation** | | | |
| Cost per Gallon | $3.75 | $3.01[1] | $/gallon |
| Deliveries Per Season | 3 | 2 | Deliveries/Year |
| Gallons Per Delivery | 2640 | 4000 | Gallons/Delivery |
| Fuel, Freight, etc. | $65 | $299 | $/Delivery |
| Cost per Delivery | $9,965 | $12,339 | $/Delivery |
| **Annual Costs** | | | |
| Annual Chemical Cost | $29,895 | $24,678 | $/Year |
| Annual Maintenance Cost (roughly estimated) | $5,000 | $5,000 | $/Year |
| **Net Present Value Calculation** | | | |
| Operation Life | 20 | 20 | Years |
| Discount Rate | 5% | 5% | % |
| Net Present Value Factor for Annual Cost | 12.46 | 12.46 | |
| Net Present Value of Annual Costs over Lifetime | $434,900 | $369,900 | $/Lifetime |
| **Replacement Costs** | | | |
| Tank Level Sensor Replacement (10-year life) | $1,000 | $4,000 | $/Lifetime |
| Weir Level Sensor Replacement (10-year life) | $10,000 | $10,000 | $/Lifetime |
| Pump Replacement (10-year life) | $5,000 | $5,000 | $/Lifetime |
| Valves and Other Sensors Replacement (estimated) | $4,000 | $4,000 | $/Lifetime |
| Net Present Value of Annual Costs over Lifetime | $434,900 | $369,900 | $/Lifetime |
| Total Replacement Costs | $20,000 | $23,000 | $/Lifetime |
| 15% Contingency of Replacement and Annual Costs | $68,200 | $59,000 | $/Lifetime |
| Total Capital Investment (From **Table 3**) | $158,300 | $391,800 | $/Lifetime |
| **Total Net Present Value** | **$681,400** | **$843,700** | **$/Lifetime (Total)** |

*Note that estimated maintenance and replacement costs were included and that are the same between alternatives to give a more representative estimate of total Net Present value (NPV) costs. NPV is currently the gold standard method for comparing the cost of two alternatives. The total NPV is meant to be a comparative value, primarily to aid in alternative selection, and does not represent a cost the PLSLWD is expected to pay currently.

[1]This is an estimate based on several quotes provided by chemical suppliers. Actual prices could be higher, depending on the supplier selected.

# 1. EVALUATION OF CURRENT SYSTEM

This section of the report outlines the condition, life cycle and replacement, and future recommendations for each component of the current ferric chloride system. Hydraulic impacts of downstream water levels and how that affects the diversion and high flow bypass on the performance of the system is also discussed. Chemical Feed Pump

## 1.1 General Description

The existing chemical feed pump is a Watson Marlow Qdos 30, which is a well-known brand of peristaltic pump that is often used in chemical feed systems. The Watson Marlow pump is one of the most commonly used chemical feed pumps and is generally regarded as being reliable and affordable. Because it is commonly used, many suppliers will also keep the most recent model in stock. The Qdos 60 is the most recent model, but differences between the models are typically negligible and a Qdos 60 can easily replace the existing pump if the pump fails at any point.

Pumps can be sold individually or as part of a skid. Skids can vary but typically consist of the pump, a mounting panel, a small chemical catchment, leak sensors, and a variety of other valves and sensors, depending on the system needs. The pump itself contains a small portion of flexible tubing to allow for peristaltic contractions to propel flow. This tubing requires regular replacement, and this work has been contracted to Vessco in recent years. The pump is then connected to the system via flexible or rigid piping (see discussion in section 1.2).


***Figure 1: Watson Marlow Qdos 30 Chemical Feed Pump.***

## 1.2 Condition

The existing pump has been in operation for approximately 10 years but is operating adequately. The operators noted that regular maintenance has been performed on the pump, according to manufacturer recommendations. As long as regular maintenance is continued, the pump can continue in operation until it fails.

## 1.3 Expected Life and Replacement

The existing pump is estimated to be approximately 10 years old. These chemical feed pumps are expected to last approximately 8-12 years; however, facilities should always be prepared to replace equipment in the event of failure. Under non-optimal service conditions, the lifespan could be as low as 5 to 10 years. Several factors suggest this pump lifespan would be in the lower 5 to 10-year category, including that the pump is located in an unheated, non-air-conditioned building that is subject to wide temperature and moisture fluctuations and that the pump is operating against higher head condition due to the long discharge line.

Any new chemical feed pump should be sized for the design conditions needed and include additional safety features to minimize exposure to chemicals. The pump should be skid mounted to include all piping, calibration chamber, and splash guards. The chemical feed system should be equipped with personal protective equipment (PPE) including a chemical-resistant face shield, chemical-resistant apron, gloves, and a portable eye-wash station and drench hose. An eye wash station is currently present in the chemical feed building, however other PPE should be kept at the building as well. PLSLWD staff noted concern that the eyewash may freeze during later Fall months. To avoid freezing issues, an insulated jacket, purchased from the eyewash manufacturer, can be installed on the eyewash unit.

The pump will require regular maintenance. The pump head is designed to be a replaceable wear piece of the pump. On average, the pump head is replaced annually at approximately $250 per unit. PLSLWD's operational needs put the lifespan at about a year. Trial and error could increase the lifespan of the pump head to about 14 months. Utilizing a maintenance contractor, such as Vessco, for regular maintenance needs is common for many facilities. This is particularly helpful with facilities that have turnover in staff and lose institutional knowledge of equipment maintenance. Furthermore, it can decrease the risk of chemical exposure to PLSLWD staff.

Many facilities choose to install two pumps in parallel to avoid downtime if a pump fails. Alternatively, some facilities keep a second pump as a "shelf spare" so that they can quickly switch out a failed pump. For PLSLWD, continuous operation is less critical, and a few days of down-time may be acceptable. Therefore, installed spare or shelf-spare is likely not necessary. If the pump fails and must be replaced, Vessco, the manufacturer's representative for the Watson Marlow pumps, can be contacted to obtain a replacement. In the unlikely event that Vessco has no pumps in stock, a replacement is likely to take 2-4 weeks to deliver. However, Vessco has noted that they keep 20-30 pumps in stock, so there is no lead time. Therefore, it will typically be easy to purchase a replacement pump in a timely manner.

Due to the age of the pump, it would be suitable to replace the pump at the same time as other construction improvements, to consolidate costs and reduce maintenance/replacement difficulties for PLSLWD staff. However, because of the short time it would likely take to replace the pump, a feasible option is to continue using the existing pump and skid, waiting until failure to replace

components. This would spread the costs out over time, but the budget must be set aside for those anticipated costs.

There is currently a pressure switch installed that is mounted to the wall above and to the side of the chemical feed pump. It is designed to shut off the pump if a high pressure set point is exceeded. Current setpoints appear to be 5-13 psi. The pressure switch is an ASHCROFT B424B model (see revised Operation and Maintenance manual). The switch is a requirement of the MnDOT's right-of-way permit. PLSLWD staff noted there may be some evidence the unit may not be working as intended. A technician can test the unit, but replacement at this time is recommended due to its low cost compared to the cost of a technician.

It is not clear when exactly each valve was installed, but the likely age of the valves is 10-20 years. Valves of the size and type in this facility can vary significantly in expected life but can also last 10-20 years. Small valves are relatively low cost (typical costs are $100-$300 per valve). At the owner's and operator's discretion, it is not uncommon to replace valves of advanced age to avoid the inconvenience of failure. The PLSLWD may opt to do that in that case. However, in many cases, valves are replaced after failure. PLSLWD staff should exercise valves on a regular basis (open and close valves) to ensure they operate appropriately and are leak free.

Manufacturers will sell the pump individually or as part of a skid, which can be customized to the system's needs. The cost for individual pumps is currently estimated at approximately $4,500 each. The cost for the pump and a pre-manufactured skid that may meet the PLSLWD's needs is approximately $8,000-$10,000. The cost for custom skids is approximately $12,000-$18,000.

## 1.4 Summary and Recommendations

The current chemical feed pump is a well-regarded brand, suitable for this application. PLSLWD can opt to replace the pump and valves at the current time or to continue using the pump and skid and replace components as they fail. Replacement of the pressure switch is recommended.

## 1.5 Chemical Feed Line

### 1.5.1 General Description

A chemical feed line extends from the chemical feed pump through a long conduit underground to the feed point. This line was installed in approximately 2013 during a construction project to relocate the feed location. The entire line is over 900 feet long. Within the chemical feed building and at the chemical feed point, there is flexible 1/2" tubing that is a poly-vinyl blend. Based on discussions with PLSLWD staff and the construction drawings, this 1/2" tubing connects via adapter to a 1" PVC line, which travels for most of the 900 ft length between the chemical feed building and the chemical feed point. Request For Information files from the construction project (from S. M. Hentges) that ask to specify type of tubing, provide an answer that 1/2" tubing in the shed is connected to the longer 1" line via adapter (though this document is not clear about the piping material). Furthermore, a document titled "Design Considerations – 2013 $FeCl_3$ work" mentions the 1" PVC carrier line as the primary feed line. Therefore, the flexible 1/2" tubing appears to connect to the 1" PVC line with an adapter at both ends of the PVC line. According to original drawings, at certain points in the path, the 1" PVC line was also installed in a 2" PVC casing, such as under the highway and at a gas line

crossing. The 1" PVC line was installed during the 2013 construction project using directional drilling technologies to minimize any disturbance on existing land conditions. Portions of the tube that are observable in the field appear to confirm the above information. The conditions of the District's MnDOT's right-of-way permit require that the feedline have secondary containment, be at an 8 ft of minimum depth below ground in the right-of-way and have no seams or joints within 100 feet of the right-of-way. At this time, we can only assume that these construction requirements were met when the line was installed during the 2013 project. The district does not know the exact location of the chemical feed line. Based on the 2013 Plans and Specifications, it does not appear the underground line was installed with a tracer wire to help locate it. However, it is expected that the line is in the general vicinity of the path shown on the 2013 drawings. If the district needs to locate the line at any point in the future, there are typical methods for locating and verification of utilities in the engineering infrastructure design and construction sector, some with higher accuracy levels and commensurately higher costs to implement. It is anticipated that the ground penetrating radar will be necessary for accurate relocation of the feedline. To do so will require blowing out the line and attempting to feed a wire into the feedline to locate and mark the pipe from the surface. Due to the lack of casing along the length of the feedline, a tracer wire will not be able to be permanently inserted unless an additional boring line is laid parallel to the existing feedline. The feedline will likely not be able to be located under Highway 13 but can be marked where it enters and exits with a metal pin. Excavation and exposing of the feedline in strategic locations is a solution that offers the possibility of adding access ports for future inspections.

### 1.5.2 Condition

The PVC line appears to be in adequate condition and no leaks or other issues appear to be currently present. Furthermore, the exposed tubing in the chemical feed building as well as at the access manhole at the chemical feed point appear to be in operating condition. However, Vessco has assisted in repairing several leaks in the building piping. The piping within the building also shows evidence of leaking as well as apparent repairs with multiple sections of piping.

### 1.5.3 Expected Life and Replacement

The PVC line as well as the poly-vinyl was installed with the 2013 construction project. The PVC line has not since been replaced but the poly-vinyl tubing has been replaced in piecemeal portions every 2-4 years.

The PVC line has been in service for approximately 10 years and PVC lines can have long service lives of approximately 20-30 years. Current service procedures, such as cleaning the lines and testing for leaks, should be continued to ensure proper operation of the line. Replacement of the long underground line is not recommended at this time.

The poly-vinyl tubing, however, requires more frequent replacement. The manufacturer's recommendation is to replace the tubing every 2 years, both within the chemical feed building and at the chemical feed point. It is recommended to replace all the poly-vinyl tubing at this time. This will also help ensure a clean, organized, and leak-free environment that does not pose a safety hazard to operators. The majority of the poly-vinyl tubing within the chemical feed building can be replaced with PVC so that frequent replacement will no longer be necessary, reducing the total amount of poly-vinyl tubing to a minimal amount around the pump and a short length inside the

chemical feed manhole. Poly-vinyl is necessary to maintain these locations due to the flexibility of the tubing. There are no other cheaper or longer-lasting alternatives to substitute poly-vinyl in these locations. For the short lengths of poly-vinyl tubing that remain, it is recommended to develop a regular maintenance plan to replace the tubing every 2 years. Replacement of this tube is already a routine practice of ongoing operations and maintenance. The remaining flexible tubing will be quite minimal and therefore likely to be low cost to replace.

### 1.5.4 Summary and Recommendations

It is recommended to replace the existing poly-vinyl tubing. Inside the chemical feed building, the tubing can nearly all be replaced with PVC to avoid the need for frequent replacement in the future. For the small amount of remaining poly-vinyl tubing, it is recommended to develop a regular maintenance plan to replace the tubing every 2 years.

## 1.6 Chemical Storage Tank and Containment

### 1.6.1 General Description

The chemical storage tank is a 4,400-gallon polyethylene tank that is commonly used for chemical storage in chemical feed systems. According to the engineer's report of 1995, the tank was originally sized based roughly on the estimated amount of ferric chloride needed during an entire season, 10% freeboard, and the rough size of a chemical delivery truck. The reasoning was that fewer chemical deliveries would lead to decreased costs. Currently, the PLSLWD estimates that the chemical needed in a typical non-drought year is roughly 6000 gallons.

Currently, Hawkins is a chemical supplier. Beginning in 2023, Hawkins no longer sends full size chemical tanker trucks because of difficulty in accessing the site. However, expected driveway improvements may improve access to the site in the future, allowing full-size tankers, see section 2. Full size tankers typically hold approximately 4,000 gallons of $FeCl_3$, which is based on an approximate maximum weight of 45,000-48,000 lbs per tanker, the density of the chemical (11.25-11.46 lbs/gal for $FeCl_3$), and some required headspace. Deliveries are now made with a smaller freight liner straight truck that have eight 330 gallons totes, which equates to up to 2640 gallons per delivery. Chemical costs are currently at $3.75 per gallon of $FeCl_3$ with Hawkins. Receiving deliveries of less than 4,000 gallons typically incurs a higher cost, due to wasted space in the tanker as well as higher cost for smaller trucks. Furthermore, if the facility does not have the ability to receive full tankers, it can limit the choice of chemical supplier.

Even when a full tanker is provided, the cost of ferric appears to vary significantly depending on the chemical supplier. Quotes from four other chemical suppliers' range in costs from $1.91-$3.64 per gallon for full tanker deliveries. On top of chemical costs, there is a nominal flat-rate delivery fee ranging from $29-$300, depending on the supplier and delivery method. The lower chemical costs, noted above, indicate significant possible savings by allowing full tankers to deliver to the site.

Therefore, while there is risk to store larger volumes of chemical, leading potentially to larger spills, there may be operational cost benefits of ensuring at least 4,000 gallons of chemical storage is available and that full tankers can access the site.

The tank was installed within a concrete chemical containment curb that was designed to contain a chemical spill in the event the tank fails. The curb area is therefore designed to hold the tank and freeboard volume. There is also a small containment curb around the area where the chemical feed pump is located, to catch spills in that area. A metal building was installed around the tank, but no path of egress was designed to allow for replacement of the tank.

***Figure 2: Existing Chemical Storage Tank.***

### 1.6.2 Condition

The tank does not currently have any obvious issues but could potentially fail at any time, based on its age. The most common point of failure of a chemical tank is at the tank sidewall penetration fittings. There are several capped fittings on the tank walls from previous pipes. These fittings typically have gaskets that become dry and brittle which leads to a leak. The lid currently does not fit properly, opening the tank contents to the building, which allows fumes to be present in the air and potentially causing more corrosion in the building.

Within the small containment area around the pump, there is a PVC pipe that carries tubes to the original chemical feed point. However, these tubes are no longer in use. The PVC pipe extends up through the concrete but does not reach as high as the curb walls. Therefore, if there is a large enough chemical spill around the pump, it can unintentionally drain through that pipe to the ditch, resulting in permit violations.

The chemical feed connection point is currently located above the containment wall, allowing any spills during filling to fall outside of containment. It is preferred that the connection couplings should be moved further inside the containment area so that any spills will be contained. Several additional issues are noted in the section below.

The storage tank is equipped with a PVC pipe that extends out of the building. These pipes serve as a vent and similar vents will be installed with any new or replaced tanks.

### 1.6.3 Expected Life and Replacement

The tank is approximately 25 years old. Polyethylene tanks of this type are generally expected by their manufacturers to have a service life of 15-20 years; however, many are functional for more than 30 years. There are several options to prepare for anticipated failure: chemical spill containment, reducing downtime of the system, and replacement of the tank. The existing system was built with a concrete chemical containment system in the event of a spill. However, the latter two options cannot easily be met. The system currently has only 1 tank and therefore has no redundancy. If the tank fails, the system will be out of service until a new tank is installed and operational. The lead time for a new tank is currently 8-12 weeks. Furthermore, there is currently no way to easily replace the tank. The building and/or concrete containment system would need to be disassembled or damaged in some way to remove the existing tank and install a tank inside. Therefore, disassembly, demolition, and construction would take additional time and cost to replace the tank. The system may therefore be out of service for potentially several months if the tank fails.

A potential solution to ease replacement of the tanks is to install a new garage door on the west side of the building. The building may require some structural modifications to make installation of the garage door possible and a large door is expected to have higher cost and more difficulty in installation. Garage door selection would be determined during design; however, it is likely it would be a manual, single door, roll-up style. Furthermore, a large tank that is similar in size to the existing tank would not be able to fit through the opening without demolishing the west side of the containment wall. Therefore, part of the wall must be demolished. To reinstall the required containment system, the concrete wall may be either rebuilt or a removable containment alternative could be installed, such as a removable waterproof barrier, to allow for ease of continued replacement in the future. A further option is to utilize a double wall polyethylene tank, which is available from multiple manufacturers, and allow for containment in case the interior tank fails. This double walled tank would need to be smaller than the current tank to fit in the existing building and would be approximately 3,150 gallons in volume (the current tank holds approximately 4,400 gallons). Furthermore, in the event that the inner wall fails, it allows the system to remain in service while a new tank is purchased and installed, reducing system downtime. In comparing a large single wall tank option (where a containment wall is rebuilt) to a large double wall tank option, the cost is approximately equal, but a double walled tank provides the additional benefit of allowing the system to continue operating for a short time if the inner tank fails, until a replacement tank can be installed. If additional conservatism is desired, both a double walled tank and a removable waterproof barrier can be installed.

An alternative to installing the existing tank with one large tank is to replace it with multiple smaller tanks. Installing multiple redundant tanks to avoid downtime is a preferred method of redundancy

for many chemical feed systems. The disadvantage of this choice is that it can sometimes require a larger building space, additional piping/tubing and valves, and additional associated cost. However, there is sufficient space in the existing building for four single-walled tanks of approximately 1,100 gallons each, that could replace the existing tank within the existing building and maintain the total storage volume of 4,400 gallons. This provides significant redundancy, allowing the system to continue operating if a tank fails. Furthermore, it reduces the required volume of the containment area. The smaller tanks can also more easily be brought in and out of the building, allowing for a short concrete wall to remain in place on the west side of the containment. The exact height of the remaining containment wall should be determined during design, but it appears that a 1,100 gallons tank can fit over the wall while allowing for the west containment wall to remain high enough to provide adequate containment. The proposed tank is 64 inches in diameter. If we assume an 8-foot-tall garage door is used, the containment wall may be reduced from 4 feet tall to 2.5 feet tall and would still provide approximately 2900 gallons of containment, assuming 6 inches of freeboard (meaning that only 2 feet of containment height is used instead of the full 2.5 feet). This provides containment for more than two tanks worth of volume. Another advantage of this option is the ease of installation of the relatively small garage door and the fewer structural modifications to the building required. The available space in the existing building allows for easy access to all tanks for filing, operations, and maintenance. The tank system could be designed to refill individual or paired tanks safely using a similar quick connect mechanism as in the existing system. A disadvantage of pairing tanks is that it will require penetration in the side of the tanks, which are typically where tank failure can occur.

A further alternative is to replace the existing 4,400-gallon tank with a double wall tank that is approximately 4,100-4,500 gallons. This would maintain the volume that the current tank can hold (and which delivery tankers typically hold) while also having double wall containment. Double walled tanks are larger and therefore the existing metal building must be replaced with a larger building. This will likely incur significantly more cost. Furthermore, if replacement of the existing building is desired by the PLSLWD, it is recommended to make it large enough to hold two large single-walled tanks, instead of a large double walled tank. This option does not appear to have significant benefit at this time.

### 1.6.4 Summary and Recommendations

The PVC pipe in the pump containment area should be sealed or extended up above the containment curb height to avoid spills draining out of the building unintentionally.

The chemical feed connection should also be moved further inside the containment area so that small spills during filling will be contained.

Two additional deficiencies of the current system should be addressed: reducing downtime in the case of tank failure and allowing for ease of replacement of the tank. This is likely one of the greatest deficiencies of the existing overall chemical feed system.

There are 2 alternative solutions available:

A) Install a large garage door on the west wall of the building, demolish the west side concrete containment wall, and replace the existing tank with a double wall polyethylene

tank of approximately 3,150 gallons. Double wall tanks tend to be larger in size than a single wall tank of the same size. Therefore, a smaller volume tank is required and would likely reduce the capital costs of tank replacement. However, chemical costs and delivery may be increased as noted above. A small curb will remain on the west side to catch small spills, and a removable waterproof barrier can optionally be installed for added spill protection.

B) Replace the existing tank with four single walled tanks of approximately 1,100 gallons. This allows for the delivery of a full tanker, provides redundancy, reduces the required volume of the containment area, and allows the system to remain operational if a tank fails. The smaller tanks can also more easily be brought in and out of the building, allowing for a short concrete wall to remain in place on the west side of the containment. However, additional piping, valving, and level sensing equipment will be required for the additional tanks.

## 1.7 Building

### 1.7.1 General Description

The current chemical feed building is a metal building that is approximately 25 years old. It currently sits close to the flow measurement area and former chemical feed location. However, the chemical feed location was moved downstream in the 2013 construction project. The building is built on a concrete pad and holds the chemical storage tank, concrete chemical spill containment walls, chemical feed pump, chemical flow feed controllers, a Speakman portable eyewash station, and other electrical equipment. The building is not heated and does not have running water.

***Figure 3: Existing Building.***

### 1.7.2 Condition

The building contains ferric chloride, which can be very corrosive to metals. The chemical storage tank, however, is vented to the outside and very little exposed chemical should be present inside the building on a typical basis. It should be noted, however, that currently the storage tank lid does not fit properly, and the tank is open to the building (this would be remedied with a tank replacement). Therefore, although the building contains corrosive chemicals and is somewhat advanced in age, it is generally in good condition.

Some corrosion can be observed on the interior metal framing. However, none of the observed corrosion appears significant enough to cause structural collapse or safety issues. The exterior of the building shows virtually no corrosion, with the side and painting being in very good condition.

Staff have noted that mice and other rodents are often inside the building. This can be unsanitary but can also lead to potential damage to system components. The door seals well, but oversized holes for pipe penetrations were observed in several locations around the exterior of the building. It is recommended to seal holes with sturdy materials. For example, spray foam alone is not recommended. Metal mesh along with spray foam can be effective as well as custom cut sheet metal installed over gaps. This work is relatively simple and can be performed by a local contractor or by PLSLWD maintenance staff. The gables also have vent openings. If sealing the exterior wall holes does not resolve the rodent issue, it is recommended to also install durable mesh screens over the vents.

### 1.7.3 Expected Life and Replacement

Metals buildings of this type may be expected to last 25-50 years. Considering the relatively low corrosion present and its good condition, the building does not currently appear to require replacement.

### 1.7.4 Summary and Recommendations

The building is in relatively good condition and does not appear to require urgent replacement. However, it is recommended to seal holes in the exterior of the building to prevent rodents from entering.

## 1.8 Level Sensors

### 1.8.1 General Description

The stream flow had been measured with a weir and an ultrasonic level sensor, including an ISCO 2110 ultrasonic level sensor and datalogger, which communicated with the chemical feed pump to allow for automated chemical feed dosing.

The volume of chemicals in the storage tank is also measured with a Siemens Ultrasonic level sensor. This detector is inside the chemical storage tank, making it difficult to access. The level sensor was found to be inaccurate when the tank held greater than 4,000 gallons.

***Figure 4: Interior ceiling of building showing corrosion (shape distortion from wide-angle lens).***


***Figure 5: ISCO Ultrasonic Level Sensor and Datalogger.***

### 1.8.2 Condition

Beginning in 2023, the ultrasonic level sensor and datalogger have not functioned. See below for further discussion.

### 1.8.3 Expected Life and Replacement

The ISCO equipment is approximately 10 years old and has a manufacturer expected life of 5-7 years. The ISCO equipment is currently a discontinued model and the new ISCO models are not backwards compatible. Therefore, if one component fails, it will need to be replaced with an older part or all the ISCO components will need to be replaced.

The datalogger has recently been non-functional and PLSLWD staff replaced it with the same model. However, upon installation of the datalogger the manufacturer's representative for ISCO (Tech Sales) found that the ultrasonic sensor has also failed. Because both the sensor and data logger have failed, it is recommended to replace both with a radar level system and associated controls.

The chemical storage tank is equipped with a Siemens ultrasonic sensor that is approximately 10 years old and is installed inside the tank. Ferric Chloride is corrosive and although the sensor may be considered by the manufacturer to be compatible with the chemical, the service life is expected to be shorter than less corrosive conditions. A radar level detector is a more suitable level measurement device for this application because it can sit above the tank, outside of corrosive conditions. Radar level detectors are also generally estimated to have a longer service life of 8-12 years and are standard industry equipment, similar to the existing ultrasonic sensor. However, radar level detectors have the advantage of being able to detect levels from outside of corrosive conditions. Therefore, when the chemical storage tank is replaced, or when the current level detector fails, it is recommended to replace the Siemens ultrasonic level sensor with a radar level detector. Furthermore, it is recommended that the radar system at the tank matches the manufacturer and model of the radar system installed at the weir, to simplify operations and maintenance. Tank sensors benefit the operator by displaying and recording continuous level data. Level data is used to track chemical usage and to predict future needs. Tank level data is used to verify pump dosing accuracy and for MPCA reporting. Both functions are important to the accurate function and dosing of the system.

To provide a refence of cost comparison (not including engineering, contingency, and other general project costs), the installed cost of one radar sensor is approximately $7,800 when purchased through a manufacturer's representative (4 sensors costing approximately $31,000) and the installed cost of an ultrasonic sensor when purchased through a manufacturer's representative is approximately $4,000 (4 sensors costing approximately $16,000). Typically, equipment must be purchased through a manufacturer's representative. However, in the case of some brands of radar and ultrasonic sensors, it appears the units can be purchased directly at a far cheaper cost. It should be noted that these brands are well known and considered very reliable. If purchased directly by the PLSLWD, the installed cost of a radar sensor (such as the Vegapuls 11) would be approximately $975 each (4 sensors costing $3,900), and an ultrasonic sensor would cost approximately $780 (4 sensors costing $3,120). Therefore, PLSLWD may wish to opt for purchasing these items directly from the manufacturer.

In the case that the existing tank is replaced with multiple smaller tanks, requiring multiple level sensors can incur somewhat high cost, both initially and when the level sensors will need replacement. An alternative to reduce this cost with 4 tanks is to pair the tanks together using piping, so that effectively there are 2 tanks, only requiring 2 level sensors. A disadvantage of this is that it will require penetration in the side of the tanks, which are typically where tank failure can occur. Given the redundancy of tanks, if there is a failure, the system can continue operating until it is replaced. However, when a tank fails, there is a chemical spill that requires cleaning, the pair of tanks require replacement and installation, and significant time/labor is required from operators. These costs and time burdens can offset cost savings from a reduced number of sensors. It is difficult to predict when a tank may fail, but even if a paired set of tanks fails once, the cost would be higher than the two additional radar sensors (the installed cost of 2 additional sensors, without engineering, contingency, and other general project costs is approximately $15,500 when purchased through a representative, or $1,950 if purchased directly by PLSLWD, whereas the cost of a pair of tanks is approximately $20,000. This does not include any costs for chemical cleanup that will be required). Therefore, from an operations and long-term cost perspective, additional radar sensors would be preferable to connecting pairs of tanks.

A further alternative is to avoid installing level sensors on the tank and opt for less expensive, but less accurate options, such as a sight glass, a float level system, or a backlighting system. Likely a combination of methods would be necessary for the system but still would not provide as much information or accuracy as a radar level sensor. To provide a reference for cost comparison, if the radar sensors are purchased directly from the manufacturer, as described above, the cost for four units is approximately $3,900. The estimated cost of a combination of low accuracy methods is estimated to be between $1,500-$3,000, providing minimal cost savings compared to radar. These options would provide a reduced level of accuracy compared to the current operations and are not preferable to the operator. For example, sight glasses can foul over time, particularly because of ferric chloride's orange color, making it quite difficult to see the water level without cleaning the sight glass regularly. Furthermore, cleaning the sight glass puts more work on the operators, requires taking a tank out of service, and increases the likelihood that operators are exposed to chemicals. However, if desired, these options can be further evaluated during the design phase.

### 1.8.4 Summary and Recommendations

The ISCO level sensing equipment at the weir and associated controls has exceeded its original service life and is a model that is discontinued and not compatible with newer models. The datalogger sensor and datalogger have both failed. Therefore, it is recommended to replace them with a newer radar level system and associated controls.

When the chemical storage tank is replaced, it is recommended to replace the existing Siemens ultrasonic level sensor with a radar level detector that matches the make/model of what is installed at the weir. The accuracy of level detection is important for verification of dosing, chemical supply management and reporting. Therefore, the recommendation is to maintain the level of accuracy of current operations with a radar lever detector which can be seated outside of corrosive conditions.

## 1.9 Chemical Feed and Mixing

### 1.9.1 General Description

Currently the chemical is fed at a location over 900 feet from the chemical feed building. The chemical is injected into the top of a 36" diameter concrete culvert. This system was installed during the 2013 project. Note that original drawings show the culvert as being 24" but this was changed to 36" during construction, according to as-built drawings.

Currently no active or passive mixing systems are installed to assist with mixing of the chemical after injection. The design presents several challenges to mixing, including that the pipe is a relatively large 36" diameter. The culvert often flows partially full, it is not desirable to create head inside the pipe and potentially increase water levels upstream, and leaves, sticks, and other debris sometimes passes through the pipe.

Debris passing through the pipe makes it difficult for most types of mixers to be installed. A bar screen or rack can be installed on the upstream side of the culvert. However, the screen would need to be cleaned regularly to allow water to continue to pass through the culvert and so that significant head is not created, leading to higher water levels upstream and potential bypass. The remote location of the culvert would make regular cleaning difficult, but if PLSLWD staff feel that it is feasible, then this can be a reasonable option. Instrumentation, such as level sensors, can be employed to detect if the entrance to the culvert becomes excessively clogged, but there is no power at the injection site so solar panels and batteries would have to be installed, leading to additional cost and maintenance requirements.

There are multiple options for mixing, including both static and dynamic mixers, but each presents a challenge. Static mixers are typically most effective with flow velocities of 5-10 ft/s, which is higher than would typically be seen in the culvert. Static mixers may also cause small debris or sediment to accumulate, even if a screen is upstream. A dynamic or motor-driven mixer would be most appropriate for the application, but no electrical power is present at the feed location. Therefore, a solar power system would likely be required, potentially with a battery system, creating additional costs. A top mounted mixer could be installed in a manhole into the top of the culvert, with multiple impellers to allow mixing at low water levels. Small debris, however, would likely catch on to the impellers, requiring regular cleaning, even if an upstream screen is used. A mixer downstream of and perhaps adjacent to the manhole, within the desiltation pond, could be considered, but it also brings a variety of challenges, including installation and maintenance of the mixer in the pond, and possible interference with solids settling. Therefore, it is not generally recommended for this application. The challenges detailed in the preceding paragraphs would similarly apply to the proposed mixing detailed in the District's Upper Watershed Blueprint report ($FeCl_3$ System Improvements Alternative 1), as well as face additional permitting and land acquisition barriers.

It should be noted that it is difficult to evaluate the mixing effectiveness of the existing system. Furthermore, it is unclear whether providing additional mixing would provide benefit to phosphorus removal, particularly considering the capital cost and maintenance requirements. Further studies could be performed on the mixing, but such studies would likely not provide significant value, considering the cost. If more effective phosphorus removal is desired, alternative chemicals may be a more feasible option, as discussed in future sections.

***Figure 6: Interior of Chemical Feed Manhole at Injection Point.***

### 1.9.2 Summary and Recommendations

Screening and mixing can be installed but come with significant disadvantages. The existing system does require some regular maintenance to remove large sticks and debris, but increased maintenance would be required if a screen is installed.

A mixing system may provide some benefit to phosphorus removal, but that benefit may be quite small compared to the additional cost and maintenance. If more effective phosphorus removal is desired, alternative chemicals may be a more feasible option, as discussed in future sections.

The choice of installing a screen and mixing system is difficult to justify from a technical and cost standpoint (see **Table 5** for costs of several options for mixer improvements). Therefore, from an engineering and cost standpoint, installing a mixing system is currently not recommended. If at some point in the future, the entire culvert and injection site are overhauled, the addition of mixing would be more cost-effective and should be considered. It should be noted, however, that addition of mixing at this time is possible and it is not uncommon for system owners to select improvements based on preference rather than cost alone. Therefore, the PLSLWD may opt to install it based on preference.

## 1.10 Hydraulic Performance and Impacts of Backwater

### 1.10.1 General Description

The location of the FeCl treatment system desiltation pond includes a complex hydraulic situation that negatively impacts the performance of the system arising from high water levels downstream on Spring Lake. The backwater or tailwater in this relatively flat drainage system is a considerable factor. In addition to the natural backwater issues, State agency permitting requirements in the past resulted in a change to the configuration of the dosing location to a culvert going into the pond and using a high flow bypass weir that is directly in the historic ditch route.

The current configuration directs flows to turn west 90-degrees through a 36" culvert, where ferric chloride is added, into the settling or desiltation (desilt) pond for floc removal. In higher flow regimes, the high flows would flow over a sheet pile weir and continue directly down the existing ditch, untreated. This was required and intended to prevent high flows from entering the settling pond area, with the intent of preventing high flows from scouring or resuspending iron-phosphorus floc flushing it out into the ditch and downstream Spring Lake.

It has become apparent that when Spring Lake downstream is high during higher flow periods, often corresponding to when it is ideal to treat the water, it interferes with this intended diversion of water into the treatment system. When the lake is high, backwater/tailwater will in essence back up into the desilt pond causing water to then just flow over the submerged weir and straight down the ditch with no or minimal treatment. This short-circuiting situation of the treatment system prevents even lower and moderate flows from being diverted and treated and negatively impacting the effectiveness of treatment. In the past, additional outlets from the desiltation pond into the adjacent wetland were added to give additional treatment and filtering of the discharging water. Currently those added outlets are negatively impacted by the backwater conditions, as illustrated on the water level graphs.

Plotting of water levels and tailwater conditions shown in the graph illustrates high tailwater downstream that may reduce the effectiveness of diverting flow away from the dosing zone and desiltation pond. The water levels are above the desiltation pond outlet (green line) for long periods of time in most years. This interferes with treated water being directed into the wetland via the two additional outlets in the northwest portion of the pond. As the water levels get near the overflow weir elevation, flow begins to use that overflow path and bypass the treatment, as shown in the photo below. The summary here illustrates a complicated system that changes through time and is not just subject to one storm but varies over multiple storms and time. Modifications to the weir in the main channel at the dosing culvert/desiltation pond junction and/or other changes should be explored further to determine if retrofitting can reduce the bypass of untreated water and thus improve treatment in these periods.

In the graphs below, **Figure 9** and **Figure 10**, it illustrates that during higher flow periods, when more pollutants are being transported, the backwater effects of Spring Lake are interfering with the proper flow routing and performance of the treatment. **Figure 9** from 2024 illustrates that during the summer months and higher flows, when concentrations of the pollutant Phosphorus are the highest and most impactful, a portion of the flow appears to be bypassing, untreated, and going directly into the lake.

***Figure 7: Water Flowing Untreated Over the Weir, With Tailwater Nearing Weir Level, Spring 2023.***

Much of the year shown in the figure has water levels higher than the desiltation pond outlet. The secondary outlets into the wetland for increased removal and filtering that were added in the past, are also being impacted even at lower water levels, such as when water levels exceed the desiltation pond outlet (green line), since they are placed at lower elevations. A brief review of historic desiltation pond records has some indication that the desiltation pond outlet may have been lowered, either by intentional alterations or natural forces, over the years, and should be investigated further. The lower outlet for the desiltation pond results in greater backwater interference into the pond. This assessment identifies the tailwater interference issue. To quantify this bypass and split flows, a more in-depth analysis would be needed. A calibrated and refined hydrologic and hydraulic (H&H) model of this specific area would be needed to quantify the impact of this situation. The model would also allow for testing of potential retrofit ideas that could improve the performance.


***Figure 8: Configuration of the Flows in the Treatment System and Overflows.***

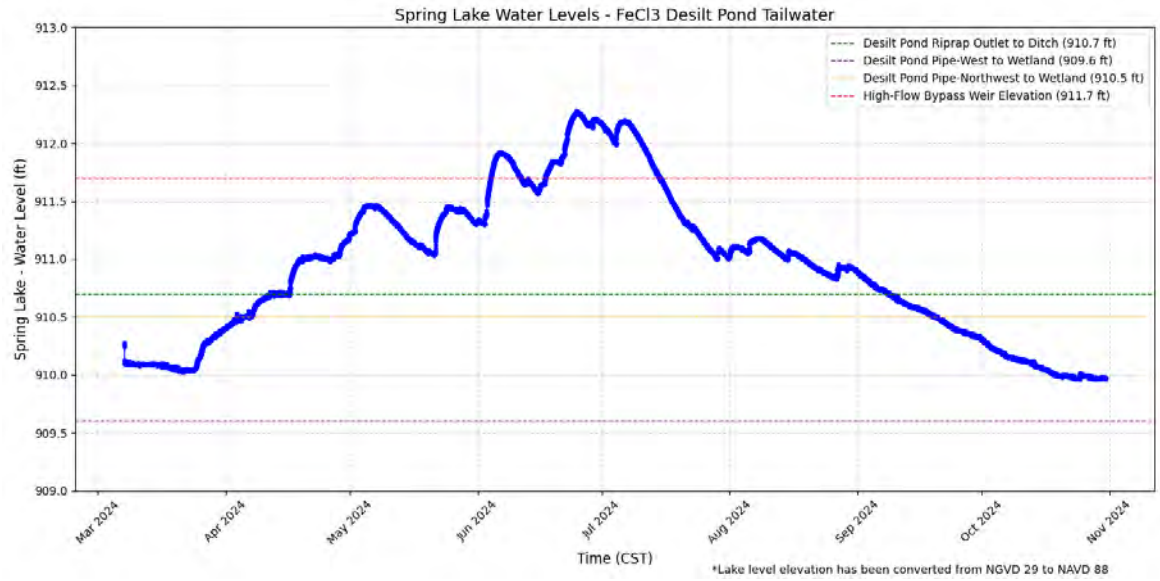



***Figure 9: High-Water Levels on Spring Lake Impacting Performance when Near or Exceeding High-Flow Weir – Recent Data from 2024.***

**Figure 10** below shows that most years, 9 of the last 11 years, have periods when the lake water levels are backing up into the desiltation pond to the point that it exceeds the high flow weir. Given that these higher water levels correspond with higher flow periods in the system, the potential for bypasses of untreated water is greater. In moderate/low flow periods, removal of phosphorus is likely occurring consistently with the system intent, but with the reduced loads of those flow regimes.

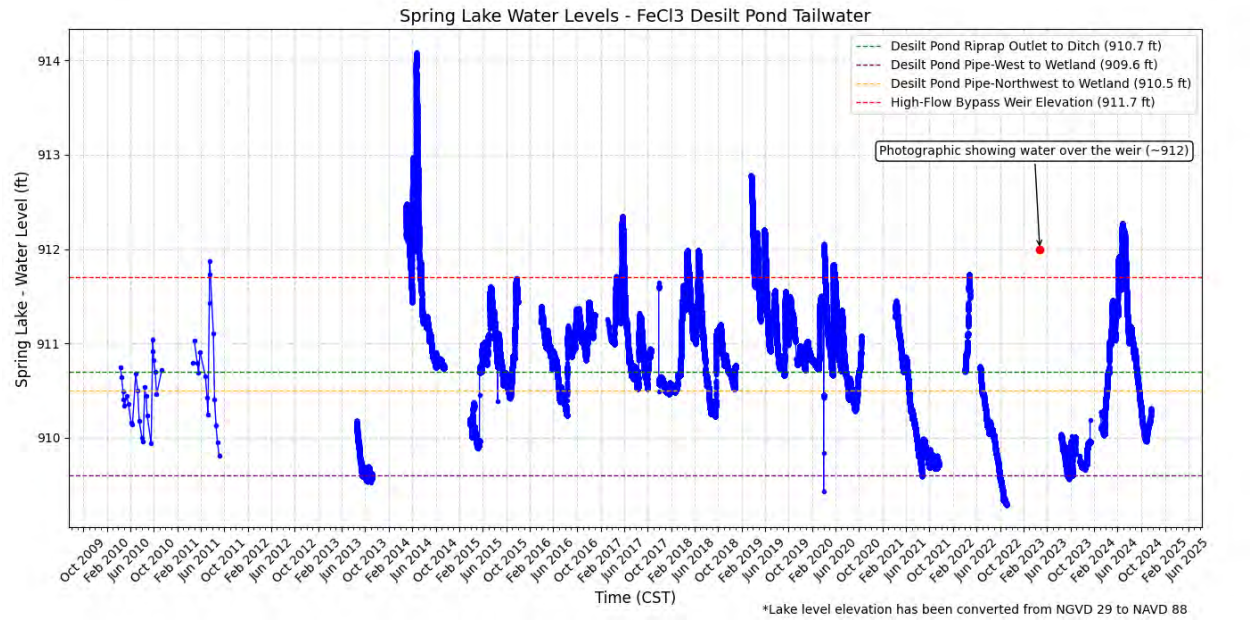



***Figure 10: Past Records of High-Water Levels on Spring Lake Impacting Performance – Levels Exceeding High-Flow Weir in 9 of the Past 11 Years.***

### 1.10.2 Summary and Recommendations

From this initial review, it is clear that a more in-depth analysis, using an updated, refined, and calibrated hydrologic and hydraulic (H&H) model will better allow the district to quantify impacts and vet possible retrofit and facility improvements to reduce the bypass of untreated water to Spring Lake. With changing climate and the greater frequency of larger events occurring during summer months, the impacts of the flat hydraulic system and backwater should expect to be both more frequent and higher levels of interference.

## 2 DRIVE ACCESS ALTERNATIVE ANALYSIS

The driveway access to the ferric chloride ($FeCl_3$) tank and dosing facility is a gravel drive and relies on coming through a private property, albeit with an easement. The current layout is barely workable, as it is a difficult-to-maneuver turn for the delivery of tanker trucks that are sometimes used to fill the tank. In the past, the orientation and size of the access drive has caused a truck to become stuck off the side of the entrance, rutting the adjacent lawn. The truck tanker company has indicated that it can only back down the driveway to the building, which requires the truck to do several maneuvers out in the state highway 13 near a curve. The trucks need to temporarily block both lanes of traffic, which can require police traffic direction and create traffic hazards for the tanker truck and other drivers. In order to remain on good terms with the adjacent landowner and have an appropriate turning configuration for delivery, four alternatives were developed. This summary outlines the four proposed alternatives, along with costs, to make improvements to the entrance to the access lane.

Each alternative includes a summary of the design, estimated quantities, and engineer's cost estimates for an improved access configuration. The work included contacting the trucking delivery company for their feedback on issues and ideas, finding easement information, modeling truck movements with truck turning analysis software for the large tanker trucks, and meeting on-site with the property owners whose driveway is affected.

The preliminary design sheets are included in **Appendix A-D**.

The designs assumed the following:

- Poor soils on site, to build the pavement subgrade to the standards for tanker trucks. There are no soil borings in the proposed areas of construction, so this is a conservative assumption.
- No topographic survey or geotechnical analysis has been completed.
- Prioritize working within the confines of the existing easement and the county/state right of way. Alternatives 2 and 3 include proposed construction outside of the existing easement and thus would require additional legal access. Based on landowner feedback, concrete would likely be necessary for negotiations of the additional easement.
- The area of disturbance is anticipated to be under 1 acre, but an Erosion Control Supervisor should be required to ensure good practice.
- Trunk turning analysis is based on WB-67 Interstate Semi-Truck (AASHTO 2011) to determine the footprint of the drive surface footprint necessary to complete the proposed route.

  - It is important to note that EOR assumed the largest truck size, at the district's request, to have all options available for deliveries for alternatives 1-3.
  - Though some deliveries have been made with smaller quantities and with smaller trucks, see alternative 4.
- For the pavement design EOR assumed:
  - 26" excavation where the driveway is getting constructed or replaced.
  - 10" granular replacement for stability.
  - 4" surface aggregate.
  - 12" base aggregate.

The engineer's cost estimates include the following assumptions:

- This scoping-level (Class 5, 0 to 2% design completion per ASTM E 2516-06) cost estimate is based on preliminary-level designs, alignments, quantities, and unit prices. Costs will change with further design.
- The total project cost includes construction costs and professional fees.
- The professional fees include:
  - Permits and Legal Fees (10% of Construction Cost)
  - Design and Construction Engineering (30% of Construction Cost)
- Unit prices are based on the current industry prices (2023).
- Time value-of-money escalation costs are not included as a construction schedule is not available at this time.
- A 20% construction contingency. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of completion of design but are not included at this level of project definition.
- A detailed breakdown of each cost estimate is included in **Appendix E-H**.
- Additional Easements, when needed, are qualified in terms of area, and are demonstrated in each cost estimate where necessary.

All alternative cost estimates also include the following additions based on the district's and landowner's feedback. The landowner expressed concerns about recurring potholes in the driveway up to the easement. EOR included the cost of converting the gravel driveway, from Highway 13 to the easement, to nonerodable concrete pavement to prevent further erosion and maintenance. Asphalt was considered, however, with sharp wheel turning movements of large trucks, asphalt is prone to damage, so a more conservative concrete drive is included here. The district would also like to improve public safety by including a gate at the entrance to the facility access road to prevent unauthorized people from parking in isolated spots down at the end of the drive near the building.

## 2.1 Alternative 1

Alternative 1 represents the existing route with proposed stabilization along the driveway. The proposed route assumes a truck approaching from East to West on Highway 13. Below is an outline of the proposed truck path for alternative 1.

The required maneuvers for each delivery include:

- Trucks approach from East to West and stop on the shoulder of Highway 13 (purple)

- Trucks back up from the shoulder of Highway 13 to the driveway, including proposed additional stabilization along the driveway (blue).
- After the truck has unloaded, it will pull forward through the driveway crossing into the left lane and then switching to the right lane (red).

The advantages of this alternative are that a) trucks remain within the current easement and b) stabilization of the current driveway which alleviates the rutting issues. The disadvantages of this alternative are that a) the trucks still must back up across lanes of oncoming traffic when entering the site and driveway and b) the delivery drivers have expressed concerns about the current route because of the time required to maneuver on the highway. The cost estimate for this alternative is $229,500. The estimated costs are summarized in **Table 1**. The details of the estimated quantities and engineer's cost estimate are summarized in **Appendix E**.

## 2.2 Alternative 2

This alternative includes the truck pulling into the private driveway and backing into the access road. Below is an outline of the proposed truck path for alternative 2.

The required maneuvers for each delivery include:

- Trucks approach from East to West and turn into the driveway past the easement boundary (purple).
- Trucks back up the driveway to the access road to the $FeCl_3$ building (blue).
- After the truck has unloaded, it will pull forward through the driveway crossing into the left lane and then switching to the right lane (red).

The advantages of this alternative are that a) reduces the time maneuvering on Highway 13 and b) includes stabilization of the current driveway which alleviates the rutting issues. The disadvantages of this alternative are that a) the truck traffic route leaves the easement and enters private property, b) requires stabilization outside of the easement on private property. The cost for this alternative is $310,300. The estimated costs are summarized in **Table 1**. The details of the estimated quantities and engineer's cost estimate are summarized in the **Appendix F**.

## 2.3 Alternative 3

Alternative 3 was suggested by the trucking company, based on a desire to minimize maneuvering on Highway 13. This alternative includes the construction of a truck turnaround in front of the $FeCl_3$ building. Below is an outline of the proposed truck path for alternative 3.

The required maneuvers for each delivery include:

- Trucks approach from East to West and turn into the driveway.
- Trucks can continue moving forward through the access road and around the turn around and unload.
- After a truck has unloaded, it will pull forward through the driveway crossing into the left lane and then switching to the right lane (red).

The advantages of this alternative are that a) reduces the time maneuvering on Highway 13, b) trucks do not have to back up and c) includes stabilization of the current driveway, which alleviates the rutting issues, as in Alternatives 1 & 2. The disadvantages of this alternative are that a) truck traffic route leaves the easement and enters private property and b) requires stabilization outside of the easement on private property. The cost for this alternative is $450,200. The estimated costs are summarized in **Table 1**. The details of the estimated quantities and engineer's cost estimate are summarized in the **Appendix G**.

### 2.4 Alternative 4

Alternative 4 represents the existing route with proposed stabilization along the driveway. The proposed route assumes using a single frame truck with no trailer (40 feet length) approaching from East to West on Highway 13. Below is an outline of the proposed truck path for alternative 4.

The required maneuvers for each delivery include:

- Trucks approach from East to West and stop in the travel lane of Highway 13 (Purple).
- Trucks back up from the travel lane of Highway 13 to the driveway, including proposed additional stabilization along the driveway (red).

The advantages of this alternative are that a) trucks remain within the current easement and b) reduce the amount of stabilization to the current driveway (compared to the other alternatives). The disadvantages of this alternative are that a) the trucks still must back up across lanes of oncoming traffic when entering the site and driveway b) the delivery drivers have expressed concerns about the current route because of the time required to maneuver on the highway and c) since the improved driveway is limited to this alternative only the modeled size truck can utilize the driveway. The estimated cost for this alternative is $25,700. The estimated costs are summarized in **Table 1**. The details of the estimated quantities and engineer's cost estimate are summarized in the **Appendix H**.

***Table 1: Engineer's Cost Estimate Summary.***

| Alternative | Construction Cost | Professional Fees | Contingency | Total Capital investment |
|---|---|---|---|---|
| **Alternative 1** | $136,600 | $54,650 | $38,250 | $229,500 |
| **Alternative 2** | $184,700 | $73,900 | $51,700 | $310,300 |
| **Alternative 3** | $268,000 | $107,200 | $75,000 | $450,200 |
| **Alternative 4** | $15,300 | $6,100 | $4,300 | $25,700 |

Alternative 4 is coupled with the facility updates for Alternative A and Alternative 1 is coupled with the facility updates for Alternative B, see Section 3, **Table 3**.

## 3 SUMMARY OF RECOMMENDED IMPROVEMENTS - ALTERNATIVES AND COST ASSESSMENT

The table (**Table 2**) below summarizes the age, expected life, deficiencies and recommendations for the equipment described in the above section. Depending on the item and the district's discretion, some components may be replaced directly by District staff themselves, whereas other items may

be designed and executed by the district engineer, or a hired consultant or contractor. Elements involved in routine maintenance by staff could likely continue in-house.

***Table 2: Summary of Existing Equipment.***

| Item | Estimated Age | Typical Life | Deficiencies | Recommendations |
|---|---|---|---|---|
| Chemical Feed Pump | 10 years | 8-12 years | Advanced age. | Replace when the pump fails. |
| Valves | 10-20 years | 10-20 years | Advanced age. | Test/exercise valves regularly. Replace when fails or at owner's discretion. |
| Pressure Switch | Unknown | 5-10 years | Advanced age. Reports of possible malfunction. | Replace unit. |
| Chemical Feed PVC Line | 10 years | 20-30 years | No significant deficiencies | Continue regular maintenance. Repair as needed. Re-evaluate conditions in the future. |
| Chemical Feed Flexible Tubing | 10 years | 2 years | Manufacturers recommend replacing it every 2 years | Replace all. Convert most to PVC inside building. Create regular replacement plan for any remaining tubing. |
| Chemical Storage Tank and Containment | 25 years + | 15-30 years | Aged tank. Incompatible Lid. It is difficult to replace it with long delivery times. PVC pipe in pump containment area drains to ditch. | Replace the tank with one of alternatives. Seal PVC pipe in pump containment area. Move chemical fill points to inside containment. |
| Building | 25 years + | 25-50 years | Does not allow for ease of replacement of tank. Rodents present. | Modify the building by adding large garage doors and modifying the west wall of containment. Seal holes for rodents. |
| Weir Level Sensor | 10 years | 5-7 years | Sensor and Datalogger have both failed and are non-functional. | Replace with radar level System and associated controls. |
| Tank Level Sensor | 10 years | 5-7 years | Aged. It is installed inside of the tank. | Replace with radar level system (that matches system at weir) |
| Chemical Feed Culvert Screening | Not Present | N/A | N/A | It can be feasible but involves significant additional maintenance and cost. |
| Chemical Feed Mixing | Not Present | N/A | N/A | Not recommended from engineering and cost standpoint but can be optionally added based on Owner's preference. |

As discussed in the previous section, several improvements are recommended in the immediate future. These items were sized and selected on a preliminary basis in order to estimate project costs. These improvements include:

- Replace the pump's pressure switch.
    - The existing switch is aged and may possibly malfunction. The switch is a requirement of the MnDOT's right-of-way permit. A replacement switch is relatively low cost.
- Replace the storage tank's ultrasonic level sensor with a radar level detector.
    - The existing level sensor is past its expected service life.
    - A radar level detector can sit outside the tank, extending the detector's life and allowing for easier maintenance, whereas the existing ultrasonic sensor must be inside the tank to work.

  - Radar level detectors on average also have a longer service life than ultrasonic systems.
  - The unit can be purchased directly from the manufacturer to reduce the costs of purchasing through a manufacturer's representative.
- Replace the ultrasonic level sensor and datalogger at the weir.
  - The sensor and data logger of the ultrasonic system have failed. Replacement with a radar system would provide updated equipment and standardization with the radar level detector that is recommended for installation on the chemical storage tank.
- Replace the poly-vinyl chemical feed tubing. Convert most of the poly-vinyl tubing within the building to PVC.
  - The existing tubing is past the manufacturer's recommended life.
  - The tubing inside the building has had multiple leaks with spot repairs.
  - Changing to PVC will avoid requiring frequent future replacement.
  - For any tubing that must remain poly-vinyl to preserve its functional operation (i.e., around the pump), it is recommended to establish a maintenance plan to replace the tubing every 2 years.
- Purchase Personal Protective Equipment (PPE) to be kept at the chemical feed building.
  - This is essential for ensuring all personnel (whether PLSLWD staff or from outside) have access to safety equipment needed for chemical feed systems.
  - This includes an insulated jacket for the existing eyewash system to avoid the potential of freezing in late fall months.

The existing tank could fail at any time. It also does not currently have a lid that fits. To solve this, two alternatives for modifications to the tank and building were developed and are as follows:

## 3.1 Alternative A

- Replacing the existing tank with a double wall polyethylene tank
  - This double walled tank provides containment while also allowing the system to continue running if the inner tank fails.
  - A 3,150-gallon tank was preliminarily selected to meet chemical feed needs as well as fit into the existing building.
    - This may cause higher chemical and delivery costs due to being smaller than a full tanker size of 4,000 gallons.
- Install Garage Door on west side of existing building and modify the west wall of the concrete containment.
  - This allows the storage tank to be easily replaced both now and, in the future, in the event that the tank fails. Allowing for replacement of the tank is critical to maintaining the system in the future.
  - The concrete containment can be demolished because the double walled storage tank provides containment. A small curb will remain for small spills.
  - Optional removable waterproof barriers can be used to provide additional containment, if desired.
- Update drive access with Alternative 4, see section 2.4.

## 3.2 Alternative B

- Replacing the existing tank with four single-wall polyethylene tanks
    - The additional number of tanks provides redundancy, allowing for the system to continue running in the event that a tank fails.
    - 1,100 gallons tanks were preliminarily selected to fit into the existing building. The total volume of 4.400 gallons maintains the existing capacity and allows for delivery of a full tanker, potentially reducing chemical and delivery costs.
    - The smaller tanks reduce the required containment volume.
    - This alternative will require more piping and valving within the building as well as additional level sensing equipment. This alternative includes 4 radar level sensors (purchased directly from the manufacturer for a reduced cost).
- Install Garage Door on west side of existing building and modify the west wall of the concrete containment.
    - This allows the storage tanks to be easily replaced both now and, in the future, in the event that a tank fails. Allowing for replacement of the tank is critical to maintaining the system in the future.
    - The smaller tanks can also more easily be brought in and out of the building, over a containment wall, allowing for a short concrete containment wall to remain in place.
- Update drive access with Alternative 1, see section 2.1.

Equipment costs, installation, general project costs, engineering, permitting, legal, and a contingency that is typical of this stage in the project are included in the costs below, **Table 3**.

To take into account potential differences in operation cost, primarily due to differences in chemical and delivery costs, as well as, replacement of level sensors on the tanks, the net present value of Alternatives A and B were calculated to develop Life Cycle Costs, **Table 4.**

Estimated chemical costs from multiple chemical suppliers were obtained comparing the cost when a full tanker can be received as compared to when delivery of a full tanker is not possible. Based on preliminary cost numbers from Hawkins Chemical, Hydrite, Wausau, Univar, and Harcros, it is estimated that a full tanker delivery would reduce average costs from $3.75 per gallon to approximately $1.91-3.64 per gallon, depending on the supplier. An estimated average of $3.01 per gallon is used for the life cycle cost comparison.

***Table 3: Recommended Improvements, Project Cost.***

| Improvement | Estimated Project Installed Cost* | |
|---|---|---|
| | Alt. A | Alt B. |
| Replace Tank (Including all appurtenances) | $35,400 | $40,600 |
| Install Garage Door and Demolish West Wall of Containment | $15,400 | $12,100 |
| Replace Tank Ultrasonic Level Sensor with Radar Level Detector(s) | $1,000 | $4,000 |
| Replace Ultrasonic Level System at Weir with a Radar Level System and Controls | $10,000 | $10,000 |
| Replace Pressure Switch | $300 | $300 |
| Replace Chemical Feed Tubing (With Mostly PVC) | $3,600 | $3,800 |
| Personal Protective Equipment | $2,100 | $2,100 |
| Seal Building Holes from Rodents | $500 | $500 |
| Heated, Insulated Eye Wash | $2,000 | $2,000 |
| Driveway Improvement | $15,300 | $136,600 |
| General (mobilization, demobilization, etc.) (10%) | $8,600 | $21,200 |
| **Total Construction Cost** | **$94,200** | **$233,200** |

| | | |
|---|---|---|
| Permits and Legal Fees (10% Construction) | $9,400 | $23,300 |
| Design and Construction Engineering (30% Construction) | $28,300 | $70,000 |
| Contingency (20% of Construction, P&L, Design & Const. Eng.) | $26,400 | $65,300 |
| **Total Capital Investment** | **$158,300** | **$391,800** |

**All costs have been rounded up to the nearest $100.*

***Table 4: Operation and Maintenance Life Cycle Costs.****

| Item | Alt. A | Alt. B | |
|---|---|---|---|
| **Chemical Cost Calculation** | | | |
| Cost per Gallon | $3.75 | $3.01[1] | $/gallon |
| Deliveries Per Season | 3 | 2 | Deliveries/Year |
| Gallons Per Delivery | 2640 | 4000 | Gallons/Delivery |
| Fuel, Freight, etc. | $65 | $299 | $/Delivery |
| Cost per Delivery | $9,965 | $12,339 | $/Delivery |
| **Annual Costs** | | | |
| Annual Chemical Cost | $29,895 | $24,678 | $/Year |
| Annual Maintenance Cost (roughly estimated) | $5,000 | $5,000 | $/Year |
| **Net Present Value Calculation** | | | |
| Operation Life | 20 | 20 | Years |
| Discount Rate | 5% | 5% | % |
| Net Present Value Factor for Annual Cost | 12.46 | 12.46 | |
| Net Present Value of Annual Costs over Lifetime | $434,900 | $369,900 | $/Lifetime |
| **Replacement Costs** | | | |
| Tank Level Sensor Replacement (10-year life) | $1,000 | $4,000 | $/Lifetime |
| Weir Level Sensor Replacement (10-year life) | $10,000 | $10,000 | $/Lifetime |
| Pump Replacement (10-year life) | $5,000 | $5,000 | $/Lifetime |
| Valves and Other Sensors Replacement (estimated) | $4,000 | $4,000 | $/Lifetime |
| Net Present Value of Annual Costs over Lifetime | $434,900 | $369,900 | $/Lifetime |
| Total Replacement Costs | $20,000 | $23,000 | $/Lifetime |
| 15% Contingency of Replacement and Annual Costs | $68,200 | $59,000 | $/Lifetime |
| Total Capital Investment (From **Table 3**) | $158,300 | $391,800 | $/Lifetime |
| **Total Net Present Value** | **$681,400** | **$843,700** | **$/Lifetime (Total)** |

**Note that estimated maintenance and replacement costs were included and that are the same between alternatives to give a more representative estimate of total Net Present value (NPV) costs. NPV is currently the gold standard method for comparing the cost of two alternatives. The total NPV is meant to be a comparative value, primarily to aid in alternative selection, and does not represent a cost the PLSLWD is expected to pay at this time.*

*[1]This is an estimate based on several quotes provided by chemical suppliers. Actual prices could be higher, depending on the supplier selected.*

As shown in **Tables 3** and **Table 4**, Alternative A is less expensive, from a capital and life cycle perspective, primarily because of the cost of driveway improvements. Furthermore, although alternative B provides benefits of redundancy, reduced risk during spillage, and greater ease of tank replacement, Alternative A is somewhat simpler, requiring only one tank. Therefore, Alternative A appears to be the preferred alternative.

## 3.3 Optional Improvement Options and Cost

Note that although the following improvements are not currently recommended, the PLSLWD may wish to pursue optional improvements, such as replacing the existing chemical feed pump, chemical feed building or adding mixing at the chemical feed point. Although these additional improvements are not recommended, they are also not discouraged and may be implemented at the discretion of PLSLWD. Therefore, the estimated cost of these improvements is provided for the sake of information.

- Screening for culvert upstream of chemical feed point
    - A simple bar screen can be installed upstream of the culvert.
    - Installation of a screen will require additional maintenance to ensure the screen does not become clogged.
    - Instrumentation can optionally be installed to monitor water levels upstream and downstream of the screen. Note however, that power is not currently present at the feed point. Therefore, solar with battery storage (for nighttime alarms) would likely be the best option for power. Furthermore, cellular signal alarms would be necessary for communicating to operators so that the screen is clogged.
- A motor driven mixer within the culvert, downstream of the chemical feed point
    - As noted in the previous section, a dynamic (motor driven) mixer would likely be the most appropriate mixing option, given the current chemical feed design.
    - Note that installing a mixer would also require installation of the upstream screen as well as solar with battery storage.
- Installing a 4,500-gallon double wall tank
    - A larger double wall tank will allow for larger deliveries but will require a larger building. This option is likely not necessary because Alternative B provides the same advantages without the need for a larger building.
- Replacing the existing metal building
    - Although the existing building is in good working condition, replacement may be preferred by PLSLWD.
- For Alternative A, adding a removable waterproof barrier to the west side of the chemical containment area to replace the demolished wall, but still allow for tank replacement.
    - This can add additional peace of mind to chemical containment, providing a tertiary containment contingency to the double wall tank.
- Replacing chemical feed pump skid
    - The existing pump is advanced in age, and replacement can be performed at this time to consolidate costs and reduce maintenance/replacement difficulty for PLSLWD staff.

The estimated costs of these optional improvements are shown in **Table 5** below.

***Table 5: Estimated Costs for Optional Improvements.***

| Option Number | Optional Improvement | Estimated Project Installed Cost* |
|---|---|---|
| 1A | Screen Only, Upstream of Chemical Feed Culvert | $13,900 |
| 1B | Screen with Instrumentation/Alarms for Cleaning (Includes Screen, Level detectors, Solar, Battery, and Cellular system) | $58,300 |
| 1C | Mixer System (Includes Screen, Solar, Battery, and Mixer. Does not include Instrumentation/Alarms, Cellular) | $44,400 |
| 1D | Mixer System with Screen Alarms (Includes Mixer, Screen, Solar, Battery, Instrumentation/Alarms, Cellular) (Most comprehensive option) | $74,700 |
| 2 | 4500 Gallon Double Wall Tank | $84,400 |
| 3 | Demolish Existing Metal Building and Construct Larger Building | $88,900 |
| 4 | Removable Waterproof Barrier for Additional Containment | $10,000 |
| 5 | Chemical Feed Pump Skid | $13,600 |

*Includes Install, Contingency (20%), Permits and legal fees (10%), and Engineering (30%).

## 3.4 Potential Permits and Funding Options

### 3.4.1 Permits

PLSLWD will be required to submit engineered plans and specifications to the MPCA for any major construction or changes to the feedline (this excludes minor changes to the existing system of general maintenance). The MPCA's technical review and approval process for treatment facilities confirms that proposed projects will comply with state permits/rules and recognized engineering practices and meet reliability criteria. The items below provide a list of the required submittals.

- Plan and Specification Submittal/Approval
- New Construction Stormwater Permit if there is more than 1 acre of land disturbance planned.

The NPDES permit will also be updated if there are construction updates or significant changes to chemical application. The district is meeting with the MPCA to discuss possible permitting requirements and hurdles for changing the chemical classification at the facility. The permitting requirements will be included in the final report. From experience with re-permitting the $FeCl_3$ facility, EOR expects the district will have to perform rigorous monitoring to ensure that the discharge requirements of the permit are met.

Note that the current NPDES permit (MN0067377) expires August 31, 2025. A permit application will need to be submitted 6 months before that date to renew the NPDES permit. That form can be found here: https://www.pca.state.mn.us/business-with-us/wastewater-permit-forms

### 3.4.2 Funding

Infrastructure improvements in the PLSLWD may be eligible to receive financial assistance in the form of grants or loans for the project through the Minnesota State Revolving Fund (SRF). The Minnesota SRF funds stormwater projects with low-interest loans called Clean Water Revolving Fund (CWRF) loans. The district may be eligible if the project meets the following requirements:

- The project addresses water quality needs (ponds for water quality may also include associated flood control benefits).
- The project consists of permanent stormwater treatment structures.
- The project is based on accepted engineering practices that result in water quality benefits. The determination as to acceptability will be based on reasonable assurance of providing water quality benefits.
- The applicant must be a local government such as a city, county, township, sanitary district, watershed district, or other governmental subdivision.
- The applicant must demonstrate the financial capacity to repay the loan, and that complete financing of the project is in place.

It appears the PLSLWD meets these eligibility requirements. There may also be an opportunity for principal forgiveness (grant) of up to 25% of the loan up to a maximum of $1 million through the Green Project Reserve (GPR). To be eligible for GPR principal forgiveness, the project must address green infrastructure, water or energy efficiency, or other environmentally innovative activities. Only the

project costs associated with advancing these four categories will be eligible for 25% principal forgiveness. The list below provides a guideline for applying for funding through the CWRF program.

1. Apply to MPCA for placement on the Project Priority List - Due March 1, 2024
2. Submit Project Plan to MPCA for placement on Intended Use Plan (IUP) – Due March 1, 2024
3. Submit project Plans and Specifications to MPCA – September 2024

An additional funding option is the Point Source Implementation Grant (PSIG) program also administered by MPCA. PSIG grants are provided to local governments through CWLF that can cover up to 80% of your project costs with a maximum of $7 million. In order to be eligible for a PSIG, a stormwater project must contribute towards meeting waste load reductions prescribed under a total maximum daily load (TMDL) plan required by Section 303(d) of the federal Clean Water Act. The district would only be eligible if the upgrades increased the load reduction from current operations. In order to have the required waste load allocation under a TMDL, a facility must be a permitted Municipal Separate Storm Sewer System (MS4). Additionally, the project must be located within the bounds of the MS4. The district is only an MS4 for a section of the Prior Lake Outlet Channel and would need to partner with Spring Lake Township for this funding source.

It should be kept in mind that pursuing grants or other funding can require significant time investment. For projects of a smaller size, the cost of pursuing grants can sometimes offset the benefit they can provide. The threshold at which grants become more cost effective depends on the percentage of the project covered, the cost of the project, and cost of staffing/labor to pursue the grant and submit appropriate paperwork. As an example, in some cases where less than 30% of a project is covered by a grant, the project cost may need to exceed approximately $500,000 for the benefits to exceed the cost. Therefore, in many cases a low interest loan may be preferable for smaller projects.

# 4 EVALUATION OF ALTERNATIVE CHEMICALS & DOSING

PLSLWD expressed interest in reviewing the existing dosing and evaluating the potential benefit of utilizing alternative chemicals to ferric chloride (ferric). Ferric has been used since the system started up approximately 25 years ago; however, there are several new chemicals that have assumed relatively widespread use since that time. Some chemicals are merely mixtures of ferric and other chemicals, with polymers added to improve removal and settling. Other chemicals are alternative compounds that can potentially perform better than ferric.

Flow data, orthophosphate, and total phosphorus data were evaluated from PLSLWD's Discharge Monitoring Reports (DMRs) for the past 7 years (since 2016) to evaluate if high flows typically lead to higher P concentrations and compare typical P concentrations to the existing concentration upstream of the weir.

The past data shows that flow is not correlated highly with total phosphorus (P) concentrations. However, the P concentrations do show a clear seasonal trend, with higher concentrations in the summertime, as shown in **Figure 11** below. This can be most clearly seen in 2016-2020, when there wasn't significant drought and measurements were taken monthly. In 2023, due to a drought, there

was no flow over the weir after June 6, 2023. Due to no flow over the weir at Hwy 13, water samples from the wetland would not be representative of typical water quality and phosphorus (P) concentrations.

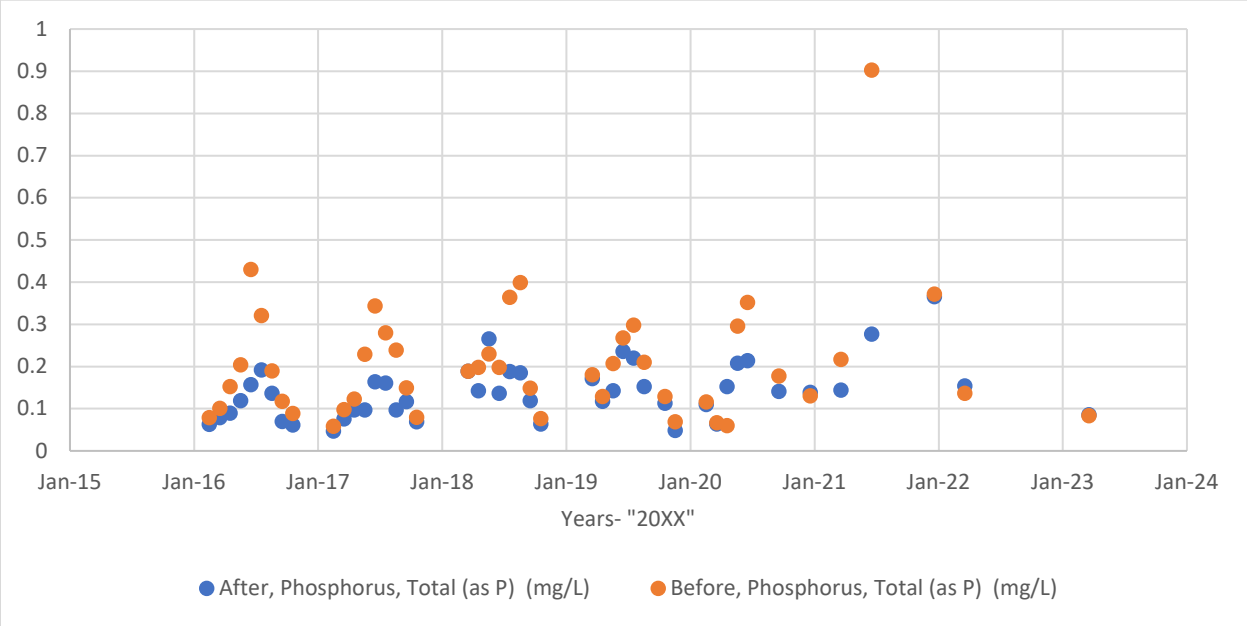



***Figure 11: Total Phosphorus Before and After Treatment from 2016-2023.***

## 4.1 Alternative Chemicals Evaluation

The PLSLWD wishes to evaluate alternative chemicals to ferric chloride to ensure it stays in line with best practices for phosphorus removal in case these have changed over time. Potential alternative chemicals included ferric/polymer blends, Alum/polymer blends, Rare Earth, as well as a variety of Polyaluminum Chloride / Polyaluminum Chlorohydrate (PAC) options.

Alum (aluminum sulfate) stands out as a candidate because it is used in similar applications for phosphorus removal. However, alum will congeal (gel) in low temperatures and the facility often operates late into the fall with cold temperatures. Therefore, while use of alum is possible, it would require heating/insulation of the building as well as heat-tracing/insulating the chemical feed line, which would be very costly and require significant construction. Alum also has issues with pH swings and buffering that make monitoring and intervention more intensive to manage. Alum is therefore not recommended.

Polyaluminum-based chemicals (Polyaluminum Chloride / Polyaluminum Chlorohydrate) are also a promising alternative. They are typically known for providing better removal of the mass of chemicals used, but they are also typically more expensive on a per mass basis. Therefore, the higher cost would need to be balanced or exceeded by higher removal. Furthermore, any change will have costs and logistical requirements associated with changing operation, permits, and maintenance to a new chemical.

Any change in chemical could have unintended consequences, even when existing data show it to be safe. Therefore, caution is encouraged in selecting a different chemical. Note that high doses of some PAC type chemicals, such as AH15667, are sometimes used as a disinfectant to kill unwanted bacterial life in some wastewater facilities. This does not necessarily mean that it is unsafe at low concentrations, but further investigation is needed to ensure it will be safe. Therefore, negative effects to the ecosystem may be possible and we do not have sufficient data to ensure that no negative effects would be caused.

Some other considerations for changing from ferric chloride to another chemical are health and safety hazards, potential gases, potential toxicity to wildlife, and effects on flora/fauna in the natural water body. While alternative chemicals are typically considered safe at the concentrations being considered, there are always possible unknowns when dealing with natural water systems. A further consideration is that of public perception. While alternative chemicals may indeed be safe, they may still create public perception concerns and do not have the track record of ferric chloride. Any current concerns may be quelled because ferric chloride has been used for over 25 years without incident. Changing the chemical can open up potential new concerns from the public, whether they have merit or not. Therefore, changing to an alternative chemical has some risk in this regard. Additionally, the uncertainty of permit approvals with alternative chemicals increases risk and burden substantially. Upon initial investigation from PLSLWD staff, the MPCA does not require review of Ferric chloride and Aluminum sulfate but would require review of the other alternatives (March 2019 Chemical Additive Review Guidance).

Regarding concerns with remaining with ferric chloride, there does not appear to be any significant issues the system is facing due to ferric chloride use. Therefore, there is not a strong driver to move to an alternative chemical. While gases from the ferric chloride can be corrosive, the system has not experienced significant issues because of it. Furthermore, some planned design modifications (such as ensuring the storage tank has a lid that closes completely) should further reduce these issues. The potential alternative chemicals generally all have their own chemical handling requirements which do not stand out as being significantly preferable to ferric chloride for this system.

A concern raised by the PLSLWD is the possibility of phosphorus re-release under anaerobic conditions in the settling pond. Anaerobic re-release with ferric chloride is possible and if anaerobic conditions are present along with disruption of the settled solids, this may be a concern. In most natural water bodies, especially shallower waterbodies, dissolved oxygen levels stay high enough to avoid this. Furthermore, the settled solids are not likely to be disturbed. The solids will also be removed periodically by the PLSLWD, according to their permit requirements. Therefore, phosphorus re-release is not likely, but if it remains a concern, additional testing downstream of the settling pond and/or monitoring dissolved oxygen profiles in the pond in a variety of conditions, are recommended to confirm whether or not it is occurring.

As noted in this report, some initial jar tests were completed on approximately 14 alternative chemicals. The tests found that three alternative chemicals show promise as an alternative to ferric (**Table 6**). These initial tests do indicate that a polyaluminum-based chemical can likely provide higher phosphorus removal with potentially less chemical usage, however, as noted, the cost of the chemical is higher on a mass basis. Therefore, the cost per % of Phosphorus removed is approximately similar.

***Table 6: Comparison of Several Chemicals Evaluated in Jar Tests.***

| Dosing Chemicals | Cost ($/gallon) | Percent Removal of Phosphorus in Test | Cost per Percent Removal ($/ % Removal) |
|---|---|---|---|
| Ferric Chloride (Current) | 3.75 | 40% | 9.29 |
| Aqua Hawk 104 | 7.1 | 69% | 10.25 |
| Aqua Hawk 217 | 7.18 | 76% | 9.46 |
| Aqua Hawk 15667 | 6.75 | 78% | 8.62 |

In summary, there does not appear to be a clear alternative chemical that would be a better choice than ferric chloride at the current time. Ferric chloride has not presented significant challenges to its use and therefore there are no strong drivers to move to an alternative. The risks of changing to a new chemical, such as potential issues of public perception, logistical requirements, and costs, appear to outweigh potential benefits, which at present appear to be minimal. Unless new information comes to light, it is recommended to continue using ferric chloride. If the PLSLWD does pursue alternative chemicals further, a polyaluminum-based chemical is likely to be a strong candidate and additional jar testing is recommended to better identify appropriate dosing for the alternative chemical and allow for more accurate cost comparison between ferric chloride and the alternative.

## 4.2 $FeCl_3$ Dosing Evaluation

The P concentration of the 2023 sample used for jar testing was compared to historical data for the water upstream of the weir and it currently shows P concentrations that are approximately 8 times higher than typical, which led to extending the project into 2024. The sampling and jar testing in 2024 is discussed in further detail in **Appendix I**. While two chemical suppliers performed testing, the results from Hawkins were more consistent with the PLSLWD's monitoring station phosphorus values and were considered the more reliable of the results and are summarized in **Table 7** below. $PO_4$ removal efficiency reached 57-65% at a dose of 0.5-58.1 mg/L $FeCl_3$. The Hawkins results did not measure the TSS level in the sampled water, so drawing any correlations due to TSS interference to evaluate its impact on Premoval is not addressed here.

Based on the seasonal increase in influent phosphorus concentrations it is recommended using two different dosing strategies based on the time of year. This summary is during flow periods, and when flow is present, and not when the system is intentionally idled over the winter months of December through February.

- March–May and October–November: Maintain the current $FeCl_3$ dosing of 2.33 mg/L (3.77 gph) for a flow rate of 33 cfs (0.5 m weir level).
- June–September: Increase $FeCl_3$ dosing to 4.0 mg/L (9 gph) to manage elevated phosphorus concentrations effectively.

The anticipated outcomes for dosing optimization included: (A) identifying opportunities to reduce dosing during certain times of the year or flow conditions to lower material costs, and (B) increasing dosing during specific periods or conditions to offset the effects of competing substances that bind $FeCl_3$, thereby enhancing phosphorus removal.

***Table 7: Jar tests results summary from Hawkins.***

| Sample Date | Chemical dosing | Dose $FeCl_3$ (mg/L) | Testing Lab | pH | EC (µS/cm) | Turbidity (NTU) | $PO_4$ as P* (mg/L) | $PO_4$ Removal efficiency (%) |
|---|---|---|---|---|---|---|---|---|
| 05 June 2024 | $FeCl_3$ | 1.5-58 | Hawkins | 7.82 | - | - | 0.47 | 57-65 |

**$PO_4$ concentrations were converted to $PO_4$ as P*

There is still a fair amount of uncertainty in the assessment that have become apparent as the data was analyzed and flow and concentration correlations were not strong nor consistent. There are likely multiple variables affecting the chemistry and removal performance beyond just flow and phosphorus concentration. The seasonal variability and likely presence of competing or interfering substances of the water chemistry that are not constant through time nor season, indicate a complicated treatment setting.

The natural variability of the CD-2 system and system monitoring data and the variable jar test results reinforce the need to monitor the benefits of the proposed changes to the system and be open to additional changes. If changes are implemented and the system is still not operating at good efficiency, further testing across diverse water quality constituents to refine dosing strategies may be warranted. Upgrades could also potentially include smart, real-time automated systems that are sensing real-time differences in water chemistry and flow conditions and would adjust dosing.

# APPENDIX A. PRELIMINARY DESIGN FOR DRIVE ACCESS ALTERNATIVE 1

ANTHONY C DERHAAG
REVOCABLE TRUST

LEVIN, TERRI

FINK, ALLEN C & LINNEA

Co. Rd.
13

LANGFORD BLVD

WB-67 - Interstate Semi-Trailer

30

935

940

940

935

930

925

920

EXISTING FENCE

HOUSE

BUSCH, DEBORA MARY

EXISTING FeCl BUILDING

KLOTZ FAMILY LTD PTNSHP NO 1
& C/O GLENN & DARLENE KLOTZ

N

0 20 40 Feet

TRUCK PATH FORWARD EAST TO WEST

TRUCK PATH BACKING WEST TO EAST

TRUCK PATH FORWARD LEAVING

TRUCK OVERHANG

PROPERTY BOUNDARY

EXISTING EASEMENT

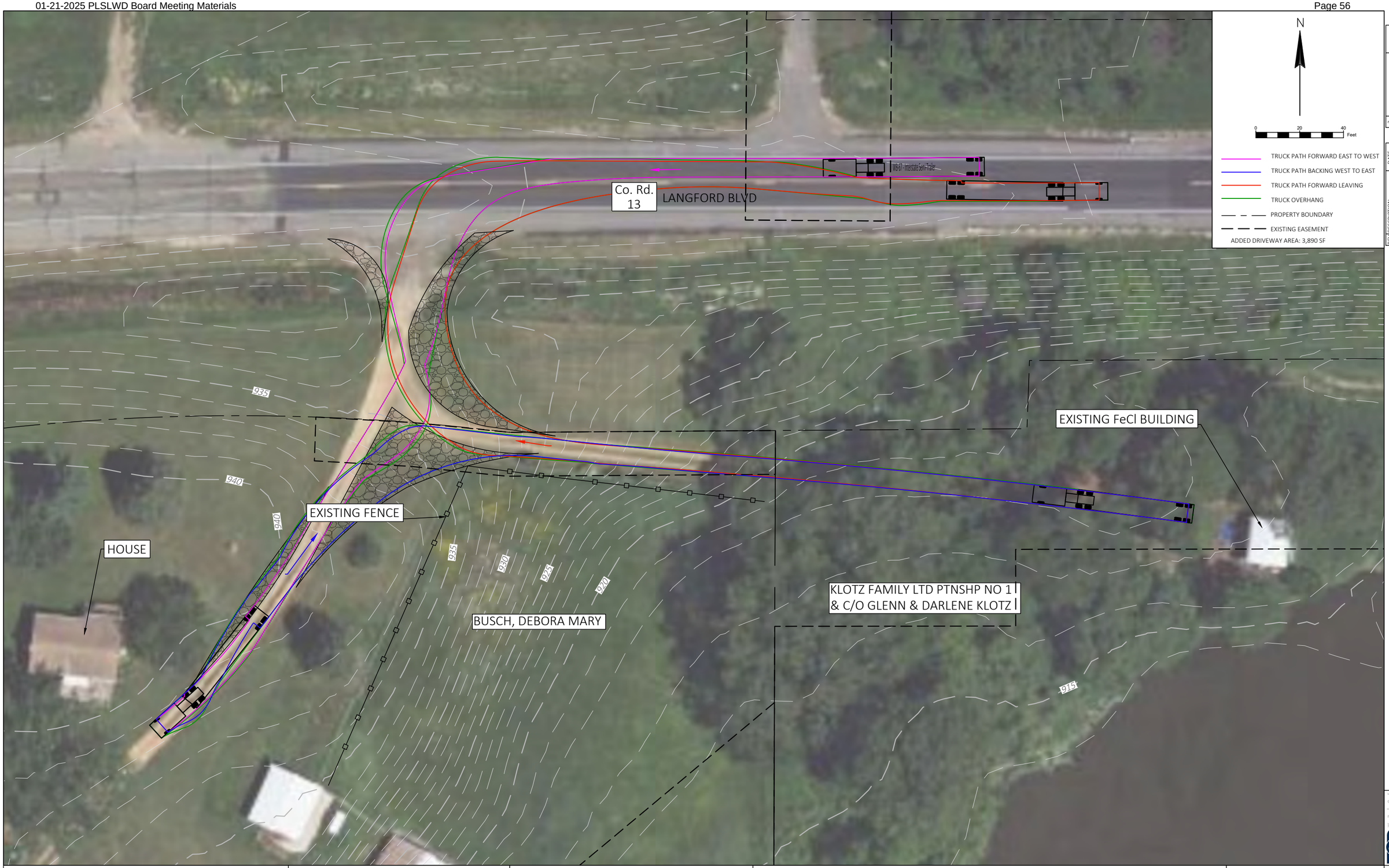
ADDED DRIVEWAY AREA: 2,150 SF

| NO | DESCRIPTION | DATE |
|---|---|---|
| 1 | | |
| 2 | | |

| | | | | |
|---|---|---|---|---|
| PROJECT: FERRIC CHLORIDE SYSTEM ASSESSMENT | CLIENT: PLSLWD | STREET: LANGFORD BLVD | DRAFT Option 1 | DATE: 09-08-2023 |

FILE NAME : X:\CLIENTS_WD\00758_PLSLWD\0168_FERRIC_CHLORIDE_SYSTEM_ASSESSMENT\09_GIMS\DWG\DESIGN\TRUCK TURNING.DWG PLOT DATE : 9/8/2023 9:54 AM PLOT BY : NATALIE MCCRAW PLOT NAME :

# APPENDIX B. PRELIMINARY DESIGN FOR DRIVE ACCESS ALTERNATIVE 2




| PROJECT: FERRIC CHLORIDE SYSTEM ASSESSMENT | CLIENT: PLSLWD | STREET: LANGFORD BLVD | DRAFT Option 2 | DATE: 09-08-2023 |
|---|---|---|---|---|

FILE NAME : X:\CLIENTS_WD\00758_PLSLWD\0168_FERRIC_CHLORIDE_SYSTEM_ASSESSMENT\09_GIMS\DWG\DESIGN\TRUCK TURNING.DWG PLOT DATE : 9/8/2023 9:54 AM PLOT BY : NATALIE MCCRAW PLOT NAME :

# APPENDIX C. PRELIMINARY DESIGN FOR DRIVE ACCESS ALTERNATIVE 3

ANTHONY C DERHAAG
REVOCABLE TRUST

LEVIN, TERRI

FINK, ALLEN C & LINNEA

Co. Rd.
13

LANGFORD BLVD

WB-67 - Interstate Semi-Trailer

29

935

940

940

EXISTING FENCE

HOUSE

935

930

925

920

BUSCH, DEBORA MARY

EXISTING FeCl BUILDING

KLOTZ FAMILY LTD PTNSHP NO 1
& C/O GLENN & DARLENE KLOTZ

N

0 20 40 Feet

TRUCK PATH FORWARD

TRUCK OVERHANG

TRUCK PATH FORWARD LEAVING

TRUCK OVERHANG

PROPERTY BOUNDARY

EXISTING EASEMENT

ADDED DRIVEWAY AREA: 14,400 SF

| NO | DESCRIPTION | DATE |
|---|---|---|
| 1 | | |
| 2 | | |

| | | | | |
|---|---|---|---|---|
| PROJECT: FERRIC CHLORIDE SYSTEM ASSESSMENT | CLIENT: PLSLWD | STREET: LANGFORD BLVD | DRAFT Option 3 | DATE: 11-06-2023 |

FILE NAME : X:\CLIENTS_WD\00758_PLSLWD\0168_FERRIC_CHLORIDE_SYSTEM_ASSESSMENT\09_GIMS\DWG\DESIGN\TRUCK TURNING.DWG PLOT DATE : 11/6/2023 3:34 PM PLOT BY : TIFFANY MUELLER PLOT NAME :

# APPENDIX D. PRELIMINARY DESIGN FOR DRIVE ACCESS ALTERNATIVE 4

ANTHONY C DERHAAG REVOCABLE TRUST

LEVIN, TERRI

FINK, ALLEN C & LINNEA

Co. Rd. 13

LANGFORD BLVD

SU-40 - Single Unit Truck

935

940

940

HOUSE

EXISTING FENCE

935

930

925

920

BUSCH, DEBORA MARY

EXISTING FeCl BUILDING

KLOTZ FAMILY LTD PTNSHP NO 1 & C/O GLENN & DARLENE KLOTZ

N

0 20 40 Feet

TRUCK PATH FORWARD

TRUCK OVERHANG

TRUCK PATH REVERSE

TRUCK OVERHANG

PROPERTY BOUNDARY

EXISTING EASEMENT

ADDED DRIVEWAY AREA: 900 SF

| NO | DESCRIPTION | DATE |
|---|---|---|
| 1 | | |
| 2 | | |

| | | | | |
|---|---|---|---|---|
| PROJECT: FERRIC CHLORIDE SYSTEM ASSESSMENT | CLIENT: PLSLWD | STREET: LANGFORD BLVD | DRAFT Option 4 | DATE: 01/09/2024 |

FILE NAME : X:\CLIENTS_WD\00758_PLSLWD\0168_FERRIC_CHLORIDE_SYSTEM_ASSESSMENT\09_GIMS\DWG\DESIGN\TRUCK TURNING_R1_20240108.DWG PLOT DATE : 1/11/2024 2:09 PM PLOT BY : TIFFANY MUELLER PLOT NAME :

# APPENDIX E. ENGINEER'S COST ESTIMATE FOR DRIVE ACCESS ALTERNATIVE 1

**Appendix A. Engineer's Opinion of Probable Cost for Alternative 1**

| | |
|---|---|
| ENGINEER'S OPINION OF PROBABLE COST (EOPC) | |
| FeCl System Assessment & Recommendation Updates: Alternative 1 | |
| PREPARED BY EMMONS & OLIVIER RESOURCES, INC. | |
| EOR JOB NO. | 00758-0168 |
| DATE PREPARED | 1/8/2024 |

**POND OUTLET MODIFICATION**

| Item Description | MnDOT Reference # | Unit | Quantity | Unit Cost | Total Cost | Notes |
|---|---|---|---|---|---|---|
| Mobilization | 2021.501 | LS | 1 | $ 13,000.00 | $ 13,000.00 | |
| Clearing | 2101.505 | ACRE | 0.19 | $ 10,000.00 | $ 1,928.15 | |
| Grubbing | 2101.505 | ACRE | 0.19 | $ 10,000.00 | $ 1,928.15 | |
| Salvage Chain Link Fence | 2104.503 | LF | 0 | $ 25.00 | $ - | Not required for this Option. |
| Excavation Common | 2106.507 | CY | 463 | $ 40.00 | $ 18,527.41 | Assume 26" excavation where driveway is getting placed or replaced |
| Granular Borrow (CV) | 2105.607 | CY | 178 | $ 50.00 | $ 8,907.41 | Assume 10" granular replacement for stability |
| Aggregate Surfacing Class V | 2118.509 | TON | 128 | $ 65.00 | $ 8,337.33 | Assume 4" surface aggregate |
| Aggregate Base Class V | 2211.509 | TON | 385 | $ 55.00 | $ 21,164.00 | Assume 12" base aggregate |
| Concrete Pavement 8" | 2301.504 | SY | 143 | $ 150.00 | $ 21,466.67 | Assume 8" Thick |
| 24" RC Pipe Culvert Class III | 2501.503 | LF | 55 | $ 100.00 | $ 5,500.00 | |
| 24" RC Pipe Apron | 2501.502 | EA | 2 | $ 2,500.00 | $ 5,000.00 | |
| Geotextile Filter Type V | 2511.504 | SY | 641 | $ 8.00 | $ 5,130.67 | Assume this is placed for stabilization where driveway is getting placed or replaced |
| Random Riprap Class III | 2511.507 | CY | 20 | $ 155.00 | $ 3,100.00 | |
| Install Chain Link Fence | 2557.603 | LF | 0 | $ 25.00 | $ - | Not required for this Option. |
| Sediment Control Log Type Wood Fiber -- 9" Diameter | 2573.503 | LF | 112 | $ 20.00 | $ 2,248.00 | |
| Silt Fence - Type HI | 2573.503 | LF | 562 | $ 7.00 | $ 3,934.00 | |
| Rolled Erosion Prevention Category 25 | 2575.504 | SY | 933 | $ 7.00 | $ 6,532.56 | |
| Seeding | 2575.505 | ACRE | 0.19 | $ 12,000.00 | $ 2,313.77 | |
| Hydraulic Bonded Fiber Matrix | 2575.508 | LB | 675 | $ 5.25 | $ 3,542.97 | Assume 3500 #/acre |
| Seed Mixture 25-141 | 2575.508 | LB | 11 | $ 50.00 | $ 568.80 | Assume 59 PLS Rate |
| Steel Gate | Special | EA | 1 | $ 3,500.00 | $ 3,500.00 | Placed at wooded entrance. |
| | | | **CONSTRUCTION COST (2023)** | | **$ 136,629.87** | |
| | | | PERMITS AND LEGAL FEES | 10.00% | $ 13,662.99 | |
| | | | DESIGN AND CONSTRUCTION ENGINEERING | 30.00% | $ 40,988.96 | |
| | | | **PROFESSIONAL FEES TOTAL** | | **$ 54,651.95** | |
| | | | **CONSTRUCTION AND PROFESSIONAL FEES TOTAL** | | **$ 191,281.82** | |
| | | | **CONSTRUCTION CONTINGENCY** | **20.00%** | **$ 38,256.36** | |
| | | | **TOTAL CAPITAL INVESTMENT** | | **$ 229,538.18** | |
| | | | **ESTIMATED ACCURACY RANGE*** ** | **-25.00%** | **$ 172,153.64** | |
| | | | | **40.00%** | **$ 321,353.46** | |
| | | | 2023 LAND VALUE (SCOTT GIS) ($/ACRE) | | $ - | |
| | | | EASEMENT AREA | | $ - | |
| | | | **LANDOWNER COMPENSATION** | | **$ -** | |

Notes

[1] 2% Design Work Completed

[2] Quantities are based on 5% Design

[3] Unit Prices are based on Current Industry Prices (2023)

[4] No topographic survey or geotechnical analysis has been completed

[5] This scoping-**level (Class 5, 0 to 2% design completion per ASTM E 2516-06)** cost estimate is based on preliminary-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of completion of design, but are not included at this level of project definition. **The estimated accuracy range for the Total Project Cost as the project is defined is -25.00% to +40.00%.** The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. **The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency.** Operation and Maintenance costs are not included.

[6] Area of Disturbance anticipated under 1 acre but an Erosion Control Supervisor should be required to ensure good practices

[7] Includes: Topographic Survey, GSOC Utility Investigation, and Wetland Desktop Review

**PARAMETERS FOR ACCURACY RANGE**

| ESTIMATE CLASS | LEVEL OF PROJECT DEFINITION (% ENGINEERING Complete) | ACCURACY RANGE | | |
|---|---|---|---|---|
| 5 | 0% to 2% | -25.00% | TO | 40.00% |
| 4 | 1% to 15% | -15.00% | TO | 25.00% |
| 3 | 10% to 40% | -10.00% | TO | 15.00% |
| 2 | 30% to 70% | -7.50% | TO | 7.50% |
| 1 | 50% to 100% | -4.00% | TO | 6.50% |

***THIS PROJECT PHASE

# APPENDIX F. ENGINEER'S COST ESTIMATE FOR DRIVE ACCESS ALTERNATIVE 2

**Appendix 2. Engineer's Opinion of Probable Cost for Alternative 2**

| | |
|---|---|
| ENGINEER'S OPINION OF PROBABLE COST (EOPC) | |
| FeCl System Assessment & Recommendation Updates: Alternative 2 | |
| PREPARED BY EMMONS & OLIVIER RESOURCES, INC. | |
| EOR JOB NO. | 00758-0168 |
| DATE PREPARED | 1/8/2024 |

**POND OUTLET MODIFICATION**

| Item Description | MnDOT Reference # | Unit | Quantity | Unit Cost | Total Cost | Notes |
|---|---|---|---|---|---|---|
| Mobilization | 2021.501 | LS | 1 | $ 17,000.00 | $ 17,000.00 | |
| Clearing | 2101.505 | ACRE | 0.19 | $ 10,000.00 | $ 1,880.17 | |
| Grubbing | 2101.505 | ACRE | 0.19 | $ 10,000.00 | $ 1,880.17 | |
| Salvage Chain Link Fence | 2104.503 | LF | 50 | $ 25.00 | $ 1,250.00 | |
| Excavation Common | 2106.507 | CY | 743 | $ 35.00 | $ 26,010.83 | Assume 26" excavation where driveway is getting placed or replaced |
| Granular Borrow (CV) | 2105.607 | CY | 286 | $ 50.00 | $ 14,291.67 | Assume 10" granular replacement for stability |
| Aggregate Surfacing Class V | 2118.509 | TON | 206 | $ 65.00 | $ 13,377.00 | Assume 4" surface aggregate |
| Aggregate Base Class V | 2211.509 | TON | 617 | $ 55.00 | $ 33,957.00 | Assume 12" base aggregate |
| Concrete Pavement 8" | 2301.504 | SY | 143 | $ 150.00 | $ 21,466.67 | Assume 8" Thick |
| 24" RC Pipe Culvert Class III | 2501.503 | LF | 55 | $ 100.00 | $ 5,500.00 | |
| 24" RC Pipe Apron | 2501.502 | EA | 2 | $ 2,500.00 | $ 5,000.00 | |
| Geotextile Filter Type V | 2511.504 | SY | 1029 | $ 7.00 | $ 7,203.00 | Assume this is placed for stabilization where driveway is getting placed or replaced |
| Random Riprap Class III | 2511.507 | CY | 20 | $ 155.00 | $ 3,100.00 | |
| Install Chain Link Fence | 2557.603 | LF | 50 | $ 25.00 | $ 1,250.00 | |
| Sediment Control Log Type Wood Fiber -- 9" Diameter | 2573.503 | LF | 164 | $ 20.00 | $ 3,276.00 | |
| Silt Fence - Type HI | 2573.503 | LF | 819 | $ 5.00 | $ 4,095.00 | |
| Rolled Erosion Prevention Category 25 | 2575.504 | SY | 1820 | $ 5.00 | $ 9,100.00 | |
| Seeding | 2575.505 | ACRE | 0.38 | $ 12,000.00 | $ 4,512.40 | |
| Hydraulic Bonded Fiber Matrix | 2575.508 | LB | 1316 | $ 4.50 | $ 5,922.52 | |
| Seed Mixture 25-141 | 2575.508 | LB | 22 | $ 50.00 | $ 1,109.30 | |
| Steel Gate | Special | EA | 1 | $ 3,500.00 | $ 3,500.00 | Placed at wooded entrance. |
| **CONSTRUCTION COST (2023)** | | | | | **$ 184,681.71** | |
| PERMITS AND LEGAL FEES | | | 10.00% | | $ 18,468.17 | |
| DESIGN AND CONSTRUCTION ENGINEERING | | | 30.00% | | $ 55,404.51 | |
| **PROFESSIONAL FEES TOTAL** | | | | | **$ 73,872.68** | |
| **CONSTRUCTION AND PROFESSIONAL FEES TOTAL** | | | | | **$ 258,554.40** | |
| **CONSTRUCTION CONTINGENCY** | | | **20.00%** | | **$ 51,710.88** | |
| **TOTAL CAPITAL INVESTMENT** | | | | | **$ 310,265.28** | |
| **ESTIMATED ACCURACY RANGE*** ** | | | **-25.00%** | | **$ 232,698.96** | |
| | | | **40.00%** | | **$ 434,371.39** | |
| 2023 LAND VALUE (SCOTT GIS) ($/ACRE) | | | | | $ 8,364.00 | Busch Property |
| EASEMENT AREA (ACRE) | | | | | $ 0.092 | Busch Property |
| **LANDOWNER COMPENSATION** | | | | | **$ 768.04** | |

Notes

[1] 2% Design Work Completed

[2] Quantities are based on 5% Design

[3] Unit Prices are based on Current Industry Prices (2023)

[4] No topographic survey or geotechnical analysis has been completed

[5] This scoping-**level (Class 5, 0 to 2% design completion per ASTM E 2516-06)** cost estimate is based on preliminary-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of completion of design, but are not included at this level of project definition. **The estimated accuracy range for the Total Project Cost as the project is defined is -25.00% to +40.00%.** The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. **The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency.** Operation and Maintenance costs are not included.

[6] Area of Disturbance anticipated under 1 acre but an Erosion Control Supervisor should be required to ensure good practices

[7] Includes: Topographic Survey, GSOC Utility Investigation, and Wetland Desktop Review

**PARAMETERS FOR ACCURACY RANGE**

| ESTIMATE CLASS | LEVEL OF PROJECT DEFINITION (% ENGINEERING Complete) | ACCURACY RANGE | | |
|---|---|---|---|---|
| 5 | 0% to 2% | -25.00% | TO | 40.00% |
| 4 | 1% to 15% | -15.00% | TO | 25.00% |
| 3 | 10% to 40% | -10.00% | TO | 15.00% |
| 2 | 30% to 70% | -7.50% | TO | 7.50% |
| 1 | 50% to 100% | -4.00% | TO | 6.50% |

***THIS PROJECT PHASE

# APPENDIX G. ENGINEER'S COST ESTIMATE FOR DRIVE ACCESS ALTERNATIVE 3

**Appendix 3. Engineer's Opinion of Probable Cost for Alternative 3**

| | |
|---|---|
| ENGINEER'S OPINION OF PROBABLE COST (EOPC) | |
| FeCl System Assessment & Recommendation Updates: Alternative 3 | |
| PREPARED BY EMMONS & OLIVIER RESOURCES, INC. | |
| EOR JOB NO. | 00758-0168 |
| DATE PREPARED | 1/8/2024 |

**POND OUTLET MODIFICATION**

| Item Description | MnDOT Reference # | Unit | Quantity | Unit Cost | Total Cost | Notes |
|---|---|---|---|---|---|---|
| Mobilization | 2021.501 | LS | 1 | $ 20,000.00 | $ 20,000.00 | |
| Clearing | 2101.505 | ACRE | 0.40 | $ 10,000.00 | $ 4,000.00 | |
| Grubbing | 2101.505 | ACRE | 0.40 | $ 10,000.00 | $ 4,000.00 | |
| Salvage Chain Link Fence | 2104.503 | LF | 50 | $ 25.00 | $ 1,250.00 | |
| Excavation Common | 2106.507 | CY | 1400 | $ 30.00 | $ 42,000.00 | Assume 26" excavation where driveway is getting placed or replaced |
| Granular Borrow (CV) | 2105.607 | CY | 540 | $ 50.00 | $ 27,000.00 | Assume 10" granular replacement for stability |
| Aggregate Surfacing Class V | 2118.509 | TON | 435 | $ 60.00 | $ 26,100.00 | Assume 4" surface aggregate |
| Aggregate Base Class V | 2211.509 | TON | 1400 | $ 50.00 | $ 70,000.00 | Assume 12" base aggregate |
| Concrete Pavement 8" | 2301.504 | SY | 143 | $ 150.00 | $ 21,466.67 | Assume 8" Thick |
| 24" RC Pipe Culvert Class III | 2501.503 | LF | 55 | $ 100.00 | $ 5,500.00 | |
| 24" RC Pipe Apron | 2501.502 | EA | 2 | $ 2,500.00 | $ 5,000.00 | |
| Geotextile Filter Type V | 2511.504 | SY | 1950 | $ 5.00 | $ 9,750.00 | Assume this is placed for stabilization where driveway is getting placed or replaced |
| Random Riprap Class III | 2511.507 | CY | 20 | $ 155.00 | $ 3,100.00 | |
| Install Chain Link Fence | 2557.603 | LF | 50 | $ 25.00 | $ 1,250.00 | |
| Sediment Control Log Type Wood Fiber -- 9" Diameter | 2573.503 | LF | 208 | $ 20.00 | $ 4,160.00 | |
| Silt Fence - Type HI | 2573.503 | LF | 1040 | $ 5.00 | $ 5,200.00 | |
| Rolled Erosion Prevention Category 25 | 2575.504 | SY | 1840 | $ 3.50 | $ 6,440.00 | |
| Seeding | 2575.505 | ACRE | 0.40 | $ 10,000.00 | $ 4,000.00 | |
| Hydraulic Bonded Fiber Matrix | 2575.508 | LB | 1330 | $ 2.25 | $ 2,992.50 | |
| Seed Mixture 25-141 | 2575.508 | LB | 25 | $ 50.00 | $ 1,250.00 | |
| Steel Gate | Special | EA | 1 | $ 3,500.00 | $ 3,500.00 | Placed at wooded entrance. |
| **CONSTRUCTION COST (2023)** | | | | | **$ 267,959.17** | |
| PERMITS AND LEGAL FEES | | | 10.00% | | $ 26,795.92 | |
| DESIGN AND CONSTRUCTION ENGINEERING | | | 30.00% | | $ 80,387.75 | |
| **PROFESSIONAL FEES TOTAL** | | | | | **$ 107,183.67** | |
| **CONSTRUCTION AND PROFESSIONAL FEES TOTAL** | | | | | **$ 375,142.83** | |
| **CONSTRUCTION CONTINGENCY** | | | **20.00%** | | **$ 75,028.57** | |
| **TOTAL CAPITAL INVESTMENT** | | | | | **$ 450,171.40** | |
| **ESTIMATED ACCURACY RANGE*** ** | | | **-25.00%** | | **$ 337,628.55** | |
| | | | **40.00%** | | **$ 630,239.96** | |
| 2023 LAND VALUE (SCOTT GIS) ($/ACRE) | | | | | $ 8,364.00 | Busch Property |
| EASEMENT AREA (ACRE) | | | | | $ 0.011 | Busch Property |
| 2023 LAND VALUE (SCOTT GIS) ($/ACRE) | | | | | $ 9,822.67 | Klotz Property |

| | | |
|---|---|---|
| EASEMENT AREA (ACRE) | $ - | Klotz Property |
| **LANDOWNER COMPENSATION** | **$ 96.01** | |

Notes

[1] 2% Design Work Completed

[2] Quantities are based on 5% Design

[3] Unit Prices are based on Current Industry Prices (2023)

[4] No topographic survey or geotechnical analysis has been completed

[5] This scoping-**level (Class 5, 0 to 2% design completion per ASTM E 2516-06)** cost estimate is based on preliminary-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of completion of design, but are not included at this level of project definition. **The estimated accuracy range for the Total Project Cost as the project is defined is -25.00% to +40.00%.** The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. **The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency.** Operation and Maintenance costs are not included.

[6] Area of Disturbance anticipated under 1 acre but an Erosion Control Supervisor should be required to ensure good practices

[7] Includes: Topographic Survey, GSOC Utility Investigation, and Wetland Desktop Review

**PARAMETERS FOR ACCURACY RANGE**

| ESTIMATE CLASS | LEVEL OF PROJECT DEFINITION (% ENGINEERING Complete) | ACCURACY RANGE | | |
|---|---|---|---|---|
| 5 | 0% to 2% | -25.00% | TO | 40.00% |
| 4 | 1% to 15% | -15.00% | TO | 25.00% |
| 3 | 10% to 40% | -10.00% | TO | 15.00% |
| 2 | 30% to 70% | -7.50% | TO | 7.50% |
| 1 | 50% to 100% | -4.00% | TO | 6.50% |

***THIS PROJECT PHASE

# APPENDIX H. ENGINEER'S COST ESTIMATE FOR DRIVE ACCESS ALTERNATIVE 4

**Appendix A. Engineer's Opinion of Probable Cost for Alternative 4**

| | |
|---|---|
| ENGINEER'S OPINION OF PROBABLE COST (EOPC) | |
| FeCl System Assessment & Recommendation Updates: Alternative 4 | |
| PREPARED BY EMMONS & OLIVIER RESOURCES, INC. | |
| EOR JOB NO. | 00758-0168 |
| DATE PREPARED | 1/8/2024 |

**POND OUTLET MODIFICATION**

| Item Description | MnDOT Reference # | Unit | Quantity | Unit Cost | Total Cost | Notes |
|---|---|---|---|---|---|---|
| Mobilization | 2021.501 | LS | 1 | $ 2,000.00 | $ 2,000.00 | |
| Clearing | 2101.505 | ACRE | 0.00 | $ 10,000.00 | $ - | Not required for this Option. |
| Grubbing | 2101.505 | ACRE | 0.00 | $ 10,000.00 | $ - | Not required for this Option. |
| Salvage Chain Link Fence | 2104.503 | LF | 0 | $ 25.00 | $ - | Not required for this Option. |
| Excavation Common | 2106.507 | CY | 44 | $ 40.00 | $ 1,777.78 | Assume 26" excavation where driveway is getting placed or replaced |
| Granular Borrow (CV) | 2105.607 | CY | 0 | $ 50.00 | $ - | Not required for this Option. |
| Aggregate Surfacing Class V | 2118.509 | TON | 22 | $ 65.00 | $ 1,444.44 | Assume 4" surface aggregate |
| Aggregate Base Class V | 2211.509 | TON | 67 | $ 55.00 | $ 3,666.67 | Assume 12" base aggregate |
| Concrete Pavement 8" | 2301.504 | SY | 0 | $ 150.00 | $ - | Not required for this Option. |
| 24" RC Pipe Culvert Class III | 2501.503 | LF | 0 | $ 100.00 | $ - | Not required for this Option. |
| 24" RC Pipe Apron | 2501.502 | EA | 0 | $ 2,500.00 | $ - | Not required for this Option. |
| Geotextile Filter Type V | 2511.504 | SY | 0 | $ 8.00 | $ - | Not required for this Option. |
| Random Riprap Class III | 2511.507 | CY | 0 | $ 155.00 | $ - | Not required for this Option. |
| Install Chain Link Fence | 2557.603 | LF | 0 | $ 25.00 | $ - | Not required for this Option. |
| Sediment Control Log Type Wood Fiber -- 9" Diameter | 2573.503 | LF | 112 | $ 20.00 | $ 2,240.00 | |
| Silt Fence - Type HI | 2573.503 | LF | 0 | $ 7.00 | $ - | Not required for this Option. |
| Rolled Erosion Prevention Category 25 | 2575.504 | SY | 0 | $ 7.00 | $ - | Not required for this Option. |
| Seeding | 2575.505 | ACRE | 0.02 | $ 12,000.00 | $ 247.93 | |
| Hydraulic Bonded Fiber Matrix | 2575.508 | LB | 72 | $ 5.25 | $ 379.65 | Assume 3500 #/acre |
| Seed Mixture 25-141 | 2575.508 | LB | 1 | $ 50.00 | $ 60.95 | Assume 59 PLS Rate |
| Steel Gate | Special | EA | 1 | $ 3,500.00 | $ 3,500.00 | Placed at wooded entrance. |
| **CONSTRUCTION COST (2023)** | | | | **$** | **15,317.42** | |
| PERMITS AND LEGAL FEES | | | 10.00% | $ | 1,531.74 | |
| DESIGN AND CONSTRUCTION ENGINEERING | | | 30.00% | $ | 4,595.23 | |
| **PROFESSIONAL FEES TOTAL** | | | | **$** | **6,126.97** | |
| **CONSTRUCTION AND PROFESSIONAL FEES TOTAL** | | | | **$** | **21,444.39** | |
| **CONSTRUCTION CONTINGENCY** | | | **20.00%** | **$** | **4,288.88** | |
| **TOTAL CAPITAL INVESTMENT** | | | | **$** | **25,733.27** | |
| **ESTIMATED ACCURACY RANGE*** ** | | | **-25.00%** | **$** | **19,299.95** | |
| | | | **40.00%** | **$** | **36,026.58** | |
| 2023 LAND VALUE (SCOTT GIS) ($/ACRE) | | | | $ | - | |
| EASEMENT AREA | | | | $ | - | |
| **LANDOWNER COMPENSATION** | | | | **$** | **-** | |

Notes

[1] 2% Design Work Completed

[2] Quantities are based on 5% Design

[3] Unit Prices are based on Current Industry Prices (2023)

[4] No topographic survey or geotechnical analysis has been completed

[5] This scoping-**level (Class 5, 0 to 2% design completion per ASTM E 2516-06)** cost estimate is based on preliminary-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of completion of design, but are not included at this level of project definition. **The estimated accuracy range for the Total Project Cost as the project is defined is -25.00% to +40.00%.** The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. **The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency.** Operation and Maintenance costs are not included.

[6] Area of Disturbance anticipated under 1 acre but an Erosion Control Supervisor should be required to ensure good practices

[7] Includes: Topographic Survey, GSOC Utility Investigation, and Wetland Desktop Review

**PARAMETERS FOR ACCURACY RANGE**

| ESTIMATE CLASS | LEVEL OF PROJECT DEFINITION (% ENGINEERING Complete) | ACCURACY RANGE | | |
|---|---|---|---|---|
| 5 | 0% to 2% | -25.00% | TO | 40.00% |
| 4 | 1% to 15% | -15.00% | TO | 25.00% |
| 3 | 10% to 40% | -10.00% | TO | 15.00% |
| 2 | 30% to 70% | -7.50% | TO | 7.50% |
| 1 | 50% to 100% | -4.00% | TO | 6.50% |
| ***THIS PROJECT PHASE | | | | |

**PARAMETERS FOR CONSTRUCTION CONTINGENCY**

| PHASE OF PROJECT | PERCENTAGE ENGINEERING COMPLETED | APPLICABLE CONSTRUCTION CONTINGENCY PERCENTAGE (%) |
|---|---|---|
| FUNDING, SCOPE AND BUDGET | 0 TO 5% | 30.00% |
| SCHEMATIC DESIGN | 5% TO 15% | 25.00% |
| PRELIMINARY | 15% TO 60% | 20.00% |
| FINAL | 60% TO 100% | 10.00% |
| CONSTRUCTION | 100% | 5.00% |
| ***THIS PROJECT PHASE | | |

# APPENDIX I. MEMO ON JAR TESTS AND DOSING REVIEW

# technical memo

| | | | |
|---|---|---|---|
| **Project Name** \| | Ferric Chloride System Assessment & Recommendation Updates | **Date** \| | 11 December 2024 |
| **To / Contact info** \| | Emily Dick (edick@plslwd.org);<br>Jeff Anderson (janderson@plslwd.org) | | |
| **Cc / Contact info** \| | Brett Emmons (bemmons@eorinc.com) | | |
| **From / Contact info** \| | Anne Wilkinson (awilkinson@eorinc.com)<br>Kajol Annaduzzaman (Kannaduzzaman@eorinc.com)<br>Carl Almer (calmer@eorinc.com) | | |
| **Regarding** \| | PLSLWD_Ferric Chloride ($FeCl_3$) Jar Tests and Dosing Review | | |

## 1. OVERVIEW

This report evaluates the use of ferric chloride ($FeCl_3$) for orthophosphate (PO4) removal in water samples collected from the south tributary to Spring Lake where the existing $FeCl_3$ dosing system is installed in the Prior Lake-Spring Lake Watershed District (PLSLWD). The assessment involved jar tests conducted by two laboratories, referred to as Harcros and Hawkins. The objective was to review the past dosing curve and identify variables that could affect optimal dosing strategies for $FeCl_3$ to enhance PO4 removal and support long-term water quality improvements in the downstream of the watershed. The results may find that conditions and technologies have not changed and simply confirm the past dosing levels or make management recommendations based on those variables.

## 2. METHODOLOGY

Multiple jar tests were performed by two different chemical suppliers to evaluate phosphate ($PO_4$) removal efficiency across a range of $FeCl_3$ dosing strategies. Water samples for the tests were initially planned for 2023, but that was a historically dry year the system was not flowing. One sample was taken from the wetland in 2023, and while the plan was to collect another sample later, no flow occurred the remainder of 2023. It was decided to extend this portion of the project into 2024, a year later than planned, to collect spring flow samples. Samples were collected in April and June in 2024.

Given the dry conditions in 2023, the sample was collected from the wetland itself. This sample was subsequently deemed unrepresentative of typical CD-13 water chemistry because it was collected from the wetland itself and under no-flow condition. Therefore, the results from July 2023 jar test were deemed unreliable and are not discussed further in this report. To address this gap, the project was extended into 2024 and additional jar testing was conducted under more typical flow conditions at the weir located at CD-2 just upstream of Highway 13. The rainfall data and the PLSLWD's sampling station flow records for 2024 are illustrated in **Figure 1**. Pre-test water quality parameters, including $PO_4$ and turbidity, were measured prior to starting the jar tests, as shown in **Table 1**.

Jar Test Purpose and Procedures

Jar tests are standard laboratory assessments for determining chemical dosages in water and wastewater treatment. They are also sometimes referred to as benchtop studies, since they are somewhat simple tests that can be conducted in the lab. The process simulates three key steps of any chemical addition and removal in water treatment: mixing, floc formation, and sedimentation. It

simulates coagulation and flocculation of a given target substance, in our case phosphorus, on a reduced scale to enhance removal efficacy. Initially, fill jars or beakers with water of equal volume.

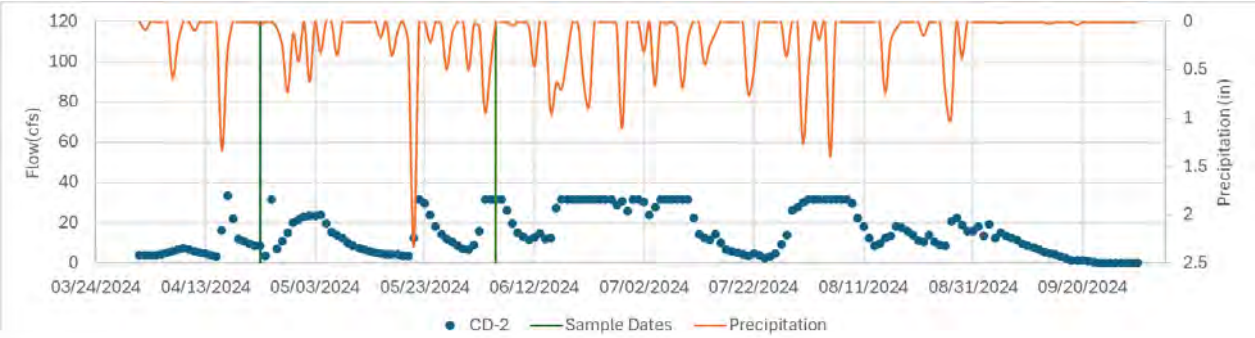



***Figure 1**: 2024 Flow and Precipitation summary. The orange line represents the precipitation, the blue dots represent the daily flow, and the green lines represent the sampling dates.*

***Table 1**: Jar tests details from Hawkins and Harcros laboratories*

| Sample Date | Chemical dosing | Dose $FeCl_3$ (mg/L) | Testing Lab | pH | EC (µS/cm) | Turbidity (NTU) | $PO_4$ as P* (mg/L) | $PO_4$ Removal efficiency (%) |
|---|---|---|---|---|---|---|---|---|
| 22 April 2024 | $FeCl_3$ | 5-35 | Harcros | 8.26 | 804.5 | 8.5 | 0.68 | 68-76 |
| 06 June 2024 | $FeCl_3$ | 1.5-58 | Harcros | 7.38 | 616 | 16.5 | 0.54 | 30-37 |
| 05 June 2024 | $FeCl_3$ | 1.5-58 | Hawkins | 7.82 | - | - | 0.47 | 57-65 |

**$PO_4$ concentrations were converted to P.*

Coagulants, in this case Ferric Chloride ($FeCl_3$) are introduced into each jar at varying levels for comparative analysis. A paddle-equipped jar rapidly agitates water to replicate the intentional fast mixing step that facilitate the chemicals coming into contact. To replicate the next stage of flocculation formation, which creates more dense clumping and aids in settling, the paddles are decelerated to enhance particle collisions and facilitate floc formation. To facilitate the settling of flocs, jars are allowed to remain undisturbed during the sedimentation process, in this case 24 hours/overnight.

Water samples from the surface of each jar are analyzed for turbidity, pH, and other critical factors. The optimal dosage is contingent upon water quality. The performed Jar tests followed the following sequence:

- Raw water samples were collected on-site in clean, labeled containers. The samples were transported to the desired lab for testing.
- Coagulant $FeCl_3$ solutions were prepared at various concentrations for the experiments.
- A series of jars or beakers filled with equal volumes of raw water, and injected $FeCl_3$ solutions of desired concentrations.
- The pre-set paddle in the jars were agitated at a speed of 200 rpm for 10 minutes to simulate flash mixing and disperse chemicals. Followed by a slow mixing with 30 rpm for 30 minutes to increase particle contact and flocculation. Finally, the jars were left undisturbed for 24 hours or overnight to settle flocs.

After 24 hours of settling, water samples (collected from 1-2" below surface level) were tested for total phosphorus (TP), ortho-phosphate (Ortho-P), and iron. Phosphate removal efficiency was

determined by measuring $PO_4$ concentrations in unfiltered samples. Ferric chloride (35-38% concentrated) was used across all jar tests to evaluate its effectiveness in removing PO4 under varying dosing strategies. In April 2024, the dosing was based on the total $FeCl_3$ concentration added, ranging from 5 mg/L to 35 mg/L. However, in the June 2024 tests, the lab reported dosing results based on elemental iron (Fe) concentrations, ranging from 1.5 mg/L (equivalent to 0.5 mg Fe/L) to 58 mg/L (equivalent to 20 mg Fe/L) of $FeCl_3$. To ensure consistency in this report, all dosing data have been converted (**Table 2**) and presented in terms of $FeCl_3$ concentration.

***Table 2**: Laboratory Jar Tests $FeCl_3$ Dosing Concentration Ranges and P Removal Efficiencies.*

| Harcros Tests | | | | Hawkins Tests | |
|---|---|---|---|---|---|
| **Sample Date** | 22 April, 2024 | **Sample Date** | 06 June, 2024 | **Sample Date** | 05 June, 2024 |
| **Analysis Report** | 01 May, 2024 | **Analysis Report** | 14 June, 2024 | **Analysis Report** | 08 July, 2024 |
| **Raw Water $PO_4$ (mg/L)** | 2.1 | **Raw Water PO4 (mg/L)** | 1.65 | **Raw Water PO4 (mg/L)** | 1.03 |
| **Raw Water P (mg/L)** | 0.68 | **Raw Water P (mg/L)** | 0.54 | **Raw Water P (mg/L)** | 0.47 |
| | | | | | |
| **$FeCl_3$ Dose** | **P Removal** | **$FeCl_3$ Dose*** | **P Removal** | **$FeCl_3$ Dose*** | **P Removal** |
| **mg/L** | **%** | **mg/L** | **%** | **mg/L** | **%** |
| 5.0 | 68 | 1.5 | 30 | 1.5 | 57 |
| 10.0 | 71 | 2.9 | 35 | 2.9 | 57 |
| 15.0 | 75 | 5.9 | 37 | 5.9 | 59 |
| 20.0 | 72 | 8.8 | 37 | 8.8 | 60 |
| 25.0 | 74 | 11.8 | 44 | 11.8 | 59 |
| 30.0 | 74 | 14.7 | 50 | 14.7 | 59 |
| 35.0 | 76 | 29.4 | 80 | 29.4 | 61 |
| | | 44.1 | 57 | 44.1 | 63 |
| | | 58.8 | 37 | 58.8 | 65 |

**The sample was tested with the Fe chemical form, which was converted to $FeCl_3$ for equivalent comparison in the analysis.*

## 3. RESULTS AND DISCUSSIONS

*Jar Test Results*

Jar tests were conducted during April 2024 and June 2024. Samples from April 2024 were sent to both Hawkins and Harcros laboratories for testing with $FeCl_3$ dosing. However, due to personnel constraints, no results were obtained from Hawkins for the April 2024 samples. Similarly, the June 2024 samples were submitted to Harcros and Hawkins, respectively, focusing on evaluating dosing strategies based on elemental iron concentrations.

While the May and June 2024 samples provided valuable data to refine the jar testing methodology, discrepancies were noted between the $PO_4$ concentrations reported by Harcros and those measured during PLSLWD's CD-2 monitoring station data at the same time and location (**Figure 2**). Harcros reported $PO_4$ concentrations exceeding the total phosphorus (TP) levels observed at CD-2, raising questions about the accuracy or consistency between different analytical testing methods, and thus the results. In contrast, Hawkins' June 2024 results were more consistent with the CD-2 data, suggesting greater consistency despite methodological differences between the laboratories.

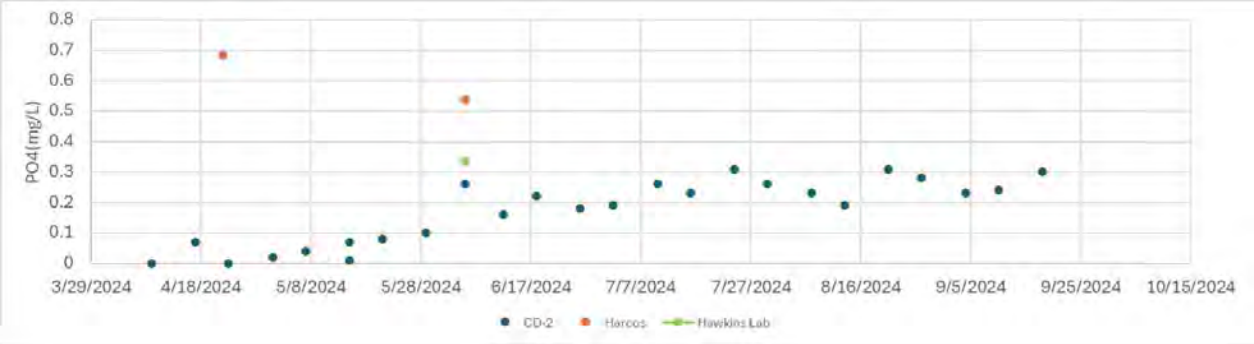



***Figure 2**: 2024 $PO_4$ Time Series. The blue dots represent the results from PLSLWD's monitoring station at CD-2, the orange dots represent the Harcros result, and green dot represents the Hawkins result.*

The $FeCl_3$ dosing profile at the facility currently applies 2.33 mg/L of 35% $FeCl_3$ (3.77gph) to treat a flow rate of 33 cubic feet per second (cfs) at a 0.5 m weir level. This dosing rate is consistent with the dosing ranges tested in the jar tests.

*Results Summary*

- **April 2024 (Harcros)**: Significant $PO_4$ removal (68–76%) was observed across $FeCl_3$ doses of 5–35 mg/L, with lower turbidity potentially contributing to the higher efficiency.
- **June 2024 (Harcros)**: Removal efficiencies ranged from 30–37% across $FeCl_3$ doses of 1.5–58.1 mg/L, with higher turbidity in the June sample likely reducing efficiency. Harcros data indicated diminishing returns beyond 29 mg/L $FeCl_3$, highlighting an efficiency plateau.
- **June 2024 (Hawkins)**: $PO_4$ removal efficiency reached 57-65% at a dose of 0.5-58.1 mg/L $FeCl_3$ (Attachment A). Importantly, Hawkins did not measure the Total Suspended Solids (TSS) level in the sampled water to evaluate its impact on $PO_4$ removal.

Preliminary findings indicate that hydraulic factors, such as water flow and settling time, significantly influence $FeCl_3$ dosing effectiveness. The current dosing rate of 2.33 mg/L at 33 cfs effectively manages flow and dosing consistency under the tested conditions. However, increased turbidity or shorter settling times could reduce $PO_4$ removal efficiency. Additionally, affects of sediment resuspension and, consequently, Fe floc stability, could impact removal results. These findings suggest that controlling TSS in the system would help optimize settling conditions and improve long-term phosphorus removal performance.

Although the results highlight significant variability, they provide valuable insights into $FeCl_3$ dosing impacts on $PO_4$ removal. Addressing discrepancies and other water chemistry factors such as TSS and others discussed in the subsequent section will refine system performance and enhance dosing reliability. **Figure 2** also illustrates $PO_4$ concentration trends across labs and monitoring timeframes, emphasizing the need for consistent analytical methods to validate results.

The dosing/mixing process is important for forming iron (Fe) flocs that can further aggregate and grow larger and increase in quantity over time, both enhancing phosphate ($PO_4$) binding and improving sedimentation removal efficiency (dense, large floc settle better). The jar test follows a standard laboratory procedure, but the onsite dosing system at PLSLWD is not operating under ideal conditions. Water flows from the dosing point into the settling pond at a similar elevation, limiting rapid mixing and relying mainly on slow mixing for particle collision and flocculation. The system includes a settling pond with an extended settling period, allowing sufficient time for Fe-$PO_4$ flocs to

settle. The jar tests achieved 50-70% phosphate removal compared to approximately 40% in the field. This performance discrepancy could be partially due to lack of a rapid mixing stage. Since the mixing stage serves to enhance particle interaction, floc formation, and overall phosphate removal efficiency, this could be a contributing factor to suboptimal removal. While ideally one would addressi these mixing challenges, from the practical standpoint, this system's configuration would make it logistically difficult and potentially quite costly to add mixing. Due to the challenges of this site, it is better to pursue other more efficient avenues first.

*Seasonality Discussion*

Water chemistry at the weir is monitored weekly by the PLSLWD to meet permitting requirements for the facility. Influent water chemistry exhibits significant variability, with seasonal patterns in phosphorus content, total phosphorus (TP), and orthophosphate (OP). These seasonal trends, first noted in a 2008 report, remain consistent with data from 2017–2024 (**Figure 3**).

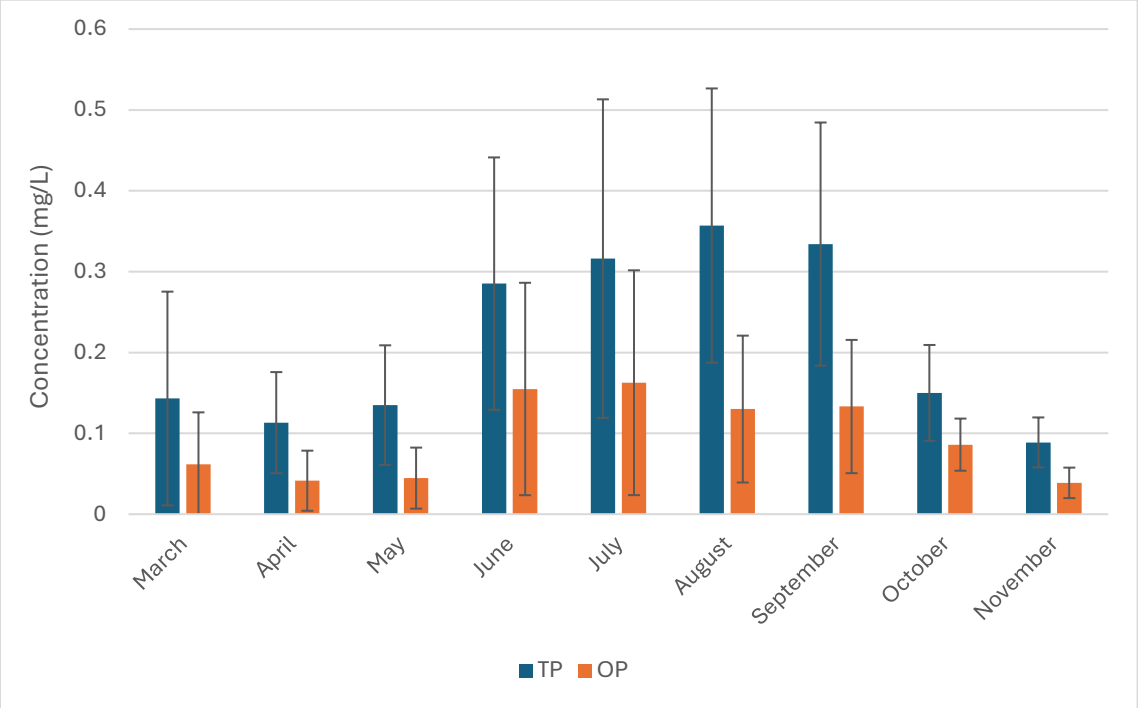



***Figure 3:*** *Monthly Phosphorus Concentrations 2017-2024. The blue bars represent the monthly average total phosphorus concentration. The orange bar represents the monthly average orthophosphate concentration. The error bars represent the standard deviation.*

Seasonal fluctuations in phosphorus concentrations, in addition to changes in other water chemistry parameters such as nitrate+nitrite, pH, hardness, chloride, total Kjeldahl nitrogen, total suspended solids, and iron (**Table 2**), could influence the efficiency of phosphorus removal. However, no significant correlation between individual water quality parameters and phosphorus removal efficiency has been tested. The primary factors affecting facility performance appear to be flow and influent phosphorus levels, indicating the need for a more tailored approach to dosing based on these factors.

*Current Dosing and Seasonal Challenges*

The current dosing strategy, which is based solely on flow, applies 2.33 mg/L of $FeCl_3$ (3.77 gph) to treat a flow rate of 33 cfs to obtain a treatment concentration of 0.8 mg/L Fe (0.5 m weir level). While this approach is effective during the spring and fall months, it does not fully address the elevated phosphorus concentrations observed during the summer.

To optimize phosphorus removal while staying within the permitted effluent iron limit of 1.0 mg/L annual average, a seasonal dosing adjustment is recommended. Based on 2024 Hawkins jar test results, a dose of 10 mg/L $FeCl_3$ would be optimal for peak summer phosphorus levels but might exceed the regulatory annual average iron discharge limit of 1.0 mg/L. Instead, $FeCl_3$ dosing can be safely increased to 3.8–4.0 mg/L (9 gph) for the summer months, and based on standard water chemistry ratios, maintaining compliance with effluent iron limits. While this calculation is linear, please note that actual variations in the effluent iron concentration may occur due to changes in water quality and environmental factors within the distillation pond. Under existing dosing conditions:

- Raw Water (CD2) Iron Concentration (Annual Ave.): 0.62 mg/L
    - Effluent (CD3) Iron Concentration (Annual Ave.): 0.85 mg/L after dosing 0.8 mg/L of Fe
- This indicates that the current dosing contributes only 0.23 mg/L of iron increase in the effluent (CD3).
- The facility currently doses 142.2 lbs/day of Fe (2.33 mg/L $FeCl_3$), of which 100 lbs/day accumulate in the pond, and only 42 lbs/day are released into the lake.

To stay within the maximum allowable effluent annual average iron concentration of 1.0 mg/L, the Fe dose should be able to be increased to 1.32 mg/L, which corresponds to approximately 3.8–4.0 mg/L of 35% $FeCl_3$ (21 gpd). These calculations are based on a constant and maximum flow condition (0.5 m weir level, or 33 cfs). In order to provide an actionable dosing strategy for the facility operator, this logic was applied to modify the flow-based dosing curve, **Figure 4**.

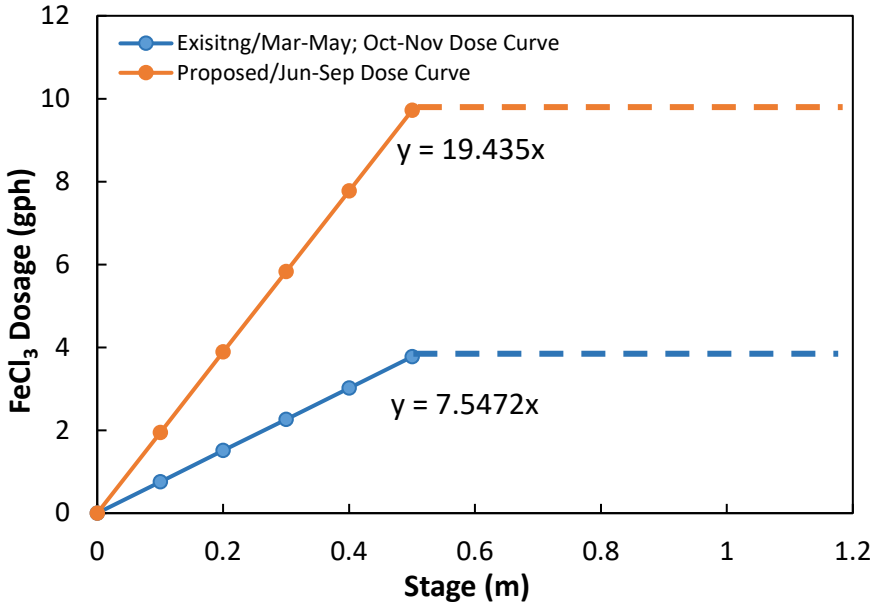



***Figure 4**: Existing and proposed dosing curve based on stage/water level in the weir.*

All of the calculations and data analyzed here are still subject to the considerable environmental variability present in this natural system. There is no guarantee that iron discharges will stay within limits and follow up monitoring and adaptive management may be needed, depending on in-situ conditions and performance.

Based on the seasonal increase in influent phosphorus concentrations we recommend using two different dosing strategies and monitoring the response.

1. March–May and October–November: Maintain the current $FeCl_3$ dosing of 2.33 mg/L (3.77 gph) for a flow rate of 33 cfs (0.5 m weir level).
2. June–September: Increase $FeCl_3$ dosing to 4.0 mg/L (9 gph) to manage elevated phosphorus concentrations effectively.

This covers the Spring, Summer, and Fall, periods of the year when the system would operate, and does not pertain to December through February. The anticipated outcomes for dosing optimization included: (A) identifying opportunities to reduce dosing during certain times of the year or flow conditions to lower material costs, and (B) increasing dosing during specific periods or conditions to offset the effects of competing substances that bind $FeCl_3$, thereby enhancing phosphorus removal.

There is still a fair amount of uncertainty in the assessment that have become apparent as the data was analyzed and flow and concentration correlations were not strong nor consistent. There are likely multiple variables affecting the chemistry and removal performance beyond just flow and phosphorus concentration. There were also some inherent constraints with the current study's data due to limitations in the dataset and methodological constraints, such as:

- *Seasonal Variability:* The available data lacked sufficient granularity to accurately capture seasonal trends in competing substances or their impact on $FeCl_3$ performance.
- *Competing Substances:* While competing substances were recognized as a potential factor, the study did not include targeted measurements or experiments to quantify their influence on $FeCl_3$ binding efficiency.
- *Flow-Based Variations:* Flow dynamics and potential flow bypass are affected by downstream tailwater that is not well understood or accounted for in system operation, and may affect outflow monitoring.

To address the data gaps and further refine dosing strategies, the following steps are recommended:

- *Expanded Monitoring:* Conducting more comprehensive seasonal monitoring of water quality parameters such as organic matter and competing ions will enhance the understanding of their interactions with $FeCl_3$ and interference with phosphorus removal.
- *Controlled Experiments:* Designing targeted jar tests or pilot studies to isolate and measure the impact of specific substances on phosphorus removal would provide valuable insights.
- *Dynamic Flow Analysis:* Expanding testing (piloting) to include a wider range of flow conditions would help refine dosing strategies and ensure better generalizability of results.

This study primarily provides an initial evaluation of the current $FeCl_3$ dosing regime and further, multi-variable detailed optimization analysis could be conducted. Future studies based on these findings will be better positioned to deliver additional refined dosing strategies, potentially including smart, automated systems that can adjust dosing to real-time differences in water chemistry and flow conditions.

## 4. CONCLUSION

The jar test findings provide some insights into the effectiveness of ferric chloride ($FeCl_3$) for PO4 removal, despite the uncertainty on the influence of water quality parameters like turbidity, hardness, and other competing compounds on removal efficiency. The discrepancies observed between PLSLWD's CD-2 and some of the jar test lab results, such as Harcros data, highlight the uncertainty included in the recommended changes. The Hawkins results may be more reliable, but this study only included one sample (June 2024) and does not show the effect of changing water chemistry on FeCl3 efficiency.

Additionally, the PO4 removal efficiency from the PLSLWD Ferric Chloride Water Treatment Facility 2022 Annual Report cited 43-72% removal efficiency from 2011-2022, which is higher than that achieved by the jar tests at similar doses. Thus, there may be various water quality parameters effecting binding or better mixing conditions within the system or influent water chemistry than represented in the jar tests. Jar testing is always considered a first step and an approximation and starting point for developing or modifying dosing regimes and must be followed up with field monitoring to confirm or adjust the dosing.

The variability of the CD-2 system monitoring data and the variable jar test results demonstrate the need to monitor the benefits of changes to the system and be open to additional changes. If changes are implemented and the system is still not operating at good efficiency, further testing across diverse water quality scenarios to refine dosing strategies may be warranted. Future jar tests/studies should prioritize collection of water throughout an entire growing season, across different flow rates, and be consistent with the analytical methods used for the CD-2 monitoring to provide more consistent results. The comprehensive jar testing should be designed to identify competing contaminants, evaluate treatment efficacy under varying seasonal, and flow conditions to optimize treatment effectiveness.

Depending on these factors, the district should be able to further optimize their dosing using historical trends and/or real-time monitoring to increase efficiency. Limitations in this study, such as insufficient seasonal testing and no-flow conditions during the study, meant challenges in dosing optimization. Future research/investigation, including expanded monitoring, controlled experiments, and dynamic flow analysis, will help bridge these gaps and enable more accurate dosing recommendations.

## 5. MEMO ATTACHMENTS

**Hawkins Jar Test Results**
**Harcros Jar Test Results**

July 8, 2024

**Customer:** Prior Lake, MN – Spring Lake
**Topic:** Phosphorus Removal Study

**Author:** Eric Sorenson

## Purpose and Background

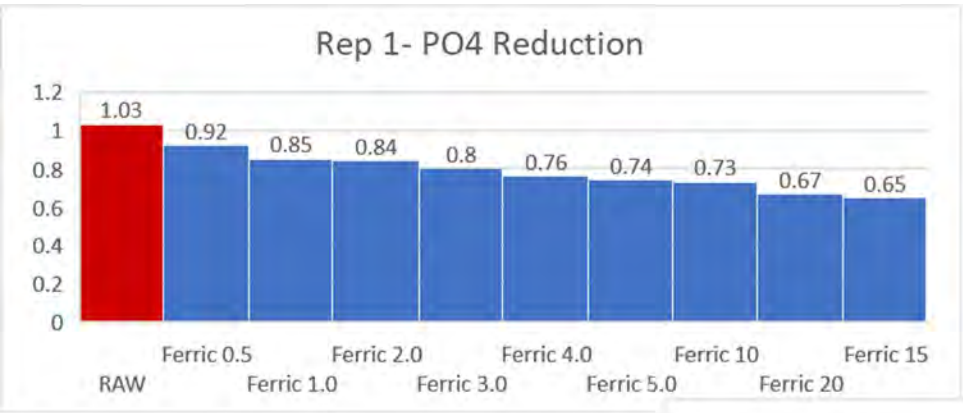
This study was conducted to investigate the use of current coagulant, Ferric Chloride, for P removal and dosage optimization.

## Sample Collection, Testing and Data

Raw water sample was taken by EOR from the site and delivered to Hawkins the next day. Testing commenced on the day water was delivered to the lab. Stock solutions were prepared at 1% by weight using DI water. Each test used 1000 mL of water that was; treated with prepared products in duplicate, stirred at 200 rpm for 10 minutes, reduced to 30 rpm to 30 minutes and allowed to settle for 24 hours. Sample was drawn slowly from 1-2 inches from the surface and PO4 measured with a HACH DR900, total P measured with Agilent 5110 ICP-OES.

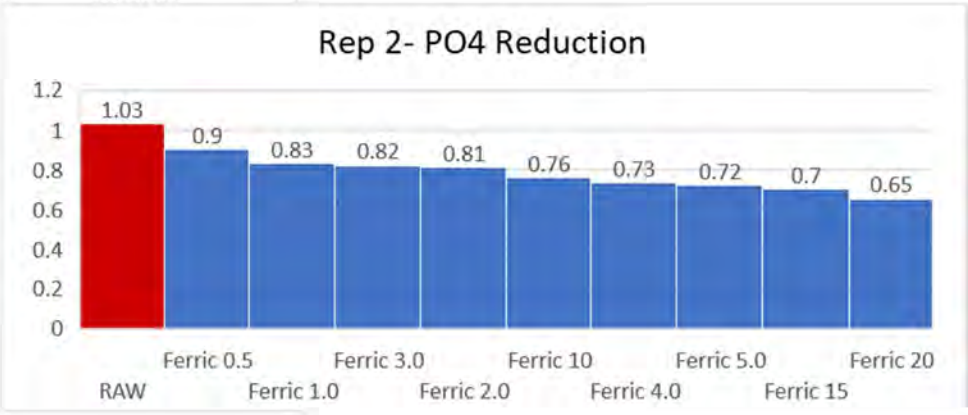
### RAW Data

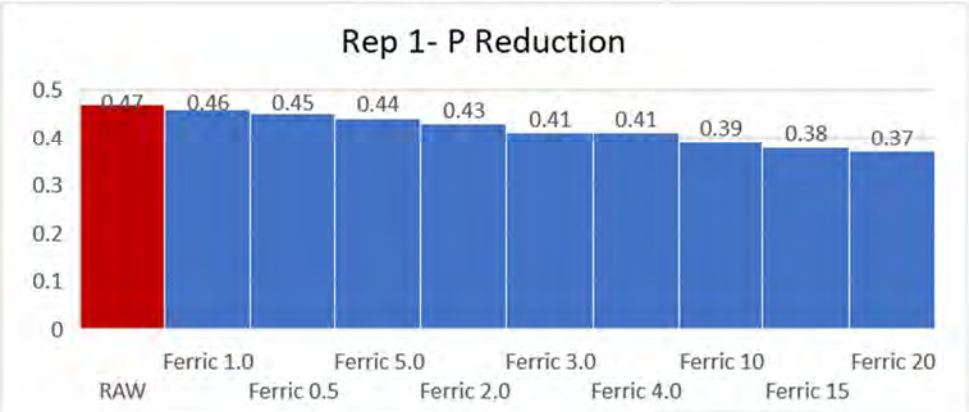
| | pH – 10 min | pH – 30 min | pH – 24 hr | OP | TP | Fe |
|---|---|---|---|---|---|---|
| RAW | 7.82 | 7.82 | 7.82 | 1.03 | 0.47 | 0.15 |
| Ferric 0.5 - 1 | 7.75 | 7.78 | 7.75 | 0.92 | 0.45 | 0.36 |
| Ferric 0.5 - 2 | 7.75 | 7.76 | 7.73 | 0.90 | 0.44 | 0.35 |
| Ferric 1.0 - 1 | 7.76 | 7.72 | 7.72 | 0.85 | 0.46 | 0.45 |
| Ferric 1.0 - 2 | 7.78 | 7.74 | 7.75 | 0.83 | 0.42 | 0.45 |
| Ferric 2.0 - 1 | 7.71 | 7.69 | 7.68 | 0.84 | 0.43 | 0.58 |
| Ferric 2.0 - 2 | 7.73 | 7.70 | 7.71 | 0.81 | 0.40 | 0.58 |
| Ferric 3.0 - 1 | 7.70 | 7.67 | 7.70 | 0.80 | 0.41 | 0.72 |
| Ferric 3.0 - 2 | 7.73 | 7.69 | 7.68 | 0.82 | 0.41 | 0.72 |
| Ferric 4.0 - 1 | 7.74 | 7.75 | 7.73 | 0.76 | 0.42 | 0.87 |
| Ferric 4.0 - 2 | 7.72 | 7.71 | 7.75 | 0.73 | 0.43 | 0.87 |
| Ferric 5.0 - 1 | 7.73 | 7.72 | 7.71 | 0.74 | 0.44 | 0.96 |
| Ferric 5.0 - 2 | 7.75 | 7.75 | 7.74 | 0.72 | 0.40 | 0.98 |
| Ferric 10 - 1 | 7.70 | 7.70 | 7.69 | 0.73 | 0.39 | 1.61 |
| Ferric 10 - 2 | 7.67 | 7.68 | 7.65 | 0.76 | 0.40 | 1.61 |
| Ferric 15 - 1 | 7.66 | 7.66 | 7.65 | 0.65 | 0.38 | 2.27 |
| Ferric 15 - 2 | 7.62 | 7.62 | 7.60 | 0.70 | 0.39 | 2.36 |
| Ferric 20 - 1 | 7.42 | 7.40 | 7.41 | 0.67 | 0.37 | 2.95 |
| Ferric 20 - 2 | 7.40 | 7.37 | 7.35 | 0.65 | 0.36 | 2.95 |




**Compiled orthophosphate Results from replicate #1 taken by HACH DR900**

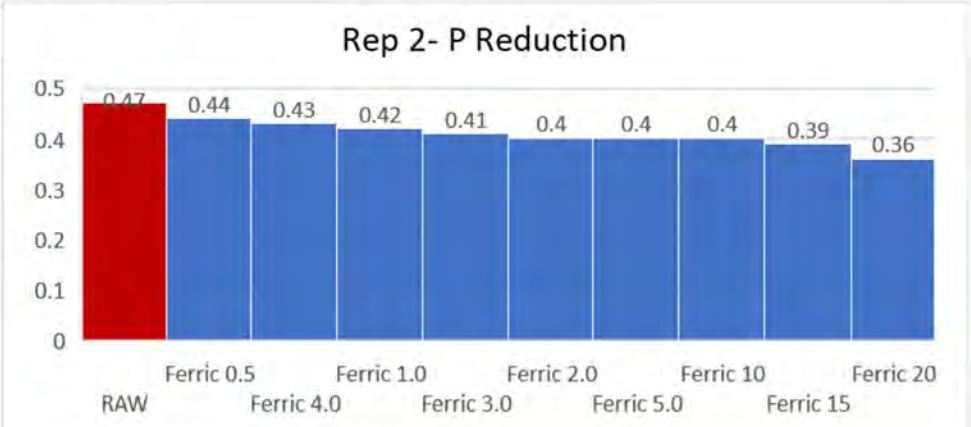
**Compiled orthophosphate Results from replicate #2 taken by HACH DR900**




**Compiled phosphorus Results from replicate #1 taken by Agilent 5110 ICP-OES**

**Compiled phosphorus Results from replicate #1 taken by Agilent 5110 ICP-OES**



Your Hawkins route sales representative – Lee Ryan will provide pricing and availability.

Please coordinate and place product order with your Hawkins WTG technical Route Sales Representative – Lee Ryan

For any questions concerning this testing report or Hawkins product recommendation, I can be reached at eric.sorenson@hawkinsinc.com or cell 715-271-1438
Thank you for considering Hawkins WTG products and services.

**Prior Lake – Spring Lake Watershed District**
**Phosphorous Removal Bench Testing**
**5/1/2024**

**Summary:**

- Samples were evaluated with various coagulants to determine phosphorous removal effectiveness.
- A sufficient sample was received to evaluate two coagulant types at the requested doses. The coagulants evaluated were ferric chloride and a 50:50 blend of ferric chloride and aluminum chloride.
- Both coagulants were effective at removing phosphorous. The 50:50 blend of ferric chloride and aluminum chloride provided slightly better results.

**Sample Information:**

- Sample ID: PLSLWD
- Sample taken: 4-22-24, 16:00
- Sample quantity: 2 gallons
- Sample handling: The sample was shipped overnight in an insulated container with an ice pack. The sample was kept refrigerated in the lab until testing occurred. Samples were adjusted to 15 - 16°C for testing.

**Treatment Procedure:**

- Samples were heated to 15 - 16°C prior to testing.
- Because of limited sample quantities, 500 ml samples were used for each coagulant dosage.
- Samples were treated at 5, 10, 15, 20, 25, 30, and 35 mg/L coagulant doses.
- An A&F jar mixer was used to prepare samples.
- The following treatment scheme was used:
    - Fast mix – 200 rpm for 10 minutes
    - Slow mix – 30 rpm for 30 minutes
    - Settle – 24 hours prior to testing
- After settling, samples were taken 1-2 inches below the top surface of the water.

**Analytical Methods Used:**

- Orthophosphate: Hach Method 8178: Phosphorous, Reactive (Orthophosphate), amino acid method
- Iron: Hach Method 8008: Iron, Total, USEPA FerroVer® Method

**Untreated Water Data:**

| Parameter | Value | Units |
|---|---|---|
| pH | 8.26 | |
| Turbidity | 8.5 | NTU |
| Conductivity | 804.5 | µS/cm |
| Phosphate | 2.1 | mg/L as PO4 |
| Phosphorous | 0.68 | mg/L as P |
| Iron | 0.05 | mg/L as Fe |

**Treated Sample Video Links:**

Ferric chloride samples: https://youtube.com/shorts/L5oVf0CCu0o

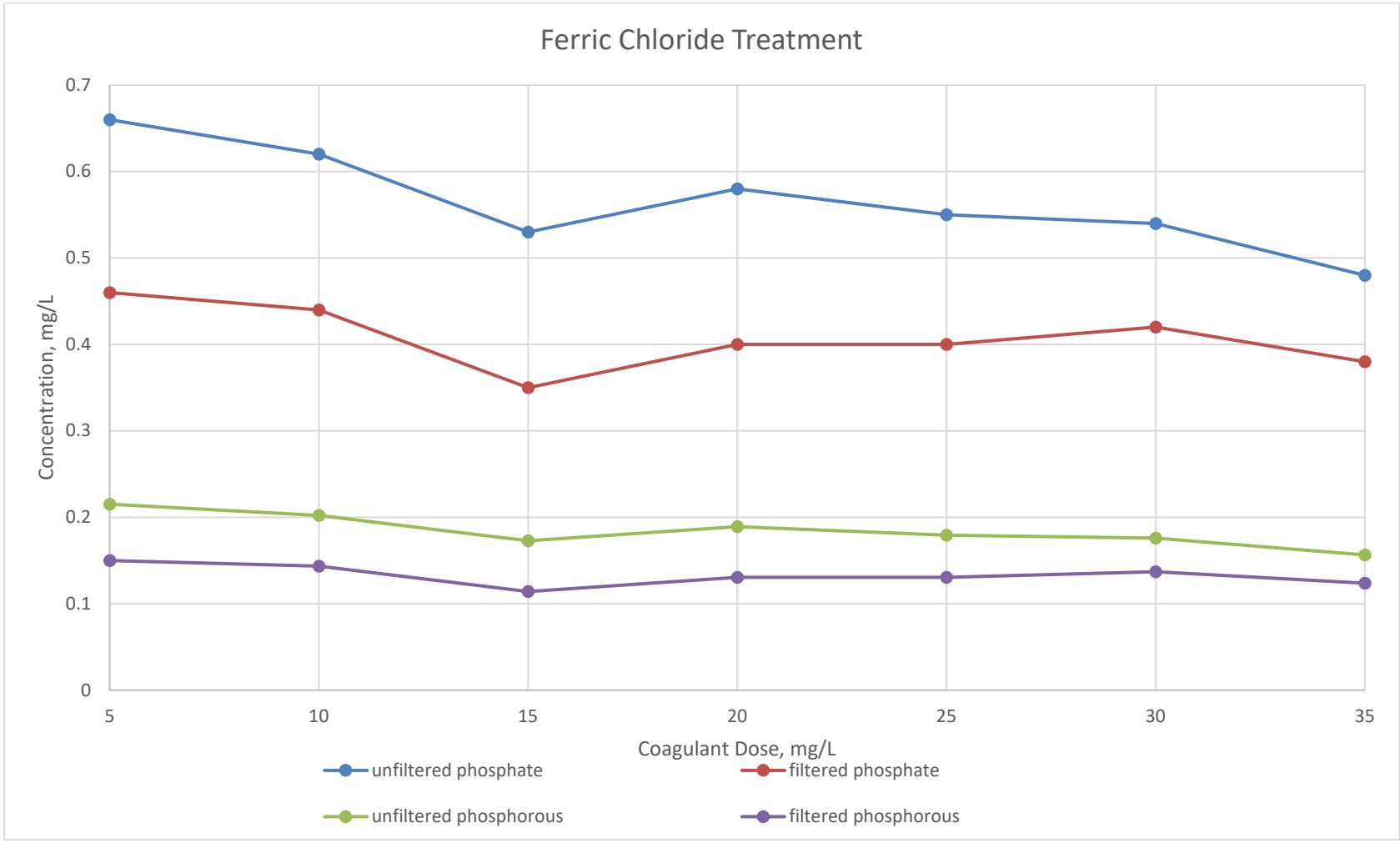
50:50 ferric chloride/aluminum chloride: https://youtube.com/shorts/UmzpMZqRvpo

**Treated Water Data with Ferric Chloride:**

| Dose, mg/L | pH after treatment | phosphate (mg/L), unfiltered | phosphate (mg/l), filtered | phosphorous (mg/L), unfiltered | phosphorous (mg/L), filtered | iron (mg/L), unfiltered | iron (mg/L), filtered | temperature, degrees C |
|---|---|---|---|---|---|---|---|---|
| 5 | 8.19 | 0.66 | 0.46 | 0.22 | 0.15 | 0.38 | 0.02 | 15.5 |
| 10 | 8.12 | 0.62 | 0.44 | 0.20 | 0.14 | 0.46 | 0.02 | 15.5 |
| 15 | 8.07 | 0.53 | 0.35 | 0.17 | 0.11 | 0.48 | 0.02 | 15.5 |
| 20 | 8.02 | 0.58 | 0.40 | 0.19 | 0.13 | 0.46 | 0.02 | 15.5 |
| 25 | 7.90 | 0.55 | 0.40 | 0.18 | 0.13 | 0.48 | 0.03 | 15.5 |
| 30 | 7.84 | 0.54 | 0.42 | 0.18 | 0.14 | 0.54 | 0.03 | 15.5 |
| 35 | 7.80 | 0.48 | 0.38 | 0.16 | 0.12 | 0.57 | 0.03 | 15.5 |

**Treated Water Data with 50:50 Blend of Ferric Chloride and Aluminum Chloride:**

| Dose, mg/L | pH after treatment | phosphate (mg/L), unfiltered | phosphate (mg/l), filtered | phosphorous (mg/L), unfiltered | phosphorous (mg/L), filtered | iron (mg/L), unfiltered | iron (mg/L), filtered | temperature, degrees C |
|---|---|---|---|---|---|---|---|---|
| 5 | 8.18 | 0.61 | 0.44 | 0.20 | 0.14 | 0.11 | 0.02 | 16 |
| 10 | 8.11 | 0.55 | 0.44 | 0.18 | 0.14 | 0.17 | 0.02 | 16 |
| 15 | 8.06 | 0.57 | 0.35 | 0.19 | 0.11 | 0.21 | 0.02 | 16 |
| 20 | 8.02 | 0.49 | 0.40 | 0.16 | 0.13 | 0.26 | 0.02 | 16 |
| 25 | 7.90 | 0.46 | 0.39 | 0.15 | 0.13 | 0.27 | 0.02 | 16 |
| 30 | 7.82 | 0.48 | 0.40 | 0.16 | 0.13 | 0.29 | 0.03 | 16 |
| 35 | 7.79 | 0.44 | 0.38 | 0.14 | 0.12 | 0.33 | 0.03 | 16 |

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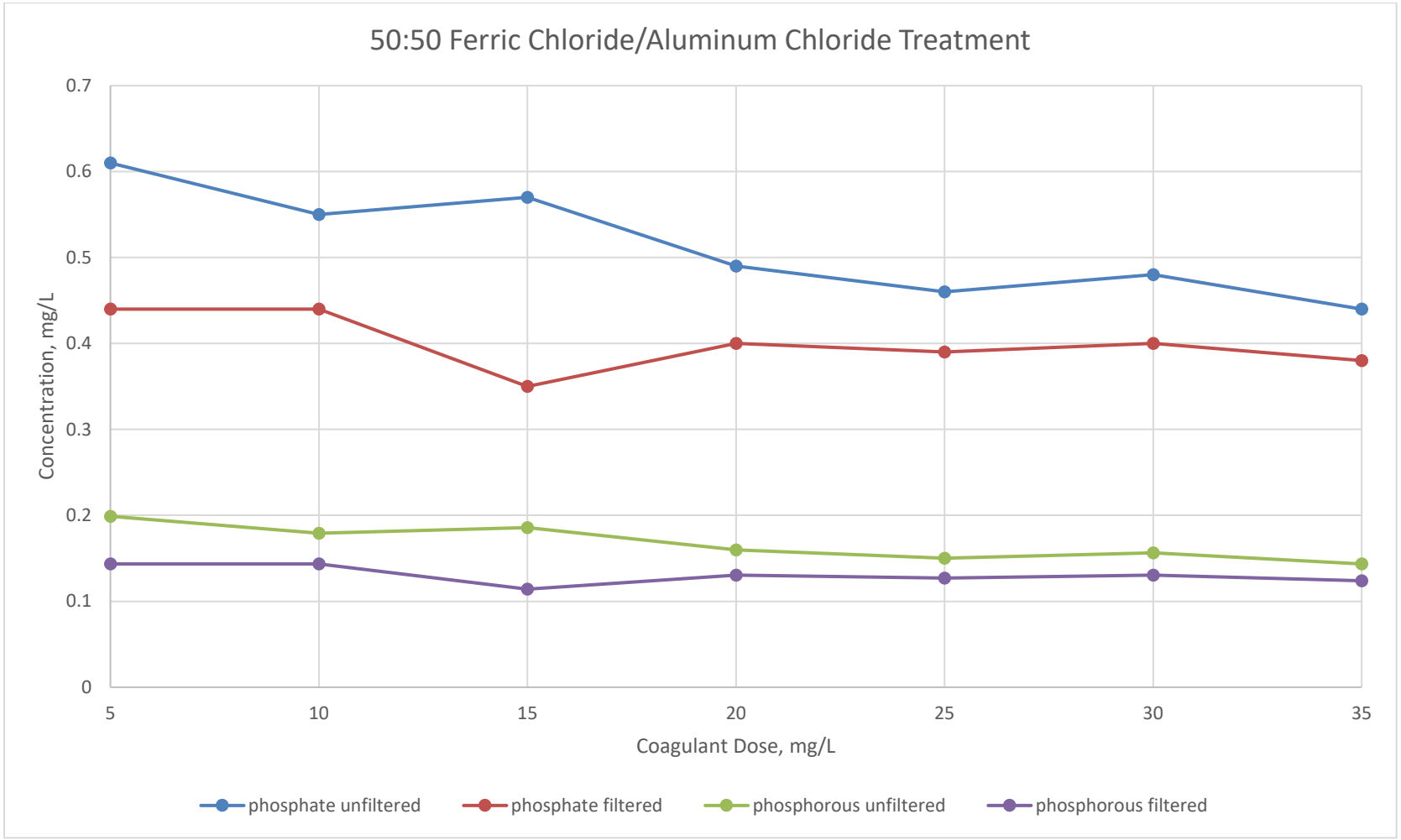
50:50 Ferric Chloride/Aluminum Chloride Treatment
Concentration, mg/L
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5
10
15
20
25
30
35
Coagulant Dose, mg/L
phosphate unfiltered
phosphate filtered
phosphorous unfiltered
phosphorous filtered

**Prior Lake – Spring Lake Watershed District**
**Phosphorous Removal Bench Testing**
**6/14/2024**

**Summary:**

- Samples were evaluated to determine phosphorous removal effectiveness.
- Ferric chloride was evaluated in this test set. The product was dosed based on iron content, not ferric chloride content.
- Ferric chloride was effective at removing phosphorous. Best results were achieved at a dose of 10 mg/L as Fe.

**Sample Information:**

- Sample ID: PLSLWD
- Sample taken: 6/5/24
- Sample received: 6/7/24
- Sample quantity: 4.5 gallons
- Sample handling: The sample was shipped overnight in insulated containers with ice packs. The sample was kept refrigerated in the lab until testing occurred. Samples were adjusted to 18°C for testing.

**Treatment Procedure:**

- Samples were heated to 18°C prior to testing.
- 1,000 ml samples were used for each coagulant dosage.
- Samples were treated at 0.5, 1, 2, 3, 4, 5, 10, 15, 20 mg/L as Fe coagulant doses.
- An A&F jar mixer was used to prepare samples.
- The following treatment scheme was used:
    - Fast mix – 200 rpm for 10 minutes
    - Slow mix – 30 rpm for 30 minutes
    - Settle – 24 hours prior to testing
- After settling, samples were taken 1.5 inches below the top surface of the water.

**Analytical Methods Used:**

- Orthophosphate: Hach Method 8178: Phosphorous, Reactive (Orthophosphate), amino acid method.
- Iron: Hach Method 8008: Iron, Total, USEPA FerroVer® Method.
- Analytical methods documents will be included with this report.

**Untreated Water Data:**

| Parameter | Value | Units |
|---|---|---|
| pH | 7.38 | |
| Turbidity | 16.5 | NTU |
| Conductivity | 616 | µS/cm |
| Phosphate | 1.65 | mg/L as $PO_4$ |
| Phosphorous | 0.54 | mg/L as P |
| Iron, total | 0.16 | mg/L as Fe |

**Videos and photos**:

Ferric chloride samples, floc characteristics, 0.5 through 3.0 mg/L: https://youtube.com/shorts/zJdiaUH6v5w

Ferric chloride samples, floc characteristics, 4.0 through 15 mg/L: https://youtube.com/shorts/tIpewSo9_ZM

Settled sample photos appear on pages 5 – 7.

**Treated Water Data with Ferric Chloride:**

| Dose, mg/L as Fe | pH after treatment | phosphate (mg/L), unfiltered | phosphate (mg/l), filtered* | phosphorous (mg/L), unfiltered | phosphorous (mg/L), filtered* | iron (mg/L), unfiltered | iron (mg/L), filtered* | temperature, degrees C |
|---|---|---|---|---|---|---|---|---|
| 0.5 | 7.34 | 1.16 | 0.85 | 0.38 | 0.28 | 0.15 | 0.02 | 18 |
| 1 | 7.31 | 1.07 | 0.81 | 0.35 | 0.26 | 0.20 | 0.03 | 18 |
| 2 | 7.27 | 1.05 | 0.80 | 0.34 | 0.26 | 0.32 | 0.04 | 18 |
| 3 | 7.25 | 1.05 | 0.80 | 0.34 | 0.26 | 0.35 | 0.05 | 18 |
| 4 | 7.23 | 0.92 | 0.75 | 0.30 | 0.24 | 0.30 | 0.05 | 18 |
| 5 | 7.21 | 0.84 | 0.71 | 0.27 | 0.23 | 0.32 | 0.05 | 18 |
| 10 | 7.17 | 0.33 | < 0.1 | 0.11 | < 0.1 | 0.47 | 0.09 | 18 |
| 15 | 7.15 | 0.69 | 0.54 | 0.23 | 0.18 | 0.69 | 0.11 | 18 |
| 20 | 7.11 | 1.04 | 0.77 | 0.34 | 0.25 | 1.87 | 0.24 | 18 |

* A 0.45 µm filter was used for all filtered samples

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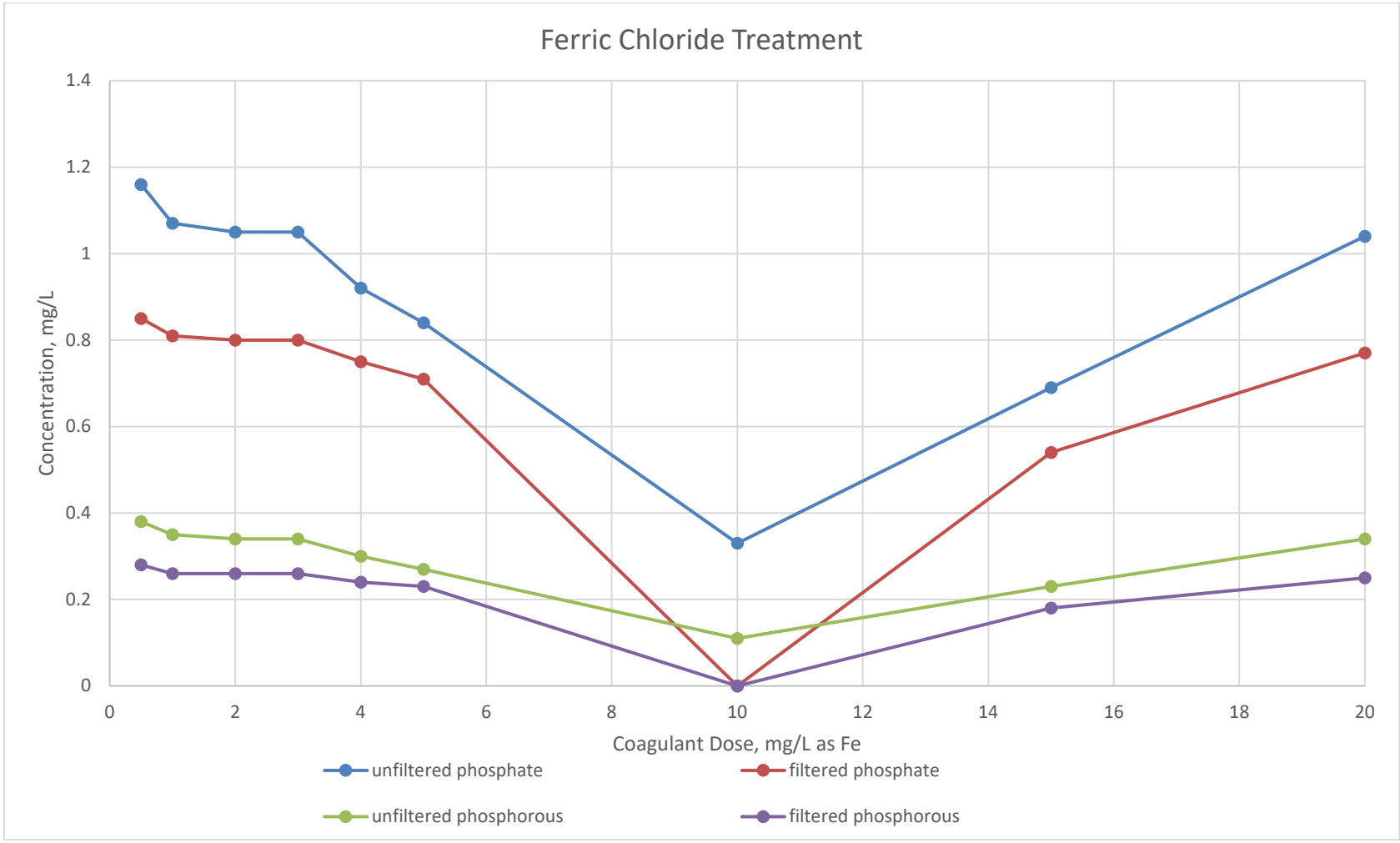
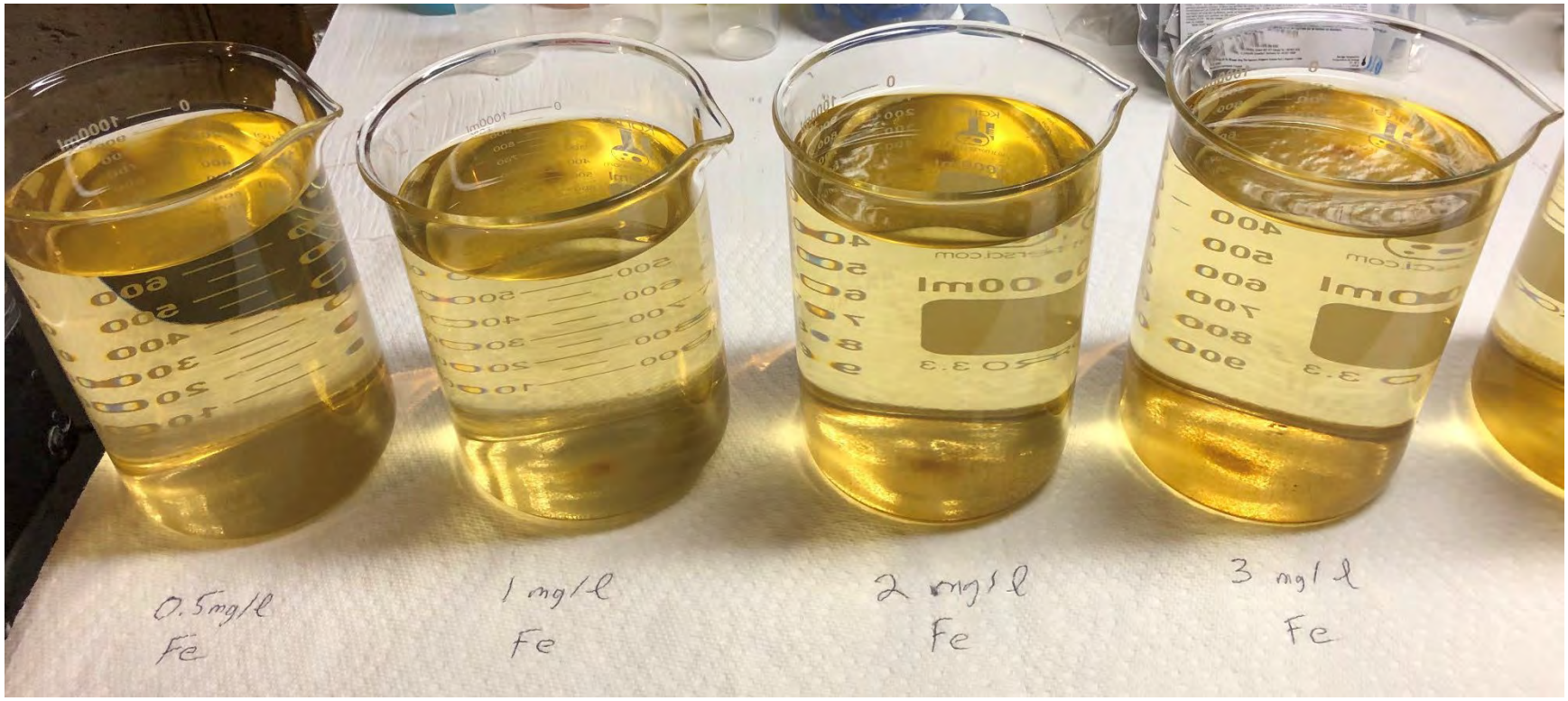

Ferric Chloride Treatment
Concentration, mg/L
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
2
4
6
8
10
12
14
16
18
20
Coagulant Dose, mg/L as Fe
unfiltered phosphate
filtered phosphate
unfiltered phosphorous
filtered phosphorous




Settled Samples

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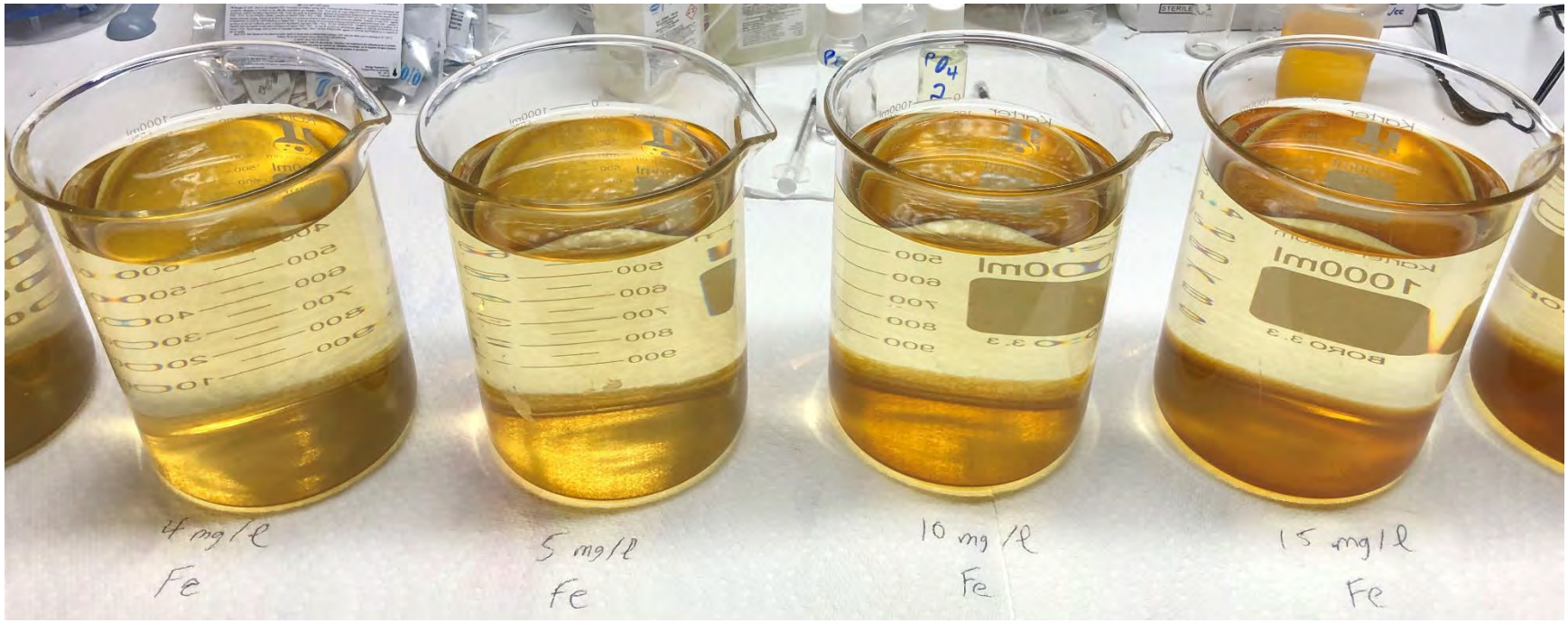
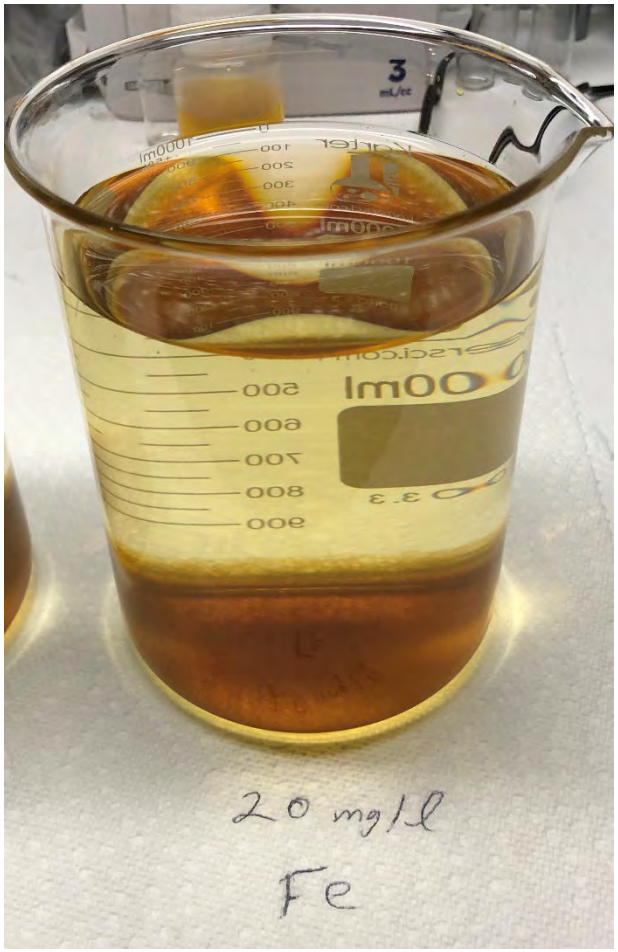


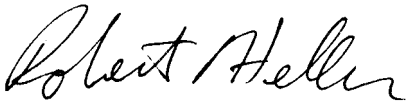

Settled Samples

HARCROS




Settled Sample

Report Completed By:



Robert Heller
Market Manager Water Treatment
530.263.5448
rheller@harcros.com

**PLSLWD Board Staff Report**
January 14, 2025

| | | | |
|---|---|---|---|
| **Subject** \| | 2025 Board Officer Appointments | | |
| **Board Meeting Date** \| | January 21, 2025 | **Item No:** | 4.3 |
| **Prepared By** \| | Joni Giese, District Administrator | | |
| **Attachments** \| | None | | |
| **Proposed Action** \| | Motion to approve board officers as listed in the board meeting packet. | | |

## Background

Per the PLSLWD Bylaws:

I. **Officers**. The Board annually will elect from among its members the following officers: president, vice president, secretary and treasurer. If any officer cannot complete his or her term of office, the Board immediately will elect from among its members an individual to complete the unexpired term. An officer's term as officer continues until a successor is elected or the officer resigns. The Board, by action at an official meeting, may appoint a manager as an officer pro tem in the event an officer is absent or unable to act, and action by that officer is required.

a. *President.* The president will:

i. preside at all meetings as chair of the Board.

ii. sign and deliver in the name of the District contracts, deeds, correspondence or other instruments pertaining to the business of the District;

iii. be a signatory to District documents if the treasurer or secretary is absent or disabled, to the same extent as the treasurer or secretary.

b. *Vice President.* The vice president will:

i. preside at meetings as chair in the absence of the president;

ii. be a signatory to District instruments and accounts if the president is absent or disabled, to the same extent as the president.

c. *Secretary.* The secretary will:

i. be a signatory to resolutions and other documents certifying and memorializing the proceedings of the District;

ii. maintain the records of the District;

iii. ensure that minutes of all Board meetings are recorded and made available to the Board in a timely manner and maintain a file of all approved minutes;

d. *Treasurer*. The treasurer will:

i. present a report at the monthly meeting of the Board of Managers that tracks each of the watershed district's funds and account balances;

ii. provide such other records as are necessary to inform the Board of the financial condition of the District.

## Discussion

The following is a list of board members serving as officers for 2024:

| | |
|---|---|
| President: | Bruce Loney |
| Vice President: | Frank Boyles |
| Treasurer: | Christian Morkeberg |
| Secretary: | Ben Burnett |

There are efficiencies and associated organization benefits to having officers remain in their current positions for another year.

## Action Item

Staff recommends Board approval of the following officer positions for 2025:

| | |
|---|---|
| President: | Bruce Loney |
| Vice President: | Frank Boyles |
| Treasurer: | Christian Morkeberg |
| Secretary: | Ben Burnett |

**PLSLWD Board Staff Report**
January 14, 2025

| | | | |
|---|---|---|---|
| **Subject** \| | 2025 Board Liaison Appointments | | |
| **Board Meeting Date** \| | January 21, 2025 | **Item No:** | 4.4 |
| **Prepared By** \| | Joni Giese, District Administrator | | |
| **Attachments** \| | 2025 Board Liaison Appointments | | |
| **Proposed Action** \| | Motion to approve the 2025 Board Liaison Appointments consistent with the list attached to the board packet memorandum. | | |

## Background

The Board assigns managers and/or staff to serve as liaisons to key watershed district partners on an annual basis. The roll of these liaisons is to provide information regarding District projects, programs and priorities to District partners and to share important updates from these organizations to the Board that may affect District interests.

Proposed listing of 2025 Board Liaison Appointments is attached.

## Recommendation

Staff recommends the Board of Managers approve the 2025 Board Liaison Appointments consistent with the list attached to the board packet memorandum.

# PLSLWD LIAISON APPOINTMENTS 2025

| MEETING | WHEN | WHO |
|---|---|---|
| City of Prior Lake | Council Meetings Second and Fourth Tuesday, 7:00 PM Council Chambers. Work Sessions before (5:00 PM). | Frank Boyles |
| City of Prior Lake<br>Citizen Engagement Committee | CEC Third Thursday, 4:30 PM<br>Prior Lake City Hall | PLSLWD staff (Patty Dronen) to monitor |
| City of Savage | Council Meetings First & Third Monday, 7:00 PM Council Chambers | vacant |
| Lower Minnesota Watershed District | Board of Managers Meeting<br>Third Wednesday, 7:00 PM Carver County Govt. Center | Ben Burnett |
| SCALE – General Membership | Second Friday, 7:30 AM | Frank Boyles |
| SCALE – Executive Committee | First Friday, 7:30 AM | Frank Boyles |
| SCALE – Service Delivery Committee | Second Monday 10:30 AM | Joni Giese |
| SCALE – Water Committee | Quarterly | Joni Giese |
| City of Shakopee | Council Meetings First & Third Tuesdays, 7:00 PM | Bruce Loney |
| Scott SWCD | Supervisor Board Meeting Third Tuesday, 9:00 AM | Matt Tofanelli |
| Scott WMO Planning Commission | Commission Meeting Fourth Monday, 4:00 PM | Bruce Loney |
| Spring Lake Township | Board Meeting Second Thursday, 7:00 PM Spring Lake Township, Town Hall | Christian Morkeberg |
| SMSC | As needed | Bruce Loney |
| CAC | Last Thursday, 6:30 PM, City Hall | Matt Tofanelli<br>PLSLWD Staff (Danielle Studer) |
| Sand Creek Township | First Thursday, 7:00 PM<br>Jordan City Hall | Christian Morkeberg |
| PLOC | Varies/ Prior Lake City Hall | Bruce Loney |
| Farmer-led Council | Varies – generally quarterly | Bruce Loney |
| Scott County | Commissioners Board Meeting<br>First and Third Tuesdays at 9:00 AM Scott County Govt. Center | Ben Burnett |
| Metro Watersheds (Gathering of Minnesota Watersheds, Region 3) | Quarterly | Frank Boyles<br>Joni Giese |

**PLSLWD Board Staff Report**
January 14, 2025

| | |
|---|---|
| **Subject** \| | Termination of Watershed Development Agreement, Doc. No. A 816076 |
| **Board Meeting Date** \| | January 21, 2025 **Item No:** 4.5 |
| **Prepared By** \| | Troy Kuphal, Scott SWCD |
| **Attachments** \| | 1) Exhibit A - Copy of Watershed Development Agreement (WDA)<br>2) Exhibit B – Infiltration Area Location Map |
| **Proposed Action** \| | Authorize the District Administrator to terminate Watershed Development Agreement, Doc. No. A 816076, conditioned on receipt of written commitment for continued maintenance from City of Prior Lake. |

## Background

In August 2008, the District entered into a Watershed Development Agreement (Agreement) with SHEPHERD OF THE LAKE EVANGELICAL LUTHERAN CHURCH and SHEPHERD'S PATH SENIOR HOUSING, INC. ("Parties") to allow for the installation of two (2) infiltration areas ("East" and "West", see Exhibit B) to the storm water management plans approved by the District under Permit 05.03 and associated amendment #1 to 05.03. The WDA was recorded as Doc. No. A 816076 on the deeds of parcels owned by the Parties. The East infiltration area is located on what is now PID 254520090, and the West infiltration area is located on what is now PID 254520040.

The infiltration areas were constructed in 2008, and in 2017 the City of Prior Lake became fee owner of parcel on which the West infiltration area is located, and PRESBYTERIAN HOMES HOUSING AND ASSISTED LIVING INC acquired the parcel on which the East infiltration area is located. The City of Prior Lake has been maintaining both areas as part of their stormwater infrastructure maintenance program. This includes the East area even though the City does not own the parcel or have a drainage and utility easement over it. It is important to note that the East infiltration area was added to an existing stormwater pond constructed in 2003 as part of the SHEPHERDS PATH ADDN development, and for which a drainage and utility easement benefitting Scott County was granted (Doc No. 555202), presumably at least in part because it receives stormwater runoff from CSAH 42.

Recently, the District was contacted by representatives of SHEPHERD OF THE LAKE EVANGELICAL LUTHERAN CHURCH (SOLLC) to inquire about the possibility of terminating the Agreement. The reason provided is that SOLLC was negotiating sale of a portion of land they own to the Shakopee Mdewakanton Sioux Community (SMSC) and both SOLLC and SMSC desired to clear the title of any liability associated with the Agreement.

## Discussion

Article 9 of the WDA provides the following:

*"This Agreement shall terminate on the date that the Infiltration Areas are* ***dedicated to and accepted by the City of Prior Lake*** (emphasis added) *for infiltration purposes. In the absence of such dedication and acceptance, this Agreement shall remain in effect and shall be enforceable by the District for a term of 30 years from the date hereof. After such time, this Agreement shall extend automatically for successive*

*periods of 10 years, unless an instrument signed by the then Owner and the District has been filed for record modifying or terminating this Agreement."*

It is staff's opinion that the City's ownership of PID 254520090 sufficiently meets the intent of being "dedicated to and accepted by the City of Prior Lake". Though the City does not own the other parcel, it has been communicated to staff that they intend to continue maintenance of the East infiltration area as they have since it was constructed. Furthermore, there is a cooperative agreement between the City and Scott County whereby the City is responsible for maintaining County stormwater facilities that are located within their jurisdiction. It is staff's further opinion that this cooperative agreement, along with the City's historic and intended future maintenance East infiltration area is also consistent with the intent of the Watershed Development Agreement as pertaining to termination. In this case, however, it would be conditioned upon the City providing formal written commitment regarding their intent for continued maintenance.

## Recommendation

Motion to authorize the District Administrator to terminate Watershed Development Agreement, Doc. No. A 816076, conditioned on receipt of written commitment for continued maintenance from City of Prior Lake, in form and content acceptable to the District Administrator.

**EXHIBIT A**

Doc. No. A 816076
OFFICE OF THE COUNTY RECORDER
SCOTT COUNTY, MINNESOTA
Certified Filed and/or Recorded on
01-20-2009 at 03:45 Receipt:200356
Pat Boeckman, County Recorder 01
Fee: $ 46.00

# WATERSHED DEVELOPMENT AGREEMENT

This Agreement is made this 8th day of August, 20 08, between the following two described parties:

1) SHEPHERD OF THE LAKE EVANGELICAL LUTHERAN CHURCH, a Minnesota corporation ("SOLLC") and SHEPHERD'S PATH SENIOR HOUSING, INC., a Minnesota corporation ("SPSH"), (SOLLC and SPSH being collectively referred to herein as the "Owner"), and

2) PRIOR LAKE-SPRING LAKE WATERSHED DISTRICT, a political subdivision of the State of Minnesota, (referred to herein as "Watershed District" or "District").

## RECITALS

A. Owner is developing certain property known as Shepherd's Path and Shepherd's Path Senior housing ("Project") located in Prior Lake, Minnesota, and legally described in Exhibits A and B.

B. The Watershed District has issued Permit 05.03 and associated amendment #1 to 05.03 ("Permit"), for a storm water management plan for the Project ("Plan"). The Owner agrees to construct, use, operate and maintain the infiltration structures within the Project as described in Exhibit C (the "Infiltration Areas") in accordance with the provisions of this Agreement.

## AGREEMENT

In consideration of the mutual covenants herein, the parties hereto agree as follows:

1. RECITALS. The foregoing recitals are true and correct and incorporated herein by this reference.

**EXHIBIT A, cont.**

2. INFILTRATION AREAS. Owner shall construct the Infiltration Areas to the specifications, in the locations, and at the times required by the Permit, the District Rules and as set forth herein.

3. USE AND MAINTENANCE. Owner shall, at its expense, use, operate, repair, maintain, replace and restore the Infiltration Areas in accordance with the requirements of the Permit, best management practices (BMPs) and specifications for the Infiltration Areas, to include without limitation the following:

(a) As applicable, the provisions of the "Minnesota Urban Small Sites BMP Manual" (Barr Engineering, printed July 2001, as amended) and "The Minnesota Stormwater Manual" (Minnesota Stormwater Steering Committee, November 2005, as amended) shall be followed for the establishment and maintenance of the Infiltration Area.

(b) Sequencing of the construction and related activities shall be coordinated by the Owner, particularly to minimize soil compaction, soil smearing and sedimentation that could compromise the capability of the Infiltration Areas.

(c) Any graded areas of the Infiltration Areas shown in Exhibit C shall be seeded and maintained to have at least 90 percent growth of vegetative cover. The Owner shall obtain the District's approval of the vegetation plan prior to installation. If growth is reduced to less than 90 percent, Owner shall seed or plant the areas as necessary to improve and maintain the vegetative cover.

(d) Once properly established, the Infiltration Areas shall be flagged or fenced as a "stay off" area during the balance of the construction activities until the area is stabilized, and as necessary following construction to preserve the function of the infiltration area.

4. RESTRICTIONS. The following restrictions shall apply to the Infiltration Areas:

(a) The Infiltration Areas shall be preserved and maintained predominantly in the location, size and condition shown on the approved Plan and Permit.

(b) Owner shall not make any use of the Infiltration Areas that would adversely affect the functions of the Infiltration Areas for the infiltration of storm water in the manner set forth in the Plan.

(c) No building, structure, playground or other impervious surface shall be placed upon or within the Infiltration Areas without the prior written consent of the District.

(d) No trash, waste or other offensive material, soil or landfill shall be placed upon or within the Infiltration Areas without the prior written consent of the District.

(e) No change in the general topography of the Infiltration Areas, including, without limitation, excavation, dredging, movement and removal or replacement of soil, shall be allowed without the prior written consent of the District.

5. INSPECTION. Owner grants to the District and is agents, employees, officers and contractors, a license to enter the Project (but not any buildings) at reasonable times to monitor subsequent activities and uses, perform work, and enforce this Agreement. The District shall give reasonable prior notice to the Owner of all such entries and shall not unreasonably interfere with the Owner's use and quiet enjoyment of the Project. This Agreement grants no right of access or entry on the Project to the general public.

6. INDEMNITY. Owner shall indemnify, defend and hold the District and its agents, employees, officers, and contractors, harmless from all claims made by itself and third parties for damage or loss sustained or costs incurred, including District staff and engineering and attorneys' fees, in connection with or arising out of the issuance of the Permit, the construction of the Project, or this Agreement.

7. COSTS AND FEES. Owner shall reimburse the District for all costs incurred in the enforcement of this Agreement, including District staff and engineering and attorneys' fees. Owner shall fully pay all invoices submitted by the District for obligations incurred under this Agreement within 7 days after receipt. Amounts not so paid shall accrue interest at the rate of 8 percent per year.

8. DEFAULT. If Owner defaults as to any obligations required by the Permit, the Rules, or this Agreement, the District may, at its option and after not less than 48 hours notice to Owner, enter upon the Project and perform the work, and Owner shall reimburse the District for all costs incurred thereby. In the event of an emergency as determined by the District, the requirement of 48 hours advance notice of default shall be waived.

9. DURATION. This Agreement shall terminate on the date that the Infiltration Areas are dedicated to and accepted by the City of Prior Lake for infiltration purposes. In the absence of such dedication and acceptance, this Agreement shall remain in effect and shall be enforceable by the District for a term of 30 years from the date hereof. After such time, this Agreement shall extend automatically for successive periods of 10 years, unless an instrument signed by the then Owner and the District has been filed for record modifying or terminating this Agreement.

10. BINDING EFFECT.

(a) This Agreement shall run with the land and bind and inure to the benefit of the parties hereto and their respective heirs, successors and assigns. However, that Owner and each successor record owner of the Project shall be fully discharged and relieved of liability under this Agreement upon ceasing to own any interest in the Project and paying all amounts and performing all obligations hereunder to the time ownership terminates.

(b) If the Project is a subdivision, the obligations of Owner under this Agreement may be transferred to and assumed by a homeowner's association responsible for the

operation and maintenance of the common areas and improvements of the Project. Upon such transfer and assumption, Owner and each successor owner of any lot in the Project shall be relieved of liability under this Agreement upon their: (i) Filing for record the assumption of liability by the homeowner's association and (ii) Payment of all amounts and performance of all obligations hereunder as of the transfer.

11. RECORDING. Owner shall provide the signed original copy of this agreement to the District for recording. The Owner shall be responsible for payment of the recording fee(s) and if such fee(s) are advanced by the District, the Owner shall reimburse the District for those fee(s).

12. MISCELLANEOUS. Unless the context otherwise requires, references in this Agreement to the Rules adopted by the District include amendments and revisions to the Rules. For the purpose of this Agreement, unless the context otherwise requires, the terms "best management practices" and "impervious surface" shall have the meaning set forth in the Rules.

(a) The invalidity or unenforceability of any provision of this Agreement shall not affect the validity or enforceability of any other provision.

(b) The failure of the District to insist on compliance or enforcement of any provision of this Agreement shall not affect the validity or enforceability or constitute a waiver of future enforcement of that provision or any other provision by the District.

(c) All notices under this Agreement shall be deemed to be sent or delivered when personally delivered to the recipient or when mailed by certified or registered mail, postage prepaid, addressed to Owner at 13760 McKenna Rd., NW, Prior Lake, Minnesota 55372 , and to the Watershed District at 15815 Franklin Trail, Prior Lake, Minnesota 55372, or at such other address as either party may hereafter designate in writing to the other.

(d) This Agreement shall be subject to and governed by Minnesota law.

**EXHIBIT A, cont.**

SHEPHERD OF THE LAKE EVANGELICAL LUTHERAN CHURCH

BY _____
ITS PRESIDENT

SHEPHERD'S PATH SENIOR HOUSING, INC.

BY _____
ITS SECRETARY

STATE OF MINNESOTA )
)ss.
COUNTY OF SCOTT )

The foregoing instrument was acknowledged before me this 8th day of August, 2008, by Sue Leibnitz, President of SHEPHERD OF THE LAKE EVANGELICAL LUTHERAN CHURCH, a Minnesota Corporation, on its behalf.

JULIE ANN DEUTSCH
Notary Public-Minnesota
My Commission Expires Jan 31, 2010

_____
Notary Public

STATE OF MINNESOTA )
)ss.
COUNTY OF SCOTT )

The foregoing instrument was acknowledged before me this 8th day of August, 2008, by Kermit Mahlum, Secretary of SHEPHERD'S PATH SENIOR HOUSING, INC., a Minnesota Corporation, on its behalf.

JULIE ANN DEUTSCH
Notary Public-Minnesota
My Commission Expires Jan 31, 2010

_____
Notary Public

update 080508 je

**EXHIBIT A, cont.**

PRIOR LAKE – SPRING LAKE
WATERSHED DISTRICT

BY _____
ITS ADMINISTRATOR

STATE OF MINNESOTA )
)ss.
COUNTY OF SCOTT )

The foregoing instrument was acknowledged before me this 5th day of January, 2009, by Michael Kinney, the Administrator of the PRIOR LAKE-SPRING LAKE WATERSHED DISTRICT, a political subdivision under Minnesota law, on its behalf.

_____
Notary Public

This instrument was drafted by:

Huemoeller, Bates and Gontarek
16770 Franklin Trail
Prior Lake, MN 55372

Return to:

Prior Lake-Spring Lake Watershed District
15815 Franklin Trail SE, Suite 100
Prior Lake, MN 55372

update 080508 je

6/12

# EXHIBIT A

## LEGAL DESCRIPTION OF SOLLC LAND

That part of the East Half of the Southeast Quarter of the Southwest Quarter of Section 22, Township 115, Range 22, Scott County, Minnesota, lying West of the East 101.63 feet of said Southeast Quarter of the Southwest Quarter of Section 22, and lying South of the North 66.00 feet of said Southeast Quarter of the Southwest Quarter of Section 22.

That part of the East 101.63 feet of the Southeast Quarter of the Southwest Quarter of Section 22, Township 115, Range 22, Scott County, Minnesota, lying South of the North 66.00 feet of said Southeast Quarter of the Southwest Quarter of Section 22.

Together with that part of the Southwest Quarter of the Southeast Quarter of said Section 22, lying Westerly of the East 515.31 feet of said Southwest Quarter of the Southeast Quarter of Section 22; Except the North 66.00 feet of the West 33.00 feet of said Southwest Quarter of the Southeast Quarter of Section 22; and also except the East 1200.00 feet of the South 800.00 feet of said Southwest Quarter of the Southeast Quarter of Section 22.

The East 1200.00 feet of the South 800.00 feet of said Southwest Quarter of the Southeast Quarter of Section 22, including the abandoned right-of-way of the Chicago, Milwaukee, St. Paul and Pacific Railroad Company (formerly the Hastings and Dakota County Railway Company).

2/2

# EXHIBIT B

## LEGAL DESCRIPTION FOR SPSH LAND

The East 515.31 feet of the Southwest Quarter of the Southeast Quarter, Section 22, Township 115, Range 22, Scott County, Minnesota, except the South 800.00 feet of said Southwest Quarter of the Southeast Quarter.

AND

That part of the Southeast Quarter of the Southeast Quarter of Section 22, Township 115, Range 22, Scott County, Minnesota, which lies west of a line described as beginning at a point on the South line of said Southeast Quarter of the Southeast Quarter distant 487.82 feet West of the Southeast corner thereof; thence north parallel with the east line of said Southeast Quarter of the Southeast Quarter to the intersection with the north line of said Southeast Quarter of the Southeast Quarter and there terminating.

12/8

**EXHIBIT A, cont.**

EXHIBIT C:

LEGAL DESCRIPTION OF INFILTRATION AREAS

Outlot C,
Shepherd's Path Addition,
Section 22, Township 115, Range 22,
Scott County, Prior Lake, MN

Outlot C includes infiltration facilities. Outlot C is located in the south central portion of the site.

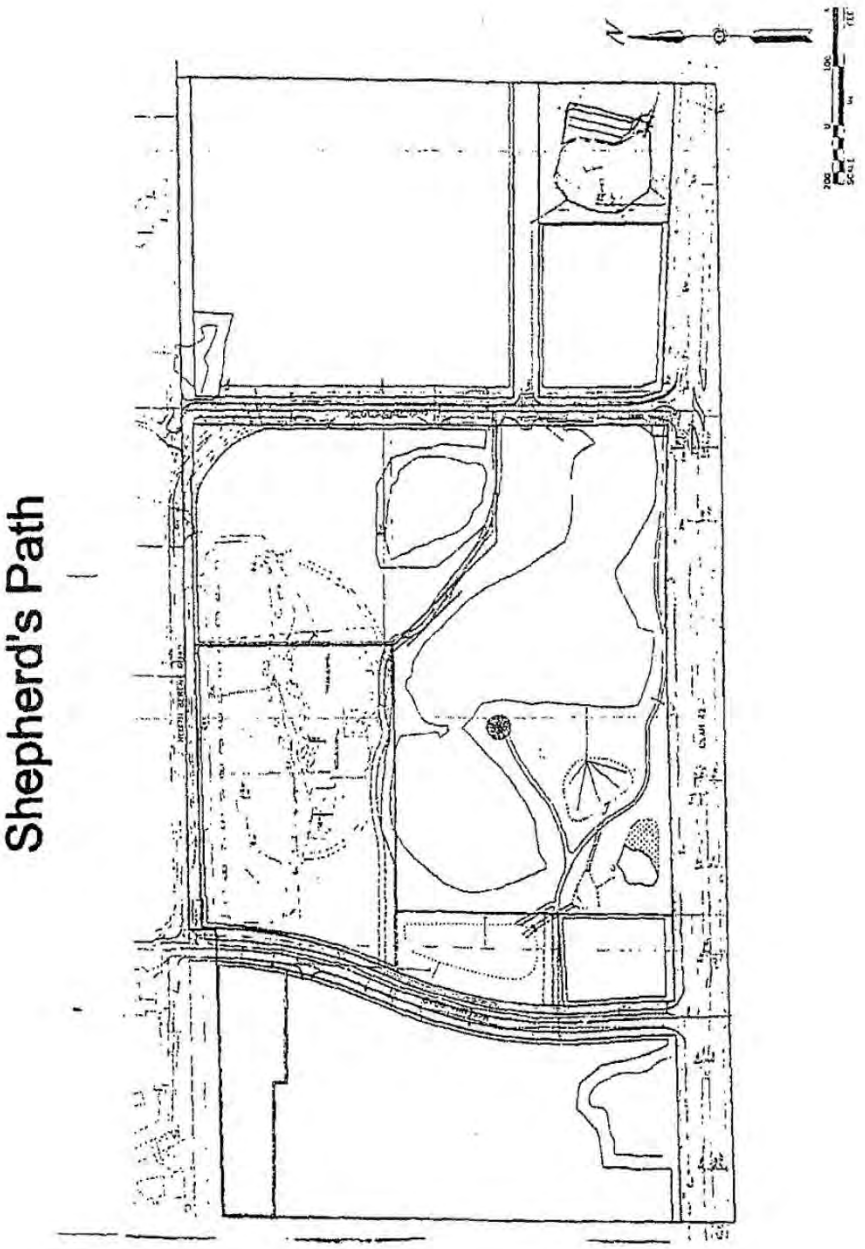
Outlot F,
Shepherd's Path Addition
Section 22, Township 115, Range 22,
Scott County, Prior Lake, MN

Outlot F includes infiltration facilities. Outlot F is located in the southeast corner of the site.

The following three pages are drawing indicating the general locations of the above infiltration facilities in Outlot C and in Outlot F.

9/12

**EXHIBIT A, cont.**




10/12

**EXHIBIT A, cont.**

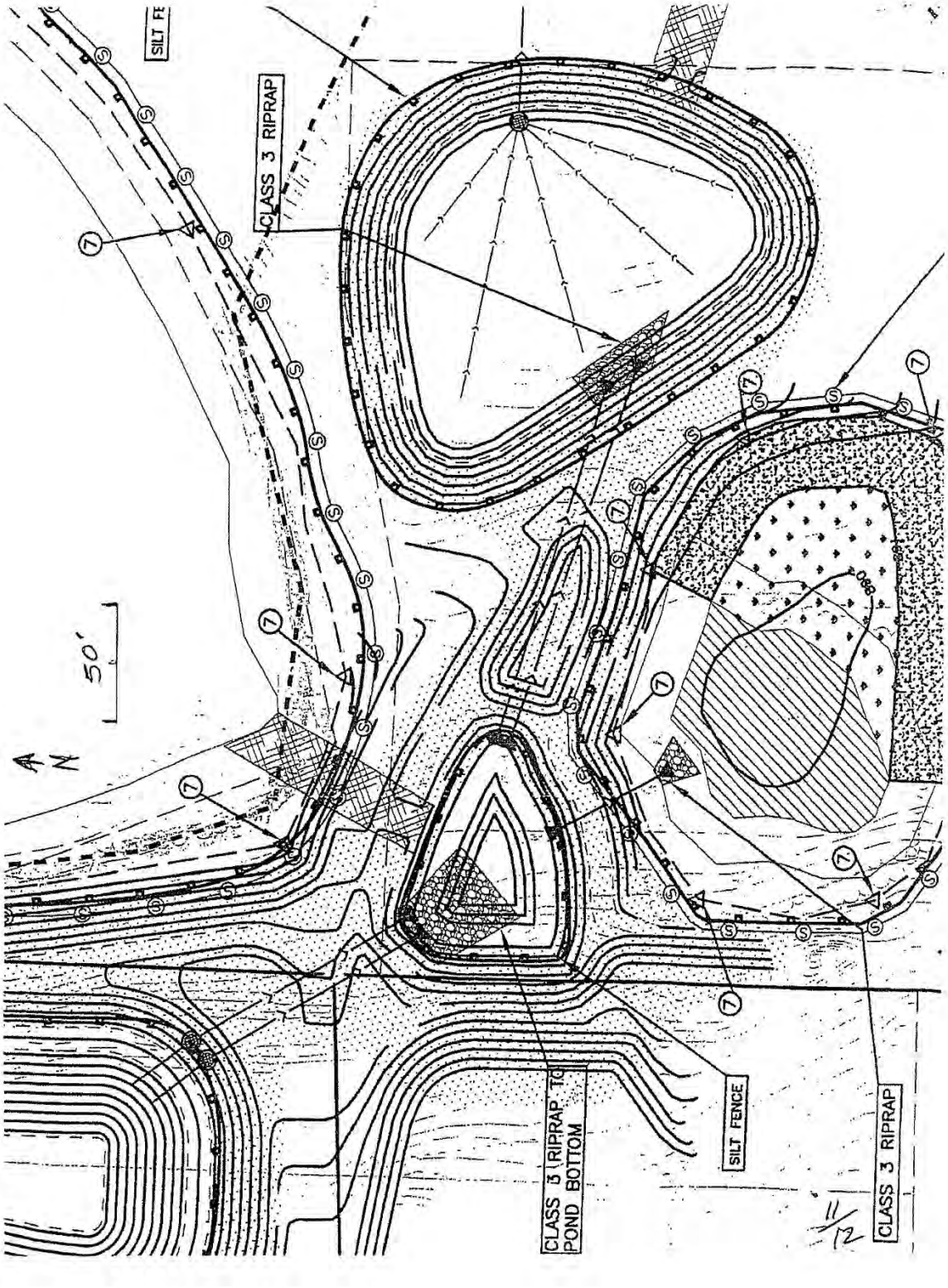
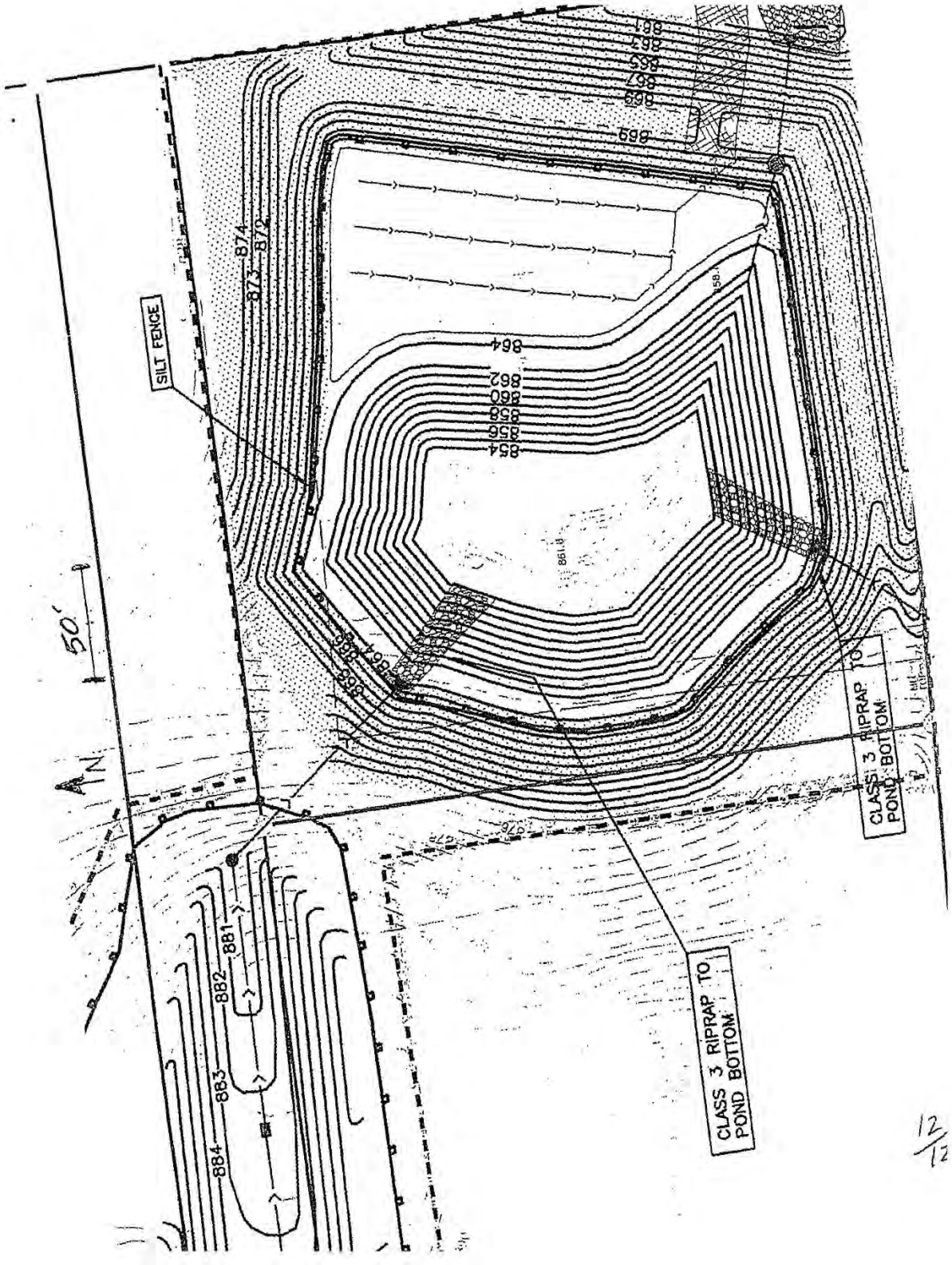


**EXHIBIT A, cont.**



# EXHIBIT B

## INFILTRATION AREA LOCATION MAP


**Legend**

- 2021 Parcel Boundaries
- Easement Boundaries

**Scale**

0 150 300 600 Feet

N

DISCLAIMER: This information is to be used for reference purposes only. PLSLWD does not guarantee the accuracy of the material contained herein and is not responsible for misuse or misinterpretation. A survey should be completed if an exact boundary location is needed.

**PRIOR LAKE SPRING LAKE WATERSHED DISTRICT**
**Financial Report - Cash Basis**
**January 1, 2024 Through December 31, 2024**

**Reflects bills paid through November 30, 2024**

| Program Element | | 2024 Source of Funds | | | | | 2024 Actual Results | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 2024 Levy | Budget Reserve | Grant Funds/Fees | Budget Adjustment | 2024 Budget | December 2024 | YTD | YTD % of Budget |
| | **General Fund (Administration)** | | | | | | | | |
| | **Revenues** | | | | | | | | |
| | Property Taxes | $ 252,000 | $ - | $ - | | $ 252,000 | $ 121,276 | $ 250,446 | 99% |
| | Interest | - | - | 9,000 | | 9,000 | - | 7,469 | 83% |
| | **Total Revenues** | **$ 252,000** | **$ -** | **$ 9,000** | **$ -** | **$ 261,000** | **121,276** | **257,915** | 99% |
| | | | | | | | | | |
| | **Expenditures** | | | | | | | | |
| | Administrative Salaries and Benefits | $ 145,000 | $ - | $ - | | $ 145,000 | 27,506 | 152,824 | 105% |
| | 703 · Telephone, Internet & IT Support | 7,000 | - | 9,000 | | 16,000 | 1,212 | 13,034 | 81% |
| | 702 - Rent | 27,500 | - | - | | 27,500 | 2,459 | 30,120 | 110% |
| | 706 · Office Supplies | 8,000 | - | - | | 8,000 | 1,007 | 6,810 | 85% |
| | 709 · Insurance and Bonds | 13,000 | - | - | | 13,000 | (871) | 10,928 | 84% |
| | 670 · Accounting | 33,500 | - | - | | 33,500 | 6,710 | 32,405 | 97% |
| | 671 · Audit | 10,500 | - | - | | 10,500 | - | 10,500 | 100% |
| | 901- Mailings | - | - | - | | - | - | - | #DIV/0! |
| | 903 · Fees, Dues, and Subscriptions | 1,500 | - | - | | 1,500 | 215 | 1,694 | 113% |
| | 660 · Legal (not for projects) | 6,000 | - | - | | 6,000 | 861 | 8,036 | 134% |
| | | | | | | | | | |
| | **General Fund (Administration) Expenditures** | **$ 252,000** | **$ -** | **$ 9,000** | | **$ 261,000** | **39,100** | **266,351** | 102% |
| | | | | | | | | | |
| | **Net Change in General Fund** | **-** | **-** | **-** | **-** | **-** | **82,176** | **(8,435)** | |

No assurance is provided on this statement. See selected information.

**PRIOR LAKE SPRING LAKE WATERSHED DISTRICT**

**Financial Report - Cash Basis**

**January 1, 2024 Through December 31, 2024**

**Reflects bills paid through November 30, 2024**

| Program Element | | 2024 Source of Funds | | | | | 2024 Actual Results | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 2024 Levy | Budget Reserve | Funds/Fees | Budget Adjustment | 2024 Budget | December 2024 | YTD | YTD % of Budget |
| | **Implementation Fund** | | | | | | | | |
| | **Revenues** | | | | | | | | |
| | Property Taxes | $ 1,697,000 | $ - | $ - | | $ 1,697,000 | 812,806 | 1,678,772 | 99% |
| | Grants/Fees | - | - | 34,000 | 90,000 | 124,000 | - | 150,903 | 122% |
| | Interest | - | - | 61,000 | | 61,000 | 35,280 | 163,951 | 269% |
| | Sales/Other | - | - | - | | - | - | 39,879 | #DIV/0! |
| | Budget Reserves | - | $ 468,500 | - | 54,856 | 523,356 | - | - | 0% |
| | **Total Revenues** | **$ 1,697,000** | **$ 468,500** | **$ 95,000** | **$ 144,856** | **$ 2,405,356** | **848,086** | **2,033,505** | 85% |
| | **Expenditures** | | | | | | | | |
| | Program Salaries and Benefits (not JPA/MOA) | $ 490,500 | $ - | $ - | $ (5,000) | $ 485,500 | **50,027** | **448,744** | 92% |
| Water Qual | 550 Public Infrastructure Partnership Projects | $ - | $ - | $ - | $ - | $ - | - | | #DIV/0! |
| Water Qual | 550 - Buck Stream | | | | $ 223,400 | $ 223,400 | 9,116 | 156,332 | 70% |
| Water Qual | 550 - Swamp Lake | | | | $ 61,000 | $ 61,000 | - | 40,015 | 66% |
| Water Qual | 550 -200th Street Pond Improvements | | | | $ 32,000 | $ 32,000 | - | - | 0% |
| Water Qual | 550 - FeCl Site Improvements | | | | $ 158,100 | $ 158,100 | 7,166 | 41,014 | 26% |
| Water Qual | 611 Farmer-led Council | 55,000 | - | - | | 55,000 | - | 36,555 | 66% |
| Water Qual | 611 Cost-Share Incentives | 68,000 | - | - | | 68,000 | - | 40,476 | 60% |
| Water Qual | 611 Highway 13 Wetland, FeCl system & Desilt, O&M | 244,000 | - | 61,000 | (158,100) | 146,900 | 2,948 | 72,517 | 49% |
| Water Qual | 611 Carp Management | 96,500 | - | - | | 96,500 | 3,924 | 47,083 | 49% |
| Water Qual | 611 Spring Lake Demonstration Project Maintenance | 1,200 | - | - | | 1,200 | 3,015 | 4,104 | 342% |
| Water Qual | 611 Alum Internal Loading Reserve | 230,000 | - | - | - | 230,000 | - | 3,517 | 2% |
| Water Qual | 611 Fish Stocking | 2,000 | - | - | | 2,000 | | 2,500 | 125% |
| Water Qual | 637 District Monitoring Program | 84,500 | - | - | | 84,500 | 26,818 | 70,893 | 84% |
| Water Qual | 626 Planning and Program Development | 27,500 | - | - | | 27,500 | 3,107 | 26,625 | 97% |
| Water Qual | 626 Fish Lake Management Plan Update | - | - | - | | - | 631 | 5,093 | #DIV/0! |
| Water Qual | 626 LGU Plan Review | - | 4,000 | - | | 4,000 | - | 832 | 21% |
| Water Qual | 626 Engineering not for programs | 20,000 | - | - | | 20,000 | 2,118 | 15,497 | 77% |
| Water Qual | 648 Permitting and Compliance | 57,000 | - | 5,000 | | 62,000 | 328 | 40,865 | 66% |
| Water Qual | 648 BMP and easement inventory & inspections | 25,000 | - | 2,000 | 20,875 | 47,875 | 697 | 27,803 | 58% |
| Water Qual | 626 Lake Ridge Stormwater Feasability Study | - | - | - | 60,000 | 60,000 | 188 | 242 | 0% |
| Water Qual | 626 Upper Watershed Projects | 194,000 | 442,000 | - | (286,400) | 349,600 | 4,202 | 68,589 | 20% |
| Water Qual | 626 District Plan Update | - | 2,500 | | | 2,500 | - | 455 | 18% |
| | **WQ TOTAL** | **$ 1,104,700** | **$ 453,500** | **$ 68,000** | **$ 110,875** | **$ 1,737,075** | **64,257** | **701,007** | 40% |
| Water Storage | 550 District-wide Hydraulic & Hydrologic model | $ 5,000 | $ - | $ - | | $ 5,000 | - | - | 0% |
| Water Storage | 626 Comprehensive Wetland Plan Update | 35,500 | | | - | 35,500 | - | - | 0% |
| | **WS TOTAL** | **$ 40,500** | **$ -** | **$ -** | **$ -** | **$ 40,500** | **-** | **-** | 0% |
| AIS | 611 Aquatic Vegetation Mgmt | 2,000 | - | $ 12,000 | $ 3,500 | $ 17,500 | - | 17,455 | 100% |
| AIS | 637 Automated Vegetation Monitoring (BioBase) | $ 1,300 | - | - | | 1,300 | - | - | 0% |
| AIS | 637 Aquatic Vegetation Surveys | 15,500 | - | - | (3,500) | 12,000 | - | | 0% |
| AIS | 637 Boat inspections on Spring, Upper & Lower Prior | 19,000 | - | 15,000 | - | 34,000 | - | 32,861 | 97% |
| | **AIS TOTAL** | **37,800** | **-** | **27,000** | **-** | **64,800** | **-** | **50,317** | 78% |
| Ed & Out | 652 Education and Outreach Program | $ 23,500 | $ 15,000 | $ - | | $ 38,500 | 555 | 29,994 | 78% |
| | **E&O TOTAL** | **$ 23,500** | **$ 15,000** | **$ -** | **$ -** | **$ 38,500** | **$ 555** | **$ 29,994** | 78% |
| | **PLOC Contribution** | | **$ -** | **$ -** | **$ 38,981** | **$ 38,981** | - | **38,981** | 100% |
| | **Debt Payment Reserve** | | - | - | | - | - | - | #DIV/0! |
| | **Total Implementation Fund** | **$ 1,697,000** | **$ 468,500** | **$ 95,000** | **$ 144,856** | **$ 2,405,356** | **114,840** | **1,269,042** | 53% |
| | **Net Change in Fund Balance Implementation Fund** | **-** | **-** | **-** | **-** | **-** | **733,246** | **764,463** | |

| | Grant Funds/Fees Anticipated | | | | 2024 Budget |
|---|---|---|---|---|---|
| | **Interest Income (general fund & Implementation fund)** | | | $ 70,000 | $ 70,000 |
| | **648 New Easement Acquisition Fees** | | | 5,000 | 5,000 |
| Water Qual | **648 Easement amendment/violations fees** | | | 2,000 | 2,000 |
| AIS | **611 Aquatic Vegetation Mgmt. (Scott County)** | | | 27,000 | 27,000 |
| Water Storage | **550 Buck Stream (SWCD Grant)** | | | 75,000 | 75,000 |
| | **Total Grant Funds/Fees Anticipated** | | | **$ 179,000** | **$ 179,000** |

**Budget Summary**

| Fund Sources/Fund Expenditures | 2024 Levy | Budget Reserves | Grants/Rev | Amendments | Budget Total | 2023 Levy | Levy Increase | % Increase |
|---|---|---|---|---|---|---|---|---|
| General Fund | $ 252,000 | | $ 9,000 | $ - | $ 261,000 | 249,200 | | |
| Implementation Fund | $ 1,697,000 | $ 468,500 | $ 95,000 | $ 144,856 | $ 2,405,356 | 1,670,736 | | |
| **Total Fund Sources** | **$ 1,949,000** | **$ 468,500** | **$ 104,000** | **$ 144,856** | **$ 2,666,356** | **1,919,936** | **$ 29,064** | **1.5%** |
| **Expenditures** | | | | | | | | |
| General Fund | | | | | 261,000 | | | |
| Implementation Fund | | | | | 2,405,356 | | | |
| **Total Expenditures** | | | | | **2,666,356** | | | |

Fund Balance Commitments/Assingments

| | | 2024 (Budget) 12-31-23 Bal | Additions | Reductions | Amendments | 12-31-24 Bal |
|---|---|---|---|---|---|---|
| | 611 Alum Internal Loading Reserve | $ 700,000 | $ 210,000 | $ - | $ - | $ 910,000 |
| | 626 Upper Watershed Projects (2024)/Capital Projects Planning (2025) | $ 442,000 | $ 485,600 | $ (636,000) | $ - | $ 291,600 |
| | Debt Payment Reserve | $ 180,000 | $ - | $ - | $ - | $ 180,000 |
| | | **$ 1,322,000** | **$ 695,600** | **$ (636,000)** | **$ -** | **$ 1,381,600** |

No assurance is provided on this statement. See selected information.

**PLSLWD Monthly Treasurers Report** Treasurer: Christian Morkeberg

*Account balances as of 12/31/24*

| | | |
|---|---|---|
| 4M Fund (Checking Account) | $ | 2,288,588 |
| 4M Fixed Income | $ | 1,910,650 |
| Total Uncleared Transactions | $ | - |
| **SUBTOTAL** | **$** | **4,199,238** |

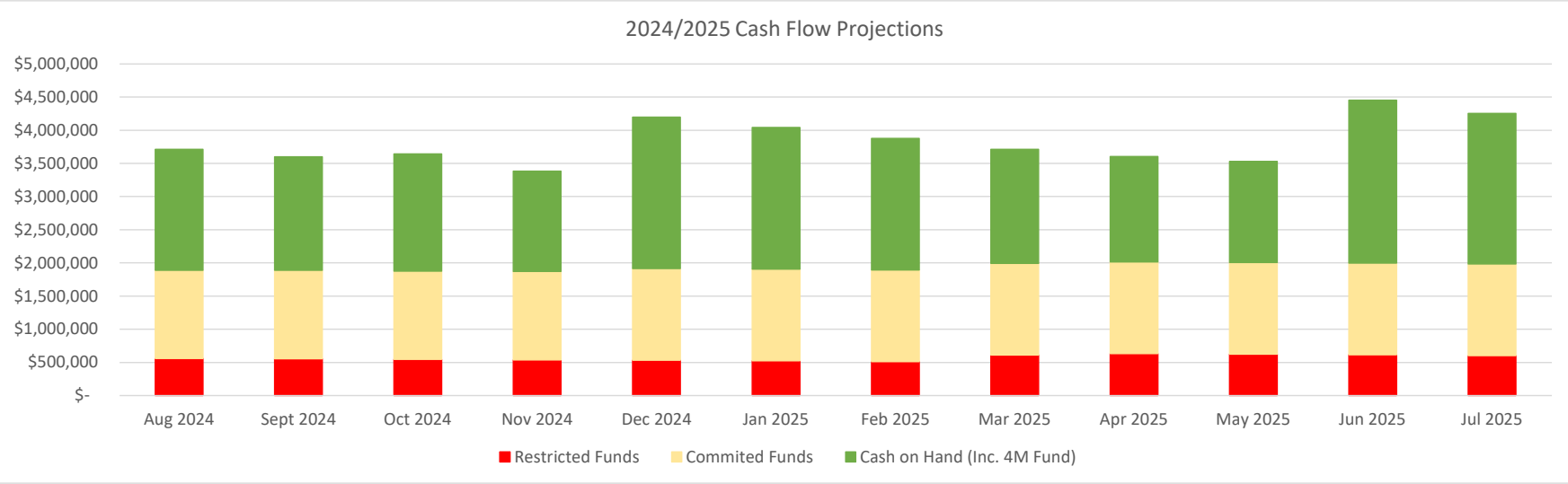
| **RESTRICTED/COMMITTED FUNDS** | | |
|---|---|---|
| Restricted - Permit Deposits, etc. (350 & 360) | $ | 120,026 |
| Restricted - PLOC Contingency Reserve (850) | $ | 264,813 |
| Restricted - PLOC O&M Funds (830) | $ | 148,955 |
| Committed - Alum Internal Loading Reserve | $ | 910,000 |
| Committed - Upper Watershed Fund Balance(2024)/Capital Projects Planning (2025) | $ | 291,600 |
| Committed - Debt Payment | $ | 180,000 |
| **TOTAL DISTRICT/PLOC RESTRICTED OBLIGATIONS** | **$** | **1,915,394** |

| | | |
|---|---|---|
| **Available cash at end of December 2024** | **$** | **2,283,844** |
| *86.1%* | *of 2024 Amended Budget* | |

**No assurance is provided on this statement. See selected information.**

# Cash Flow Chart

| Month (End of Month) | Aug 2024 | Sept 2024 | Oct 2024 | Nov 2024 | Dec 2024 | Jan 2025 | Feb 2025 | Mar 2025 | Apr 2025 | May 2025 | Jun 2025 | Jul 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Restricted Funds | $ 558,009 | $ 556,969 | $ 545,873 | $ 539,310 | $ 533,794 | $ 523,794 | $ 513,794 | $ 611,919 | $ 634,355 | $ 624,355 | $ 614,355 | $ 604,355 |
| Commited Funds | $ 1,332,000 | $ 1,332,000 | $ 1,332,000 | $ 1,332,000 | $ 1,381,600 | $ 1,381,600 | $ 1,381,600 | $ 1,381,600 | $ 1,381,600 | $ 1,381,600 | $ 1,381,600 | $ 1,381,600 |
| Cash on Hand (Inc. 4M Fund) | $ 1,823,480 | $ 1,712,110 | $ 1,763,504 | $ 1,513,175 | $ 2,283,844 | $ 2,136,334 | $ 1,981,774 | $ 1,719,089 | $ 1,587,429 | $ 1,526,343 | $ 2,455,507 | $ 2,269,564 |
| Total Cash on Hand | $ 3,713,489 | $ 3,601,079 | $ 3,641,377 | $ 3,384,485 | $ 4,199,238 | $ 4,041,728 | $ 3,877,168 | $ 3,712,608 | $ 3,603,384 | $ 3,532,298 | $ 4,451,462 | $ 4,255,519 |




Draft Amounts subject to chanbge during audit preparation

No assurance is provided on these financial statements. See selected information

# PLSL Watershed District

Cash Minimum Balance Alert $ 150,000

| | Aug 2024 | Sept 2024 | Oct 2024 | Nov 2024 | Dec 2024 | 2024 Total | Jan 2025 | Feb 2025 | Mar 2025 | Apr 2025 | May 2025 | Jun 2025 | Jul 2025 | Total Jan-Jul 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cash on hand (beginning of month) | $ 3,895,010 | $ 3,713,489 | $ 3,601,079 | $ 3,641,377 | $ 3,384,485 | | $ 4,199,238 | $ 4,041,728 | $ 3,877,168 | $ 3,712,608 | $ 3,603,384 | $ 3,532,298 | $ 4,451,462 | |
| **Cash Receipts** | | | | | | | | | | | | | | |
| Property Tax Levy | $ - | $ - | $ 573 | $ - | $ 934,082 | $ 934,655 | $ 7,050 | $ - | $ - | $ - | $ - | $ 1,060,424 | $ - | $ 1,067,474 |
| BWSR WBIF | - | - | 104,968 | - | - | 104,968 | - | - | - | - | 83,974 | - | - | 83,974 |
| Grants - Other | - | - | 27,000 | - | - | 27,000 | - | - | - | - | 9,500 | - | - | 9,500 |
| PLOC Contributions | - | - | - | - | - | - | - | - | 108,125 | 32,436 | - | - | - | 140,561 |
| Interest Income | 8,473 | 7,361 | 32,534 | 6,307 | 35,280 | 99,029 | 7,100 | 7,100 | 7,100 | 30,000 | 7,100 | 30,400 | 7,100 | 95,900 |
| Other Receipts | 8,000 | - | 84 | - | 4,950 | 46,247 | 375 | 375 | 375 | 375 | 375 | 375 | 375 | 2,625 |
| Total Cash Reciepts | $ 16,473 | $ 7,361 | $ 165,159 | $ 6,307 | $ 974,312 | $ 1,211,899 | $ 14,525 | $ 7,475 | $ 115,600 | $ 62,811 | $ 100,949 | $ 1,091,199 | $ 7,475 | $ 1,400,034 |
| Total Cash Available | $ 3,911,483 | $ 3,720,850 | $ 3,766,238 | $ 3,647,684 | $ 4,358,797 | | $ 4,213,763 | $ 4,049,203 | $ 3,992,768 | $ 3,775,419 | $ 3,704,333 | $ 4,623,497 | $ 4,458,937 | |
| **Cash Paid Out** | | | | | | | | | | | | | | |
| Salaries and Per Diems | $ 45,704 | $ 48,834 | $ 48,353 | $ 39,512 | $ 77,534 | $ 326,946 | $ 51,660 | $ 51,660 | $ 51,660 | $ 51,660 | $ 51,660 | $ 51,660 | $ 51,660 | $ 361,620 |
| Office Expense, Audit, Accounting | 6,979 | 7,251 | 7,520 | 14,647 | 6,937 | 47,875 | 10,375 | 10,375 | 10,375 | 10,375 | 10,375 | 10,375 | 10,375 | 72,625 |
| PLSLWSD Program Costs | 116,368 | 58,051 | 57,892 | 202,477 | 69,572 | 568,341 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 131,383 | 731,383 |
| PLOC Contribution | | | | | | - | | | 108,125 | | - | - | - | 108,125 |
| PLOC Operations | 3,729 | 5,635 | 11,096 | 6,563 | 5,516 | 41,943 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 70,000 |
| Debt Service | | | | | | - | - | - | - | - | - | - | - | - |
| Other Disbursements | $ 25,213 | | | | | 25,213 | | | | | | | | - |
| Subtotal | $ 197,994 | $ 119,771 | $ 124,861 | $ 263,199 | $ 159,559 | $ 985,106 | $ 172,035 | $ 172,035 | $ 280,160 | $ 172,035 | $ 172,035 | $ 172,035 | $ 203,418 | $ 1,343,753 |
| Cash on Hand (end of month) | $ 3,713,489 | $ 3,601,079 | $ 3,641,377 | $ 3,384,485 | $ 4,199,238 | | $ 4,041,728 | $ 3,877,168 | $ 3,712,608 | $ 3,603,384 | $ 3,532,298 | $ 4,451,462 | $ 4,255,519 | |

Draft amounts subject to change during audit

No assurance is provided on these financial statements

PLSLWD
Cost Analysis
Year to Date 12/31/2024

| | Year to Date 12/31/2024 Amount | % of total |
|---|---|---|
| Program staff costs | **448,744** | **29.2%** |
| Consultants | | |
| EOR | 168,603 | |
| Blue Water Science | 6,600 | |
| Hawkins, Inc. | 25,485 | |
| Three Rivers Park District | 20,457 | |
| WSB & Associates | 41,221 | |
| Scott Soil and Water Cons. | 135,893 | |
| RMB Environmental Labs | 33,210 | |
| HDR Engineering Inc. | 20,258 | |
| Waterfront Resorations | 29,985 | |
| PLM | 10,747 | |
| Vessco | 6,090 | |
| Kisters North America | 5,400 | |
| | **498,550** | **32.5%** |
| Hard costs, exclusive of prog staff & consultant costs | 282,768 | |
| | **282,768** | **18.4%** |
| Overhead and Administration | | |
| Staff costs | 152,824 | |
| Audit/Accounting/Legal | 50,941 | |
| Other admin overhead | 52,000 | |
| IT Support (Rymark) | 10,586 | |
| | **266,351** | **17.3%** |
| Bonds payments | **-** | **0.0%** |
| PLOC Contribution | 38,981 | **2.5%** |
| **Expenses excluding PLOC expenses per manager report** | **1,535,393** | **100.0%** |

No assurance is provided on this statement. See selected information.
This statement omits required disclosures.
This statement is prepared on the cash basis of accounting.

PRIOR LAKE SPRING LAKE WATERSHED DISTRICT

**WORKSHOP MEETING MINUTES**
***Tuesday, November 19, 2024***
***Prior Lake City Hall***
***4:00 PM***

| | |
|---|---|
| Members Present: | Bruce Loney, Frank Boyles, Ben Burnett, Christian Morkeberg, Matt Tofanelli |
| Staff & Consultants Present: | Joni Giese, District Administrator<br>Emily Dick, Water Resources Project Manager<br>Carl Almer, EOR, District<br>Jeff Anderson, Water Resources Program Coordinator<br>Danielle Studer, Water Resources Specialist<br>Patty Dronen, Administrative Assistant |
| Others Present: | Wes Steffens, Spring Lake Association<br>Jim Fitzsimmons, Scott SWCD<br>Jody Brennan, Scott County<br>Lisa Quinn, Spring Lake Township |

The meeting was called to order at 4:00 PM.

**Administrator Report**

- Minnesota Board of Water and Soil Resources awarded Emily Dick the Employee of the Year award. The award recognizes a watershed organization employee across the state each year.
- Orderly Annexation has gone forward, and Alternative Urban Areawide Review (AUAR) is planned for the area. The AUAR will look at environmental impacts and planning for stormwater, etc. The District has expressed interest in being involved in the process.
- Setting up a meeting with Spring Lake Township to discuss planning in area near Lydia.
- MS4 status was discussed with MPCA and a “re-evaluation form” was provided to potentially remove the District’s MS4 status. There appears to be no benefit to maintain MS4 status. The District’s MS4 area is already covered by other municipal entities. The District Administrator will continue investigating and will submit the re-evaluation form if it continues to be favorable.
- A portion of Shepherd’s Path property (old YMCA) is going to be acquired by the Shakopee Mdewakanton Sioux Community (SMSC). Land put into trust cannot be encumbered with easements. SMSC and PLSLWD are investigating options for alternative approaches for SMSC to still provide for the management of the existing conservation easements on the property.

Separately, there have been likely encroachments of a city trail, garden, and access drive on other portions of the Shepherd's Path property. The District will be working with parties to address encroachments.

- The District surveyed and marked boundaries of the Duck's Unlimited wetland and reached out to adjacent neighbors. There are sign posts installed and the District plans to place no trespassing signs once the signs are fabricated.

**Proposed 2025 Budget**

After the Board approved a 6% increase levy at the September Board meeting, the Board requested that staff prepare some modified options at different rate increases. District Administrator Giese gave an overview of several options for the 2025 Budget ranging from 3-6% levy increases at the November Board Workshop. Board Managers requested that a resolution for both 5 and 6% be drafted for Board decision at the final Levy Hearing. The 5 and 6% levies were discussed by Board managers. The 5% rate would essentially keep tax rates steady from 2024. The same budget is reflected in both options. The 5% levy rate utilizes more budget reserves.

**Minnesota Watersheds Conference and Business Meeting Debrief**

Board Manager Ben Burnett presented an overview of the annual Minnesota Watersheds Conference. As a result of the Region 3 Caucus, Manager Burnett will be on the resolution committee, and Manager Boyles may be on the legislative committee for 2025. A summary of the resolution hearing voting results was given. The MN Watersheds Board will now take the passed resolutions and prioritize the resolutions. One of the primary resolutions will focus on reducing chloride contamination in water resources.

**PLOC Pipelining Schedule Update**

District Project Manager Emily Dick presented an update on the Prior Lake Outlet Channel (PLOC) pipelining. The District has now re-established a schedule with the retained engineering firm to advance the project. It is anticipated that the competitive bid process be pursued as soon as possible to allow contractor flexibility to construct in this winter or next.

**Liaison Updates**

<u>District Partner Reports</u>

- *Spring Lake Township*- The Township is dealing with some easement issues. The Township will be meeting with the District Administrator in January.
- *Scott SWCD*- Assisting over 40 District landowners, 30 are planning to install a project. Completed four major construction projects, including Buck stream stabilization, grade stabilizations on CD-10, and shoreline stabilization on Spring Lake. A new state grant will bring in roughly $60,000 for water quality projects. Conservation easement work continues to be advanced.
- *Scott County*- Approved the levy today at 6.8%. The largest impact was an increase in health care costs. Cannabis ordinance is in place. District 54A position is still in hearing.
- *Spring Lake Association*- SLA put together a 2025 plan which will include one newsletter, educational events, AIS prevention, etc. The boat ramp improvements are still pending. Bought an underwater camera to look for things at the bottom of the lake and may pursue a Dive the Lake event.

Manager Liaison Reports

- *CAC*- None.
- *Scott SWCD*- Record equipment rentals, record cost share, 200 erosion control project inspections.
- *Lower Minnesota Watershed District*- None.
- *Sand Creek Township*- None.
- *Spring Lake Township*- None.
- *Scott WMO*- Budget is increasing to 6.8%. There are three commission member positions open. Held a community engagement meeting for their Watershed Management Plan update.
- *Shakopee*- None.
- *SCALE*- None.
- *Scott County*- None.
- *Metro Watersheds*- None.
- *PLOC Cooperators*- None.
- *Farmer-Led Council*- None.

Respectfully Submitted,
Emily Dick
12/17/2024

**REGULAR MEETING MINUTES**
***Tuesday, December 17, 2024***
***Prior Lake City Hall***
***6:00 PM***

| | |
|---|---|
| Members Present: | Bruce Loney, Frank Boyles, Matt Tofanelli, Ben Burnett |
| Members Absent: | Christian Morkeberg |
| Staff & Consultants Present: | Joni Giese, District Administrator<br>Jeff Anderson, Water Resources Coordinator<br>Emily Dick, Water Resources Project Manager<br>Carl Almer, EOR, District Engineer |
| Others Present: | Wesley Steffen, Spring Lake Association<br>Brett Emmons, EOR |

- **1.0 CALL TO ORDER & PLEDGE OF ALLEGIANCE:**
  The meeting was called to order by President Loney at 6:02 pm, and everyone present recited the Pledge of Allegiance.

- **2.0 PUBLIC COMMENT**
  None

- **2.1 PUBLIC HEARING – 2025 Budget and Levy**
  - Motion to Open Public Hearing by Manager Burnett; 2nd by Manager Tofanelli; passed 4-0.
    - 2025 Budget — Resolution 24-385.
      - Presented by Administrator Giese.
    - 2025 Levy — Resolution 24-386.
      - Presented by Administrator Giese.
    - No Public comment.
  - Motion to close Public Hearing Manager Burnett; 2nd by Manager Tofanelli; passed 4-0.
  - Motion to adopt Resolution 24-385 by Manager Tofanelli; 2nd by Manager Burnett; Passed 4-0.
  - Motion to adopt Resolution 24-386 Certifying the Final 2025 Administrative and

Metropolitan Water Management Tax Levy (reflective of "Option B" with a levy amount of $2,046,450) by Manager Tofanelli; 2nd by Manager Burnett; Passed 4-0.

- **3.0 APPROVAL OF AGENDA**
  - Agenda changes:
    - Added 4.4 Spring Lake Demonstration Parcel survey.
  - Motion to approve amended agenda by Manager Tofanelli; 2nd by Manager Burnett; Passed 4-0.

- **4.0 OTHER OLD/NEW BUSINESS**

**4.1 Programs & Projects Update**

- Staff provided a report of its many activities the preceding month, and some upcoming events.
- Staff is still at the fire station.
- Congratulations, Emily Dick, for the 2024 Outstanding Watershed Organization Employee of the Year award! This award is presented annually by BWSR to one employee within the State of Minnesota.
- All lakes have iced over by 12/11/24.
- Lake water quality results and report cards are now on the website.
- Fish lake Management plan: found a site with very high phosphorus levels in the soil. District staff is working with the farmer to rotate crops to draw down nutrient levels.
- The pipelining project is moving forward. Staff will seek authorization from the PLOC Cooperators to go out for bid on 1/7/25.

**4.2 Ferric Chloride System Assessment**

- Emily introduced Brett Emmons from EOR, who presented the report findings that were included in the meeting packet.
- There was much discussion regarding and several errors pointed out by Managers.
- There was an inquiry from Manager Tofanelli whether there is technology available to better remotely monitor and operate the system.
  - Staff responded the new equipment will include a pressure switch and new equipment has the capability to be programmed to provide alarms of potential leak detection.
  - Manager Tofanelli expressed interest in pursuing use of improved technologies to improve system operations.
- There was an inquiring from Manager Tofanelli about the correlation of lab results to field conditions and whether other existing research was sought out that could be leveraged to inform the operation of the system. Mr. Emmons stated that EOR did a literature search and there not a lot of comparable facilities to reference. He cautioned that wastewater facilities are quite different than treating in natural systems like the District is doing as natural systems have numerous variables that cannot be controlled.
- Mr. Emmons will follow-up with engineers about questions and clean-up the

report and bring back.
- Motion to table approval of assessment report by Manager Boyles; 2nd by Manager Tofanelli; Passed 4-0.
- Motion to clean-up and revise report based on feedback and comments from the discussion by Manager Boyles; 2nd by Manager Tofanelli; Passed 4-0.

**4.3 Permit 24.02: Trunk Highway (TH) 13 Trail**
- Presented by Administrator Giese.
- Motion to approve the permit application for the TH 13 Trail project subject to conditions noted in the Permit Application and Staff Review Comments, by Manager Tofanelli; 2nd by Manager Burnett; Passed 4-0.

**4.4 Spring Lake Demonstration Parcel survey**
- Presented by Emily Dick.
- Motion to approve the contracting of Valley Surveying for surveying, marking, and mapping of the Spring Lake demonstration Site for an amount of $3,200 for execution by the District Administrator, and with any further non-substantive changes on advice of legal counsel; by Manager Burnett; 2nd by Manager Tofanelli; Passed 4-0.

- **5.0 TREASURER'S REPORT**

President Loney summarized the financial information contained in the packet including:
5.1 Monthly Financial Reports
- Financial Report
- Treasurers Report
- Cash Flow Projections
- Cost Analysis

- **6.0 CONSENT AGENDA**

The consent agenda is considered as one item of business. It consists of routine administrative items or items not requiring discussion. Items can be removed from the consent agenda at the request of the Board member, staff member, or a member of the audience. Please state which item or items you wish to remove for separate discussion.
- 6.1 Meeting Minutes – November 19, 2024, Board Workshop
- 6.2 Meeting Minutes – November 19, 2024, Board Meeting
- 6.3 Claims List and Bank Purchase Card Expenditures Summary
- 6.4 Budget Amendment Resolutions:
  - Resolution 24-387: Amending the 2024 Budget to Reclass Funds in the 509-Implementation Fund, from 611-Highway 13 Wetland, FeCl System & Desilt, O&M to 550-FeCl Site Improvements
  - Resolution 24-388: Amending the 2024 Budget to Reclass Funds in the 509-Implementation Fund, from 626-Upper Watershed Projects to 626-Lake Ridge Feasibility Study
  - Resolution 24-389: Amending the 2024 Budget to Reclass Funds in the 509-Implementation Fund, from 626-Upper Watershed Projects to 550-200th Street Pond Improvements

- 6.5 Year End Fund Commitments:
  - Resolution 24-390: Alum Internal Loading Fund Balance Commitment
  - Resolution 24-391: Capital Project Planning Fund Commitment
- Motion to approve consent agenda by Manager Tofanelli; 2nd by Manager Burnett; Passed 4-0.

- **7.0 UPCOMING MEETING/EVENT SCHEDULE:**
  - CAC Meeting, Thursday, December 19, 2024, 6:00 pm (Prior Lake Library Large Meeting Room)
  - PLOC special cooperators meeting, January 7, 2025, 11:00 am (Virtual mtg)
  - Board of Managers Workshop, Tuesday, January 21, 2025, 4:00 pm (Prior Lake City Hall – Parkview Conference Room)
  - Board of Managers Meeting, Tuesday, January 21, 2025, 6:00 pm (Prior Lake City Hall – Council Chambers)
  - Farmer-Led Council Meeting, Thursday, January 23, 2025, 12:00 pm (Spring Lake Town Hall)

- **8.0 ADJOURNMENT**
  - Motion to adjourn by Manager Tofanelli; 2nd by Manager Burnett; Passed 4-0
  - Meeting adjourned at 7:46 pm

Respectfully Submitted,
Ben Burnett, PLSLWD Secretary, 1/15/2025

PRIOR LAKE SPRING LAKE WATERSHED DISTRICT

**SPECIAL MEETING MINUTES**
***Thursday, January 9, 2025***
***Prior Lake City Hall***
***4:00 PM***

| | |
|---|---|
| Members Present: | Bruce Loney, Frank Boyles, Matt Tofanelli |
| Staff & Consultants Present: | Joni Giese, District Administrator |
| | Emily Dick, Water Resources Project Manager |
| Others Present: | Senator Eric Pratt |
| | Representative Ben Bakeberg |

The meeting was called to order at 4:00 PM.

**PLSLWD Update**

- Board managers provided an overview of the watershed district, reported on recent successes, and shared current initiatives.
- Several of Minnesota Watershed's and SCALE's 2025 legislative priorities were discussed. Minnesota Watershed's priorities include establishing regulation for chloride pollution and establishing a 60-day DNR permit review period. Some of SCALE's priorities include reforming public notice requirements and supporting funding for SWCD's statewide. The Senator and Representative gave feedback on initiatives and the statewide climate for the proposed changes.

Respectfully Submitted,
Emily Dick
1/13/2025

PRIOR LAKE SPRING LAKE WATERSHED DISTRICT

# CAC Meeting Minutes

Thursday September 26, 2024
6:00 – 7:30 PM

Attendees:

CAC Members: 7 of 7 members present = 100% ***(≥50%)***

- ☒ Loren Hanson
- ☒Richard Schirber
- ☒ Ron Hoffmeyer
- ☒ Curtis Witt
- ☒ Anna Alswager
- ☒ Ryan Murr
- ☒ Amy Butani

| | |
|---|---|
| Staff: | Emily Dick, Joni Giese, Danielle Studer |
| Board members: | Christian Morkeberg |
| Other: | Lisa Quinn (Spring Lake Township) |

CAC Business (Meeting called to order at 6:00 PM)

- Approval of the agenda:
  - Motion: Dick Schirber
  - Second: Amy Butani
  - Motion Carried

- Approval of Minutes:
  - Motion: Curtis Witt
  - Second: Ryan Murr
  - Motion Carried

- Review of August/September Board Meetings: Christian Morkeberg
  - Work on the draft budget
  - CAC priorities of water quantity, prevent flooding, and restoring wetlands and habitat influenced budget decisions
    - Additional details on individual projects
    - Spring is considered impaired, so it is mandated that an attempt is made to reach TMDL goal.
      - If all projects were implemented, there would be a reduction of 1900lbs of phosphorous
  - Preliminary draft budget is a 6% increase over 2024. Work is going on to reduce the increase on the budget.

        - 91% of budget goes towards projects
        - $756,000 of reserves will be used in 2025 budget
        - Discussion of Memo from Joni Giese. Titled: 2025 Proposed Budget and Levy, September 17
    - The Scott Soil and Water Conservation District gave a presentation at the Board Workshop on farming best practices
        - Increased cooperation with the Scott SWCD is important in relating with farmers and the Farmer Led Counsel
    - Fish Lake shoreline restoration workshop was held at the Spring Lake Township building in July
    - New website is functional

- Budget review
    - Board approved $2,066,590 Proposed Tax levy
    - Total Budget is $3,216,725
    - Budget can only be decreased until final approval on December 17, 2025
    - Dick Schirber posed question: Do we have enough people on staff to accomplish the project list? General feeling is that additional help would always be welcome; but if we use proper phasing, achieving the plans are possible.
    - Discussion around Fish Lake Management Plan and projects.
    - Separate financial statements exist exclusively for the PLOC.
        - PLSLWD needs to have $950,000 available to spend on PLOC. MPCA will then re-imburse PLSLWD the funds expended.
    - Education is needed on PLOC Low Flow Gate policies and who makes these decisions.

- Minnesota Watershed resolutions process review
    - PLSLWD is a member of this organization, which provides education and lobbies for issues affecting water and watershed districts and management organizations.
        - September 1-WDs submit resolutions to Minnesota Watersheds
            - This time is too late to get goals accomplished; need to start earlier to improve chances of success.
        - October 31-Resolution emails to WDs
        - November board meeting-Decide what to vote on
        - December 6-Delegates vote
    - CAC should discuss potential resolution submissions in January. See resolution hand out on email from Danielle.

- Check in on AIS mechanical harvesting research interest
    - Additional discussion to occur in the future.
    - Dick Schirber offered to do additional research on this project.

- Upcoming Fall Events
    - Memo distributed on Buckthorn removal-Oct. 5

- Buckthorn Wreath making at Boathouse Brewery-Oct 26

- Staff Project Updates
  - PLOC Lining Update
    - Grant awarded
    - Remaining cost to be funded by PLSLWD-$83,000
    - Likely construction Winter 2025/2026
  - Swamp IESF
    - $179,935 Funds secured
    - $2,000 donated by Spring Lake Township
    - Staff applied for additional grant
    - Expected construction 2025
  - Ferric Site Improvements
    - Expected construction fall 2024-2025
  - Carp Management Status/Updates
    - Population on Upper Prior Lake is showing good progress
    - Continuing work on Spring Lake
    - Removing tracking stations soon, data will be processed at that time
    - Espionage program is helpful

Motion to adjourn at 7:27 PM
Motion-Dick Schirber
Second-Amy Butani
Motion Carried

# Prior Lake Spring Lake Watershed District
## Claims list for Invoice Payments due for the prior month

Managers will consider approving this claims list - Staff payroll and benefits, Manager per diems, and Health insurance premiums have already been paid via ACH transfers. After the managers vote, two Managers will approve individual payments via BILL within three days of the meeting for approved claims. Then, staff will release payment via BILL to the claims list parties.

| Vendor | Invoice Link | Description | Amount |
|---|---|---|---|
| **1. Watershed District Projects (excluding staff payroll)** | | | |
| **EOR** | x | General Engineering | $ 1,820.00 |
| | | Swamp Lake IESF Final Design & CMS | $ 1,516.25 |
| | | Desiltation Pond Outlet & High-Flow Bypass FS | $ 620.00 |
| | | Spring Lake Post-Alum Sediment Core Analysis | $ 14,120.00 |
| | | PLOC Low Flow Gate Assessment Tasks 2 & 3 | $ 2,118.00 |
| | | Buck Stream Stabilization | $ 1,397.50 |
| | | FeCl Site Improvements | $ 1,489.00 |
| | | BMP Easements | $ 104.00 |
| | | Permitting | $ 1,384.50 |
| **Edina Realty** | x | Advising - Paul Krueger | $ 3,500.00 |
| **Metropolitan Council** | x | Camp Lake WQ Monitoring | $ 3,800.00 |
| **Stantec** | x | Lake Ridge Stormwater Feasibility Study - Invoice #1 | $ 5,942.82 |
| | x | Lake Ridge Stormwater Feasibility Study - Invoice #2 | $ 7,667.29 |
| **RMB** | x | Ferric Monitoring | $ 1,088.00 |
| **Vessco** | x | Feedline Winterization | $ 525.00 |
| **Smith Partners** | | Water Resource Plan | $ 269.00 |
| | | Easements | $ 269.00 |
| | | Permitting | $ 107.60 |
| **Xcel Energy** | x | Utilities | $ 10.72 |
| **CLA** | | Bill.com fees | $ 55.00 |
| | | **Subtotal** | **$ 47,803.68** |
| **2. Outlet Channel - JPA/MOA (excluding staff payroll)** | | | |
| **CLA** | | PLOC Meeting and Prep | $ 250.00 |
| **EOR** | | 2024 PLOC Engineering Assistance - Seg 1 | $ 208.00 |
| | | 2024 PLOC Engineering Assistance: Channel-wide | $ 1,525.00 |
| | | 2024 PLOC XP-SWMM Updates | $ 3,330.50 |
| **Smith Partners** | | PLOC Outlet Channel Legal work | $ 1,318.10 |
| | | **Subtotal** | **$ 6,631.60** |
| **3. Payroll, Office and Overhead** | | | |
| **ADP Manager Per Diems** | | | $ 2,100.00 |
| **ADP Staff Payroll** | | | $ 35,121.57 |
| **ADP Taxes & Benefits** | | | $ 28,622.19 |
| **NCPERS** | x | February Premiums | $ 96.00 |
| **Reliance Standard** | x | January LTD and STD Premiums | $ 939.71 |
| **HealthPartners** | x | January Health Insurance Premiums | $ 8,213.98 |
| **City of Prior Lake** | x | Rent (February 2025) | $ 2,458.64 |
| **CLA** | x | Monthly Accounting November | $ 2,600.00 |
| | | Technology and Client Support Fee | $ 160.85 |
| | | Monthly Payroll Processing Fees | $ 367.00 |
| **Smith Partners** | x | General Legal Services | $ 484.20 |
| | | IT contract support | $ 1,669.96 |
| **Rymark** | x | January Billing (7 workstations) | $ 952.41 |
| **MetroSales** | x | Contract base rate January-Feb | $ 155.00 |
| | x | Quarterly usage | $ 585.45 |
| **Prior Lake Chamber of Commerce** | x | Yearly Dues | $ 150.00 |
| **League of Minnesota Cities** | x | Yearly Dues | $ 2,358.00 |
| **StarTribune** | x | December public notices | $ 113.76 |
| **US Bank** | | December 26-January 25 Billing | $2,351.07 |
| | | **Subtotal** | **$ 89,499.79** |

**TOTAL CLAIMS DECEMBER 2024 $ 143,935.07**

**Prior Lake-Spring Lake Watershed District**
**US Bank Transactions through 12/25/2024**

| Trans Date | Merchant Name | Amount | Receipt Link | Staff Approval | Class | Customer | Expense | Description |
|---|---|---|---|---|---|---|---|---|
| 11/26/2024 | USPS | $ 10.45 | x | Emily Dick | 550 Capital Projects | Buck Stream Stabilization | 901 Mailings | Buck Stream mailing |
| 11/29/2024 | Amazon | $ 62.69 | x | Patty Dronen | 637 Monitoring & Research | Equipment Storage & Maintenance | 876 Field Equipment & Maintenance | |
| 12/2/2024 | Dakotah Meadows | $ 80.00 | x | Patty Dronen | 637 Monitoring & Research | Equipment Storage & Maintenance | 903 Dues, Fees, Subscriptions | |
| 12/2/2024 | Group Greeting | $ 5.41 | x | Emily Dick | 405 General Fund | | 710 Office Expense Other | staff appreciation joni bday |
| 12/3/2024 | Grandview Lodge - Northwoods Pub | $ 8.59 | x | Joni Giese | 626 Planning | Planning and Program Development | 902 Meals and Lodging | |
| 12/4/2024 | Verizon | $ 30.08 | x | Jeff Anderson | 648 Regulation | Easement Inspections & violations | 876 Field Equipment & Maintenance | Cell data |
| 12/6/2024 | Grandview Lodge | $ 967.14 | x | Joni Giese | 626 Planning | Training | 902 Meals and Lodging | |
| 12/9/2024 | Microsoft | $ 4.83 | x | Patty Dronen | 626 Planning | Planning and Program Development | 903 Dues/Fees/Subscriptions | Software |
| 12/9/2024 | Holiday Stationstores | $ 13.24 | x | Patty Dronen | 626 Planning | Planning and Program Development | 902 Meals and Lodging | Donuts for Joni's birthday |
| 12/9/2024 | Tractor Supply | $ 19.78 | x | Zach Nagel | 637 Monitoring & Research | Equipment Storage & Maintenance | 876 Field Equipment & Maintenance | Boat winterization |
| 12/9/2024 | Shell Oil | $ 63.27 | x | Zach Nagel | 637 Monitoring & Research | Equipment Storage & Maintenance | 876 Field Equipment & Maintenance | Boat gas |
| 12/17/2024 | Nothing Bundt Cakes | $ 58.00 | x | Patty Dronen | 626 Planning | Planning and Program Development | 902 Meals and Lodging | |
| 12/17/2024 | Jimmy Johns | $ 85.65 | x | Patty Dronen | 626 Planning | Planning and Program Development | 902 Meals and Lodging | |
| 12/18/2024 | Shell Oil | $ 42.62 | x | Zach Nagel | 637 Monitoring & Research | Equipment Storage & Maintenance | 801 Gas, Mileage | Truck gas |
| 12/23/2024 | Vistaprint | $ 366.16 | x | Danielle Studer | 652 Education & Outreach | General Education Outreach | 806 Program Costs-Miscellaneous | Logo Hats |
| 12/23/2024 | Adobe | $ 92.06 | x | Patty Dronen | 626 Planning | Planning and Program Development | 903 Dues, Fees, Subscriptions | |
| 12/23/2024 | GameShow Battle Room | $ 441.10 | x | Patty Dronen | 626 Planning | Planning and Program Development | 710 Office Expense Other | Staff outing |
| | | | | | | | | |
| | **TOTAL** | **$ 2,351.07** | | | | | | |

PRIOR LAKE SPRING LAKE WATERSHED DISTRICT

## 6.6 2025 Regular Board Meeting Schedule

Third Tuesday of each month (unless otherwise noted below*), starting at 6:00 PM in the Prior Lake City Hall Council Chambers.

January 21
February 18
March 18
April 15
May 20
June 17
July 15
August 19
September 16
October 21
November 18
December 16

## 6.7 2025 CAC Meeting Schedule

Last Thursday every other month (*unless noted below), 6:00-7:30 PM
Meetings will be held in Wagon Bridge Conference Room, Prior Lake City Hall, unless indicated otherwise below.

January 30 (Parkview Conference Room, Prior Lake City Hall)
March 27
May 29
July 24*
September 25
November 20*

## 6.8 2025 Citizen Advisory Committee Members

The Prior Lake-Spring Lake Watershed District's (PLSLWD) Citizen Advisory Committee (CAC) consists of residents who provide input and recommendations to the Board on projects, reports, prioritization, and act as the primary interface for the Board to address the current issues of concern of the local citizens.

The CAC meets during odd numbered months on the last Thursday of the month at 6:00 pm at the Prior Lake City Hall (4646 Dakota St. SE, Prior Lake, MN 55372). Members serve three-year terms*, must reside within the Watershed District, and are appointed by the PLSLWD Board of Managers.

### CURRENT MEMBERS

**Loren Hanson**
Term: 4/16/2024-4/15/2027

**Ron Hoffmeyer**
Term: 05/10/2022 – 03/31/2025

**Curtis Witt**
Term: 05/10/2022 – 03/31/2025

**Anna Alswager**
Term: 11/14/2023 – 11/13/2026

**Amy Butani**
Term: 01/16/2024 – 01/15/2027

**Richard Schirber**
Term: 01/16/2024 – 01/15/2027

**Ryan Murr**
Term: 3/19/2024-3/18/2027

**Aaron Pietsch**
Term: 11/19/2024-11/18/2027

*Members serve three-year terms beginning when membership is approved. For members appointed prior to 2023, terms end in March of the third year of membership.

PRIOR LAKE SPRING LAKE WATERSHED DISTRICT

## 6.9 Selecting the 2025 Official Newspaper

The Board of Managers selects the Minnesota StarTribune as its official District newspaper for 2025.

PRIOR LAKE SPRING LAKE WATERSHED DISTRICT

## 6.10 Selecting the 2025 District Depository Bank

The Board of Managers selects Minnesota Municipal Money Market Fund (4M Fund) in Albertville, Minnesota, in association with US Bank, Prior Lake Branch, as its official District Depository Bank for 2025.

**PLSLWD Board Staff Report**
January 15, 2025

| | | | |
|---|---|---|---|
| **Subject** | Quarterly Report of Investment Activities | | |
| **Board Meeting Date** | January 21, 2025 | **Item No:** | 6.11 |
| **Prepared By** | Joni Giese, District Administrator | | |
| **Attachments** | None. | | |
| **Proposed Action** | No action requested. | | |

## Background

The Prior Lake-Spring Lake Watershed District (PLSLWD) Investment Policy and Procedure Manual – Investment of Watershed District Funds states at least quarterly, the District Administrator shall submit a written report of investment activities to the Board of Managers. This memorandum is intended to meet this District governance requirement.

## Discussion

As of December 31, 2024, $2.288,588 (54.5%) of PLSLWD funds are maintained in two money market accounts earning interest at 4.502% and 4.515%. The Administrator will continue to monitor funds in the lower yield account, which is used to cover District expenses, and transfer funds from the higher yield account as needed. $1,910,650 (45.5%) of District funds are invested in eight certificates of deposit earning interest ranging from 4.07% - 5.20%. The time and dollar weighted average portfolio yield on fixed rate investments is 4.45%.

The CD's are structured to mature using a laddered approach with a quarter of the funds maturing approximately every three months. Using a laddered approach reduces interest rate market risk and provides availability of funds for current obligations. The next scheduled maturity and reinvestment period is mid-April. The weighted average portfolio maturity of fixed rate investments is 232.4 days.

Interest rates are starting to decline due to the Federal Reserve cutting federal fund interest rates by 50 basis points in September, and 25 basis points in November and December. It is possible that additional rate cuts will be made by the Federal Reserve in the next year. Estimated interest income for 2025 attempt to reflect reduced interest rates.

All investments are managed through the 4M Fund, which ensures investment activity is in compliance with State Statutes and District policies.

Per the December 31, 2024, Treasurers Report, $1,915,394 (45.6%) of the District's funds are classified as either restricted or committed funds.

**PLSLWD Board Staff Report**
January 15, 2025

| | | | |
|---|---|---|---|
| **Subject** \| | CLA 2025 Outsourcing Preparation Statement of Work Agreement | | |
| **Board Meeting Date** \| | January 21, 2025 | **Item No:** | 6.12 |
| **Prepared By** \| | Joni Giese, District Administrator | | |
| **Attachments** \| | CLA Outsourcing Preparation Statement of Work | | |
| **Proposed Action** \| | Motion to approve the CLA 2025 Outsourcing Preparation Statement of Work | | |

## Background

Pursuant to *Minnesota Statutes section 103B.227, subdivision 5*, PLSLWD issued a biennial notice soliciting letters of interest for professional services (District Engineer, Audit, Accounting, and Legal Counsel) for 2024 and 2025. The request was sent to professional firms who might be interested on September 18, 2023.

## Discussion

Staff reviewed and evaluated the submittals and recommended CLA to provide accounting services to PLSLWD for 2024 and 2025. On November 14, 2023, the Board authorized the District Administrator to negotiate professional service agreements with firms as recommended by staff for District Engineer, legal counsel, accountant, and auditor for 2024 and 2025.

Contracting with CLA entails entering into three agreements:

- A Master Services Agreement that covers 2024 and 2025
  - This agreement was executed on January 17, 2024
- An annual Outsourcing Preparation Statement of Work Agreement, which covers accounting services
  - The 2024 Outsourcing Preparation Statement of Work Agreement was executed on January 17, 2024
  - The 2025 Outsourcing Preparation Statement of Work Agreement is attached for board review and approval
- An annual Payroll Services Statement of Work Agreement
  - This agreement was executed on June 21, 2024. Given the length of time to get this statement of work agreement executed, the term of the agreement was extended to December 2025

Staff has worked with CLA to develop the attached 2025 Outsourcing Preparation Statement of Work Agreement. The cost of services within the Statement of Work agreement is consistent with CLA's proposal in 2023.

## Recommendation

Staff recommends Board approval of the CLA 2025 Outsourcing Preparation Statement of Work Agreement.

## Budget Impact

The cost associated with proposed activity is covered under the General Fund budget item 670-Accounting.

CliftonLarsonAllen LLP
https://www.claconnect.com

November 12, 2024

***Preparation Statement of Work***

This agreement constitutes a statement of work ("SOW") under the master service agreement ("MSA") made by and between CliftonLarsonAllen LLP (“CLA,” “we,” “us,” and “our”) and Prior Lake - Spring Lake Watershed District (“you” and “your”) dated January 1, 2024 or any superseding MSA. The purpose of this SOW is to outline certain services you wish us to perform through December 31, 2025 in connection with that agreement.

**Scope of professional services**

Christopher G. Knopik is responsible for the performance of the project, recurring, consulting and/or additional annual services identified in this agreement.

**Ongoing normal accounting services associated with Prior Lake-Spring Lake Watershed District and the Prior Lake Outlet Channel (PLOC) memorandum of Agreement (MOA) Cooperators:**

- **Outsourced accounting functions - Principal**
  - Provide engagement oversight and review
  - Provide industry expertise
  - Review monthly and quarterly reports
  - Assist with questions from the District, as needed
  - Perform other accounting services, as requested
  - Gather information necessary to facilitate the District's annual financial statement audit

- **Outsourced accounting functions - Accountant**
  - Month-end and quarter end close process, including adjusting entries
  - Reconcile certain accounts monthly/quarterly and prepare journal entries
  - Prepare financial statements – additional information is provided below
  - Assist with coding of receipts and disbursements
  - Assist with questions from the district, as needed
  - Additional services as requested by management
  - Gather information necessary to facilitate the entity’s annual financial statement audit

- Prepare federal Form 1099 and Form 1096 from information provided by you and transmit federal Form 1099 to federal state taxing authorities on your behalf

- Our 1099 preparation services could include electronically transmitting 1099 forms to federal and state taxing authorities on your behalf

**Preparation Services - Financial statements and supplementary reports**
You have requested that we prepare the monthly financial statements and supplementary reports of Prior Lake - Spring Lake Watershed District and quarterly financial statements of the PLOC MOA Cooperators, which comprise the financial statements identified below not in accordance with GAAP (financial reporting framework).

- **PLSLWD monthly financial statements and supplementary reports:**
  Statement of Activities (aka "Managers Report" or "Financial Report")
  Treasurers Report
  Cash Flow Projection
  Cost Analysis

- **PLSLWD year-end financial statements and supplementary reports:**
  Statement of Financial Position (aka "Balance Sheet")

- **PLOC MOA Cooperators quarterly financial statements and supplementary reports:**
  Statement of Activities
  Contracted Services Summary

- **PLOC MOA Cooperators annual report**
  Cost share allocation for PLOC Cooperators

The financial statements will not include the statement of cash flows and the related notes to the financial statements.

Management has requested the financial statements be prepared without substantially all disclosures, which is a departure from the financial reporting framework. The financial statements will identify these departures.

The supplementary information accompanying the financial statements, if requested, will be prepared and presented for purposes of additional analysis and is not a required part of the basic financial statements.

**Engagement objectives and our responsibilities**
The objective of our engagement is to prepare financial statements in accordance with the financial reporting framework based on information provided by you and information generated through our outsourced accounting services.

We will conduct our preparation engagement in accordance with Statements on Standards for Accounting and Review Services (SSARSs) promulgated by the Accounting and Review Services Committee of the American Institute of Certified Public Accountants (AICPA) and comply with the AICPA's Code of Professional Conduct, including the ethical principles of integrity, objectivity, professional competence, and

due care.

**Engagement procedures, limitations, and management responsibilities**

We are not required to, and will not, verify the accuracy or completeness of the information you will provide to us for the engagement or otherwise gather evidence for the purpose of expressing an opinion or a conclusion. Accordingly, we will not express an opinion, a conclusion, nor provide any assurance on the financial statements and the supplementary information.

Our engagement cannot be relied upon to identify or disclose any financial statement misstatements, including those caused by fraud or error, or to identify or disclose any wrongdoing within the entity or noncompliance with laws and regulations. We have no responsibility to identify and communicate deficiencies in your internal control as part of this engagement. You agree that we shall not be responsible for any misstatements in the entity's financial statements that we may not identify as a result of misrepresentations made to us by you.

CLA's relationship with you shall be solely that of an independent contractor and nothing in the MSA or a SOW shall be construed to create or imply any relationship of employment, agency, partnership, or any relationship other than an independent contractor.

**No assurance statement**
The financial statements will not be accompanied by a report. However, management agrees that each page of the financial statements will include a statement clearly indicating that no assurance is provided on them.

Our firm cannot be associated with any financial statements you file with the U.S. Securities and Exchange Commission (SEC) and accordingly, the name of our firm cannot be included in any of Prior Lake - Spring Lake Watershed District's public filings.

**Management responsibilities related to the preparation**

The engagement to be performed is conducted on the basis that you (management and, when appropriate, those charged with governance) acknowledge and understand that our role is to prepare financial statements in accordance with the financial reporting framework.

We are required by professional standards to identify management's responsibilities in this agreement. Those standards require that you acknowledge and understand that management, and those charged with governance, as appropriate, have the following overall responsibilities that are fundamental to our undertaking the engagement to prepare your financial statements in accordance with SSARSs:

**a.** The selection of the financial reporting framework to be applied in the preparation of the financial statements and determining that the financial reporting framework is acceptable in the circumstances.

**b.** The design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

**c.** The prevention and detection of fraud.

**d.** To ensure that the entity complies with the laws and regulations applicable to its activities.

**e.** The accuracy and completeness of the records, documents, explanations, and other information, including significant judgments, you provide to us for the engagement to prepare financial statements.

**f.** To provide us with the following:

**i.** Access to all information relevant to the preparation and fair presentation of the financial statements, such as records, documentation, and other matters.

**ii.** Additional information that may be requested for the purpose of the engagement.

**iii.** Unrestricted access to persons within the entity with whom we determine it necessary to communicate.

We understand that you are engaging us to make recommendations and perform services to help you meet your responsibilities relevant to the preparation and fair presentation of the financial statements (items a, b, c, and d).

For all accounting services we may provide to you, including the preparation of your financial statements, management agrees to assume all management responsibilities; oversee the services; evaluate the adequacy and results of the services; and accept responsibility for the results of the services.

***Beneficial ownership information reporting***

Beginning in 2024 under the Corporate Transparency Act (CTA), certain entities organized in the U.S. (including entities that are disregarded for federal income tax purposes) and foreign entities doing business in the U.S. are required to report information to the Financial Crimes Enforcement Network (FinCEN) as to their beneficial ownership. The report must provide each beneficial owner, each company applicant and other required information. Entities subject to the beneficial ownership information (BOI) reporting include a corporation, limited liability company, or any other entity created by the filing of a document with the secretary of state or similar office under state, Tribal or foreign country law. Note that some entities are exempt from the BOI reporting requirements (including many nonprofits and certain large operating companies).

**It is your responsibility to prepare and submit any BOI report to FinCEN that is required under the CTA.** We have no obligation to identify any filing requirements or provide any services related to BOI reporting.

You agree that CLA will not be providing any services that could be viewed as having control or being a beneficial owner of the entity that would require you to list CLA, its partners, principals, directors, officers, employees or agents, in any BOI report. We will not act as a corporate agent or in any capacity where we are preparing or filing legal documents on your behalf. We also will not make any management decisions that indicate substantial control of your entity, including the following decisions:

- Reorganization, dissolution or merger of the reporting company; compensation and incentives of senior officers;
- Making, terminating, fulfilling or not fulfilling significant contracts;
- Selecting, terminating business lines, ventures, or geographic focus;
- Making major expenditures, incurring significant debt, issuing securities, approving operating budgets, selling, transferring, leasing or mortgaging principal assets;
- Amending governing documents; or
- Determining the nature, scope and attributes of the business conducted.

**Fees and terms**

Our professional services will be billed on an hourly basis based on the degree of responsibility and contribution of the professionals working on the engagement. We will also bill for expenses (including internal and administrative charges) plus a technology and client support fee of five percent (5%) of all professional fees billed. We will also bill any third-party software subscription fees that you direct CLA to purchase and incur on your behalf. The total payment for services will not exceed $46,320 ($37,320 for Prior Lake Spring Lake Watershed District and $9,000 for PLOC MOA Cooperators) for calendar year 2025. This paragraph governs over any other provision of the agreement indicating "estimated" cost.

Our fees are estimated to be as follows for calendar year 2025 for the District:
Monthly fee for accounting $2,500 (estimated 18 hours per month)
Monthly fee for payroll * $400/ month
Monthly fee for Bill.com** $85
Tech fee (5% of professional fees) $125
Estimated monthly fee $3,110
* See separate SOW
** Bill.com fees are as follows:
- A monthly base fee of $20.30/month
- E-payments of $0.49/payment
- Physical checks of $1.49/payment
- $5.00 per user/month

PLOC MOA fees estimated to be $9,000 for the year.
In the event that this SOW is terminated and the clause to provide up to 60 days of services to the District is requested those services will be provided at the following rates: Accountant $95/hour; Controller $175/ hour; and Principal/Quality Assurance $275/hour.
The fee and time estimate are based on anticipated cooperation from your personnel and their assistance with preparing requested schedules. If the requested items are not available on the dates required or are not accurate, the estimated fees will likely be higher. If unexpected circumstances require significant additional time, we will advise you before undertaking work that would require a substantial increase in the fee estimate.

**Use of the financial statement**
The financial statements we prepare are for management's use. If you intend to reproduce and publish the financial statements, they must be reproduced in their entirety.

**Non-Solicitation**
You agree that during the term and for a period of one year after the expiration or termination date of the MSA, you will not solicit, hire, contract with, or engage the services of any person providing services to you on behalf of CLA without the prior written consent of CLA. If you breach this non-solicitation provision, you shall pay $125,000.00 to CLA as liquidated damages within two weeks of the date on which the former CLA employee or consultant begins his or her new employment with you.

**Termination of SOW**
Either party (you or CLA) may terminate this particular SOW at any time by giving written notice to the other party. On termination, CLA at your request, will provide services that you request, for up to 60 days from date of termination notice, to assist in your transition to another service provider. You and CLA will consult to define transition services and you will compensate CLA for such services at rates set forth in the Outsourcing Preparation Statement of Work. Upon termination of this particular SOW, the provisions of this SOW and the existing MSA shall continue to apply to all services rendered prior to termination.

**Agreement**
We appreciate the opportunity to provide the services described in this SOW related to the MSA, between CLA and the Prior Lake-Spring Lake Watershed District effective January 1, 2025. All terms and provisions of the MSA shall apply to these services. If you agree with the terms of this SOW, please sign below and return a signed copy to us to indicate your acknowledgment and understanding of, and agreement with, this SOW.

**CliftonLarsonAllen LLP**
Christopher G. Knopik
Principal
16123973266
christopher.knopik@claconnect.com

**Response**
This SOW correctly sets forth the understanding of Prior Lake - Spring Lake Watershed District and is accepted by:

**CLA**
CliftonLarsonAllen LLP

Christopher G. Knopik

Christopher G. Knopik, Principal

**SIGNED** 1/6/2025, 11:10:18 AM CST

**Client**
Prior Lake - Spring Lake Watershed District

SIGN:

Joni Giese, Administrator

DATE:

**PLSLWD Board Staff Report**
January 15, 2025

| | | | |
|---|---|---|---|
| **Subject** \| | District Engineer Master Services Agreement: 2025 Rate Schedule | | |
| **Board Meeting Date** \| | January 21, 2025 | **Item No:** | 6.13 |
| **Prepared By** \| | Joni Giese, District Administrator | | |
| **Attachments** \| | EOR Memo Regarding 2025 Rate Schedule | | |
| **Proposed Action** \| | Motion to approve the EOR 2025 Hourly Fee Schedule | | |

## Background

In 2024, PLSLWD entered into a Master Services Consulting Agreement with EOR for the purpose of EOR serving as the District Engineer for the years 2024 and 2025.

## Discussion

Pursuant to Paragraph 4. Rates and Fees, of the Master Services Consulting Agreement between EOR and PLSLWD, the schedule of fees is subject to revisions annually, subject to approval by the PLSLWD Board.

## Recommendation

Staff recommends Board approval of the EOR 2025 Hourly Fee Schedule.

## Budget Impact

District engineering services are reflected in the following Implementation Fund budget items:

- 626 Engineering Not for Programs
- 648 Permitting and Compliance
- 648 BMP Easement Inventory and Inspections

These fees also apply to district engineering services performed for the prior lake outlet channel and scopes of work initiated in 2025. Work performed using the new hourly fee schedule will need to be performed within approved budgets.

# memo

| | | | |
|---|---|---|---|
| **Subject** | EOR Master Services Consulting Agreement | **Date** | 1/9/2025 |
| **To** | Joni Giese, District Administrator | | |
| **Cc** | | | |
| **From** | Carl K. Almer | | |
| **Regarding** | 2025 Rate Schedule | | |

EOR continually monitors market trends and overall costs with the intention of providing our clients with the best possible value. To recruit and maintain top individuals in the field we must keep up with the market, which currently has a very high demand for water resource professionals and engineers.

Inflation and cost-of-living increases over the last few years have been significantly higher than historical averages. We do feel that our hourly rates are cost-competitive with our peers and are of best value when considering the quality and efficiency generated by our experienced team and integrated approach to water resources.

Pursuant to Paragraph 4. Rates and Fees of the Master Services Consulting Agreement between PLSLWD and EOR dated January 17, 2024, please find attached for consideration an updated Attachment A - EOR Hourly Fee Schedule for 2025. Notes regarding the offered rates:

- The 2025 rates represent an average 4.8% increase from 2024 rates.
- These rates represent nearly a 5% discount from EOR standard rates.
- You will see the 2025 rates with our invoice for January hours with the exception that the 2024 rate schedule will continue to be honored for projects initiated prior to 2025.

Please let me know if you have any questions.

# ATTACHMENT A – EOR 2025 HOURLY FEE SCHEDULE

| Classification | Hourly Rate |
|---|---|
| Professional 1 | $129.00 |
| Professional 2 | $162.00 |
| Professional 3 | $189.00 |
| Professional 4 | $218.00 |
| Technician 1 | $93.00 |
| Technician 2 | $112.00 |
| Technician 3 | $137.00 |
| Project Principal | $239.00 |
| Senior Principal | $265.00 |
| Support Staff | $89.00 |

**Professionals:**
Includes licensed and non-licensed engineers, landscape architects, geologists, scientists, surveyors, field professionals, and geospatial professionals with bachelor's or advanced degrees.

**Technicians:**
Work requires a combination of basic scientific knowledge and manual skills, which can be obtained through two years of post-high school education, such as is offered in technical schools, community colleges, or through equivalent on-the-job training.

**Principal Partners:**
Officers and departmental managers at the highest level of EOR staff classification performing technical and quality control supervision.

**Support Staff:**
Non-manual clerical work performed by office administrators, administrative assistants, bookkeepers, messengers, office helpers, and clerks.

**Additional Notes:**

- *Reimbursable expenses (Reproduction, Printing, Duplicating, Mileage at current government rates, DGPS equipment, field supplies, use/rental of special equipment, etc.) will be billed at cost.*
- *Subcontracted services will be billed at cost plus 10% to cover overhead expenses.*
- *Expert witness trial and deposition testimony will be billed at the above hourly rates times 1.5.*
- *Payment is due upon receipt of invoice. If the invoice is not paid within thirty (30) days after invoice date, Client will also pay a finance charge thereon of 1.5 percent or the maximum rate allowed by law, whichever is less, for each month thereafter or portion thereof that an invoice remains unpaid.*

**PLSLWD Board Staff Report**
January 13, 2025

| | | | |
|---|---|---|---|
| **Subject** \| | 2025 WSB Carp Management Services Contract | | |
| **Board Meeting Date** \| | January 21, 2025 | **Item No** \| | 6.14 |
| **Prepared By** \| | Jeff Anderson, Water Resources Coordinator | | |
| **Attachments** \| | 2025 WSB Carp Management Services Contract | | |
| **Action** \| | Motion to approve the 2025 WSB Carp Management Services Contract | | |

## Background

WSB has performed carp management services for the PLSLWD since 2015 and are experts in the field of invasive common carp. They have helped the District meet grant objectives, annual and long-term goals, and lead innovative plans during this time. In 2024, WSB conducted a mark and recapture study on Upper Prior Lake which showed the carp population meeting long term goals.

## Discussion

Carp management is an integral part of improving the water quality in Spring and Upper Prior Lakes as discussed in the 2013 TMDL reports. The carp management program is also relied on to achieve assurances set in the 2019-2021 BWSR grant. District staff and consultants are set to continue carp management as outlined in the recently updated 2024 Integrated Pest Management Plan for Carp (IPM). The 2025 WSB Carp Management Services Contract Scope of Services (Exhibit A) outlines six tasks where WSB will complete annual objectives resulting in reduction of carp biomass, assessing populations, tracking movement through PIT stations, barrier design, build and installation, data analysis and reporting, and project management. In 2024, we verified Upper Prior Lake is meeting our population goal which means a shift from intensive management to the final phase of management called “maintenance” found in the IPM. The priority objective in 2025 will be biomass reduction through removals in Spring Lake. Contracted services also include the coordination and subcontracting of commercial netters.

## Recommendation

District staff is requesting that the Board of Managers approve the attached 2025 WSB Carp Management Services Contract written not to exceed $78,949.

## Budget Impact

The cost associated with the proposed 2025 activity is covered under budget item 611 Carp Management.

**AGREEMENT BETWEEN**
**PRIOR LAKE - SPRING LAKE WATERSHED DISTRICT and**
**WSB & ASSOCIATES, INC**

**2025 CARP MANAGEMENT SERVICES**

This agreement is entered into by the Prior Lake - Spring Lake Watershed District, a public body with powers set forth at Minnesota Statutes chapters 103B and 103D (PLSLWD), and WSB LLC, a Minnesota corporation (CONSULTANT). In consideration of the terms and conditions set forth herein and the mutual exchange of consideration, the sufficiency of which hereby is acknowledged, PLSLWD and CONSULTANT agree as follows:

1. Scope of Work

CONSULTANT will perform the work described in the January 15, 2025, Scope of Services attached as Exhibit A (the "Services"). Exhibit A is incorporated into this agreement and its terms and schedules are binding on CONSULTANT as a term hereof. PLSLWD, at its discretion, in writing may at any time suspend work or amend the Services to delete any task or portion thereof. Authorized work by CONSULTANT on a task deleted or modified by PLSLWD will be compensated in accordance with paragraphs 5 and 6.

2. Independent Contractor

CONSULTANT is an independent contractor under this agreement. CONSULTANT will select the means, method and manner of performing the Services. Nothing herein contained is intended or is to be construed to constitute CONSULTANT as the agent, representative or employee of PLSLWD in any manner. Personnel performing the Services on behalf of CONSULTANT or a subcontractor will not be considered employees of PLSLWD and will not be entitled to any compensation, rights or benefits of any kind from PLSLWD.

3. Subcontract and Assignment

CONSULTANT will not assign, subcontract or transfer any obligation or interest in this agreement or any of the Services without the written consent of PLSLWD and pursuant to any conditions included in that consent. PLSLWD consent to any subcontracting does not relieve CONSULTANT of its responsibility to perform the Services or any part thereof, nor in any respect its duty of care, insurance obligations, or duty to hold harmless, and indemnify under this agreement. PLSLWD hereby approves the use of Don Geyer, Tim Adams, and/ or Jeff Reidemann as subcontractors.

4. Duty of Care; Indemnification

CONSULTANT will perform the Services with reasonable care and in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances at the same time and in the same or similar locality. CONSULTANT will hold harmless and indemnify PLSLWD, its board members, employees from actions, costs (including reasonable attorney fees), damages and liabilities to the extent caused by: (a) CONSULTANT’s negligent or otherwise wrongful act or omission, or breach of a specific contractual duty; or (b) a subcontractor’s negligent or otherwise wrongful act or omission, or

breach of a specific contractual duty owed by CONSULTANT to PLSLWD. For any claim subject to this paragraph by an employee of CONSULTANT or a subcontractor, the indemnification obligation is not limited by a limitation on the amount or type of damages, compensation or benefits payable by or for CONSULTANT or a subcontractor under workers' compensation acts, disability acts or other employee benefit acts.

5. Compensation

PLSLWD will compensate CONSULTANT for the Services on an hourly basis and reimburse for direct costs in accordance with Exhibit A. Invoices will be submitted monthly for work performed during the preceding month. Payment for undisputed work will be due within 30 days of receipt of invoice. Direct costs not specified in Exhibit A will not be reimbursed except with prior written approval of the PLSLWD administrator. Subcontractor fees and subcontractor direct costs, as incurred by CONSULTANT, will be reimbursed by PLSLWD at the rate specified in PLSLWD's written approval of the subcontract.

The total payment for each task will not exceed the amount specified for that task in Exhibit A unless specifically authorized in writing by PLSLWD. The total payment for the Services will not exceed $78,949. Total payment in each respect means all sums to be paid whatsoever, including but not limited to fees and reimbursement of direct costs and subcontract costs, whether specified in this agreement or subsequently authorized by the administrator. PLSLWD recognizes there are rental fees associated with Box Nets, Hog Trap panel traps, Parasitic units, and Sample nets detailed in Exhibit A. Other equipment operated or owned by CONSULTANT to complete the scope of services does not include usage fees.

CONSULTANT will maintain all records pertaining to fees or costs incurred in connection with the Services for six years from the date of completion of the Services. CONSULTANT agrees that any authorized PLSLWD representative or the state auditor may have access to and the right to examine, audit and copy any such records during normal business hours.

6. Termination; Continuation of Obligations

This agreement is effective when fully executed by the parties and will remain in force until end of day 1/20/2026 unless earlier terminated as set forth herein.

PLSLWD may terminate this agreement at its convenience, by a written termination notice stating specifically what prior authorized or additional tasks or services it requires CONSULTANT to complete. CONSULTANT will receive full compensation for all authorized work performed, except that CONSULTANT will not be compensated for any part performance of a specified task or service if termination is due to CONSULTANT's breach of this agreement.

Insurance obligations; duty of care; obligations to indemnify and hold harmless; and document-retention requirements will survive the completion of the Services and the term of this agreement.

7. No Waiver

The failure of either party to insist on the strict performance by the other party of any provision or obligation under this agreement, or to exercise any option, remedy or right herein, will not

waive or relinquish such party's rights in the future to insist on strict performance of any provision, condition or obligation, all of which will remain in full force and affect. The waiver of either party on one or more occasion of any provision or obligation of this agreement will not be construed as a waiver of any subsequent breach of the same provision or obligation, and the consent or approval by either party to or of any act by the other requiring consent or approval will not render unnecessary such party's consent or approval to any subsequent similar act by the other.

Notwithstanding any other term of this agreement, PLSLWD waives no immunity in tort. This agreement creates no right in and waives no immunity, defense or liability limit with respect to any third party of this agreement, specifically but not exclusively Section 4.

8. Insurance

At all times during the term of this Agreement, CONSULTANT will have and keep in force the following insurance coverages:

A. General: $1.5 million, each occurrence and aggregate, covering CONSULTANT's ongoing and completed operations on an occurrence basis and including contractual liability.

B. Professional liability: $1.5 million each claim and aggregate. Any deductible will be CONSULTANT's sole responsibility and may not exceed $200,000. Coverage may be on a claims-made basis, in which case CONSULTANT must maintain the policy for, or obtain extended reporting period coverage extending, at least three (3) years from completion of the Services.

C. Automobile liability: $1.5 million combined single limit each occurrence coverage for bodily injury and property damage covering all vehicles on an occurrence basis.

D. Workers' compensation: in accordance with legal requirements applicable to CONSULTANT.

CONSULTANT will not commence work until it has filed with PLSLWD a certificate of insurance documenting the required coverages and naming PLSLWD as an additional insured for general liability, along with a copy of the additional insured endorsement establishing coverage for CONSULTANT's ongoing and completed operations as primary coverage on a noncontributory basis. The certificate will name PLSLWD as a holder and will state that PLSLWD will receive written notice before cancellation, or a change in the limit of any described policy under the same terms as CONSULTANT.

9. Compliance With Laws

CONSULTANT will comply with all applicable laws and requirements of federal, state, local and other governmental units in connection with performing the Services and will procure all licenses, permits and other rights necessary to perform the Services.

In performing the Services, CONSULTANT will ensure that no person is excluded from full employment rights or participation in or the benefits of any program, service or activity on the

ground of race, color, creed, religion, age, sex, disability, marital status, sexual orientation, public assistance status or national origin; and no person who is protected by applicable federal or state laws, rules or regulations against discrimination otherwise will be subjected to discrimination.

10. Data and Information

All data and information obtained or generated by CONSULTANT in performing the Services, including documents in hard and electronic copy, software, and all other forms in which the data and information are contained, documented or memorialized, are the property of PLSLWD. CONSULTANT hereby assigns and transfers to PLSLWD all right, title and interest in: (a) its copyright, if any, in the materials; any registrations and copyright applications relating to the materials; and any copyright renewals and extensions; (b) all works based on, derived from or incorporating the materials; and (c) all income, royalties, damages, claims and payments now or hereafter due or payable with respect thereto, and all causes of action in law or equity for past, present or future infringement based on the copyrights. CONSULTANT agrees to execute all papers and to perform such other proper acts as PLSLWD may deem necessary to secure for PLSLWD or its assignee the rights herein assigned.

PLSLWD may immediately inspect, copy or take possession of any materials on written request to CONSULTANT. On termination of the agreement, CONSULTANT may maintain a copy of some or all of the materials except for any materials designated by PLSLWD as confidential or non-public under applicable law, a copy of which may be maintained by CONSULTANT only pursuant to written agreement with PLSLWD specifying terms.

11. Data Practices; Confidentiality

The requirements of Minnesota Statutes §13.05, subdivision 11, apply to this agreement.

12. PLSLWD Property

All property furnished to or for the use of CONSULTANT or a subcontractor by PLSLWD and not fully used in the performance of the Services, including but not limited to equipment, supplies, materials and data, both hard copy and electronic, will remain the property of PLSLWD and returned to PLSLWD at the conclusion of the performance of the Services, or sooner if requested by PLSLWD. CONSULTANT further agrees that any proprietary materials are the exclusive property of PLSLWD and will assert no right, title or interest in the materials. CONSULTANT will not disseminate, transfer or dispose of any proprietary materials to any other person or entity unless specifically authorized in writing by PLSLWD.

Any property including but not limited to materials supplied to CONSULTANT by PLSLWD or deriving from PLSLWD is supplied to and accepted by CONSULTANT as without representation or warranty including but not limited to a warranty of fitness, merchantability, accuracy or completeness. However, CONSULTANT's duty of professional care under paragraph 4, above, does not extend to materials provided to CONSULTANT by PLSLWD or any portion of the Services that is inaccurate or incomplete as the result of CONSULTANT's reasonable reliance on those materials.

13. Notices

Any written communication required under this agreement to be provided in writing will be directed to the other party as follows:

To PLSLWD:

Joni Giese, District Administrator
Prior Lake - Spring Lake Watershed District
4646 Dakota Street SE
Prior Lake MN 55372

To CONSULTANT:

Tony Havranek, Director of Fisheries
WSB LLC
178 East 9th St., Suite 200
St. Paul, MN 55101

Either of the above individuals may in writing designate another individual to receive communications under this agreement.

14. Choice of Law; Venue

This agreement will be construed under and governed by the laws of the State of Minnesota. Venue for any action will lie in Scott County.

15. Whole Agreement

The entire agreement between the two parties is contained herein and this agreement supersedes all oral agreements and negotiations relating to the subject matter hereof. Any modification of this agreement is valid only when reduced to writing as an amendment to the agreement and signed by the parties hereto. PLSLWD may amend this agreement only by action of the Board of Managers acting as a body.

**IN WITNESS WHEREOF**, intending to be legally bound, the parties hereto execute and deliver this agreement.

**CONSULTANT**

By_____ Date: _____

Its_____

**PRIOR LAKE -SPRING LAKE WATERSHED DISTRICT**

By_____ Date: _____

Its_____

**Exhibit A**
**Scope of Services**

**Exhibit A**

**2025 Scope of Services**

**Date: 1-15-2025**

**TASK 1: Project Management**

Complete administrative tasks (budget), permit acquisition, meetings with district and internal staff, planning, grant writing, presentation, etc.

Project Management Budget:

| | | **Max. Unit Cost** | **Rate** | |
|---|---|---|---|---|
| **Staff Time** | Director of Fisheries | $218.00 | /hr. | |
| | Sr. Environmental Scientist | $137.00 | /hr. | |
| | Environmental Scientist | $112.00 | /hr. | |
| | | **TOTAL BUDGET:** | | **$7,354.00** |

Project Management Deliverables: Meeting notes, permits, and presentation.

**Task 2: Carp Removal and Seining**

Residual carp biomass in Spring Lake will need to be targeted to ensure that carp biomass density thresholds are achieved and kept below the 100 kg/ha threshold that may negatively impact the alum treatments and associated water quality and lake ecology. The Consultant will coordinate both open water and under ice carp removals using a variety of gear types including seine nets, gill nets, electrofishing, specialized traps, and box nets. The consultant will coordinate removal events to be completed by commercial fishing crews. Removal schedules will be coordinated with district staff and timing will be dictated by weather and fish aggregations. Carp removal may also be completed on connected waterbodies where data indicates there may be either adult or juvenile carp that have the potential to migrate to Spring Lake and Prior Lakes. Upper Prior Lake is transitioning to maintenance mode per the IPM and District planning. Removals will be conducted on Upper Prior Lake when favorable opportunities present themselves. District staff will aid in providing up to date locations of carp locations through telemetry tracking.

Carp Removal Budget:

| | | **Max. Unit Cost** | **Rate** | |
|---|---|---|---|---|
| **Staff Time** | Director of Fisheries | $218.00 | /hr. | |
| | Sr. Environmental Scientist | $137.00 | /hr. | |

| | | | | |
|---|---|---|---|---|
| | Environmental Scientist | $112.00 | /hr. | |
| | Box Net Rental/ Hog Trap | $1,500.00 | /unit/season | |
| **Sub-Contractors** | Commercial Netters | $3,000-$8,000 (varies) | /event | |
| | | **TOTAL BUDGET:** | | **$31,441** |

Carp Removal Deliverables: Remove carp biomass, report on total pounds removed per attempt, removal observations, contract commercial netters.

**Task 3. Population Assessments**

The Consultant will complete assessments of the carp population to determine abundance and gather other essential population characteristic data to track changes in abundance and identify reproduction and recruitment. Boat electrofishing CPUE assessments will be conducted on Spring Lake, Upper Prior, and Fish Lakes. If time and budget support, conduct CPUE on Lower Prior Lake. A total of up to 10 carp captured from survey or removal efforts will be surgically implanted with radio tags. Implant remaining 5 radio-tags from 2024. PLSLWD will supply new 2025 radio tags. Aging analysis from carp collected in 2024 and 2025 will be done to determine age classification within the focused waterbodies of Spring, Upper Prior and Fish Lake if budget allows. Aging information can help determine barrier effectiveness, spawning success, and gain valuable information on the implementation of the IPM.

Population Assessment Project Budget:

| | | **Max. Unit Cost** | **Rate** |
|---|---|---|---|
| **Staff Time** | Sr. Environmental Scientist | $218.00 | /hr. |
| | Mini/ standard trap | $200/$500 | / unit/2 night set |
| | **TOTAL BUDGET:** | | **$15,008** |

Population Assessment Project Deliverables: Updated population estimate spreadsheet. Implant a total of 10-15 radio tags into carp from Spring or Prior Lakes. Implant PIT tags as needed. Conduct aging analysis on 50 carp.

**Task 4. PIT Set Up and Data Analysis**

The Consultant will collaborate with District staff to identify locations of 2025 PIT stations and provide technical assistance to ensure correct setup, operations, and maintenance. PIT readers to be used in stations in 2025 are set to have software and firmware upgrades. Consultant will work to set-up 1-2 “parasite” telemetry PIT tracking devices on District stations. PLSL District staff will be responsible for downloading data from each of the PIT stations and providing the data to WSB for analysis. PLSL District

staff will also regularly monitor PIT stations to assure that the stations have power and are working properly as well as uninstall stations for storage.

PIT Station Equipment, Set Up, and Data Analysis Budget:

| | | **Max. Unit Cost** | **Rate** |
|---|---|---|---|
| **Staff Time** | Sr. Environmental Scientist | $137.00 | /hr. |
| | Director of Fisheries | $218.00 | /hr. |
| | Parasitic unit fee | $1,000/unit | |
| | **TOTAL BUDGET:** | | **$5,524** |

PIT Station Set Up and Data Analysis Deliverables: Memo summarizing PIT data, aid with equipment firmware updates.

**Task 5. FeCl Bypass Barrier Design, Build, and Installation**

The Consultant will work with District staff to create a barrier design that will meet the needs of the Districts Ferric Chloride Water Treatment System. The barrier will be located at the FeCl bypass weir and be designed to limit capture of debris and cause water level rise. Carp can move over the FeCl bypass weir during high flow periods and utilize the FeCl desiltation pond as a spawning area. Blocking spawning to the desiltation pond is a key objective to prevent recruitment on Spring Lake. The barrier will be designed to be built of materials that will support longevity of the installation. PLSLWD staff will coordinate with District engineer to provide necessary hydraulic and flow information. District staff will aid in permit acquisition. Material purchase, construction, and installation will become secondary or future tasks based on budget availability.

FeCl Bypass Barrier Design, Build, and Installation Budget:

| | | **Max. Unit Cost** | **Rate** | **Total Budget** |
|---|---|---|---|---|
| **Staff Time** | Director of Fisheries | $218.00 | /hr. | |
| | Sr. Environmental Scientist | $137.00 | /hr. | |
| | Environmental Scientist | $112.00 | /hr. | |
| | **ESTIMATED TOTAL BUDGET:** | | | **$12,287** |

FeCl Bypass Barrier Design Deliverables: Project coordination, design bypass Barrier, drawings.

**Task 6. Data and Reporting**

The Consultant will coordinate with PLSL District staff to prepare an update to the annual PLSL Watershed Carp IPM. In addition, the consultant will maintain existing fishery datasets and update as needed.

Data and Reporting Budget:

| | | **Max. Unit Cost** | **Rate** | **Total Budget** |
|---|---|---|---|---|
| **Staff Time** | Director of Fisheries | $219.00 | /hr. | |
| | Sr. Environmental Scientist | $137.00 | /hr. | |
| | Environmental Scientist | $112.00 | /hr. | |
| | **ESTIMATED TOTAL BUDGET:** | | | **$7,335** |

Data and Reporting Deliverables: IPM review and final 2025 report summarizing activities and data analysis.

Budget:

| **Tasks** | **Total Budget** |
|---|---|
| 1. Project Management | $7,354 |
| 2. Carp Removals and Seining | $31,441 |
| 3. Population Assessments | $15,008 |
| 4. PIT Set Up and Data Analysis | $5,524 |
| 5. FeCl Bypass Barrier Design, build and Installation | $12,287 |
| 6. Data and Reporting | $7,335 |
| **TOTAL BUDGET:** | **$78,949** |

**PLSLWD Board Staff Report**
January 15, 2025

| | | |
|---|---|---|
| **Subject** \| | EOR Scope of Services: Upper Prior Lake Post-Alum Treatment Sediment Core Analysis | |
| **Board Meeting Date** \| | January 21, 2025 | **Item No:** 6.15 |
| **Prepared By** \| | Jeff Anderson, Water Resources Coordinator | |
| **Attachments** \| | EOR Scope of Services: Upper Prior Lake Post-Alum Treatment Sediment Core Analysis | |
| **Proposed Action** \| | Motion to approve the EOR Scope of Services for Upper Prior Lake Post-Alum Treatment Sediment Core Analysis | |

## Background

As the District continues to monitor lake water quality, the alum reserve fund keeps growing and questions have been raised whether it is time to perform alum treatments on select District lakes. Hypolimnetic water quality data is used as indicator of how long an alum treatment is effectively capturing sediment phosphorus release. Upper Prior Lake's data set has been quietly trending upwards over the past few years prompting increased interest. The 2020 alum treatment was majority funded by a Clean Water Fund competitive graft that holds the District to an assurance agreement that requires the District to conduct the second treatment and meet state water quality standards for the 10-year life of the project.

## Discussion

The Upper Prior Lake management plan recommends follow up core be completed at least one year prior to the completion of the first dose to determine follow up guidance. The first alum treatment dose on Upper Prior Lake was anticipated to last at least five years, which will be reached this spring. Staff requested EOR to develop a Scope of Services to conduct the sediment core collection, 3rd party lab coordination, analysis, and technical memorandum discussing current conditions, effectiveness of past treatments, costs, and deliver recommendations for future adaptive management.

In the August 20, 2024, board meeting, the board of managers approved a motion to conduct coring and analysis on Spring Lake in 2024. The Spring Lake Post-Alum Treatment Sediment Core Analysis is on track to be completed in March of 2025. The timeframe for completing coring and analysis on Upper Prior Lake is set for June 2025, allowing for consideration in the 2026 budget planning process starting in July. If approved, comparing the results between the two lakes will give insights on how to prioritize lakes and reserve funds for future alum treatment projects.

## Recommendation

Motion to approve the EOR Scope of Services for Spring Lake Post-Alum Treatment Sediment Core Analysis.

## Budget Impact

The cost associated with the proposed activity is $23,858 and will be covered under budget item 611 Alum Internal Loading Reserve.

# SCOPE OF SERVICES

## UPPER PRIOR LAKE POST-ALUM TREATMENT SEDIMENT CORE ANALYSIS

| PLSLWD | |
|---|---|
| CLASS: | 611 Alum Internal Loading Reserve |
| PROJECT: | Upper Prior Lake Post-Alum Treatment Sediment Core Analysis |

| EOR | | | |
|---|---|---|---|
| JOB: | 00758-0190 | | |
| PHASE: | N/A | TASK: | N/A |

START DATE: 1/22/2025 END DATE: 6/30/2025

TOTAL PROJECT BUDGET: $23,858

**OVERVIEW OF PROJECT SCOPE:**

Upper Prior Lake received its first alum dose in 2020. The lake management plan recommends follow up sediment cores be collected before the subsequent doses to afford adaptive management and potentially adjust the alum treatment plan. In response, District staff requested EOR to prepare a scope of services to conduct follow up sediment coring and evaluation of alum treatment effectiveness on Upper Prior Lake following the alum treatment. EOR will conduct the sediment core sampling, deliver the samples to University of Wisconsin Stout for analysis of phosphorus release rate, phosphorus fractionation, and alum deposition depth. EOR will also analyze District water quality data, climate data, the original alum plan and dosing recommendations, and sediment chemistry results before and after the alum treatment. EOR will provide a memo with an explanation of results and recommendations for future alum dosing.

The following scope outlines the anticipated tasks, hours, and schedule to advance this field work, analysis, and technical memorandum for future alum treatments.

**PROJECT TEAM**

| PLSLWD | |
|---|---|
| **PROJECT LEAD:** | Jeff Anderson, Water Resources Coordinator |
| *OTHER STAFF:* | Joni Giese, District Administrator |
| **EOR** | |
| **PROJECT LEAD:** | Anne Wilkinson (32) |
| *OTHER STAFF:* | Carl Almer (5), John Sarafolean (6), Joey Castaneda (4) |

## SUMMARY OF TASKS

| TASK 1: Sediment Core Collection | |
|---|---|
| **SUMMARY:** | EOR will collect nine sediment cores from the locations in Figure 1. EOR will deliver the sediment cores to the University of Wisconsin Stout. Cores from all nine sediment locations will be segmented into six sections: 0-2cm, 2-4cm, 4-6cm, 6-8cm, 8-10cm, 10-20cm. Each section will be analyzed for loosely-bound P, iron-bound P, labile organic P, and aluminum-bound P. In addition, five sediment core locations will be analyzed for soluble reactive phosphorus release rates. Incorporating release rate analysis is imperative to understanding the load reductions achieved by the alum treatment. The five locations represent a cross section of the alum application area. The release rate data from these five locations is the minimum resolution necessary to understand any spatial variability of the alum treatment effectiveness. |
| **DELIVERABLES:** | Laboratory results |
| **TIMELINE:** | January-May 2025 |
| **ESTIMATED COSTS:** | $17,287 |
| **TASK 2: Analysis and Technical Memorandum** | |
| **SUMMARY:** | EOR will analyze water quality, climate, fisheries, macrophyte, and sediment core trends and dosing plans to determine the effectiveness of the 2020 alum treatment. EOR will evaluate both the temporal and spatial lake response to the 2020 treatment. EOR will use this analysis to provide recommendations for adaptive management of internal loading on Upper Prior Lake. EOR will summarize the findings from Task 1 and 2 and provide recommendations for future management on Upper Prior Lake. |
| **DELIVERABLES:** | Technical Memorandum |
| **TIMELINE:** | March-June 2025 |
| **ESTIMATED COSTS:** | $6,571 |

## ESTIMATED COST SUMMARY

| DESCRIPTION | | HOURS/ QUANTITY | ESTIMATED COST |
|---|---|---|---|
| **TASK 1:** | Sediment Core Collection | 13 | $1,987 |
| **LAB EXPENSES:** | UW Stout | - | $15,300 |
| **TASK 2:** | Analysis and Technical Memorandum | 34 | $6,571 |
| **OTHER EXPENSES:** | Mileage<br>Equipment rental<br>Other | ***Included in the above estimated costs*** | |
| | | **TOTAL** | $23,858 |

*NOTE: Actual costs may differ from the estimated task costs, but the project must not exceed the TOTAL.*

**ASSUMPTIONS:** The estimated cost summary for the execution of the tasks in this Scope of Services is based upon the following assumptions:

1) District staff will accompany EOR staff to collect the sediment cores.
2) EOR will provide boat and sampling equipment.
3) The sediment core data will be available by June 2025.

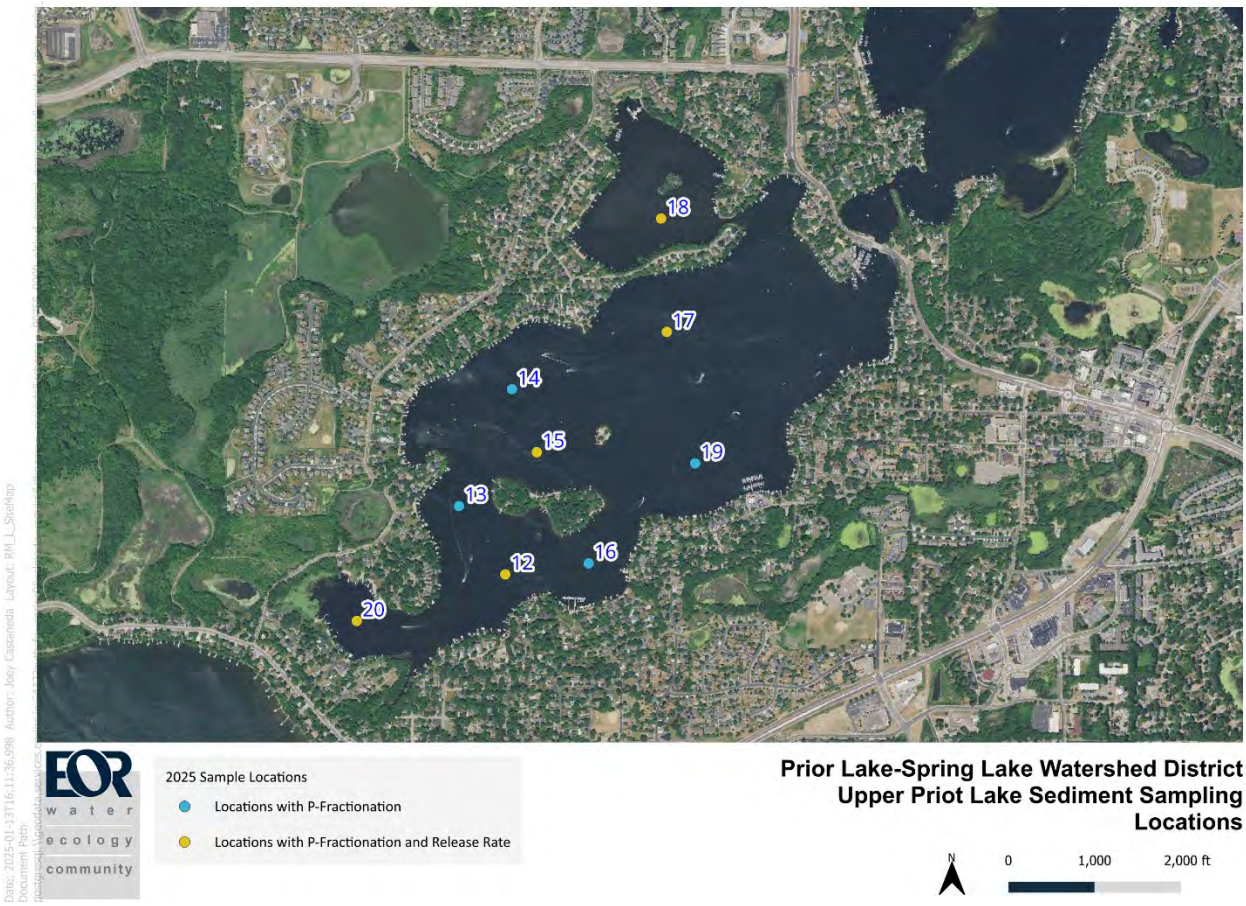



*Figure 1: 2025 Sediment Core Locations*

**SIGNATURES:**

The services described in this Scope of Services are being provided in accordance with the Master Services Consulting Agreement between PLSLWD and EOR dated January 17, 2024. Any changes to the project team, tasks, deliverables, timeline, or total cost will require a signed amendment/update to this Scope of Services.

| Prior Lake-Spring Lake Watershed District | | Emmons & Olivier Resources, Inc. | |
|---|---|---|---|
| Signature: | | Signature: | |
| Name: | Joni Giese | Name: | Carl K. Almer |
| Title: | District Administrator | Title: | Water Resources Lead |
| Date: | | Date: | |