

2023 Annual Report of Orono Lake Improvement District (OLID)

The OLID was formed on July 23, 2019

2023 Annual Report Prepared by the [Orono Lake Improvement District Board of Directors](#).

1. Financial Conditions

- a. All items included in the proposed budget for 2024 were approved by members on August 22, 2023 at the OLID Annual Meeting.

- **Goal 1-8: OLID Annual Services and Activities Fee (100% approval)**

The Orono Lake Improvement District Board of Directors proposed that the OLID request the City of Elk River to impose a service charge within the OLID in the amount of \$100 per full unit for 2024 OLID Annual Services and Activities. This service charge is to support the services and activities itemized in the proposed budget at a total cost of no more than the \$17,100 budgeted expenses.

The Goals for 2024 include Aquatic Invasive Species (AIS) Control of Curly-leaf Pondweed, Undesirable Aquatic Vegetation and Organisms Public, Waters Control Fisheries Survey, Preservation and/or Stocking, Website Licensing and Maintenance, County Special Assessment Fees, Office Supplies and Organizational Expenses, OLID Board Liability Insurance and developing a Cash Reserve to meet cash flow needs or have as contingency funds (see Appendix 5 for full budget detail). These charges will be collected by Sherburne County during the 2024 taxation period.

- **2023 Budget and Financial Conditions**

The OLID financial report for 2023 as of December 7, 2023 showed expenses of \$22,165.65, deposits of \$24,222.34, a checking balance of \$16,007.17 and savings balance of \$2,921.75. As of December 7, 2023 the OLID has received \$17,112.15 (including the 2022 last installment of \$227.50) from Sherburne County in annual property services and activities charges. It is estimated that the OLID will receive the 2023 outstanding balance of 215.37 in January 2024 as the final payment of the tax reconciliation process for a total of \$17,100. In addition, we will be receiving \$413.37 from the City of Elk River as its portion of our Sherburne SWCD Point Intercept survey grant and \$620.06 from Sherburne SWCD (the final 25% of the grant itself).

Aquatic Invasive Species (AIS) management planning and control grants were received from Sherburne SWCD of \$2,480.25 and the MN DNR of \$5,250.00.

2. Business transacted by the district

- a. The OLID has incurred the following business expenses transacted by the Orono Lake Improvement District as of December 7, 2023.

● OLID Liability Insurance coverage	\$932.00
● County Special Assessment Fee	\$890.00
● Point-Intercept Surveys	\$3,307.00
● Lake Vegetation Management Planning	\$832.53
● Fisheries Survey Preservation and/or Stocking	\$2050.00
● Web Licensing and Maintenance	\$119.96
● Office Supplies and Organizational Expenses	\$672.69

3. Status of all projects

a. Lake Orono Restoration and Enhancement (LORE)

- In total, dredging removed just over 140,000 cubic yards of material from various locations within both the upper and lower portions of the lake. Shoreline restoration was completed along the point off Simonet Drive and along the west shoreline of Orono Cemetery. The project was completed in April 2021.
- Part of the LORE project included the creation of a sedimentation catch basin. The catch basin is intended to capture non suspended sedimentation. Maintaining the catch basin will require sedimentation removal. Future sedimentation removal may consist of hydraulic or mechanical dredging.

b. The Sedimentation Management Plan

- The plan aims to address the issue of sediment accumulation within the lake. Sedimentation is a natural process where soil, organic matter, and other particles are deposited in bodies of water over time, resulting in reduced water quality and habitat degradation. The plan outlines strategies and actions to mitigate sedimentation and restore the lake's health.

c. BioBase Use Strategies – surveys generated using [BioBase](#), which uses sonar to create detailed depth (bathymetry), vegetation and hardness maps of the lake bottom. These surveys provide valuable data on three key aspects: bathymetry, vegetation, and bottom hardness. Here's a brief overview of each component:

- **Bathymetry:** Bathymetry refers to the measurement of water depth in a body of water. BioBase uses sonar technology to create detailed bathymetric maps of Lake Orono. These maps show the contours and variations in water depth, providing important information about the lake's topography.
- **Vegetation:** The surveys help to identify the distribution and extent of different types of aquatic plants and algae present in the lake. Understanding the vegetation patterns is crucial for assessing the ecological health of the lake and determining any potential impacts on water quality, navigation, or recreational activities.
- **Bottom Hardness:** BioBase surveys additionally provide data on the hardness of the lake bottom. By measuring the substrate composition, including sediment types and bottom consistency, the management plan can gain insights into the sedimentation processes occurring in the lake. This information aids in understanding sediment dynamics, deposition areas, and potential erosion concerns.

By integrating the data from these surveys, the Orono Lake Improvement District (OLID) can develop a comprehensive sedimentation management plan. This plan may include strategies for mitigating sedimentation issues, such as implementing erosion control measures, managing vegetation, and conducting periodic dredging activities. The data generated by BioBase surveys helps inform decision-making processes and allows for a more effective and targeted approach to managing sedimentation in Lake Orono.

d. 2023 Sedimentation assessment and monitoring report.

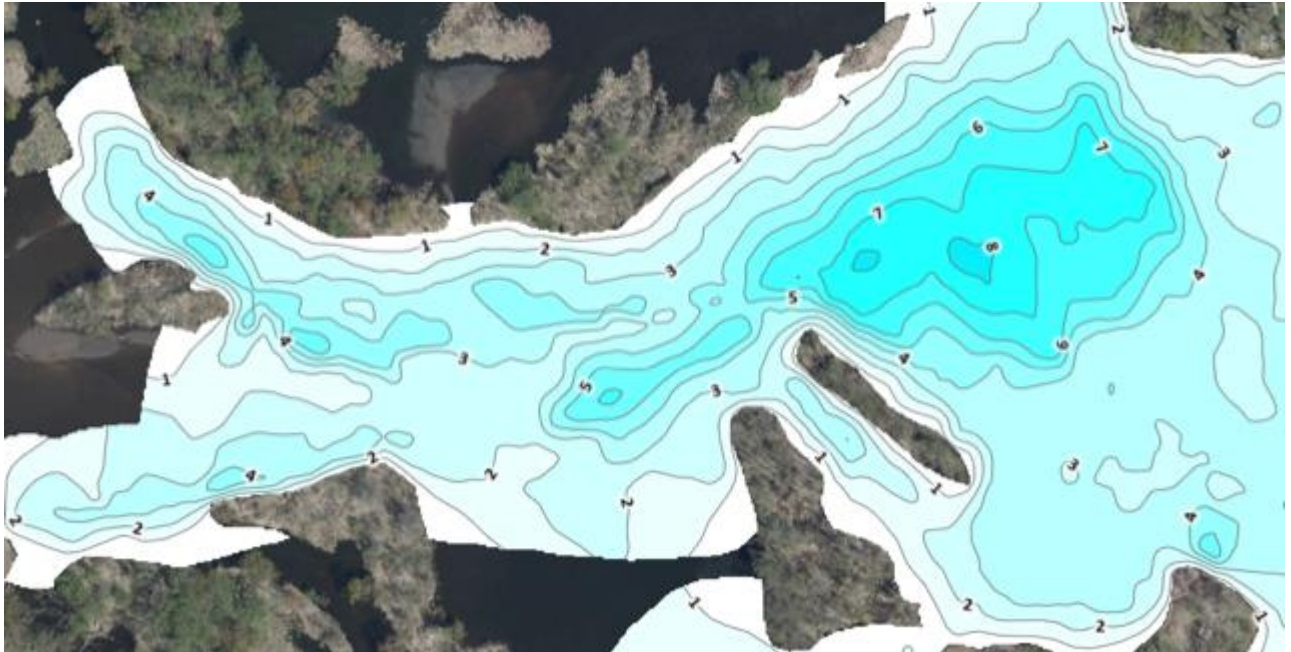
BioBase surveys were conducted in 2022 and in 2023 by the OLID sedimentation assessment and monitoring committee. The surveys conducted in 2022 provided valuable baseline data on sedimentation in the catch basin. Some key findings when comparing the data from the 2022 and 2023 surveys include:

- The rate at which sediment was accumulating in the catch basin was determined based on the data collected in 2022 and 2023.

- Survey indicates a year over year accumulation of sedimentation in the catch basin of 7,744 cubic yards of material.

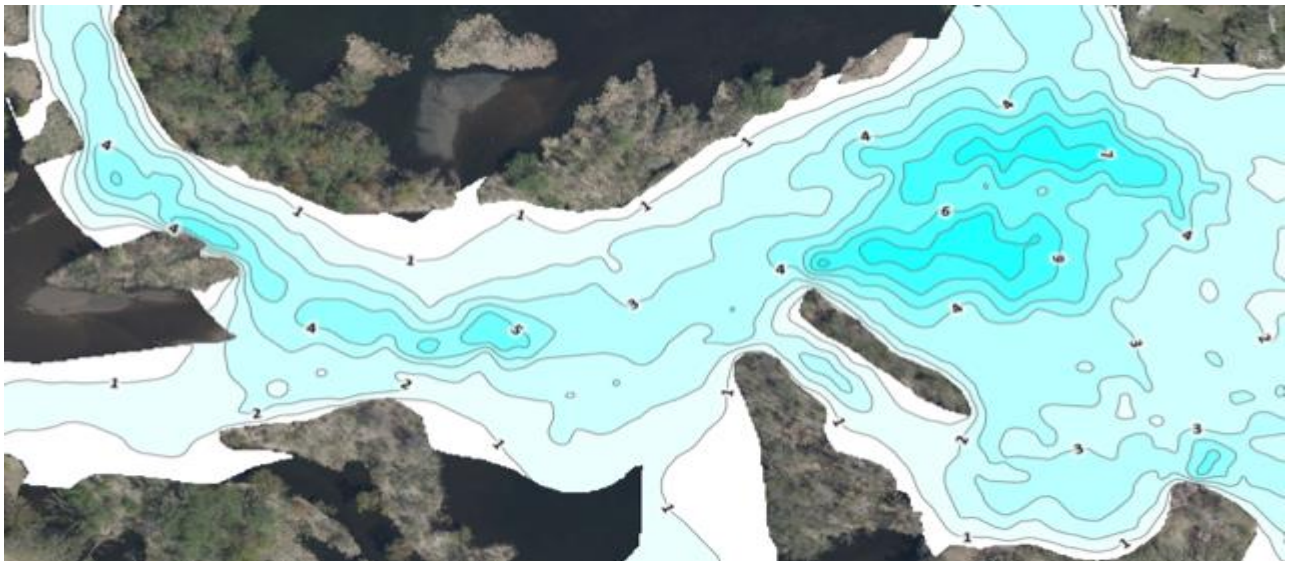
2022 Catch Basin (depth measurements)

Water Volume (acre ft)	35.004
Water Depth Avg (ft)	4.16
Water Depth Max (ft)	8.33
Water Depth Min (ft)	0.19



2023 Catch Basin (depth measurements)

Water Volume (acre ft)	30.204
Water Depth Avg (ft)	3.59
Water Depth Max (ft)	7.61
Water Depth Min (ft)	0.14



- **Potential Sources:** Sediment could be from nearby scouring and/or shoreline erosion identified in red below and from upstream locations within the watershed.

2023 aerial view near catch basin



Further strategies to quantify resedimentation and its remediation will be addressed in the 2021 – 2026 Lake Orono Management Plan. Sediment Management is now an additional subcategory on the OLID website.

- e. **OLID Website:** In 2020 the development and release of the <https://oronolid.org/> website was achieved with considerable savings obtained from the group licensing of its web platform. The go-live date of the website was July 31, 2020. Besides being the official bulletin board for the OLID it provides a document repository, project updates, a member contact form and links to key partner organizations and educational resources.

In 2021 the new category of [Lake Management Plan](#) was added to the main menu with [Aquatic Invasive Species](#), [Fisheries](#) and [Water Quality](#) as subcategories and updated in 2022. Further, in 2022 the purchasing of a Lowrance HDS-7 sonar system and licensing BioBase software to track sediment build-up for future dredging projects and to map aquatic vegetation was added to the Lake Management Plan page. In 2023 additional updates were added to each of those section. The OLID is currently adding Sediment Management and Aquatic Vegetation (both Native and Invasive Species) as additional separate subcategories to its staging website. We plan to make those public on the production website in 2024.

- f. Lake Management Plan:

- **Aquatic Invasive Species (AIS) Prevention and Control**

1. Curly-leaf pondweed (CLP): Though it was again colder and there was higher precipitation than usual last spring, CLP started appearing as anticipated below the water surface in abundance in early May 2023.

Formal curly-leaf pondweed delineation was done as part of a complete point-intercept survey on May 20, 2023. Related, as an alternative to Endothall this year the MN DNR recommended using Flumioxazin over Diquat. Though Flumioxazin is less expensive than Endothall it is slightly more expensive than Diquat, but considered to be more friendly to the environment. Flumioxazin is also considered by our service provider Lake Management Inc. (LMI) to be the most effective of the three herbicides in control.

Therefore, the OLID submitted a treatment permit request for 33.8 acres on May 22, 2023 that was reduced the next day to 30.9 acres (see Appendix 15, page 3) using Flumioxazin. The reduction was to stay within the 15% littoral limit for all herbicide treatments, due to the higher level of shoreline permit requests in 2023. The selective treatment of Flumioxazin was applied by our service provider Lake Management Inc. (LMI) on May 25, 2023. Within a week stress and dying back of the CLP was easily discernable and by mid-June the CLP was largely eradicated in the seven public water areas that were treated. In the end result, the treatment was considered to be highly effective by lake property owners and lake users.

In addition, it is our understanding that in 2023 Lake Orono was one of 10 Minnesota lakes to partner with the MN DNR in studying the use and effectiveness of Flumioxazin for CLP treatment. OLID volunteers collected pH level water samples on the May 25, 2023 treatment date as part of the study.

2. Eurasian Watermilfoil (EWM): The status of this recent AIS threat is that after the 8.76 rapid response treatment of EWM on August 5, 2021, it again fortunately was not found in either of the two point-intercept surveys that were conducted in 2022 nor 2023. That was also the case in three point-intercept surveys that were conducted in 2021.

Regarding the Eurasian watermilfoil (EWM) AIS Control Contract that the OLID was awarded in 2021 and requested extended twice to 2022 and 2023, as we anticipated the potential re-emergence of EWM, the OLID was very appreciative that Sherburne SWCD provided that preparedness support. Per previous agreement with re-emergence not occurring since the rapid response, the grant was cancelled and initial payment of \$1,500 was returned to Sherburne SWCD.

3. Zebra Mussels: On Friday, September 11, 2020 after the LORE dredging project drawdown was halfway to completion Zebra Mussels were found. The finding was made by a lake property owner who also happens to be an Aquatic Invasive Species Specialist for Carver County. The individual reported the finding that day to the DNR and Sherburne SWCD. It was reported the following day to the OLID.

Two zebra mussel “hot spots” were found by the Carver County AIS Specialist (and later inspected by Sherburne SWCD) in areas along northern Main Street NW. In addition, single zebra mussels were found on an anchor on the sandbar off the cemetery point by another lake property owner and by SWCD near the public boat landing attached to a native mussel. The DNR received both photos and specimens to verify the infestation.

It was hoped that the freeze associated with the LORE dredging project drawdown would result in freezing all exposed zebra mussels. In 2021 the zebra mussel veliger tests that were collected were all again negative. However, one of the last of the five new eDNA tests from June / August came back with a positive response for zebra mussels.

Further, in 2021 zebra mussel monitoring platforms were doubled from 3 to 6 locations and property owners were encouraged to thoroughly inspect their docks and lifts (see the now annual flyer as Appendices 12). Unfortunately, one new platform zebra mussel finding was reported in 2022 on Main Street NW.

In addition, in 2023 there were continued findings on Main Street NW (both on a monitoring platform and equipment) and a new area discovery was made on a lift and dock on Simonet Drive NW. The 2023 findings were made during the annual inspections that are encouraged of all lake property owners. Notice of zebra mussels is still posted by the DNR at the public boat landing.

The trailering and passage of boats from one body of water to another has significantly contributed to the spread of zebra mussels. Recreational boaters, anglers, and commercial barges all need to take great care to avoid the transfer of zebra mussel “stowaways.” Unfortunately, once a colony of zebra mussels is established in a waterbody, it is nearly impossible to prevent them from spreading elsewhere. The best protection is to keep them from entering Orono Lake altogether.

The OLID is working on a number of strategies and educational opportunities in efforts to prohibit the further spread of the zebra mussels (see Appendices 13 for further details).

- **Native Plant and Algae Management**

Due to a variety of conditions associated with the LORE project and significant drought in 2021 and 2022 Water star-grass and persistent nuisance Filamentous algae were big concerns for property owners and lake users. However, in 2023 the most significant differences from the previous year were the continued re-establishment of various native plants since the refilling of the lake in April 2020 after the LORE project, but decrease in Water star-grass and Filamentous algae. The most notable native plant increase was in Coontail (see Appendices 15, pages 2 through 7 for additional detail). A variety of factors appear to be involved, including very abnormal winter and spring weather condition in 2023. In 2024, the OLID intends to continue May and July point-intercept surveys to monitor aquatic vegetation changes.

In 2022, we also resumed public waters AIS treatments and continued to enhanced them by promoting Lake Management Inc. (LMI) use by private lake property owners and in 2023 participation increased. From 2017 to 2022 over 20+ individual lake property owners (over 30+ in 2023) contracted with Lake Management, Inc. per year for aquatic plant management herbicide treatments in early June and in later July. The goal is to recruit even more participation in 2024.

Further, we continue to communicate to property owners MN DNR regulations regarding private shoreline treatment and CLP hand-pulling via our email lists and website.

- **Water Quality Testing and Improvement**

An ongoing goal of our lake management plan is to monitor and improve water clarity and quality in both Upper and Lower Lake Orono by further pinpointing harm sources and implementing a reduction plan. The Secchi disk readings, total phosphorus and chlorophyll-a testing has been collected monthly by volunteers and paid for by the City of Elk River since 2003.

In 2019 volunteer bi-weekly collection of dissolved oxygen and water temperature data was completed. Analysis by the Sherburne Soil and Water Conservation District (SWCD) determined that these were not factors causing reduced water clarity in Lower Lake Orono. The recommendation was to consider adding True Color, Total Suspended Solids and/or Zooplankton testing ([link to report](#)).

In 2020 additional chemical water sample collection and analysis was conducted. True Color and Total Suspended Solids have been added. The additional \$735 cost of the testing was paid for by the OLID. Potential future Zooplankton testing has been costed, but it is unclear as to if it would yield data that would resolve the clarity discrepancy.

SWCD reported the results and conclusions from the testing to the Lake Orono Water Quality Committee (LOWQC) at its meeting held on January 13, 2020.

In addition, the floating clumps of soil (or kicked-up sediment) with Filamentous algae attached observed in the spring that has been increasing in density and volume of acres on the lake each year was much worse in 2021. This may have been exacerbated by the refilling of the lake in April 2021. That said, it is a new issue that the OLID intends to monitor and make action recommendations as needed and appropriate.

In 2023 monthly Secchi disk readings, total phosphorus and chlorophyll-a testing were done as usual, with results being inconclusive as to the water quality discrepancy cause.

- **Leveraging Real-Time Water Quality Data for Sustainable Lake Improvement**

In recent years, technological advancements have revolutionized the field of environmental monitoring, providing efficient and accurate solutions for continuously assessing key parameters in lakes. Monitoring water bodies is crucial for understanding and managing ecosystems, and various technologies now offer real-time data on essential factors such as water level, temperature, conductivity, dissolved oxygen, turbidity, and nitrogen levels.

The Orono Lake Improvement District (OLID) plays a crucial role in preserving and enhancing the ecological health of lakes. This summary explains how the OLID may harness real-time data to make informed decisions, foster community engagement, and drive long-term water quality enhancement.

Key Benefits of Real-Time Water Quality Data:

1. **Timely Decision-Making:** Real-time data allows the OLID to monitor water quality parameters continuously, enabling timely responses to emerging issues such as algal blooms, pollution events, or changes in nutrient levels. This agility is essential for mitigating potential environmental impacts promptly.
2. **Data-Driven Planning:** By collecting and analyzing real-time data, the OLID gains a comprehensive understanding of the lake's dynamic ecosystem. This insight facilitates evidence-based planning and targeted interventions, optimizing resource allocation for maximum impact.
3. **Early Warning Systems:** Establishing early warning systems based on real-time data empowers the OLID to predict and prevent adverse water quality events. This proactive approach minimizes the impact of potential threats and enhances the overall resilience of the lake ecosystem.

Utilizing Real-Time Data for Decision-Making:

1. **Identifying Pollution Sources:** Real-time data aids in pinpointing the sources of pollution, allowing the OLID to collaborate with multiple relevant stakeholders within the county and watershed to implement corrective measures. Whether from agricultural runoff, urban discharges, or other contributors, targeted actions can be taken to reduce pollutants.
2. **Adaptive Management:** Continuous monitoring supports an adaptive management approach, allowing the OLID to adjust strategies based on real-time feedback. This iterative process ensures that the lake improvement initiatives remain effective and responsive to evolving environmental conditions.
3. **Community Engagement:** Real-time data can be shared with the community through accessible platforms, fostering awareness and engagement. Informed communities are more likely to participate in conservation efforts, support regulations, and contribute to the overall success of lake improvement projects.

Long-Term Strategies for Water Quality Enhancement:

1. **Baseline Assessment:** Real-time data serves as a confirmation data set of the existing data that has been collected for the lake to enhance the foundation for establishing baseline conditions, enabling the OLID to measure the effectiveness of interventions over time. Long-term trends and patterns guide the development of sustainable management practices.
2. **Educational Programs:** Leveraging real-time data for educational initiatives enhances public understanding of the lake's ecosystem and the importance of water quality. Informed citizens are more likely to adopt environmentally friendly practices, further contributing to the lake's long-term health.
3. **Policy Advocacy:** Real-time data empowers the OLID to advocate for evidence-based policies at local and regional levels. Collaborating with policymakers ensures that regulations align with the latest scientific understanding, supporting the sustainable development of the lake and its surrounding areas.

In conclusion, the integration of real-time water quality data into the decision-making processes of the Lake Improvement District is a transformative step toward achieving sustained water quality improvement. By embracing technology and engaging the community, the OLID can create a dynamic and adaptive framework that safeguards the ecological integrity of the lake for future generations.

● **Fisheries Stocking, Preservation and Management**

The OLID continued to stock fish for the 2023 season. There was a grand total of 1,850 fish stocked in the springtime for the 2023 season. A variety of species were stocked to help build the fish population that is naturally occurring in Lake Orono. By species there were 1,000 Bluegill, 800 Perch and 50 Adult Crappie stocked into the lake. The goal for the stocking was that they were introduced into the lake prior to spawning for the 2023 season.

The total cost was \$2,050 that was paid for through the OLID. The supplier provided us with many extra fish at a discounted rate bringing the average price per fish down to \$1.10, much lower than competitor's quotes. The OLID plans to continue stocking each year until 2029 when the next schedule survey is performed by the DNR to determine what the fish population is at that time. The DNR had stocked Walleye the previous year but does not have any plans to continue stocking Walleye into Lake Orono at this time.

Catch and release education and awareness efforts continued in 2023. Seven voluntary catch and release signs have been placed on shore in popular fishing areas and the boat launch. The goal of this effort by the OLID is to limit the harvesting of fish while stocking is in progress. While catch and release cannot be mandatory, education and volunteering are an effective approach to improve fisheries.

Further, the OLID also plans to continue the volunteer catch and release program until for the next few years as necessary to support the success of the fish stocking. This is a volunteer program that is promoted through education to the lake users online, through meetings and by signs posted around the lake. The Elk River Parks and Recreation department added a sign this summer to the boat landing.

4. **Other matters of interest for the district**

- a. In 2023 the OLID Board had twelve regular monthly meetings. The standard regular meeting date, time and location continues to be the fourth Tuesday of the month, from 5:30 p.m. to 7:00 p.m. at Elk River City Hall (except for the December meeting that is held on the third Tuesday). The OLID Annual Meeting on August 22, 2023 was held this year in the

Emergency Operations Center at the Elk River Fire Department. The OLID very much appreciated the City of Elk River making the facility available for the event as it is an ideal location.

2023 Orono Lake Survey –the OLID conducted a twenty one question survey to receive public opinion regarding Orono Lake. The survey was conducted for a period of one month in the summer of 2023. Topics of the survey included lake usage, water quality, fisheries and OLID involvement. The survey was open to anyone interested in participating and received 215 participants.

The Survey was facilitated by an online service (survey monkey) and was accessible by a website address and/or QR code. Advertising of the survey was conducted by door hangers that were delivered to each lake resident and posted at several public venues.

The survey results were presented at the OLID annual meeting and reported to the Elk River City Council. The survey results will assist the OLID in better understanding the public’s opinion regarding the management and usage of Orono Lake. The survey results are included as Appendices 14.

- b. 2023 Elections – the OLID conducted its fourth board of directors’ election in 2023. The result was that Mike Olson was elected to a three-year term.
- c. The OLID presented an annual activities summary update to the Elk River City Council and requested 2024 budget approval at the council’s regular meeting on September 5, 2023 (the presentation is included as Appendices 11).

5. **The intentions of the directors for the succeeding year/years**

- a. 2024 Budget and Goals were provided to the membership at the August 22, 2023 annual meeting for vote and approval (full detail provided in appendices).

Project/Activity	Budget
1. AIS Control Curly-leaf Pondweed	\$8,385
2. Undesirable Aquatic Vegetation and Organisms Public Waters Control	\$2,000
3. Fisheries Survey, Preservation and/or Stocking	\$2,000
4. Web licensing and maintenance	\$200
5. County Special Assessment Fee	\$890
6. Office Supplies and Organizational Expenses	\$675
7. OLID Board Liability Insurance	\$950
8. Cash Flow needs or contingency (e.g., AIS, suitable grants, other)	\$2,000
Total cost of goals 1 – 8	\$17,100*

*OLID property owner annual cost for 2023 of \$100.00 per unit.

- a. Lake Orono Water Quality Committee work continues on a “living” 2021 – 2026 Lake Orono Management Plan. The Lake Orono Water Quality Committee (LOWQC) is a joint effort with the City of Elk River and the Sherburne County Soil and Water Conservation District (SWCD). The OLID Board intends to request a work session with the Elk River City Council to review the draft plan findings and recommendations in spring 2023.
- b. Continue to work with the LOWQC to evaluate the results of the LORE dredging project and discuss any follow-up actions. Particular focus will be placed on the development of an ongoing sediment management plan, Curly-leaf pondweed, Eurasian Milfoil and Zebra Mussel AIS infestation monitoring and management and the potential to seek funding for undesirable native plant overgrowth and algae control through [Minn. Statute 103G.625](#).

Appendices

1. 2023 OLID Notice of Annual Meeting (mailing)
2. PLANT-96-1332657-1 (newspaper public notice)
3. OLID Annual Meeting Agenda 2023
4. OLID Annual Meeting Minutes 8-22-23
5. OLID Proposed Projects & Budget 2024
6. OLID Service Charge & Voting Criteria
7. OLID Board Application 2022
8. OLID Absentee Ballot for Director Election 2023
9. 2023 Director Election & Proposed Budget Ballot
10. OLID Resolution 23-01.pdf (requesting the City of Elk River approve the 2023 OLID Service Charge)
11. OLID City Council Meeting presentation September 5, 2023
12. Sherburne County Water Equipment Cleaning Handout
13. MAISRC - Living with Zebra Mussels Handout
14. Orono Lake Survey Results 08-24-23
15. 2023 Lake Orono AIS Grant Project Summaries