Madoc Sewage Lagoon
Findings & Recommendations Briefing Note

January 2026

Prepared by: Moira Lake Property Owners Association (MLPOA)

---

1. Overview

The Madoc Sewage Lagoon discharges treated wastewater into Deer Creek, which flows into Moira Lake. While the lagoon operates within its current Environmental Compliance Approval (ECA), the receiving environment — especially Moira Lake — shows signs of ecological stress.

This summary highlights key findings from a performance and gap analysis conducted by MLPOA, using OCWA reports, provincial water quality objectives, climate trends, and resident observations.

---

2. What's Working

- Lagoon meets ECA limits for $CBOD_5$, TSS, pH, and total phosphorus (TP).
- Regular alum dosing helps reduce phosphorus levels.
- OCWA submits annual reports to the Ministry of the Environment (MECP).
- No major compliance violations reported in recent years.

---

3. Key Issues Identified

3.1 Nutrient Overload Risk

- Lagoon discharges TP within its ECA limit (1.0 mg/L) but routinely exceeds the Provincial Water Quality Objective (PWQO) for lakes (0.02 mg/L) by 30–50×.
- There is no phosphorus load cap for Moira Lake — cumulative effects remain unmanaged.

3.2 Monitoring Gaps

- Testing focuses on minimum compliance, not ecological protection.

- No monitoring of:
    - Soluble reactive phosphorus (SRP)
    - Bacteria (E. coli)
    - Dissolved oxygen (DO) downstream
    - Biological health (e.g., fish, benthic invertebrates)
    - Groundwater seepage
- Reports lack trend analysis or nutrient loading estimates.

3.3 Seasonal Timing and Risk

Discharges from the Madoc Sewage Lagoon typically occur in May (spring) and November (fall). These windows are selected to avoid peak recreation seasons and take advantage of cooler temperatures. However, changing seasonal hydrology can increase the risks associated with each period.

- In spring, discharge often coincides with high flows in Deer Creek caused by snowmelt and heavy rains. While this may improve dilution, it also means lagoon cells can reach near-capacity earlier, shortening retention time and potentially reducing treatment effectiveness.
- In fall, creek levels are often very low following summer drought and reduced rainfall. As a result, the effluent can make up a larger proportion of creek flow, reducing dilution and increasing its relative ecological impact — even when parameters meet compliance limits.

This seasonal dynamic underscores the need for adaptive discharge planning based on real-time flow and weather conditions.

3.4 Climate Pressures

- Warmer temperatures, extreme rainfall, and summer droughts increase:
    - Effluent temperature
    - Nutrient mobility
    - Risk of algal blooms
- The current lagoon design does not account for climate-related stress.

3.5 Public Observations

- Residents report:
    - More algae and aquatic weeds
    - Murky or green water
    - Reduced recreational water quality
- There is a disconnect between official performance reports and lived experience.

---

4. Recommendations

A. Monitoring & Transparency

- Add testing for SRP, ammonia, bacteria, DO, chlorophyll-a
- Compare effluent to PWQOs, not just ECA limits
- Resume toxicity testing and biological surveys
- Track and publish nutrient loads
- Provide plain-language annual summaries to the public

B. Environmental Protection

- Work with MECP to establish a Moira Lake nutrient cap
- Review and optimize alum dosing
- Incorporate ecosystem health indicators into planning

C. Climate Resilience

- Use forecasts to optimize discharge timing
- Expand storage and buffering capacity
- Begin long-term planning for future disinfection

D. Public Engagement

- Share monitoring results in accessible formats
- Host seasonal updates or public Q&A sessions
- Involve MLPOA or public reps in future planning efforts

5. Conclusion

The lagoon is functioning within its legal permit, but growing evidence — including ecological indicators, resident feedback, and climate impacts — suggests that compliance alone is not enough.

Protecting Moira Lake requires enhanced monitoring, better communication, and forward-looking planning. These actions will ensure the lagoon continues to meet both regulatory standards and the environmental values of the local community.