

Memorandum to the Council of Corporation of the Municipality of Temagami

Subject: Intrusion Detection Systems and PLC Integration for Temagami Wastewater Facilities

Memo No: 2025-M-084

Date: April 10, 2025

Attachment: Appendix A - Temagami North Lagoon Blower Building Intrusion System
Expenditure Request

Appendix B - Temagami South Lagoon Intrusion System Expenditure Request

Appendix C - Temagami North Cedar Sewage Pumping Station Intrusion System
Expenditure Request

Prepared By: Laala Jahanshahloo - CAO/Treasurer

Recommendation

BE IT RESOLVED THAT Council receives Memo 2025-M-084, along with Appendix A, Appendix B, and Appendix C, which are hereby made part of this report, as presented;

AND FURTHER THAT Council accepts the proposal from OCWA to implement the intrusion detection systems and PLC integration at the following locations:

- Temagami North Lagoon Blower Building (as per Appendix A),
- Temagami South Lagoon (as per Appendix B), and
- Temagami North Cedar Sewage Pumping Station (as per Appendix C);

AND FURTHER THAT Council authorizes the CAO/Treasurer to proceed with project execution.

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1. Executive Summary

The Municipality of Temagami has identified important compliance and operational considerations at three wastewater facilities: The North Lagoon Blower Building, South Lagoon, and Cedar Sewage Pumping Station. These sites currently lack modern intrusion detection systems and alarm infrastructure, creating exposure to regulatory non-compliance, service interruptions, and asset vulnerability.

This report outlines a phased, cost-effective upgrade plan designed to align with:

- Environmental Compliance Approval (ECA) requirements
- Provincial cybersecurity guidance (MECP Memo 2024-M-207)

The proposed solutions have been technically validated, integrate with existing infrastructure, and support the municipality's commitment to responsible asset management and regulatory compliance. Council approval is requested to proceed.

2. Compliance and Risk Management

2.2. Environmental Compliance Approval (ECA)

- The North Lagoon Blower Building is required to operate continuously to maintain regulated lagoon conditions.
- Operational interruptions may necessitate additional sampling, reporting, and temporary manual monitoring.
- Non-compliance could result in regulatory fines ranging from \$10,000 to \$50,000 under the *Ontario Water Resources Act*.

2.2. Facility Security Considerations

- North Lagoon Blower Building: This facility currently lacks an intrusion detection system and relies on outdated alarm infrastructure, leaving it vulnerable to unauthorized access or equipment failure.

- ▶ South Lagoon: There are no alarms or communication systems in place, limiting the municipality's ability to detect and respond promptly to incidents.
- ▶ Cedar Sewage Pumping Station: The backup generator at this site lacks security measures, increasing the risk of unauthorized access or tampering with critical infrastructure.

2.3. Cybersecurity Compliance

MECP Memo 2024-M-207 recommends:

- ▶ Isolation of SCADAⁱ/PLCⁱⁱ systems from internet access.
- ▶ Implementation of multifactor authentication.
- ▶ Routine staff training and vulnerability testing.

3. Proposed Upgrades

3.1. North Lagoon Blower Building

- ▶ Scope: Install modern intrusion detection system with PLC integration for remote monitoring.
- ▶ Leverages 2023 SCADA and radio upgrades to avoid redundancy.
- ▶ Cost: \$22,003.83 (labour, materials, Selogⁱⁱⁱ PLC panel).
- ▶ Technical Validation: Supported by research on graph-based PLC integrity monitoring^{iv}, which helps detect unauthorized code changes and ensures system reliability.

3.2. South Lagoon

- ▶ 2025: Install horn-based intrusion alarm (\$6,847.56).
- ▶ 2026: Integrate PLC and radio system (\$4,567.56).
- ▶ This phased approach addresses current limitations while aligning future upgrades with provincial cybersecurity guidance.

3.3. Cedar Sewage Pumping Station

- Scope: Install basic intrusion system.
- Cost: \$4,959.10.
- Purpose: Enhance protection of the water treatment plant's backup generator.

4. Cost-Benefit Analysis

- North Lagoon Blower Building: The proposed investment of \$22,003.83 will prevent potential fines of up to \$50,000 and reduce the need for manual monitoring, which currently costs an estimated \$15,000 per year.
- South Lagoon: A total investment of \$11,415.12 (across two phases) addresses long-standing security limitations. Deferring these upgrades would prolong vulnerabilities and delay compliance with future SCADA integration standards.
- Cedar Sewage Pumping Station: The recommended investment of \$4,959.10 is essential to protect the backup generator - an asset critical to water treatment operations. Without action, the site remains exposed to risks of unauthorized access or equipment tampering.

5. Strategic Alignment

5.1. Cost Mitigation

The proposal for the North Lagoon Blower Building includes \$1,900 in potential savings if OCWA performs the panel wiring.

5.2. OCWA Protocol Integration

- Existing OCWA systems already meet key MECP cybersecurity standards (SCADA isolation, manual updates, staff readiness)
- Proposed upgrades address complementary physical security needs without duplication

6. Council Decision Points

6.1. Approve Upgrades

- ▶ Proceed with the following actions in 2025:
 - North Lagoon Blower Building - \$22,003.83
 - Cedar Sewage Pumping Station - \$4,959.10
 - South Lagoon horn alarm (2025) - \$6,847.56
- ▶ Plan for 2026 South Lagoon PLC/radio integration - \$4,567.56

6.2. Defer Upgrades

Risk exposure includes:

- Potential fines and regulatory follow-up associated with non-compliance
- Increased operational demands due to reliance on manual monitoring
- Ongoing exposure to unauthorized access or unmonitored system disruptions

7. Conclusion

The proposed security and compliance upgrades at the North Lagoon Blower Building, South Lagoon, and Cedar SPS represent a necessary and strategic investment in the Municipality of Temagami's core infrastructure. These measures directly address Environmental Compliance Approval (ECA) obligations, align with provincial cybersecurity standards (MECP Memo 2024-M-207), and mitigate operational and physical security vulnerabilities.

By taking a phased, fiscally responsible approach, the municipality can strengthen its environmental stewardship, protect critical assets, and reduce long-term risk exposure.

Council approval of these upgrades demonstrates proactive governance, regulatory alignment, and a clear commitment to sustainable infrastructure management.

8. Endnotes

ⁱ **SCADA (Supervisory Control and Data Acquisition)** is a system that lets operators remotely monitor and control infrastructure like water treatment plants. It helps detect problems and respond faster from a central location.

ii **PLC (Programmable Logic Controller)** is a small industrial computer used to control equipment like pumps or alarms. It runs automatic instructions to keep systems working smoothly without manual input.

iii **Selog** is a Canadian industrial automation and control systems provider specializing in Programmable Logic Controller (PLC) solutions for water/wastewater, manufacturing, and critical infrastructure.

iv **Graph-based PLC integrity monitoring** is a security method that uses graphs to model and track a PLC's logic and behavior. By analyzing how code flows or how devices communicate, it helps detect unauthorized changes or attacks on the system.

EXPENDITURE REQUEST

 OCWA Facility No.: Tem N Lag Blower
6029

Date: March 04 2025

Requested by: Bryce Logan

Description of Proposed Work:

Install PLC and Intrusion System Integrate and Commission

Expenditure – Part A: Labour

Position/Equip.	Description	Qty	Rate	Total
Instrument Tech	Run Conduit Install PLC and Intrusion System.	40	\$95.00	\$3,800.00
Millwright			\$95.00	\$
SR Operator			\$95.00	\$
			\$	\$
TOTAL PART A:				\$3,800.00

Expenditure – Part B: External Services and/or Materials

Agency/ Material	Description	Qty	Rate	Total
<input type="checkbox"/> Chess	Intrusion System	1	\$1,862.62	\$1,862.62
<input type="checkbox"/> Discount	Conduit and Wire	1	\$1,500.09	\$1,500.09
<input type="checkbox"/> Selog	PLC Panel, programming	1	\$12,900.00	\$12,900.00
<input type="checkbox"/>				
Sub-total (Includes Non-Refundable HST – 1.76%) Part B:				\$16,548.93
OCWA Mark-up (10%) – on Sub-total Part B:				\$1,654.89
TOTAL PART B:				\$18,203.83

☐ Check box to validate estimate/quote is attach

Additional Comments: This will be the Start of the PLC System for monitoring at the Lagoon Blower building critical alarms. Expansion with control will be requested in 2026 Capital

TOTAL PART A:	\$3,800.00
TOTAL PART B:	\$18,203.83
TOTAL:	\$22,003.83

Municipal Rep. – Print

Municipal Rep. – Signature

Date

EXPENDITURE REQUEST

OCWA Facility No.: 5997 Tem S Lag

Date: March 06 2025

Requested by: Bryce Logan

Description of Proposed Work:

Install Intrusion System at Tem S Lagoon

Expenditure – Part A: Labour

Position/Equip.	Description	Qty	Rate	Total
Milwright			\$95.00	\$
Instrument Tech	Install Intrusion System	24	\$95.00	\$2,280.00
SR Operator			\$95.00	\$
TOTAL PART A:				\$2,280.00

Expenditure – Part B: External Services and/or Materials

Agency/ Material	Description	Qty	Rate	Total
<input type="checkbox"/> Chess	Elk Intrusion System with Horn	1	\$2,203.01	\$2,203.01
<input type="checkbox"/> Discount	Wire, Conduit, Screws	1	\$1,500.09	\$1,500.09
<input type="checkbox"/> Gold belt	Cement Bits	1	\$200.00	\$200.00
<input type="checkbox"/>				
<input type="checkbox"/>				
Sub-total (Includes Non-Refundable HST – 1.76%) Part B:				\$3,971.79
OCWA Mark-up (15%) – on Sub-total Part B:				\$595.77
TOTAL PART B:				\$4,567.56

☐ Check box to validate estimate/quote is attach

Additional Comments: There is No telephone or radio system currently at the South Lagoon. This intrusion system will only have a Horn as an output alarm. 2026 Capital we will propose Radio communication as well as PLC control back to the S WTP Scada PC for alarming and site monitoring and control.

TOTAL PART A:	\$2,280.00
TOTAL PART B:	\$4,567.56
TOTAL:	\$6,847.56

Municipal Rep. – Print

Municipal Rep. – Signature

Date

EXPENDITURE REQUEST

 OCWA Facility No.: Tem N Cedar SPS
 SPS 6029

Date: Feb 20 2025

Requested by: Bryce Logan

Description of Proposed Work:

Install and program Intrusion System

Expenditure – Part A: Labour

Position/Equip.	Description	Qty	Rate	Total
Instrument Tech	Run Conduit to relocate key pad, replace faulty intrusion system	16	\$95.00	\$1,520.00
Millwright			\$95.00	\$
SR Operator			\$95.00	\$
			\$	\$
TOTAL PART A:				\$1,520.00

Expenditure – Part B: External Services and/or Materials

Agency/ Material	Description	Qty	Rate	Total
<input type="checkbox"/> Chess	Intrusion System	1	\$1,862.62	\$1,862.62
<input type="checkbox"/> Discount	Conduit and Wire	1	\$953.73	\$953.73
<input type="checkbox"/>			\$	\$
<input type="checkbox"/>				
Sub-total (Includes Non-Refundable HST – 1.76%) Part B:				\$2,865.92
OCWA Mark-up (20%) – on Sub-total Part B:				\$573.18
TOTAL PART B:				\$3,439.10

☐ Check box to validate estimate/quote is attach

Additional Comments:

TOTAL PART A:	\$1,520.00
TOTAL PART B:	\$3,439.10
TOTAL:	\$4,959.10

Municipal Rep. – Print

Municipal Rep. – Signature

Date