2023 CLI-ECA Annual Performance Report Sewage Collection System

City of Sault Ste. Marie
CLI-ECA 316-W601

Submitted to: City of Sault Ste. Marie
Engineering and Construction Division

Submitted by: AECOM Canada Ltd.
Sault Ste. Marie, Ontario
Includes PUC Services Inc. reporting on
Large Pump Stations and SSOTank

Delivering a better world

Statement of Qualifications and Limitations

The attached Report (the “Report”) has been prepared by AECOM Canada Ltd. (“AECOM”) for the benefit of the Client (“Client”) in accordance with the agreement between AECOM and Client, including the scope of work detailed therein (the “Agreement”).

The information, data, recommendations and conclusions contained in the Report (collectively, the “Information”):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the “Limitations”).
- represents AECOM’s professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to AECOM which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time..

AECOM shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. AECOM accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

AECOM agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but AECOM makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable construction costs or construction schedule provided by AECOM represent AECOM’s professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Since AECOM has no control over market or economic conditions, prices for construction labour, equipment or materials or bidding procedures, AECOM, its directors, officers and employees are not able to, nor do they, make any representations, warranties or guarantees whatsoever, whether express or implied, with respect to such estimates or opinions, or their variance from actual construction costs or schedules, and accept no responsibility for any loss or damage arising therefrom or in any way related thereto. Persons relying on such estimates or opinions do so at their own risk.

Except (1) as agreed to in writing by AECOM and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

AECOM accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information (“improper use of the Report”), except to the extent those parties have obtained the prior written consent of AECOM to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

AECOM: 2015-04-13

Quality information

Prepared by	Checked by		
J. Griffiths	R. Talvitie		

Revision History

Revision	Revision date	Details
Rev 0	March 25, 2024	Draft issued for City Review
Rev 1	March 26, 2024	Draft issued for City Review
Rev 2	March 28, 2024	Final for issue

Distribution List

# Hard Copies	PDF Required	Association / Company Name
0	1	Catherine Taddo, City of Sault Ste. Marie
0	1	Director – Northern Region, Ontario Ministry of the Environment, Conservation and Parks
0	1	Sudbury District Office Manager, Ontario Ministry of the Environment, Conservation and Parks

Prepared for:

City of Sault Ste. Marie
Engineering and Construction Division

Prepared by:

AECOM Canada Ltd.
523 Wellington Street East
Sault Ste. Marie, ON P6A 2M4
Canada

T: 705.942.2612
F: 705.942.3642
aecom.com

Prepared in association with:

PUC Services Inc.
Reporting on Large Sewage Pumping Stations and SSO Tank
"City of Sault Ste. Marie
Wastewater Lift Stations
CLI-ECA Annual Report
July – December 2023"

Table of Contents

1. Introduction

1.1. System Overview

The Sault Ste. Marie Sewage Collection System consists of works for the collection and transmission of Sewage, consisting of a total of 373.97 km of sewers including trunk sewers, separate sewers, and nominally separate sewers, sewage pumping stations, two wet-weather interceptor tanks, and 22.89 km of forcemains, with discharge into the West End Water Pollution Control Plant and East End Water Pollution Control Plant.

This sewage collection system is operated under Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) Number 316-W601, Issue 1, dated February 3, 2023. This CLI-ECA is issued by the Ontario Ministry of the Environment, Conservation and Parks (MECP). The CLI-ECA revoked and replaced all prior ECAs for sewage works described in Schedule B, Section 1 of the Approval.

This system includes 5 large sewage pumping stations and a sanitary sewer overflow (SSO) tank that are operated by PUC Services Inc. (PUC) under contract with the City of Sault Ste. Marie (City). The balance of the system is operated and maintained by the City through the Public Works and Engineering Services Department (PWES). The CLI-ECA does not include the West End Water Pollution Control Plant, the East End Water Pollution Control Plant, or the Main Pump Station located on the property of the West End Water Pollution Control Plant. These facilities operate under their own ECAs.

1.2. Reporting Details

CLI-ECA Schedule E, Section 6 requires the Owner of the authorized sewage collection system to prepare an annual performance report, to be submitted on or before March 31st of each year. The report is to cover the period from January 1st to December 31st of the preceding calendar year. For the first year of reporting, given that the ECA was issued in February 2023, this report covers the period from July 1st to December 31st, 2023, per communications between the City and the MECP Approvals Branch.

This report is intended to satisfy the reporting requirements of the ECA as detailed in Schedule E, Section 6.

This report consists of two parts.

> **Part 1** was prepared by AECOM Canada Ltd based on information supplied by the City and addresses the sewage collection system and the small sewage pumping stations operated by PWES. It does not include the large sewage pumping stations or the sanitary sewer overflow tanks.
>
> **Part 2** was prepared by PUC Services Inc., Environmental Operations Department, and addresses the large sewage pumping stations and the sanitary sewer overflow tanks that are operated by PUC. The PUC report "City of Sault Ste. Marie Wastewater Lift Stations CLI-ECA Annual Report July – December 2023" is included as Section 3 of this report.

2. Annual Report Part 1 - Sewage Collection System and Small Pump Stations

2.1. Monitoring Data and Environmental Trends

CLI-ECA Schedule E Section 4.6.3 calls for, if applicable, a summary of all required monitoring data with interpretation of the data and any conclusions drawn from the data about the need for future modifications to the Authorized System or system operations. This section of the CLI-ECA reporting requirements does not apply. As such, no data summary, related interpretation, and conclusions are presented here.

2.2. Operating Problems and Corrective Actions

2.2.1 Small Pump Stations Operating Problems

The small sewage pump stations transmit pump operating data and alarm conditions by radio to the PWES Service Centre where the information is displayed on SCADA. Alarms from the stations trigger the SCADA system to alert the PWES Watchman who provides 24/7 oversight of the system. PWES Operators are dispatched to address alarm conditions.

Operating problems at the small sewage pumping stations for the last half of 2023 are shown in **Table 1**. The most common problems are utility power failures and grease accumulation on float bulbs. The City has 3 portable diesel generators that are deployed to the sewage pump stations as necessary to provide backup power. Another portable generator is permanently kept at the Bonney Street SPS. Stations are regularly cleaned to remove grease from wet wells and float bulbs.

The pump control panel at Fort Creek Pump Station failed unexpectedly in early 2023. The panel's controller was no longer supported by the manufacturer necessitating replacement of the complete panel. A new panel is on order and will be installed in early 2024. The station is currently being operated using a rented Xylem control panel.

A new pump control panel was installed at the Varsity Ave Pump Station as part of an electrical upgrading program at the pump stations.

The Landfill Site Pump Station is nearing the end of its theoretical service life and is currently the subject of an upgrading study. The pump station capacity is also being assessed and may be increased to address a planned landfill expansion and a proposed new biosolids / source separated organics (SSO) composting facility.

The small sewage pumping stations are operating well with minor, manageable problems.

Table 1 July to December 2023 Small Pump Station Operating Problems and Corrective Actions

Pump Station Number	Pump Station Name	Operating Problem	Corrective Action
1	Gore St.	Utility power undervoltage. Voltage too low to power pumps.	Notified Electrical Utility Operator who increased output voltage from transformer supplying the station.
2	Bonney St.	Utility power failures	Run off diesel generator
2	Bonney St.	Ultrasonic level indication failure	Replace ultrasonic level transducer. Milltronics reprogrammed
2	Bonney St.	Pump # 2 overload	Reset pump
2	Bonney St.	High water alarm - panel not functioning properly	Correct panel faults.
2	Bonney St.	Utility power failure caused high water alarm when backup generator stolen from property	Generator recovered by Police. Generator now secured at the site.
3	Muriel Dr.	Utility power outage	Connect portable generator
6	Pine St.	Utility power outages	Connect portable generator

Pump Station Number	Pump Station Name	Operating Problem	Corrective Action
9	Roberta Bondar Park	Utility power outage	Connect portable generator
10	Landfill Site	High pump discharge pressures for flow achieved	Undertake annual forcemain flushing. Camera inspect forcemain. Identified locations where flushing has been less effective, and accumulations exist. Plan made to fully clean forcemain in Spring 2024 by adding additional high-pressure hose to the sewer rodding truck.
11	Varsity Ave	Grease accumulation on floats,	Clean floats regularly. Install new pump control panel with ultrasonic level sensor to control pumps.
11	Varsity Ave	High water alarm - utility power failure	Connect portable generator
12	Fort Creek	Control panel failure earlier in year. Several high-level alarms due to stuck PUMP START float.	Clean floats regularly. Run station using a loaner control panel and float switches. Purchase new control panel with ultrasonic level sensor to control pumps – delivery in early 2024.
13	Tallack Blvd.	Utility power failure	Connect portable generator
16	Industrial Park	Grease accumulation on floats	Clean floats regularly
17	Upper Lake St.	Utility power failure	Connect portable generator
20	Frontenac St.	Utility power failure	Connect portable generator

2.2.2 Collection System Operating Problems

There were no recurring operating problems in the collection system during the last half of 2023.

2.3. Calibration, Maintenance, and Repairs

2.3.1 Small Pump Stations Calibration, Maintenance, and Repairs

The small sewage pumping stations are checked by PWES staff on a weekly basis, typically on Fridays before the weekend. All inspection, maintenance, calibration, and repair activities are recorded in logbooks kept at each station. Work is scheduled and documented in the PWES work order system.

Calibrations, maintenance work, and repairs done at the small sewage pumping stations operated by City PWES staff during the last half of 2023 are shown in **Table 2**. This information includes occasions when operators responded to pump station alarms received by the SCADA system located at the PWES Service Centre.

The bulk of the maintenance work relates to cleaning the wet wells and instrumentation to ensure good operation. Major repairs included the replacement of the pump control panel at the Varsity Ave. pump station as part of a planned replacement program. The PLC controller in the pump control panel at the Fort Creek pump station failed unexpectedly after a short service life. As noted above, a loaner control panel is currently in use and that control panel will be replaced in early 2024.

The ultrasonic level transmitter at Bonney St. pump station was recalibrated after the ultrasonic transducer was replaced. The ultrasonic level transmitter at Varsity Ave. PS was calibrated as part of the commissioning process for the new control panel installation.

The small sewage pumping stations operated by City PWES are in overall good condition and receive regular inspections. Required maintenance, calibrations, and repairs are conducted promptly to ensure continued reliability.

Table 2 July to December 2023 Small Pump Station Calibration, Maintenance, and Repair Activities

Pump Station Number	Pump Station Name	Maintenance Calibration and Repair Activities
	All Stations	Weekly scheduled tests of stations including amperage checks for pumps, visual panel inspection, test run of pumps, visual inspection of wet well, grounds keeping / snow removal
1	Gore St.	Paint control panel
2	Bonney St.	Pump Start and Stop levels reprogrammed in Milltronics. Time wetwell drawdowns to confirm pump performance, Replace level sensor transducer
3	Muriel Dr.	Hydro meter changed by Utility, Clean and degrease wet well, Remove decommissioned agitator, Replaced lock on generator connection box.
4	Huron St.	Clean and degrease wet well
5	Lower Lake St.	Replace insulation on piping in station, Reset Milltronics level sensor
6	Pine St.	Grounds maintenance and painting
7	McGregor Ave	Replace insulation on piping in station
9	Roberta Bondar Park	Add degreaser
10	Landfill Site	Pump # 2 failed - sent out for rebuild, Clean flush and vacuum forcemain, Camera inspection at west end of forcemain at Old Goulais Bay Rd
11	Varsity Ave	Cleaned grease off float balls on 2 occasions, stop ball stuck - cleaned floats and reset panel, New control panel commissioning
12	Fort Creek	High water alarm on 5 occasions, Clean grease from START ball on 2 occasions, Power outage at panel repaired by electrician, Clean wet well, Clean all float balls
13	Tallack Blvd	Clean wet well
16	Industrial Park	Clean station floats on 2 occasions, Grounds maintenance, Grease pumps
17	Upper Lake St.	Clean and degrease wet well, install new pump bases (North side), Time wet well drawdowns to confirm pump performance on 2 occasions
19	Millwood / Denwood	Clean straining basket, replace lifting chains on straining basket, Clean and degrease wet well, Exercise valves
20	Frontenac St.	Clean and degrease station, Flush forcemain, Repair rail system for pumps, Paint station and panel, Repair forcemain in station, Change rail system for pumps 1 & 2
21	Fox Run West	Clean station wet well

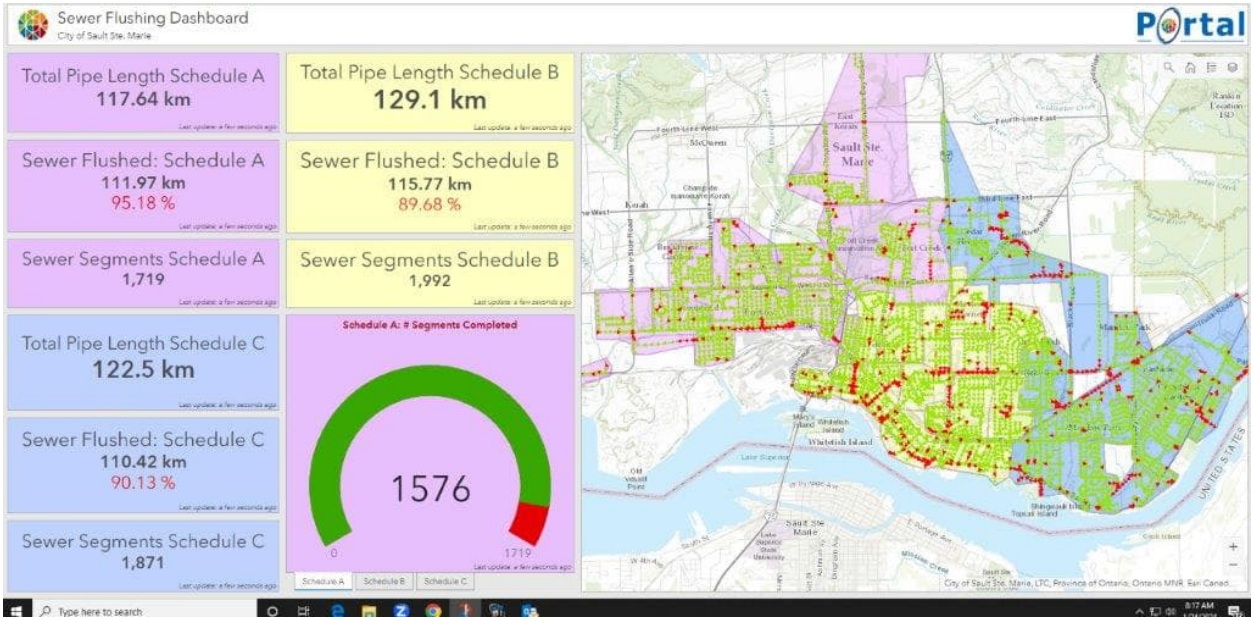
2.3.2 Collection System Calibration, Maintenance, and Repairs

There were no calibrations performed on collection system components between July 1st and December 31st, 2023.

The gravity sewers and forcemains receive regular, scheduled maintenance.

The gravity sewers are flushed using a PWES flusher truck on a 3-year cycle. The sewer flushing is tracked on a computer Dashboard at the PWES Service Center. **Figure 1** shows the Dashboard representing the end of the 2023 flushing season. The City of Sault Ste. Marie is divided into 3 colour-coded regions, labelled Schedule A, B, and C. Schedule A was flushed in 2023, Schedule C was flushed in 2022, and Schedule B was flushed in 2021. The plan is to clean the gravity sewers in the area represented by Schedule B in 2024.

Figure 1 2023 Gravity Sewer Flushing Dashboard



Sewers that are coloured green on the Dashboard indicate they were flushed. Sewers in red were not flushed, typically due to construction activities that prevented access. In 2023, PWES flushed 1,719 sewer segments for a total of approximately 112 km of 118 km of gravity sewers in Schedule A. Ninety-five percent of the gravity sewers in Schedule A were flushed in 2023.

There are ten low pressure forcemains in the collection system that are flushed on an annual basis (refer to **Table 3**). There are also approximately 367 m of sensitive sewer laterals within City rights-of-way that are flushed twice annually to ensure they remain clear.

Table 3 2023 Forcemain Flushing

Type	Street	Length (m)
Forcemain	Brule Rd	691
Forcemain	Fourth Line W	1576
Forcemain	Fifth Line E	839
Forcemain	Third Line W	399
Forcemain	Lang Ct	50
Forcemain	Hadley Pk.	116
Forcemain	McNeice St.	127
Forcemain	McNeice St.	193
Forcemain	Trunk Rd	1832
Forcemain	Landfill Site PS	1525

A total of 57 manholes were repaired in the last half of 2023. The work included the replacement of damaged / missing / offset covers or repairs to manhole risers. There was also a 4.5m length of clay sanitary sewer main on Queen St. E. that had to be repaired when a remotely controlled video inspection camera could not be retrieved. The sewer was excavated, and a section removed to free the inspection camera. The clay pipe was replaced with 250 mm PVC pipe.

2.4. Complaints

Table 4 presents complaints received in the last half of 2023 that concerned the sanitary collection system. There were six complaints related to odours from the sanitary sewer system, all of which were investigated. There were three instances of a blocked sanitary sewer or drain which were corrected by cleaning the pipes. There was one instance of a reported sink hole that was inspected using a CCTV camera system.

Odour complaints may be caused by a blocked sewer lateral or a dried-out P-trap in a residence. On rare occasions, flushing the sewer mains can result in backwash travelling up the sewer lateral. If there is no backflow prevention device on the lateral, this liquid can enter the home. On these instances, City crews record the visit to the home and document any damage that may have occurred.

There were also nine complaints related to manhole lids broken, missing, damaged by snow removal operations, or offset. These were all investigated, and action was taken to replace the lids and / or repair the manhole riser. This work is included in the number of manhole repairs noted in **Section 2.3.2** above.

Table 4 July to December 2023 Collection System Complaints

Location	Nature of Complaint	Actions
Great Northern Rd	Drain blocked	Vacuum out drain
McNabb St	Sanitary main blocked	Flush sanitary main
Conmee & Wellington	Sanitary main blocked	Flush sanitary main
Peoples Rd.	Sink hole	CCTV inspection of main
Winfield Dr.	Odour after flushing main	Inspected lateral in house, put plug in the cleanout
Bay St.	Odour	Inspected, no corrective action
Millcreek Dr.	Odour	Inspected, no corrective action
Ruscio Cres.	Odour	Inspected, no corrective action
Estelle St.	Odour	Inspected, no corrective action
John St.	Odour	Inspected, no corrective action

2.5. Alterations to the Authorized System

Table 5 presents the alterations made to the Authorized System in 2023. There were no alterations that pose a significant drinking water threat.

Table 5 2023 Alterations to the Authorized System

Street	From / To	Nature of Alteration
Biggings Avenue	Queen Street East to Wellington Street East	Replaced existing 200 mm clay sanitary main with 250 mm PVC sanitary main
Wemyss Street	Pim Street to Trelawne Ave.	Replaced existing 200 mm & 375 mm sanitary mains with 250 mm PVC & 375 mm PVC respectively
Blake Avenue	McNabb Street to Wawanosh Ave.	Replaced existing 250 mm sanitary main with 300mm main

2.6. Collection System Overflows and Spills

There were no overflows from the sanitary collection system between July 1st and December 31st, 2023.

2.7. Sanitary Sewage Collection System Improvement Efforts

The City is undertaking several initiatives to reduce sanitary collection system overflows, spills, and sewage treatment plant overflows and bypasses. The key initiatives are detailed in the following subsections.

2.7.1. Asset Management Plan and Wastewater Master Plan

The City has completed a Wastewater Asset Management Plan, and a Wastewater Master Plan (WWMP) is presently under development. These Plans provide guidance on the short and long-term wastewater infrastructure improvements to address asset condition and potential future capacity constraints. The WWMP will ensure wastewater infrastructure improvements are in alignment with the City's Official Plan Update and ensure adequate capacity at the treatment plants and in the collection system. The modelling will be used to identify and assess wet versus dry weather flows and support capital planning, asset management and development applications.

Work on the WWMP is underway. The project scope includes:

- Modeling of the sanitary collection system
- Sanitary system flow monitoring and system model calibration
- Completion of capacity studies for the two sewage treatment plants
- Collection and review of background documentation on the existing works
- Review of drainage areas and complete capacity analysis of the drainage areas
- Site inspections and condition assessments of pump stations and treatment plants and any applicable capacity assessments.
- Identification and review of proposed improvement alternatives with cost estimates

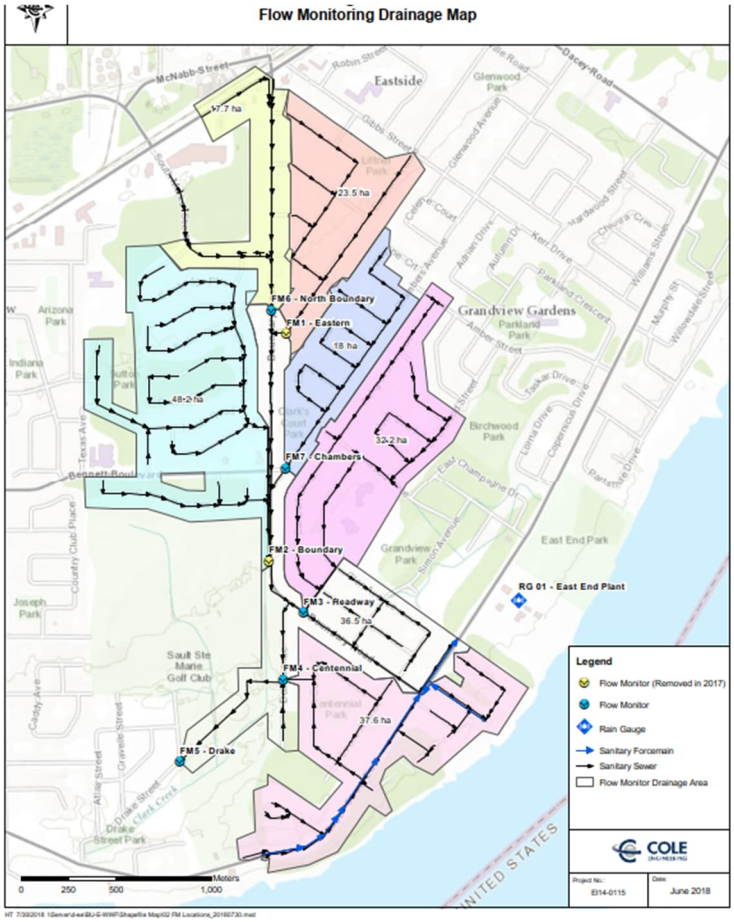
The uncalibrated sanitary collection system model is complete. The City has a network of seven rain gauges across the City and 16 flow meters have been installed in the sewage collection system. This equipment connects wirelessly to facilitate regular data logging. This information will be used to compare dry versus wet weather flows and to calibrate the collection system model.

Condition assessment field work has been completed for the sewage pumping stations and the two wastewater treatment plants. A Technical Memorandum has been completed which summarizes the findings of the condition assessments and includes a funding needs analysis looking 50 years into the future.

2.7.2.Inflow and Infiltration Studies

The City previously retained Cole Engineering Group Ltd. (Cole) to analyze data collected from the City's sewer flow and rainfall monitoring program within a 212-hectare catchment area (focus area) upstream of the East End Wastewater Treatment Plant. The focus area is identified in the **Figure 2** below, excerpted from the 2018 Cole report. **FM** denotes the location of a flow metering device installed in the sanitary sewers. **RG** denotes a rain gauge location.

Figure 2 2015 to 2018 Inflow and Infiltration Study Focus Area



The study characterized the dry weather flows resulting from population and groundwater infiltration. It observed that there was significant inflow and infiltration throughout the focus area. The data indicated there are regions where there may be indirect inflow and infiltration sources such as deteriorating infrastructure or foundation drains connected to the sanitary sewer system.

2.7.3.Sewer Reconstruction

The replacement of underground infrastructure will decrease inflow and infiltration. Due to the substantial cost and limited funds available, projects are undertaken on a priority needs basis.

The City's 2023 budget capital plan for road reconstruction was $10 million. This is budget dedicated to road, stormwater management, and sanitary sewer upgrades. These renewal projects contribute to reductions in inflow & infiltration, overflows, and bypasses. In 2023, the City replaced sanitary sewers on Biggings Avenue, Wemyss Street, and Blake Avenue. Refer to **Table 5** above.

In 2024, the City has plans to reconstruct the sanitary sewers shown in **Table 6**, below. The 2024 road reconstruction budget capital plan is $6.5 million.

Table 6 2024 Road Reconstruction Plans

Street	From	To
Queen Street	Elgin Street	March Street
Stanley Street	Pine Street	Elizabeth Street
Spruce Street	Railroad Avenue	Wilcox Avenue
Lower Lake Street	Queen Street	Civic 24 Lake Street

2.8. Summary

The sanitary sewage collection system and small sewage pumping stations operated by the City of Sault Ste. Marie Public Works and Engineering Services Department are operating well and receive regular routine inspections and maintenance. Necessary repairs are promptly made and any complaints from the Public are investigated and resolved. The City has ongoing efforts to quantify and assess wet weather flows, decrease overflows, spills and bypasses from the collection system and wastewater treatment plants.

3. Annual Report Part 2 – Large Pump Stations and Sanitary Sewer Overflow Tank

City of Sault Ste. Marie Wastewater Lift Stations

CLI-ECA Annual Report July- December 2023

Submitted to: City of Sault Ste. Marie Engineering Department

Prepared by: PUC Services Inc. Environmental Operations March 2024

Table of Contents

Introduction: CLI- ECA

1.0 Schedule A:

The large lift stations in Sault Ste. Marie operate under the Environmental Compliance Approval for Municipal Sewage Collection System ECA number: 316-W601 Issue Number 1 dated at Toronto this 3rd day of February 2023, by the Ontario Ministry of Environment, Conservation and Parks (MECP). The large lift stations are maintained and operated under contract by the Public Utilities Commission Services (PUC).

The new consolidated linear infrastructure (CLI-ECA) system was implemented in 2023. This report is in compliance with the requirement to submit an annual report.

The PUC also operates and maintains the two water pollution control plants that are not under this CLI-ECA:

1. The East End Water Pollution Control Plant is located at 2221 Queen Street East, System Number 110000640 and ECA 3973-AFPTCN issued January 10, 2017. River Road, Clark Creek, Pim Street and the SSO all are processed at the east plant.
2. The West End Water Pollution Control Plant is located at 55 Allens Side Road, System Number 110002540 and ECA 5922-BZNHV3 issued April 19, 2021. Young Street and John Street lift stations are processed at the West plant. Note John St. can be diverted to the East Plant if needed.
3. Main lift station is located on the property of the west plant with a system number of 110000640 and ECA number of 5283-79SQ8J issued December 13, 2007.

2.0 Station Locations

The Sault Ste. Marie Sanitary Sewer and Wastewater Treatment system has 5 large lift stations and one Sanitary Sewer Overflow station (SS0) that the PUC Services Inc. is contracted to operate and maintain for the City of Sault Ste. Marie Inc. The large lift stations are only a part of the entire sewer system.

The large lift stations (Schedule B) are located within the city of Sault Ste. Marie at the following addresses:

PS-21: 62 River Road- River Road/Tartentorus lift station
PS-22: 1677 Queen St. East – Clark Creek and Drake St lift stations
PS-23: 291 John St.- John Street pumping station
PS-24: 816 Bay Street- Pim St. lift station
PS-ASC: 800 Young St. – Young St. pumping station
CSO#5: 1265 Queen St. East- Bellevue Sanitary Sewer Overflow station (SSO)

River Road, Pim St, Clark Creek/Drake and the SSO are designed to flow by gravity to the East end Wastewater Pollution control plant for treatment.

John St. Young and Main station flow to the west end wastewater pollution control plant. John street can also be diverted to the east plant if needed.

Clark Creek Lift Station

3.0 Schedule B: Station Descriptions and Design Parameters

PS-21: River Road: Sanitary sewage pumping station located at 62 River Rd., 35 m west of the intersection of Murphy St. and River Rd., Sault Ste. Marie, District of Algoma, ON, consisting of a below-grade rectangular reinforced concrete twin chamber wet well, each chamber 4.9 m x 3 m inside x approx. 5 m deep, adjacent to a below-grade reinforced concrete 10.2 m x 8 m inside x approx. 8.6 m deep, dry pit pump chamber, equipped with 3 electric motor driven, dry-pit, vertical, centrifugal, non-clog sewage pumps, with provision for a future fourth pump, each pump rated at 175 L/s at 20.5 m TDH.

Capacity: 319 L/s (firm pumping capacity), Overflow sewer directly to St. Mary's River. Overflow sensor within overflow chamber

Equipment: 3 pumps (2 duty, 1 standby), with 27,561.6 m3/d and 20.5 m total head, [2] wet wells. The station is connected to [2] 450 mm diameter forcemains, one exiting from the north side of the station, discharging to forcemain junction valve chamber within the site and a second exiting from the south side of the station, capped at each end, intended for future operation of as a four-pump station.

PS-22: Clark Creek: Sanitary sewage pumping station located at 1677 Queen St. E., Sault Ste. Marie, District of Algoma, ON, consisting of 4 dry pit submersible sewage pumps, each rated at 880 L/s at a TDH of 13.5 m. This facility also houses the Drake Street sanitary sewage pumping station (i.e. wet well no. 3) consisting of two submersible pumps each rated at xxx L/s at a TDH of xxx which pump directly into the adjacent wet well no. 1

Capacity: 1,600 L/s (peak flow), Bellevue SSO tank provides 12,000m3 of emergency storage

Equipment: Clark Creek PS - 4 pumps (3 duty, 1 standby), with 138,240 m3/d and 13.5 m total head, [2] wet wells No's 1 and 2. The station is connected to [1] 900 mm diameter forcemain, discharging into the East End Water Pollution Control Plant.

The station contains [1] on-site odour control unit, ECA 6087-9S9PSZ dated February 4, 2015– in-situ oxidant fogger, dispersing a maximum of 1.59 kg/d of oxidant in 2 wet wells, passively discharging to the air through 4 stacks, each having an exit diameter of 0.1 m. This unit is not in use.

PS-23: John Street: Sanitary sewage pumping station located at 291 John St., approximately 60 m west of John Street and south of the Canadian Pacific Railway R.O.W., Sault Ste. Marie, District of Algoma, ON, consisting of a below-grade rectangular reinforced concrete single chamber wet well (9.8 m x 7.35 m x approx. 8.6 m max. depth), adjacent to a below-grade rectangular reinforced concrete dry well (12.0 m x 8.75 m inside x approx. 8.6 m max. depth), equipped with 4 electric motor driven, dry-pit submersible sewage pumps. Pumps to the West Plant.

Capacity: 550 L/s (2 pumps with rated capacity of 200 L/s and 2 pumps with rated capacity of 350 L/s. No emergency storage however the flow can be diverted to the East Plant.

Equipment: 2 pumps (1 duty, 1 standby), with 17,280 m3/d and 20 m total head, and 2 pumps (1 duty, 1 standby) with 30,240 m3/d and 35 m total head, [1] wet well. The station is connected to [1] 550 mm diameter forcemain, discharging to sanitary sewer at Lyons Ave. and Farwell Terrace.

PS-24: Pim Street: Sanitary sewage pumping station located at 816 Bay St., at the corner of Pim St. and Bay St., Sault Ste. Marie, District of Algoma, ON, consisting of 4 dry-pit submersible sewage pumps with a rated capacity of 500 L/s each against a TDH of 21 m.

Capacity: 1,170 L/s (daily peak flow), 500m3 overflow storage tank

Equipment: 4 pumps (3 duty, 1 standby), with 101,088 m3/d and 28 m total head, [2] wet wells. The station is connected to [1] 750 mm diameter forcemain, discharging to sanitary manhole at Queen St. E. and Pine St.

PS-ASC: Young Street: Sanitary sewage pumping station located at 800 Young St., approximately 170 m west of the intersection of Young St. and Glasgow Ave., Sault Ste. Marie, District of Algoma, ON, a built-in-place screw pumping station equipped with two 2950 mm O.D. screw pumps rated at a capacity of 2,200 L/s at a lift of 6.877 m, and one 1525 mm O.D. screw pump rated at 350 L/s at a lift of 7.631 m.

Capacity: 2,550 L/s (total firm capacity) no emergency storage

Equipment: 3 pumps (2 duty, 1 standby), with 220,320 m3/d, [1] wet well. The station discharges to [1] 1,800 mm diameter sanitary sewer.

4.0 Schedule C: NA

5.0 Schedule D: General NA

6.0 Schedule E: Operating Conditions:

General Operations:

PUC services Inc. staff are certified under O. Reg. 129/04 (Licensing of Sewage Works Operators) under the OWRA and its approval. All staff also operate both the East and West Water Pollution control plants for the City of Sault Ste. Marie. Staff have an Overall Responsible Operator (OR0) assigned daily for monitoring and supervising all activities at the plants and stations. Staff physically check stations during the work week and are on call 24 hours a day for any issues that may arise.

Duties of Operating Authority:

The PUC operates the large lift stations described above and ensures they are maintained and in a state of good repair. Sampling and reporting are done as per the ECA.

Operations and Maintenance:

Stations are checked daily during the work week and as needed during repairs and maintenance. Stations are also monitored 24 hours a day through the SCADA network. Alarms are set at each station that will call out an operator if any parameters are not functioning for 24-hour maintenance.

Screen volume levels are monitored daily on SCADA at the wastewater plants. Screens are cleaned when volumes are showing accumulation of debris and usually done several times a week for Clark Creek, River Road and Pim St., and weekly for John St.

All stations are also equipped with diesel generators that will turn on in the event of power failure. The generators and alarms are checked on a monthly basis and have load bank testing completed annually.

Flows are measured and documented in the logbook. See Table 2 and Table 3.

O&M manuals include procedures necessary for the operation and maintenance of the stations. The O&M manuals are being updated in 2024. Logbooks are maintained and stored on site documenting each visit and any work completed on the equipment including the date, time and person conducting the inspections, maintenance or service. Services to equipment is scheduled with PUC maintenance program and documented electronically in the system.

Collection System Overflows: Overflows are reported via email to the MECP, downstream water systems (OCWA) and Algoma Public Health on the Canadian side and Chippewa County Health Dept. in Sault Ste. Marie Michigan as per an agreement for international waters. See Table 1.

Efforts are made to reduce Collection System overflows from the SSO by slowly emptying the tank back to the East Plant for treatment when possible. See Table 1.

Table 1: Untreated Overflows/Spills/Bypass:

Location		Date	Volume	Duration	Reason	Sampled	SAC#
NA							

Untreated spills/bypass into the St. Mary's River are documented and sent SAC and also sent to ec-FA-LP-ON.ec@canada.ca to satisfy the reporting requirements of section 38(7) of the Fisheries Act.

There were no untreated sewage bypasses in 2023.

Flow Data

The sewage flows to the large lift stations are summarized below in Table 2.

Table 2: Station Annual Flows (m^3) July - December

Month	Clark Creek	Pim/ Bay St.	River Road	John Street Estimate	Young St (Calculation)
July	423,899	300,284	181,100	68,987	308,845
August	429,182	336,600	219,000	69,800	323,720
September	399,179	240,255	174,500	60,458	294,253
October	415,347	284,170	182,100	64,577	355,549
November	523,507	362,550	232,500	96,623	491,607
December	627,987	472,107	258,100	44,570	512,355
Total	2,819,101	1,995,966	1,247,300	405,015	2,286,329

As can be seen in Table 2 more flow is directed through the east end plant. The SSO is also used for temporary storage of wastewater during high flow and to divert from Clark Creek / Drake St. lift stations to prevent backflow into homes and businesses. Wastewater stored in the SSO is diverted back to the east end plant slowly to prevent the east end plant from going into bypass. Prior to large rain/storm events the larger pumps at Young St. and Main station in the west end are sometimes made lead pumps in preparation of increased volume and to prevent a large serge when they turn on during high flows.

7.0 Schedule F, Not Applicable

8.0 Complaints:

No complaints received in 2023.

9.0 Calibration, maintenance, and repairs to major structures/equipment

Overview for all stations:

1. Repair phone dialer and communications
2. Valve exercising and pump maintenance including OEM inspections
3. Weekly station checks
4. New lighting installed
5. Monthly diesel and alarm checks
6. Annual Load Bank testing for generators
7. New ATS fob and door alarms (except CSO)
8. Annual Wet Well cleaning at River Road, Pim Street, Clark Creek and John St. Stations

PS-21: 62 River Road:

1. Exhaust fan replacement
2. Installed 1" water line
3. Bypass flow totalizer repairs and calibration
4. Replaced float in Wet well #2
5. Valve packing

PS-22: 1677 Queen St. East – Clark Creek:

1. Monthly unplugged pumps
2. Check ozone odour control system

PS-24: 816 Bay Street- Pim St. Station:

1. Pump #1 sent for maintenance
2. Repair/install sewage overflow chamber pump
3. Installed new receptacle for new ATS equipment
4. Wet Well concrete work

PS-23: 291 John St.:

1. Installed camera system
2. New gas detectors installed

PS-ASC: 800 Young St.:

1. Heater repairs
2. Verified milltronics
3. Repaired drive pulley on exhaust fan
4. Installed Versaview

CSO#5- 1265 Queen St. East- Bellevue Sanitary Sewer Overflow station (SSO):

1. Repair stop float switch on sump pump
2. Installed new lights when charging circuit failed

10: Summary

The large lift stations servicing the City of Sault Ste. Marie are monitored 24 hours a day through SCADA.

Lift Station Screens are cleaned as need and at least weekly to maintain flow. Regular maintenance is completed as scheduled in the Preventative Maintenance program by PUC and documented in the system. All site visits and work completed are documented in the logbook at each station including the date, time, work done and person doing the work. Pumps are also cleaned as needed when plugged and lead and lag pumps are changed on a regular basis to ensure all pumps are operational. Annual pump maintenance is also conducted by original equipment manufacturers (OEM)to ensure optimal running ability.

Standby generators are available at each site and tested monthly. Load bank testing is also completed annually.

Spills/ bypasses are sampled during our high flow events which is usually related to snow melts in the spring and high precipitation.

All large lift stations are maintained and are operating as designed.