

Township of North Glengarry

Maxville Wastewater System

2022 Annual Report

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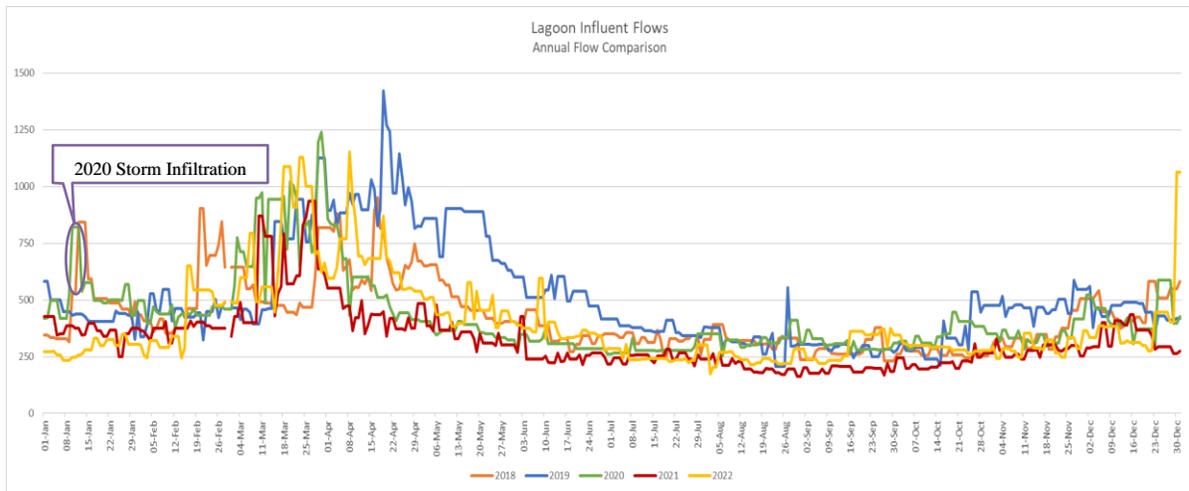
1. Performance Assessment

Summary and interpretation of all monitoring data collected in accordance with condition 10 and a comparison to the effluent limits outlined in condition 7, including an overview of the success and adequacy of the works

The Maxville wastewater system is a class 1 facility, which is comprised of a collection system and a lagoon treatment system servicing the village of Maxville, Ontario. The collection system is comprised of an interconnected network of sanitary service laterals, sanitary sewage mains, sanitary manholes, sewage force mains and pumping stations used to collect and transport wastewater to the treatment lagoon system. The lagoon system is comprised of a coagulant dosing system, 2 facultative lagoon cells, and influent and effluent chambers. The influent wastewater is dosed with coagulant year-round to aid in reducing phosphorus levels and flow is rotated between the lagoons annually. The wastewater is treated through natural biological means and only discharged annually, coinciding with the Spring thaw and peak flows conditions of the West branch of the Scotch River.

During the 2022 calendar year, 143,615m³ of untreated raw sewage was directed to the Maxville Lagoon system for treatment, which has increased from the previous years observed flows. The total flows are based on the metered influent flow just prior to the Lagoon Splitter Chamber. There were no additional effluent sewage sources into the system throughout this calendar year. No system wide CCTV inspections and only minimal system growth was observed during this year.

Figure 1: 5yrs Lagoon Influent Flow Comparison



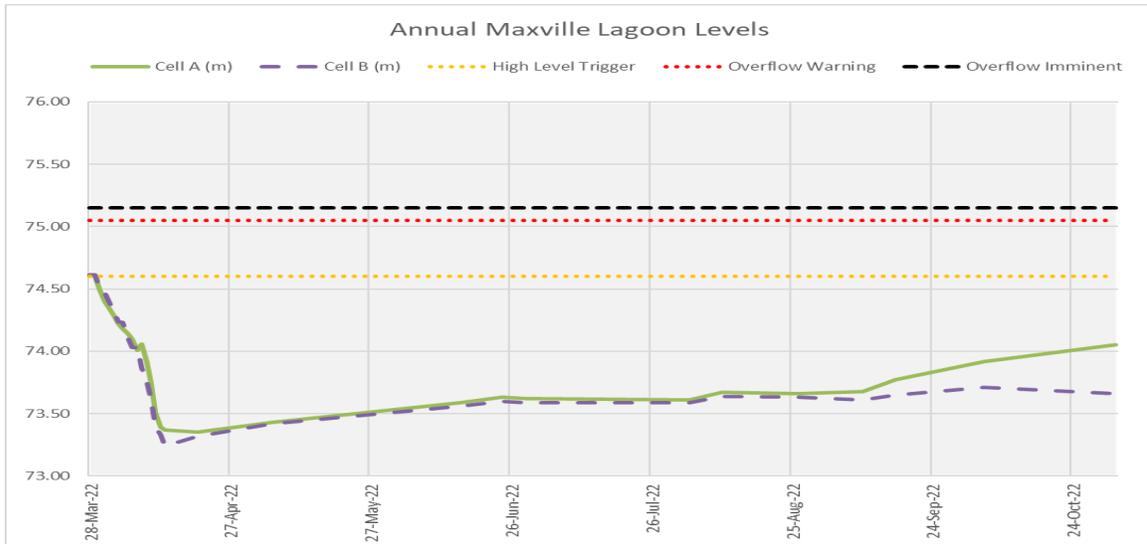
The system operated well throughout 2022, with the raw sewage strength remaining similar to previous years, as per Table 1. The wastewater effluent pre-discharge samples were taken on 2 occasions prior to starting the annual discharge and all sampling results indicated effective treatment was achieved. The wastewater effluent quality was well below the provincial and federal annual average limits, although one sample results did surpass the limit. Please see subsections below for a full summary of results and refer to Appendix A for a full summary of all flows, raw influent and treated effluent results.

The figure below displays the lagoon cell levels as measured throughout 2022. The top of the berm is represented by 76.00m and the bottom of the lagoon cell is represented by 73.00m. The levels were taken from each cell daily during the seasonal discharge and at least monthly outside of the discharge period when the cells were not covered by ice.

A high-water level trigger has been set at 76% capacity or 74.60m, at which point the township will implement a contingency plan to prevent overflow. No issues or concerns were noted during this period, although it was

noted that Cell A levels were found to increasing above Cell B starting in August 2022. The operators are continuing to monitor and determine if a blockage is present at the interconnecting piping.

Figure 2: Annual Lagoon Levels



i. Raw Sewage Monitoring

Condition 10 (3) of the ECA requires monthly raw sewage sampling at the Main Station for CBOD₅, Total Suspended Solids (TSS) and Total Phosphorus (TP). All sampling was completed as per conditions listed above; no additional samples were taken during 2022. Although results are slightly increased from previous years for most parameters, with exception to BOD₅, the sewage strength appears to be consistent with previous finding indicating not much variation in the inflowing sewage strength. Please refer to Appendix A for a full summary of the raw quality analysis.

Table 1: Annual Average Raw Sewage Monitoring Comparison

| Year | Annual Average Result | | |
|------|----------------------------|---------------|--------------|
| | BOD ₅ (mg/L) | TSS (mg/L) | TP (mg/L) |
| 2022 | 104.6 | 201.4 | 4.22 |
| 2021 | 183.1 | 170.5 | 4.12 |
| 2020 | 83.9 | 127 | 3.92 |
| 2019 | 112.3 | 222.2 | 3.32 |
| 2018 | 157.4 | 212.1 | 3.97 |

ii. Pre-Discharge Monitoring

Condition 10(3) of the ECA requires the sampling and analysis of BOD₅, TSS and TP in each lagoon cell 14 days prior to discharge commencement, which is performed to ensure that the effluent limits of each parameter are met prior to discharge. The table below summarizes the dates samples were taken and sample results within the 14-day period. In 2022 a total of 2 sets of samples were taken prior to the commencement of the discharge, all results indicated effluent sewage did not require additional treatment prior to discharge.

Table 2: Pre-Discharge Sampling Summary

| Sampling Locations | Cell A | | | Cell B | | |
|----------------------------|------------------|-----|------|------------------|-----|------|
| Effluent Parameters (mg/L) | BOD ₅ | TSS | TP | BOD ₅ | TSS | TP |
| ECA Effluent Limit (mg/L) | 30 | 30 | 1 | 30 | 30 | 1 |
| 15-Mar-2022 | 7 | 12 | 0.58 | 9 | 12 | 0.29 |
| 16-Mar-2022 | 8 | 12 | 0.55 | 8 | 9 | 0.22 |

iii. Spring Discharge Monitoring

The 2022 annual spring discharge was a non-stop flow over 17-day period, within a calculated 380.7hrs. The discharge was started on Monday March 28, 2022 and was shut down on Wednesday April 13, 2022, with a total effluent volume of 181,615m³ discharged into the West Branch of the Scotch River. Throughout the discharge, daily flow monitoring was completed to ensure the flows remained within the allowable 3:1 mixing ratio.

Table 3: Discharge Flow Summary

| Date | Start Time | Total hours | River Flow (m ³ /s) | Discharge Rate (m ³ /s) | Mixing Ratio (3:1) | Discharge Amount (m ³) |
|-----------|------------------|--------------|--------------------------------|------------------------------------|--------------------|------------------------------------|
| | (from Sting Ray) | (calculated) | (calculated) | (calculated) | (calculated) | (from Sting Ray) |
| 28-Mar-22 | 11:07 | | 1.046 | 0.083 | 12.60 : 1 | |
| 29-Mar-22 | 10:28 | 23.27 | 0.507 | 0.155 | 3.27 : 1 | 6,120.6 |
| 30-Mar-22 | 10:07 | 23.42 | 0.320 | 0.099 | 3.23 : 1 | 12,767.8 |
| 31-Mar-22 | 10:23 | 24.22 | 0.448 | 0.131 | 3.42 : 1 | 8,016.1 |
| 01-Apr-22 | 10:00 | 23.55 | 0.536 | 0.150 | 3.57 : 1 | 8,980.9 |
| 02-Apr-22 | 10:36 | 24.62 | 0.408 | 0.096 | 4.25 : 1 | 13,362.9 |
| 03-Apr-22 | 10:35 | 23.88 | 0.243 | 0.075 | 3.24 : 1 | 8,230.4 |
| 04-Apr-22 | 10:43 | 24.05 | 0.383 | 0.125 | 3.06 : 1 | 5,329.1 |
| 05-Apr-22 | 9:08 | 22.37 | 0.324 | 0.105 | 3.09 : 1 | 10,479.7 |
| 06-Apr-22 | 9:39 | 24.45 | 0.385 | 0.122 | 3.16 : 1 | 8,706.6 |
| 07-Apr-22 | 9:54 | 24.23 | 0.392 | 0.111 | 3.53 : 1 | 10,695.6 |
| 08-Apr-22 | 9:30 | 23.53 | 4.634 | 0.207 | 22.39 : 1 | 9,428.6 |
| 09-Apr-22 | 9:55 | 24.48 | 1.920 | 0.230 | 8.35 : 1 | 15,802.6 |
| 10-Apr-22 | 9:57 | 23.97 | 0.991 | 0.225 | 4.40 : 1 | 18,185.8 |
| 11-Apr-22 | 10:07 | 24.18 | 0.619 | 0.202 | 3.07 : 1 | 17,416.3 |
| 12-Apr-22 | 10:03 | 22.88 | 0.514 | 0.164 | 3.13 : 1 | 15,027.9 |
| 13-Apr-22 | 8:07 | 23.68 | | | | 13,063.8 |

Condition 10(2) of the ECA requires that during the discharge the lagoon effluent is to be sampled at a minimum of 4 times per cell based on the % draw down. Samples are to be collected at the start of the discharge, at 33%, at 67% and on the final day. During the 2022 discharge, samples were collected 6 times from a single point at the discharge outfall, as the cell discharges are blended before being released. The effluent discharge was also tested for acute lethality, as per federal requirements. There were no exceedances to note. Please refer to section 7 and Appendix A for further information.

2. Groundwater and Surface Water Monitoring

Summary and Interpretation of all groundwater monitoring data

Condition 10(3) of the current ECA addresses the requirements of the monitoring program. Sampling is to be performed annually, semi-annually or three times per year depending on the parameter, as per Table 6-

Groundwater Monitoring and Table 7-Surface Water Monitoring. JP2G Consultants in association with the Greer Galloway Group was retained by the Township to complete the annual monitoring program for the Maxville lagoon system. An annual report is submitted to the Ministry of Environment and to the Township upon completion each calendar year.

As per the report, the groundwater flow direction is east-northeast, consistent with historical findings and results indicate that the lagoons are having some impacts on the groundwater in the area. However, the results were well within the compliance requirements of the MOECC B-7 guideline and no potable groundwater users are within the area immediately downgradient of the site. The surface water results indicated the lagoons do not appear to have significantly impacted the water quality in the West Branch of the Scotch River and the results observed in river were significantly outside the concentrations measured in the eastern cell of the lagoons (2021 results).

3. Operational Problems

A description of any operating problems encountered and corrected

Collection System:

- sewage pump failure due to debris in wet well
 - pulled pump and removed debris from pump impeller as required.
- manor station guide rails damage and pump chain damage
 - replaced damaged chains, to schedule guide rail replacement
- manor station generator non-start caused by condensation in in fuse
 - faulty fuse was replaced by JC Cayer

Treatment System:

- pilot light failure on gas heater in coagulant dosing building
 - reignite pilot light as required
- entry security gate damaged
 - repaired gate as needed
- cell levels offset indicating possible blockage in interconnected piping
 - monitoring to determine if action is required
- noted hydrogen smell at effluent chamber but not at discharge outfall
 - no action taken
- noted minor foaming at discharge outfall, caused by outfall configuration and flow velocity
 - no action taken

4. Maintenance

Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works

Collection System:

- Annual generator maintenance in April
- Annual lifting device inspection in April
- Annual inspection of force main signage and repair/replacement as required
- Annual level monitoring equipment calibration in December
- Monthly emergency generator testing, no issues noted
- Monthly alarm signal testing
- Monthly pest control monitoring, no issues noted

Treatment System:

- Annual flow meter calibration in April 2022
- Removed vegetation growth inside berms
- Propane tank replaced by supplier

5. Effluent Quality Control and Assurance

Summary of any effluent quality assurance or control measures undertaken in the reporting period

All sampling was performed within provincial guidelines by licensed operators, as per internal SOP's. Sampling schedules with sign off are also used to ensure that operational staff are aware of sampling requirements and timeline as per the ECA and Federal requirements.

Effluent quality control and assurances measures were undertaken by the MOE certified laboratory, Caduceon Environmental Laboratories and AGAT Laboratories, which conducts analysis for the Township.

6. Flow Measurement and Calibration

Summary of the calibration and maintenance carried out on all effluent monitoring equipment

Annual calibration was completed by St- Laurent Instrumentation in December 2022. Calibrations were performed on all level detection units (pumping station levels and chemical tank levels), and flow sensing devices (magmeters, miltronics, etc).

7. Effluent Objectives

A description of efforts made, and results achieved in meeting the effluent objectives of condition 6

Sampling was completed six times throughout the discharge period and the annual average concentrations were well below the provincial ECA design objectives, the provincial ECA effluent limits, and the Federal Wastewater System Effluent Regulations limits. One of the six samples taken for TSS was above the allowable concentration limits, but it did not cause an exceedance of the annual average, so no report was made. This sample was the last sample taken prior to discharge shut down, there was no notation of abnormal observances during sampling or an indication the sample had an increased suspended solid appearance. An acute lethality sample was taken at the midpoint of the discharge, and the results indicated the sample was not acutely lethal. Please refer to the tables below for the summary results. A full discharge summary can be found in Appendix C.

Table 4: Provincial and Federal Effluent Sampling Results

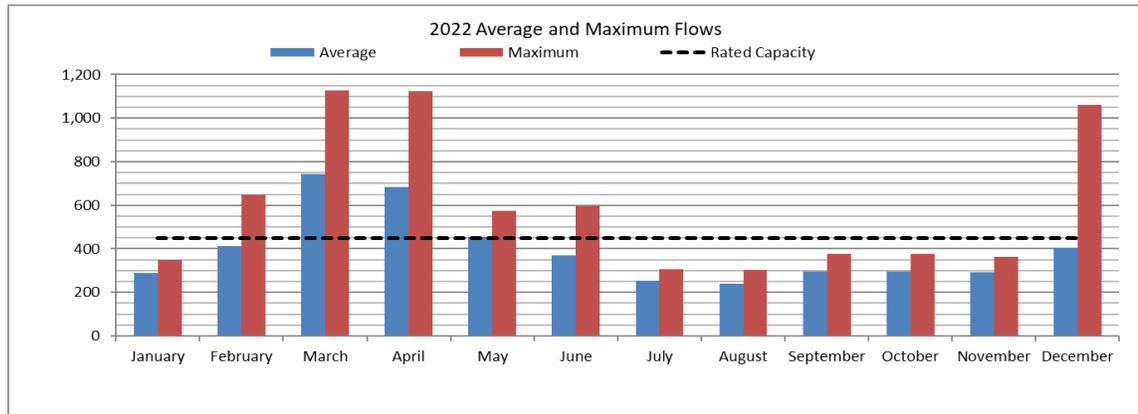
| Effluent Parameter | CBOD ₅ | TSS | TP | pH | Acute Lethality |
|--|-------------------|-----------|-------------|-------------|-----------------|
| <i>Provincial Effluent Limits (mg/L)</i> | 30 | 30 | 1 | 6.0 - 9.5 | |
| <i>Federal Effluent Limits (mg/L)</i> | 25 | 25 | | | 50 % |
| 20-Mar-2022 | 6 | 14 | 0.48 | 6.77 | |
| 30-Mar-2022 | 8 | 13 | 0.52 | 7.00 | |
| 04-Apr-2022 | 6 | 18 | 0.31 | 6.58 | |
| 05-Apr-2022 | | | | | 0 |
| 06-Apr-2022 | 9 | 8 | 0.29 | 6.77 | |
| 11-Apr-2022 | 4 | 11 | 0.23 | 7.03 | |
| 13-Apr-2022 | 5 | 32 | 0.51 | 7.10 | |
| 2022 Maxville Average Concentration | 6.3 | 16 | 0.39 | 7.03 | |

Table 5: Provincial Calculated Waste Loading Results

| Effluent Parameter | CBOD ₅ | TSS | TP | pH |
|---|-------------------|------|-----|----|
| Provincial Average Waste Loading Limits (kgs) | 4932 | 4932 | 164 | |
| 2022 Maxville Average Waste Loading (kgs) | 1150 | 2906 | 71 | |

The annual average daily flow for 2022 was calculated to be 394m³/day, and the maximum daily flow for the year was reported to be 1,129m³/day. This represents 87.5% of the total rated capacity, which is within the rated capacity of this facility. Please refer to the chart below and to Appendix A for a full summary of flows, for the Maxville Sewage Treatment Works. The flow values displayed below are based on the lagoon influent flows, due to flow discrepancies noted in previous years.

Figure 3: Monthly Average and Maximum Flow Comparison



There were no reports made in regard to floating or settleable solids within the wastewater effluent. There were also no reports made that the effluent wastewater contained oil or any other substance that created a visible film, sheen, foam or discolouration to the receiving waters.

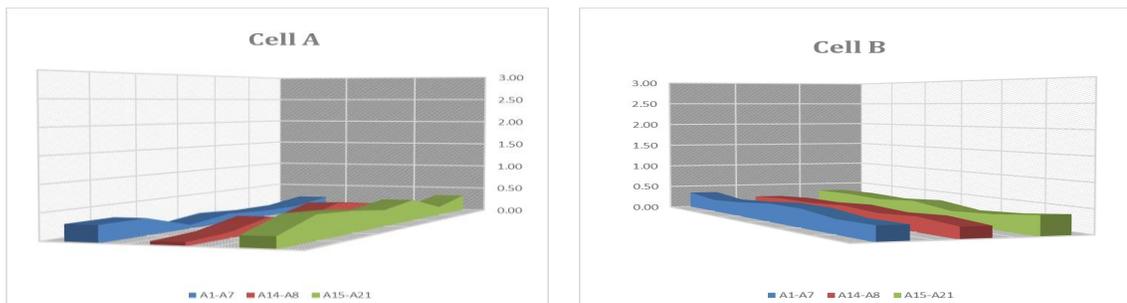
8. Sludge Accumulation

A tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed

A Sludge Management Plan created by McIntosh Pert and put into place in 2008. As part of the monitoring methods, it is recommended that sludge level should be taken annually.

Sludge levels in Cell A were collected on November 11, 2022 and levels in Cell B were collected on November 14, 2022. As per the report, no points exceeded the volume/depth elevation as per setpoints developed through the plan but the total sludge volume in Cell B exceeded the trigger warning. It was also noted that warning triggers were also exceeded at Cell A and Cell B outfall and as such the sludge should be removed or dispersed as per recommendations. The Township is to determine if any action is required.

Figure 4: Lagoon Cell Sludge Levels



9. Complaints

Summary of any complaints received during the reporting period and any steps taken to address the complaints.

There were no complaints within this reporting period from the wastewater system.

10. Bypass, Overflow, Spill or Abnormal Discharge Event

A summary of all bypass, overflow, spill, abnormal discharge events

There were no bypasses, overflows, spills or abnormal discharge events in 2022.

11. Other

Any other information the District Manager requires from time to time

There are no additional monitoring or reporting requirements at this time.

NORTH GLENGARRY WATER WORKS

WASTEWATER TREATMENT WORKS PERFORMANCE RESULTS

Municipality: North Glengarry

Year: 2022

Project: Maxville WWTP

Receiving Stream: West Branch Scotch River

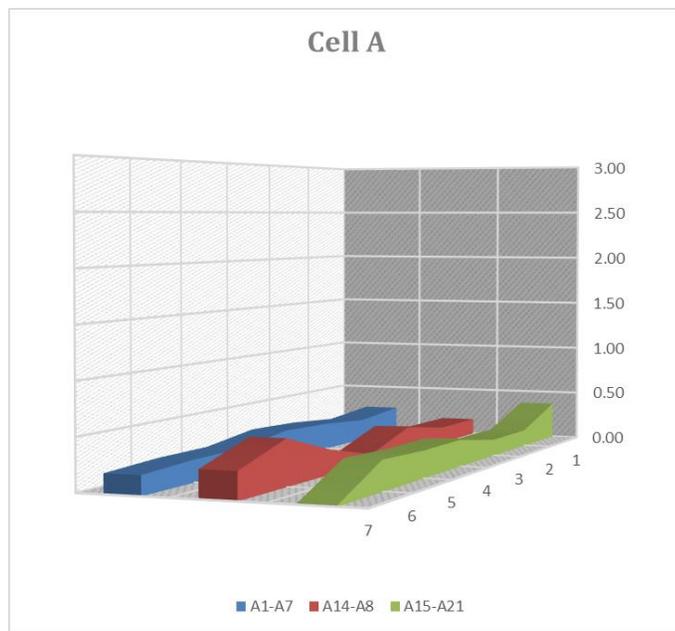
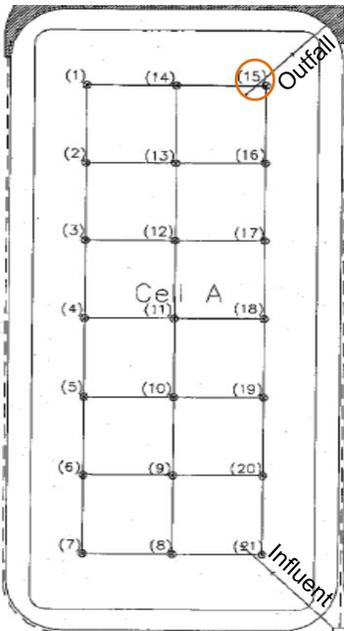
Description: 1 Pumping Station, 2 Facultative Cells
Seasonal Discharge with Phosphorous Removal

Design Capacity: 450 m³/day

| MONTH | Flows | | | | | | Biochemical Oxygen Demand | | | | Suspended Solids | | | |
|-----------------|---------------------------------------|---|---|---------------------------------------|---|---|-------------------------------------|---|---------------------|---|------------------------|-----------------------------|---------------------|---------------------------|
| | Total Influent Flow (m ³) | Average Daily Influent Flow (m ³) | Maximum Daily Influent Flow (m ³) | Total Effluent Flow (m ³) | Average Daily Effluent Flow (m ³) | Maximum Daily Effluent Flow (m ³) | Average Raw BOD ₅ (mg/L) | Average Effluent CBOD ₅ (mg/L) | Percent Removal (%) | Average CBOD ₅ Loading (kgs) | Average Raw TSS (mg/L) | Average Effluent TSS (mg/L) | Percent Removal (%) | Average TSS Loading (kgs) |
| January | 8,918 | 288 | 348 | | | | 86 | | | | 640 | | | |
| February | 11,502 | 411 | 650 | | | | 68 | | | | 295 | | | |
| March | 23,010 | 742 | 1,129 | 35,885 | 8,971 | 12,768 | 88 | 7 | 203.0 | 92 | 195 | 14 | 355.9 | 93 |
| April | 20,501 | 683 | 1,123 | 145,729 | 11,210 | 18,186 | 27 | 6 | 1,099.9 | 78 | 75 | 17 | 1,959.5 | 77 |
| May | 14,075 | 454 | 576 | | | | 33 | | | | 44 | | | |
| June | 11,090 | 370 | 596 | | | | 220 | | | | 56 | | | |
| July | 7,812 | 252 | 305 | | | | 108 | | | | 155 | | | |
| August | 7,453 | 240 | 302 | | | | 55 | | | | 280 | | | |
| September | 8,872 | 296 | 376 | | | | 74 | | | | 410 | | | |
| October | 9,019 | 291 | 345 | | | | 258 | | | | 310 | | | |
| November | 8,811 | 294 | 364 | | | | 138 | | | | 240 | | | |
| December | 12,552 | 405 | 1,062 | | | | 82 | | | | 155 | | | |
| Total | 143,615 | | | 181,615 | | | 1,237 | | 1,150.2 | | | | 2,905.8 | |
| Average | 11,968 | 394 | | 11,351 | 10,091 | | 103 | 6.3 | | 85 | 238 | 16 | | 85 |
| Maximum | 23,010 | | 1,129 | | | 18,186 | 258 | | | 92 | 640 | | | 93 |
| Criteria | | 450 | | | | | | 30 | | 4932 | | 30 | | 4932 |

2022 Annual Cell A Sludge Reports

| Maxville | Cell A-Sample Point Sludge Volume (m ³) | | | | | | | | | | | | | | | | | | | | Total Sludge Volume (m ³) | Total Sludge Volume (%) | Warning Trigger ² | |
|-----------|---|-----|------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|------|-----|-----|-----|-----|------|------|---------------------------------------|-------------------------|------------------------------|---------------------------------|
| Date | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | | | |
| 12-Nov-08 | 1754 | 271 | 624 | 458 | 937 | 791 | 545 | 715 | 608 | 608 | 608 | 608 | 608 | 1038 | 356 | 624 | 624 | 937 | 937 | 624 | 1446 | 15,717 | 62 | Total Sludge Volume is Elevated |
| 22-Apr-09 | 356 | 312 | 312 | 562 | 312 | 146 | 711 | 392 | 203 | 608 | 1215 | 871 | 810 | 254 | 284 | 728 | 312 | 312 | 937 | 416 | 1067 | 11,119 | 44 | |
| 27-Apr-10 | 711 | 416 | 583 | 520 | 416 | 271 | 237 | 0 | 101 | 263 | 263 | 304 | 101 | 415 | 237 | 271 | 167 | 416 | 520 | 416 | 711 | 7,340 | 29 | |
| 07-Oct-10 | 237 | 354 | 312 | 208 | 250 | 312 | 284 | 277 | 405 | 243 | 1337 | 243 | 142 | 2076 | 356 | 458 | 354 | 312 | 312 | 208 | 284 | 8,963 | 36 | |
| 08-Dec-11 | 0 | 0 | 0 | 0 | 0 | 312 | 237 | 277 | 203 | 142 | 0 | 0 | 0 | 0 | 119 | 146 | 42 | 312 | 354 | 1186 | 1114 | 4,442 | 18 | |
| 24-Oct-12 | 119 | 104 | 146 | 0 | 146 | 42 | 166 | 115 | 101 | 41 | 0 | 101 | 203 | 231 | 47 | 42 | 104 | 42 | 42 | 104 | 356 | 2,249 | 9 | |
| 06-Oct-14 | 521 | 395 | 291 | 271 | 291 | 395 | 427 | 438 | 81 | 446 | 162 | 344 | 284 | 438 | 616 | 437 | 479 | 458 | 333 | 500 | 403 | 8,010 | 32 | |
| 06-Nov-15 | 379 | 437 | 1478 | 229 | 541 | 437 | 498 | 369 | 324 | 324 | 527 | 628 | 628 | 600 | 379 | 541 | 749 | 645 | 1082 | 749 | 379 | 11,923 | 47 | |
| 07-Nov-16 | 403 | 125 | 458 | 333 | 229 | 562 | 142 | 369 | 324 | 446 | 446 | 446 | 446 | 507 | 24 | 562 | 354 | 458 | 458 | 250 | 261 | 7,600 | 30 | |
| 29-Oct-19 | 687 | 458 | 458 | 500 | 229 | 500 | 332 | 323 | 527 | 425 | 648 | 547 | 344 | 738 | 569 | 604 | 604 | 604 | 562 | 770 | 853 | 11,279 | 45 | |
| 28-Oct-20 | 450 | 437 | 437 | 604 | 541 | 437 | 616 | 600 | 911 | 486 | 182 | 527 | 324 | 369 | 24 | 604 | 541 | 541 | 333 | 333 | 877 | 10,174 | 40 | |
| 11-Nov-22 | 521 | 250 | 250 | 354 | 146 | 666 | 759 | 161 | 223 | 547 | 243 | 648 | 446 | 161 | 759 | 354 | 874 | 666 | 874 | 978 | 521 | 10,400 | 41 | |

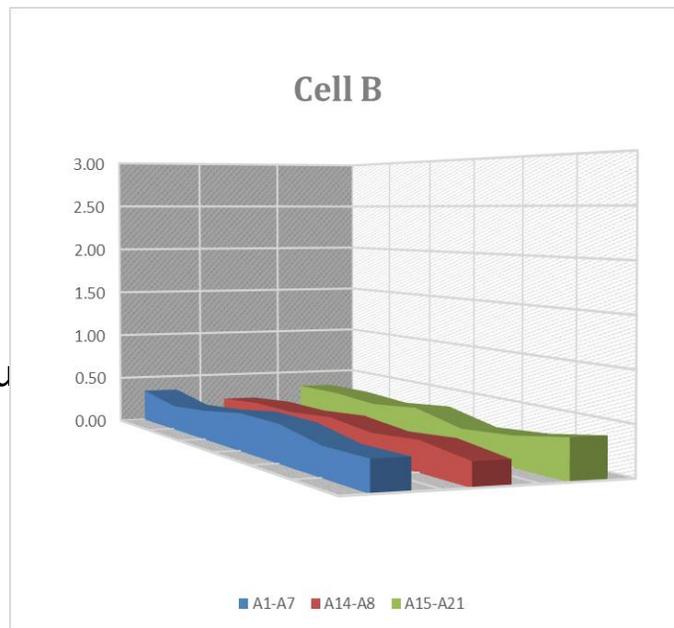
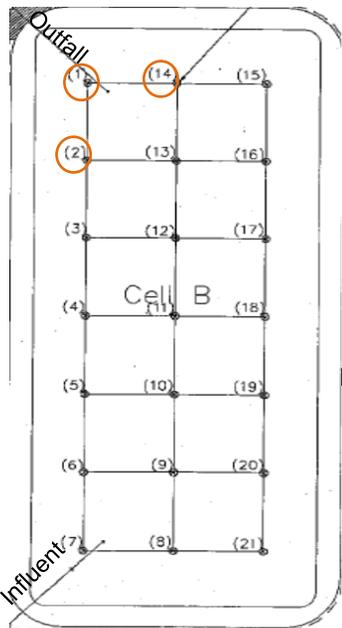


Triggers and Suggested Actions

- Sludge depth completed on November 11, 2022
- Currently Cell A is at 41% of allowable volume, which is a 1% decrease from 2020
- No single point location exceeded sludge depth triggers, but the level at the outfall exceeded the warning trigger

2022 Annual Cell B Sludge Reports

| Maxville | Cell B-Sample Point Sludge Volume (m ³) | | | | | | | | | | | | | | | | | | | | | Total Sludge Volume (m ³) | Total Sludge Volume (%) | Warning Trigger ² | | | | | | | | | | |
|----------|---|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|------|------|-----|-----|------|-----|------|---------------------------------------|-------------------------|------------------------------|---------------------------------|---|---|---|---|---|---|---|---|--|
| | Date | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | | | | 21 | | | | | | | | | |
| | 12-Nov-08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 22-Apr-09 | 1422 | 312 | 354 | 624 | 624 | 791 | 1185 | 507 | 405 | 304 | 203 | 770 | 446 | 1268 | 1304 | 624 | 937 | 1249 | 687 | 1145 | 1730 | 16,890 | 67 | Total Sludge Volume is Elevated | | | | | | | | | |
| | 27-Apr-10 | 474 | 312 | 583 | 479 | 312 | 167 | 308 | 346 | 101 | 0 | 304 | 0 | 405 | 185 | 853 | 479 | 104 | 312 | 208 | 208 | 237 | 6,376 | 25 | | | | | | | | | | |
| | 07-Oct-10 | 356 | 104 | 250 | 250 | 104 | 208 | 284 | 231 | 304 | 304 | 203 | 243 | 243 | 0 | 119 | 146 | 458 | 312 | 354 | 146 | 356 | 4,972 | 20 | | | | | | | | | | |
| | 08-Dec-11 | 0 | 0 | 354 | 312 | 354 | 312 | 1967 | 231 | 446 | 142 | 142 | 101 | 668 | 0 | 166 | 208 | 146 | 520 | 562 | 312 | 521 | 7,464 | 30 | | | | | | | | | | |
| | 24-Oct-12 | 237 | 208 | 250 | 208 | 146 | 208 | 166 | 346 | 243 | 142 | 304 | 142 | 203 | 161 | 166 | 146 | 104 | 146 | 104 | 146 | 237 | 4,011 | 16 | | | | | | | | | | |
| | 06-Oct-14 | 640 | 333 | 666 | 479 | 541 | 395 | 593 | 254 | 263 | 263 | 81 | 101 | 284 | 392 | 403 | 520 | 458 | 187 | 479 | 208 | 593 | 8,133 | 32 | | | | | | | | | | |
| | 06-Nov-15 | 640 | 458 | 333 | 333 | 229 | 229 | 735 | 369 | 225 | 20 | 243 | 344 | 344 | 623 | 640 | 354 | 125 | 354 | 770 | 229 | 261 | 7,857 | 31 | | | | | | | | | | |
| | 07-Nov-16 | 284 | 354 | 354 | 562 | 354 | 562 | 521 | 277 | 243 | 344 | 344 | 547 | 446 | 623 | 166 | 21 | 562 | 562 | 354 | 354 | 877 | 8,710 | 35 | | | | | | | | | | |
| | 29-Oct-19 | 924 | 125 | 333 | 562 | 291 | 395 | 379 | 969 | 648 | 425 | 324 | 446 | 385 | 969 | 616 | 333 | 500 | 562 | 500 | 708 | 379 | 10,772 | 43 | | | | | | | | | | |
| | 28-Oct-20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | 14-Nov-22 | 806 | 541 | 645 | 812 | 812 | 624 | 735 | 554 | 628 | 527 | 628 | 527 | 527 | 484 | 782 | 708 | 645 | 770 | 541 | 645 | 972 | 13,911 | 55 | Total Sludge Volume is Elevated | | | | | | | | | |



Triggers and Suggested Actions

- Sludge depth completed on November 14, 2022
- Currently Cell A is at 55% of allowable volume, which is a 12% increase from 2019
- No single point location exceeded sludge depth triggers, but the total cell volume and 3 locations at the outfall exceeded the warning trigger

2022 Annual Outfall Summary

| Triggers | Monitoring Point | Warning ² - Sludge Depth Exceeds Trigger on | Monitoring Point | Warning ² - Sludge Depth Exceeds Trigger on | Monitoring Point | Warning ¹ - Sludge Depth Exceeds Trigger on | Monitoring Point | at the Cell A outfall, Cell B |
|----------|------------------|--|------------------|--|------------------|--|------------------|-------------------------------|
| Cell A | 13 | 12-Nov-08 | 14 | 12-Nov-08 | 15 | | 16 | 12-Nov-08 |
| | 13 | 22-Apr-09 | 14 | | 15 | | 16 | 22-Apr-09 |
| | 13 | | 14 | | 15 | | 16 | |
| | 13 | | 14 | 07-Oct-10 | 15 | | 16 | |
| | 13 | | 14 | | 15 | | 16 | |
| | 13 | | 14 | | 15 | | 16 | |
| | 13 | | 14 | | 15 | 06-Oct-14 | 16 | |
| | 13 | 06-Nov-15 | 14 | 06-Nov-15 | 15 | | 16 | 06-Nov-15 |
| | 13 | | 14 | | 15 | | 16 | 07-Nov-16 |
| | 13 | | 14 | 29-Oct-19 | 15 | | 16 | 29-Oct-19 |
| | 13 | | 14 | | 15 | | 16 | 28-Oct-20 |
| | 13 | | 14 | | 15 | 11-Nov-22 | 16 | |
| | Cell B | 1 | | 2 | | 13 | | 14 |
| 1 | | 22-Apr-09 | 2 | | 13 | | 14 | 22-Apr-09 |
| 1 | | | 2 | | 13 | | 14 | |
| 1 | | | 2 | | 13 | | 14 | |
| 1 | | | 2 | | 13 | 08-Dec-11 | 14 | |
| 1 | | | 2 | | 13 | | 14 | |
| 1 | | 06-Oct-14 | 2 | | 13 | | 14 | |
| 1 | | 06-Nov-15 | 2 | | 13 | | 14 | 06-Nov-15 |
| 1 | | | 2 | | 13 | | 14 | 07-Nov-16 |
| 1 | | 29-Oct-19 | 2 | | 13 | | 14 | 29-Oct-19 |
| 1 | | | 2 | | 13 | | 14 | |
| 1 | | 14-Nov-22 | 2 | 14-Nov-22 | 13 | 14-Nov-22 | 14 | |

Triggers and Suggested Actions

| | |
|---|--|
| — | Note ² : If a sample point is underlined, this signifies that the volume/depth of a sludge in that section of the cell is elevated and action might be required to obtain a uniform sludge distribution |
| 1 | Trigger depth of 0.25 m near outlet is exceeded Removal or Dispersal of sludge may be required |
| 2 | More than half the <i>Total Sludge Volume</i> (25,170 m ³) noted on the ECA is estimated in each cell Depending on location of elevated sludge depths, removal or dispersal of sludge may be required |
| 3 | The trigger sludge depths (see <i>Sample Points Area</i> sheet) is exceeded in this cell At an individual locations, the sludge depth in more than 1/3 of the working depth in the cell (1.8 m); sludge removal or dispersal may be required |



***Maxville
Spring
Discharge
2022***

April 2022

**Township of North Glengarry
Water Works Department**
Prepared by Angela Cullen

Maxville Spring Discharge 2022 Annual Report

Discharge Summary

The annual discharge was continuously run over 17 days from Monday March 28, 2022, until Wednesday, April 13, 2022. The total discharge time frame meets the minimum requirements of set out in ECA#5368-8PPQA2 and it also coincided with the spring peak flows.

The total lagoon effluent volume released to the west branch of the Scotch River was calculated to be 181,615m³, with an average daily flow of 11,351m³. The flows were maintained to ensure greater than 3:1 mixing ratio, for a 4-part downstream flow.

| Parameter | Total |
|---|---------|
| Total Days Discharged | 17 |
| Total Hours Discharged | 380.77 |
| Total Amount Discharge to Creek (m ³) | 181,615 |
| Average Daily Flow to Discharge (m ³) | 11,351 |

| Date | Start Time | Total hours | River Flow | Discharge Rate | Mixing Ratio | | Discharge Amount |
|-----------|------------------|--------------|-----------------------------------|-----------------------------------|-----------------------|----|------------------------------------|
| | (from Sting Ray) | (calculated) | m ³ /s (calculated) | m ³ /s (calculated) | (3:1) (calculated) | | m ³ (from Sting Ray) |
| 28-Mar-22 | 11:07 | | 1.046 | 0.083 | 12.60 | :1 | |
| 29-Mar-22 | 10:28 | 23.27 | 0.507 | 0.155 | 3.27 | :1 | 6,120.57 |
| 30-Mar-22 | 10:07 | 23.42 | 0.320 | 0.099 | 3.23 | :1 | 12,767.81 |
| 31-Mar-22 | 10:23 | 24.22 | 0.448 | 0.131 | 3.42 | :1 | 8,016.08 |
| 01-Apr-22 | 10:00 | 23.55 | 0.536 | 0.150 | 3.57 | :1 | 8,980.99 |
| 02-Apr-22 | 10:36 | 24.62 | 0.408 | 0.096 | 4.25 | :1 | 13,362.90 |
| 03-Apr-22 | 10:35 | 23.88 | 0.243 | 0.075 | 3.24 | :1 | 8,230.44 |
| 04-Apr-22 | 10:43 | 24.05 | 0.383 | 0.125 | 3.06 | :1 | 5,329.09 |
| 05-Apr-22 | 9:08 | 22.37 | 0.324 | 0.105 | 3.09 | :1 | 10,479.67 |
| 06-Apr-22 | 9:39 | 24.45 | 0.385 | 0.122 | 3.16 | :1 | 8,706.59 |
| 07-Apr-22 | 9:54 | 24.23 | 0.392 | 0.111 | 3.53 | :1 | 10,695.61 |
| 08-Apr-22 | 9:30 | 23.53 | 4.634 | 0.207 | 22.39 | :1 | 9,428.56 |
| 09-Apr-22 | 9:55 | 24.48 | 1.920 | 0.230 | 8.35 | :1 | 15,802.59 |
| 10-Apr-22 | 9:57 | 23.97 | 0.991 | 0.225 | 4.40 | :1 | 18,185.79 |
| 11-Apr-22 | 10:07 | 24.18 | 0.619 | 0.202 | 3.07 | :1 | 17,416.29 |
| 12-Apr-22 | 10:03 | 22.88 | 0.514 | 0.164 | 3.13 | :1 | 15,027.89 |
| 13-Apr-22 | 8:07 | 23.68 | | | | :1 | 13,063.82 |

*Note on April 1 and April 8 data estimates were used to generate daily flow values due to discrepancies from battery issues.

Sampling Summary

During this discharge period, samples were taken on 6 occasions from the discharge and on 3 occasions from upstream and downstream locations. Although 1 sample point exceeded the ECA limits, the monthly and annual averages for all parameters were still well below the limits and objectives set out in the ECA, which indicates good quality treatment. Sampling was also completed for acute lethality to meet the requirements for the Federal Wastewater Systems Effluent Regulation. The sample result indicated 0% mortality, meaning the effluent was not acutely lethal to rainbow trout.

| Parameter | # Samples Taken | ECA Parameter Limits (mg/L) | Average Reading (mg/L) | ECA Average Waste Loading Limits (Kgs) | Average Waste Loading (kgs) | Adverse Samples | Mortality % |
|-------------------|-----------------|-----------------------------|------------------------|--|-----------------------------|-----------------|-------------|
| Discharge | | | | | | | |
| CBOD ₅ | 6 | 30 | 6.3 | 4932 | 1150.23 | 0 | |
| T.S.S | 6 | 30 | 16.0 | 4932 | 2905.83 | 0 | |
| T.P. | 6 | 1 | 0.4 | 164 | 70.83 | 0 | |
| pH | 17 | | 7.03 | | | | |
| Acute Lethality | 1 | | | | | | 0 |
| Upstream | | | | | | | |
| CBOD ₅ | 3 | | 3.0 | | | | |
| T.S.S | 3 | | 17.0 | | | | |
| T.P. | 3 | | 0.1 | | | | |
| pH | 3 | | 6.69 | | | | |
| Downstream | | | | | | | |
| CBOD ₅ | 3 | | 3.0 | | | | |
| T.S.S | 3 | | 18.3 | | | | |
| T.P. | 3 | | 0.1 | | | | |
| pH | 3 | | 7.02 | | | | |

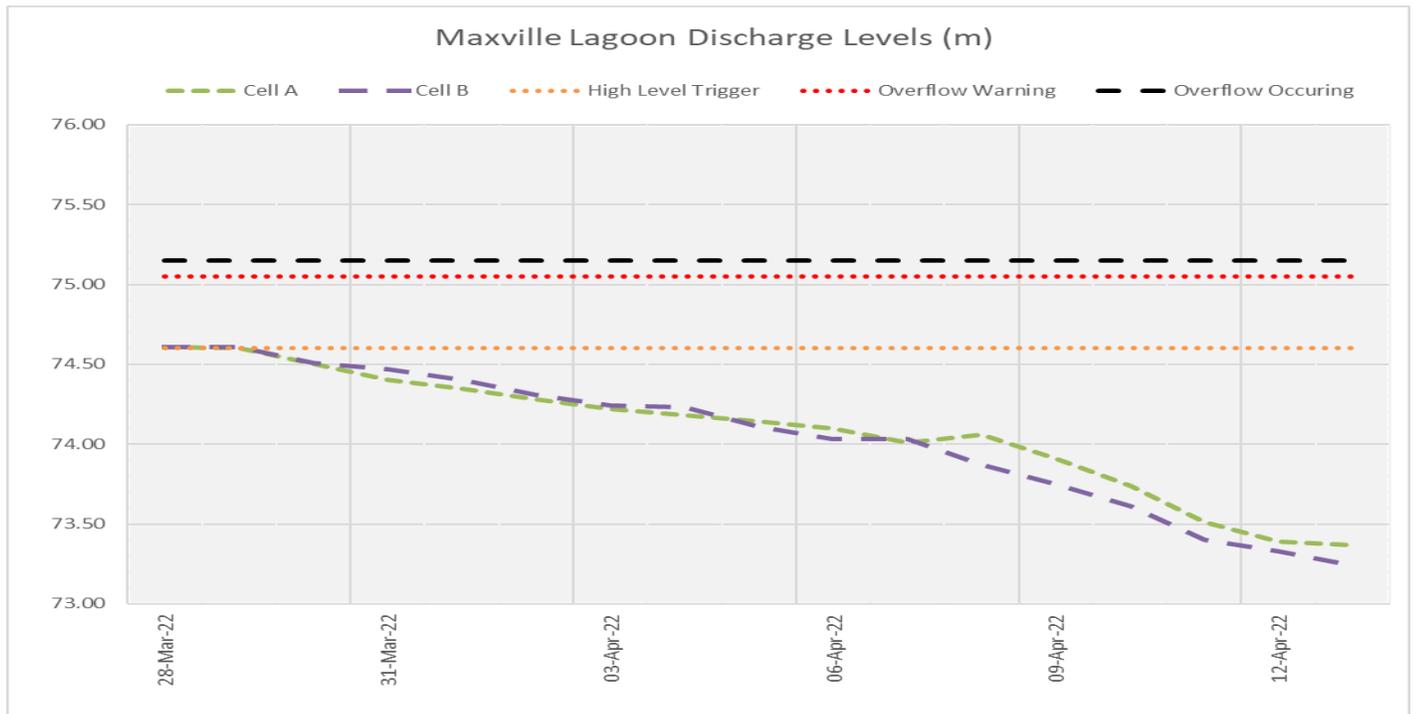
| Date | Discharge pH | Discharge Dissolved Oxygen mg/L | Discharge Temperature °C | Discharge TSS Sample mg/L | Discharge TSS Loading kg | Discharge CBOD ₅ Sample mg/L | Discharge CBOD ₅ Loading kg | Discharge TP Sample mg/L | Discharge TP Loading kg | Discharge Acute Lethality % |
|------------------|----------------|---------------------------------|--------------------------|---------------------------|--------------------------|---|--|--------------------------|-------------------------|-----------------------------|
| | (grab sample) | (grab sample) | (grab sample) | (grab sample) | (calculated) | (grab sample) | (calculated) | (grab sample) | (calculated) | (grab sample) |
| 28-Mar-22 | 6.77 | 7.42 | 3.2 | 14 | | 6 | | 0.48 | | |
| 29-Mar-22 | 6.93 | 5.3 | 3.5 | | 85.69 | | 36.72 | | 2.94 | |
| 30-Mar-22 | 7.00 | 3.78 | 3.8 | 13 | 165.98 | 8 | 102.14 | 0.52 | 6.64 | |
| 31-Mar-22 | 6.90 | 4.48 | 3.8 | | 104.21 | | 64.13 | | 4.17 | |
| 1-Apr-22 | 8.29 | 3.81 | 4.3 | | 116.75 | | 71.85 | | 4.67 | |
| 2-Apr-22 | 6.77 | 3.50 | 5.0 | | 173.72 | | 106.90 | | 6.95 | |
| 3-Apr-22 | 7.00 | 4.81 | 6.5 | | 107.00 | | 65.84 | | 4.28 | |
| 4-Apr-22 | 6.58 | 7.48 | 10.2 | 18 | 95.92 | 6 | 31.97 | 0.31 | 1.65 | |
| 5-Apr-22 | 6.83 | 5.25 | 8.7 | | 188.63 | | 62.88 | | 3.25 | 0 |
| 6-Apr-22 | 6.77 | 5.91 | 10.0 | 8 | 69.65 | 9 | 78.36 | 0.29 | 2.52 | |
| 7-Apr-22 | 7.16 | 6.10 | 8.0 | | 85.56 | | 96.26 | | 3.10 | |
| 8-Apr-22 | 7.32 | 7.67 | 5.3 | | 75.43 | | 84.86 | | 2.73 | |
| 9-Apr-22 | 7.18 | 10.59 | 5.7 | | 126.42 | | 142.22 | | 4.58 | |
| 10-Apr-22 | 6.73 | 10.79 | 7.9 | | 145.49 | | 163.67 | | 5.27 | |
| 11-Apr-22 | 7.03 | 10.34 | 7.5 | 11 | 191.58 | 4 | 69.67 | 0.23 | 4.01 | |
| 12-Apr-22 | 7.16 | 6.18 | 12.1 | | 165.31 | | 60.11 | | 3.46 | |
| 13-Apr-22 | 7.10 | 3.30 | 10.5 | 32 | 418.04 | 5 | 65.32 | 0.51 | 6.66 | |
| ECA Limit | 6.0-9.5 | | | 30 | 4932 | 30 | 4932 | 1 | 164 | 50 |
| # Samples | 17 | 17 | 17 | 6 | 16 | 6 | 16 | 6 | 16 | 1 |
| Minimum | 6.58 | 3.30 | 3.20 | 8 | 69.65 | 4 | 31.97 | 0.23 | 1.65 | 0 |
| Average | 7.03 | 6.27 | 6.82 | 16 | 144.71 | 6 | 81.43 | 0.39 | 4.18 | 0 |
| Maximum | 8.29 | 10.79 | 12.10 | 32 | 418.04 | 9 | 163.67 | 0.52 | 6.95 | 0 |

Lagoon Levels

Lagoon cell level in Cell A was discharge over 17 days and decreased 1.24m in total, starting at a measured level of 74.61m to a final measured level of 73.37m.

Lagoon cell level in Cell B was discharge over 17 days and decreased 1.37m in total, starting at a measured level of 74.61m to a final measured level of 73.24m.

| Parameter | Discharge Period | | | |
|-----------|------------------|-------|--------|-------|
| | Cell A | | Cell B | |
| Minimum | 73.37 | -0.23 | 73.24 | -0.21 |
| Maximum | 74.61 | 0.05 | 74.61 | 0.00 |
| Average | | -0.08 | | -0.09 |
| Total | | -1.24 | | -1.37 |

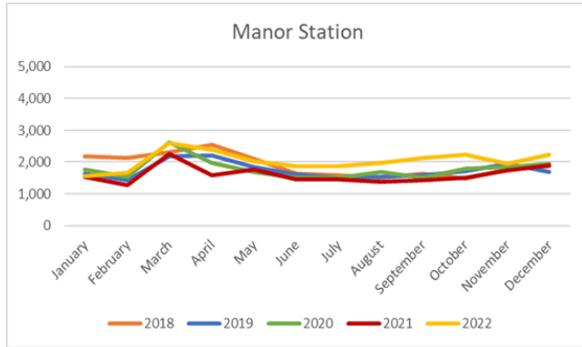


Issues

Observed issues noted during this discharge period were minor in nature and include the following:

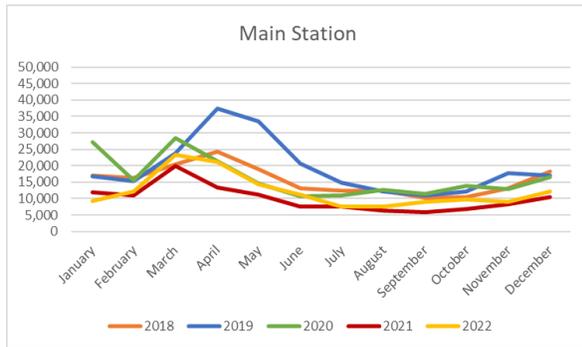
- operational staff noted sulfur smell on 1 day.
- operational staff noted foam intermittently at discharge outfall, caused by water flows, foam noted within 3m from discharge outfall.
 - no foam noted near mixing zone for discharge and river water.
- battery issues on 2 occasions
 - estimated flows during battery issues, which was over a cumulative 9 min period.

System Station Flow Comparisons



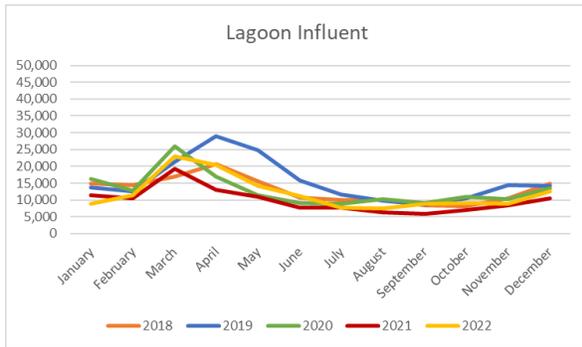
Manor Station

| Month | 2018 | 2019 | 2020 | 2021 | 2022 |
|-----------|--------|--------|--------|--------|--------|
| January | 2,173 | 1,636 | 1,755 | 1,531 | 1,562 |
| February | 2,131 | 1,417 | 1,530 | 1,272 | 1,654 |
| March | 2,310 | 2,181 | 2,633 | 2,259 | 2,605 |
| April | 2,553 | 2,201 | 1,966 | 1,588 | 2,401 |
| May | 2,092 | 1,843 | 1,695 | 1,766 | 2,017 |
| June | 1,633 | 1,617 | 1,501 | 1,466 | 1,859 |
| July | 1,575 | 1,507 | 1,497 | 1,465 | 1,863 |
| August | 1,498 | 1,535 | 1,693 | 1,375 | 1,963 |
| September | 1,628 | 1,590 | 1,500 | 1,417 | 2,127 |
| October | 1,484 | 1,712 | 1,786 | 1,507 | 2,233 |
| November | 1,778 | 1,937 | 1,857 | 1,733 | 1,943 |
| December | 1,858 | 1,690 | 1,955 | 1,903 | 2,244 |
| Annual | 22,714 | 20,866 | 21,367 | 19,284 | 24,471 |



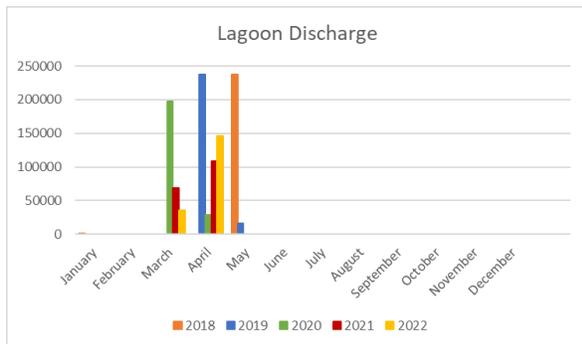
Main Station

| Month | 2018 | 2019 | 2020 | 2021 | 2022 |
|-----------|---------|---------|---------|---------|---------|
| January | 17,144 | 16,875 | 27,201 | 12,056 | 9,161 |
| February | 16,219 | 15,266 | 15,535 | 11,010 | 12,113 |
| March | 20,367 | 23,932 | 28,496 | 19,874 | 23,348 |
| April | 24,362 | 37,403 | 21,512 | 13,432 | 21,067 |
| May | 18,873 | 33,625 | 14,503 | 11,144 | 14,431 |
| June | 13,098 | 20,617 | 10,729 | 7,483 | 11,150 |
| July | 12,346 | 14,803 | 10,843 | 7,525 | 7,560 |
| August | 12,355 | 12,063 | 12,729 | 6,291 | 7,504 |
| September | 10,317 | 10,919 | 11,457 | 5,773 | 8,924 |
| October | 10,483 | 12,079 | 13,929 | 6,924 | 9,673 |
| November | 13,076 | 17,706 | 12,937 | 8,289 | 8,993 |
| December | 18,359 | 16,922 | 16,586 | 10,500 | 12,276 |
| Annual | 186,999 | 232,210 | 196,457 | 120,301 | 146,199 |



Lagoon Influent

| Month | 2018 | 2019 | 2020 | 2021 | 2022 |
|-----------|---------|---------|---------|---------|---------|
| January | 14,951 | 13,737 | 16,293 | 11,389 | 8,918 |
| February | 14,417 | 12,586 | 12,904 | 10,444 | 11,502 |
| March | 16,909 | 21,265 | 26,004 | 19,383 | 23,010 |
| April | 20,543 | 28,994 | 17,037 | 13,113 | 20,501 |
| May | 15,519 | 24,903 | 11,349 | 10,914 | 14,075 |
| June | 10,677 | 15,693 | 9,161 | 7,697 | 11,090 |
| July | 10,091 | 11,550 | 8,784 | 7,663 | 7,812 |
| August | 10,092 | 9,772 | 10,186 | 6,305 | 7,453 |
| September | 8,295 | 8,600 | 9,085 | 5,788 | 8,872 |
| October | 8,207 | 10,483 | 10,909 | 6,987 | 9,019 |
| November | 10,506 | 14,329 | 10,252 | 8,288 | 8,811 |
| December | 14,844 | 14,069 | 13,577 | 10,442 | 12,552 |
| Annual | 140,207 | 171,911 | 141,964 | 107,971 | 131,063 |



Lagoon Effluent

| Month | 2018 | 2019 | 2020 | 2021 | 2022 |
|-----------|---------|---------|---------|---------|---------|
| January | | | | | |
| February | | | | | |
| March | | | 197,008 | 68,556 | 35,885 |
| April | 237,321 | 237,322 | 28,306 | 109,050 | 145,729 |
| May | | | 15,872 | | |
| June | | | | | |
| July | | | | | |
| August | | | | | |
| September | | | | | |
| October | | | | | |
| November | | | | | |
| December | | | | | |
| Annual | 237,321 | 253,194 | 225,314 | 177,606 | 181,614 |