

# Lucan Water Pollution Control Plant and Collection System Annual Performance Report



*Prepared For:*  
*The Township of Lucan*  
*Biddulph*

*Operating Authority:*



Reporting Period of January 1<sup>st</sup> – December 31<sup>st</sup>, 2023

Issued: March 25, 2024

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## Overview

The following report was prepared by the Ontario Clean Water Agency (OCWA) on behalf of The Corporation of the Township of Lucan Biddulph in accordance with:

- Condition 11(4) (a) through (l) cited in Environmental Compliance Approval #7008-B7CJWY issued February 11, 2019 to The Corporation of the Township of Lucan Biddulph.
- Schedule E (4) cited in Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) #050-W601 issued December 7, 2022 to The Corporation of the Township of Lucan Biddulph.

## System Process Description

The Lucan Water Pollution Control Plant (WPCP) is an extended aeration plant that provides tertiary-level treatment of municipal wastewater with UV disinfection. There is also a two-cell lagoon system for storing excess flow. The rated capacity of the Lucan WPCP is 1700 m<sup>3</sup>/d.

### Raw Wastewater Collection

The Lucan Wastewater Collection (WWC) System is operated under CLI-ECA #050-W601. Gravity sewers within Lucan are operated by the Township of Lucan Biddulph. For information on this part of the WWC system, refer to Appendix A.

Pumping stations and forcemains within the WWC system are operated by OCWA. There are two pumping stations in the collection system. Chestnut Pumping Station pumps wastewater to the Lucan WPCP or to the storage lagoons. The pumping station consists of five pumps (1 jockey, 1 duty, 1 standby duty, 1 high-flow, 1 standby high-flow). The jockey pump handles normal flow conditions and pumps to the treatment plant through a 200 mm forcemain. When flows are higher, the duty pumps operate to achieve flow relief and maintain levels in the wet well. If, during peak flows, flow exceeds the capacity of both duty pumps, the high-flow pumps will operate and send flow to the lagoon through a 300 mm forcemain. Once peak flow subsides, flow from the lagoon can be returned to the wet well by opening an actuated plug valve on the 300 mm forcemain. Flow is then processed through the Lucan WPCP.

Joseph Street Pumping Station has two pumps (1 duty, 1 standby). This station connects to a 100 mm forcemain that discharges to a sanitary manhole on a neighbouring street.

Milltronics monitors wet well levels, which control the start/stop cycle of all pumps and high-level alarms. There are also back-up float alarms at both pumping stations. Chestnut Pumping Station has a designed overflow that flows into the Benn Drain and a standby diesel generator.

### Preliminary Treatment

Raw sewage flows through a mechanical bar screen and into a vortex grit chamber. Screenings and grit separated out during these processes are removed and sent to a landfill.

### Biological Treatment

The majority of biological treatment occurs during the aeration process. Positive displacement blowers add air to the aeration tanks. This air provides the necessary oxygen for bacteria to multiply and break down organic material. Chemical pumps add aluminum sulfate to the aeration tanks to assist in the settling of organic matter in the secondary clarifiers.

### Secondary Clarifiers

Sewage from the aeration tanks settles in the secondary clarifiers. The previous addition of aluminum sulfate aids in flocculation and chemical precipitation of soluble phosphorus. To maintain the biological treatment process, settled sludge is returned to the aeration tanks or wasted to the digesters.

### Filtration

Secondary clarifier effluent flows by gravity to the filtration system, which consists of two disk filters. These filters remove solids that cannot be removed through secondary clarification alone. Tertiary filtration assists in removing total suspended solids and total phosphorus thus further improving effluent quality.

### Final Effluent Disinfection

Filtered effluent flows to an Ultraviolet (UV) channel where UV light inactivates pathogens remaining in the effluent. Final effluent is discharged into the Little Ausable River.

### Sludge Management System

Sludge storage is contained in four concrete digester tanks. There are coarse bubble diffusers in the tanks that assist in the aerobic digestion of the sludge. Sludge is periodically hauled from the digesters and land applied.

### System Facts:

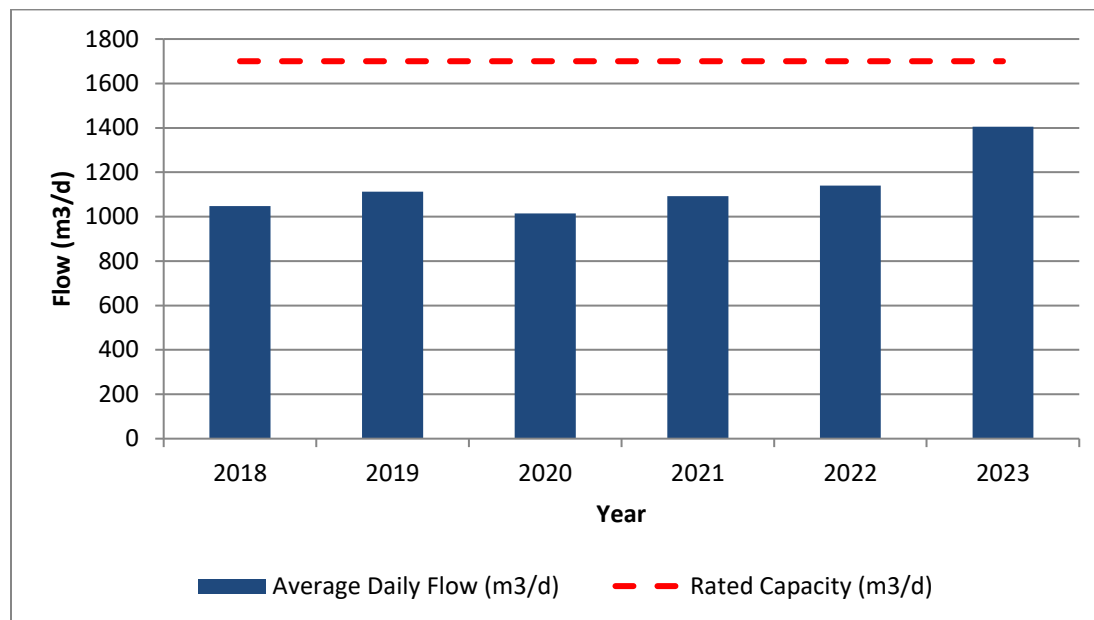
<b>Environmental Compliance Approval</b>	#7008-B7CJWY (issued February 11, 2019)
<b>CLI Environmental Compliance Approval</b>	#050-W601 (issued December 7, 2022)
<b>Rated Capacity</b>	1700 m <sup>3</sup> /d
<b>Receiving Water</b>	Little Ausable River

In 2023, the Lucan WPCP and WWC system was operated in accordance with the provincial regulations as required in ECA #7008-B7CJWY and 050-W601.

## Influent Flow Monitoring

The Lucan WPCP is rated to treat an average daily flow of 1700 m<sup>3</sup>. Refer to Figure 1 for a comparison of the average daily flow for the last six years against the rated capacity of the plant. The Lucan WPCP is at 83% of the rated capacity of 1700 m<sup>3</sup>/d.

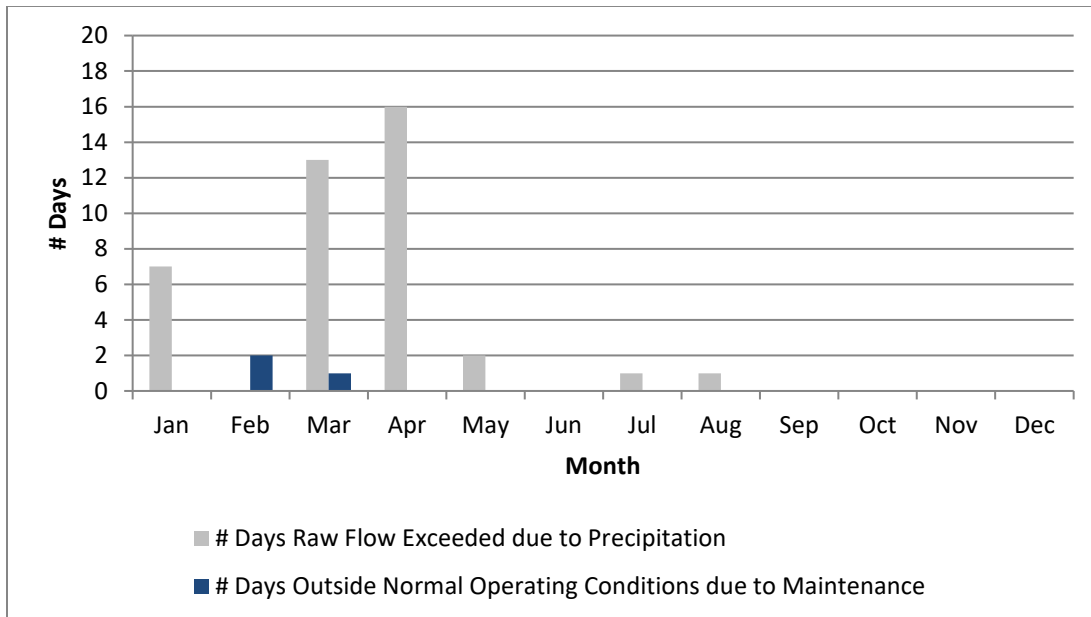
Figure 1: Influent Flows 2018-2023



The Lucan WPCP ECA requires additional daily sampling when the plant operates outside of normal operating conditions. This could be due to maintenance or being above the rated capacity for raw inflow as the result of heavy precipitation. In respect to the latter, the ECA's rated capacity of 1700 m<sup>3</sup>/d has defined normal operating conditions.

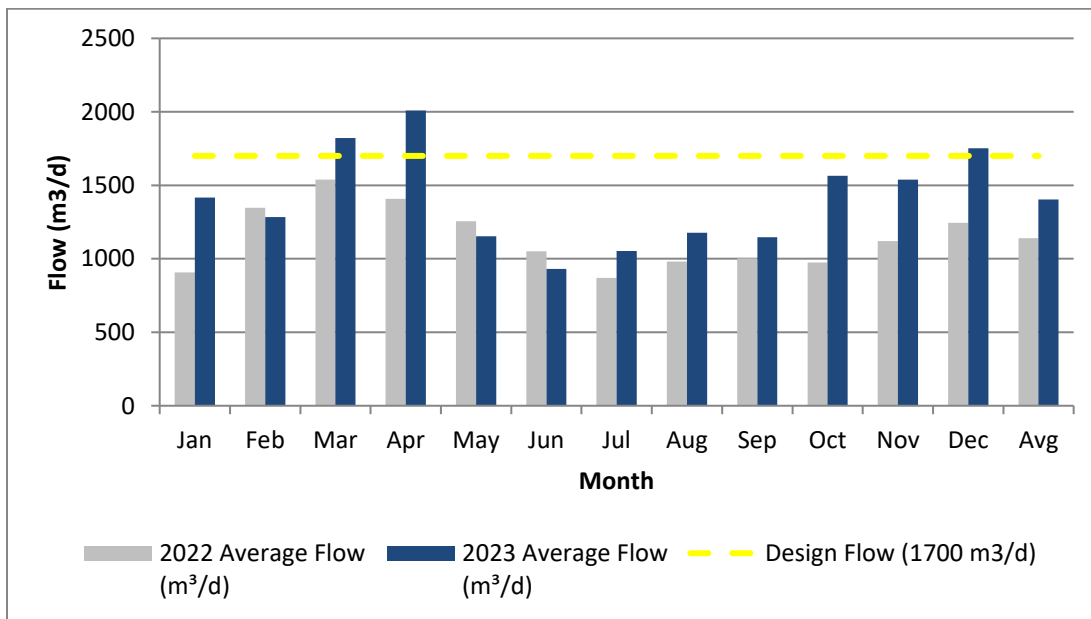
In 2023, there were 43 days when the plant was outside of normal operating conditions, 40 of which were due to heavy rain and three due to plant maintenance. However, note that in October, 2023, an engineer's assessment was obtained whereby the normal operating conditions of the plant were identified as 3600 m<sup>3</sup>/d with all system components working. While the ECA continues to require that the annual average daily flow of 1700 m<sup>3</sup>/d to be met, additional samples are not required to be taken unless the plant is outside of normal operating conditions—now assessed as 3600 m<sup>3</sup>/d. All 40 days where extra samples were required in 2023 due to raw flow exceeding the rated capacity would not have resulted in being outside of normal operating conditions under the new engineer's assessment. Thus, it is expected that additional sampling will significantly decrease in 2024. Refer to Figure 2 for the number of days the WPCP operated outside of normal operating conditions.

Figure 2: Days Outside Normal Operating Conditions



The raw sewage average daily flow in 2023 was 1404 m<sup>3</sup>/d versus 1140 m<sup>3</sup>/d in 2022. This 21% increase was due to wet weather throughout the year. Refer to Figure 3 for 2023 average daily flows by month and the corresponding annual average.

Figure 3: Average Daily Flows by Month

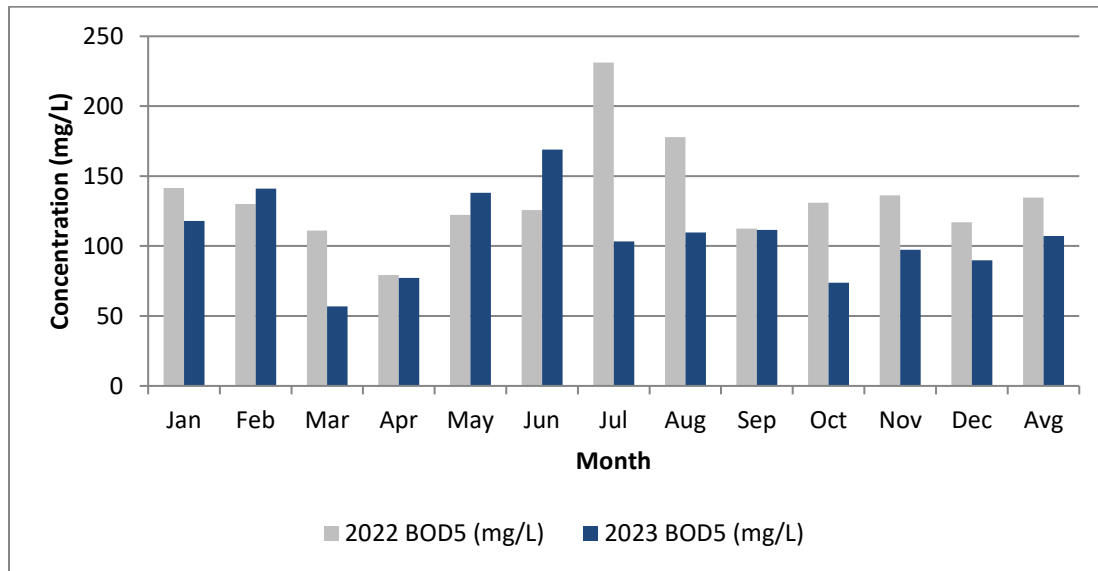


## Influent Data

Influent is monitored weekly for Biological Oxygen Demand (BOD<sub>5</sub>), Total Suspended Solids (TSS), Total Phosphorous (TP) and Total Kjeldahl Nitrogen (TKN) through a composite sample. In 2023, all parameter sample results were lower than their 2022 averages. This is likely due to increased precipitation as seen in the increased average daily flow for 2023.

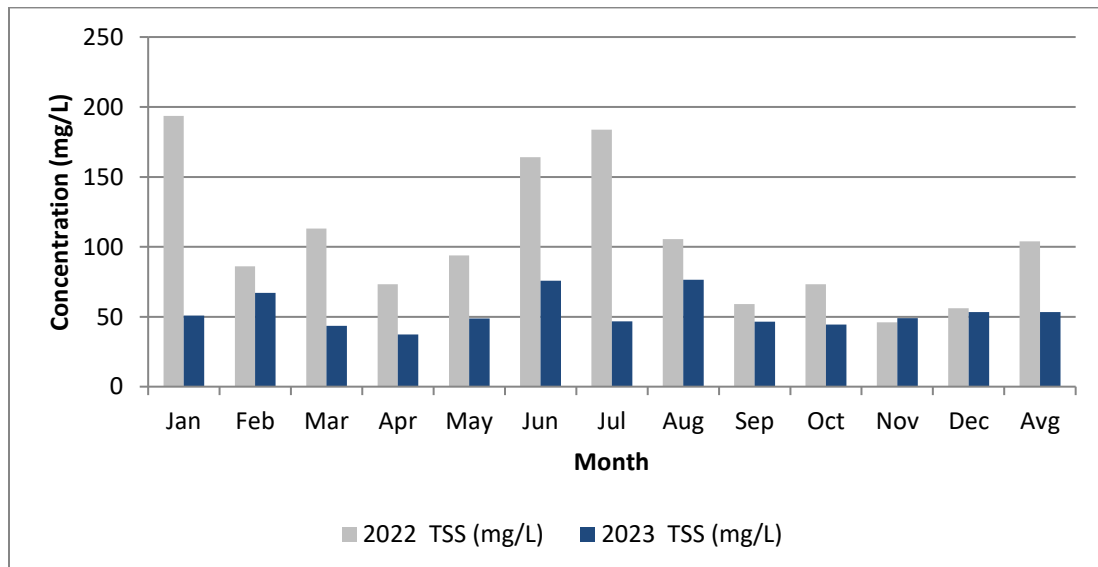
In 2023, the average raw BOD<sub>5</sub> concentration was 107 mg/L, a 20% decrease from 2022. Refer to Figure 4 for a comparison of 2023 monthly raw BOD<sub>5</sub> concentrations to 2022 concentrations.

Figure 4: Raw BOD<sub>5</sub> Concentrations



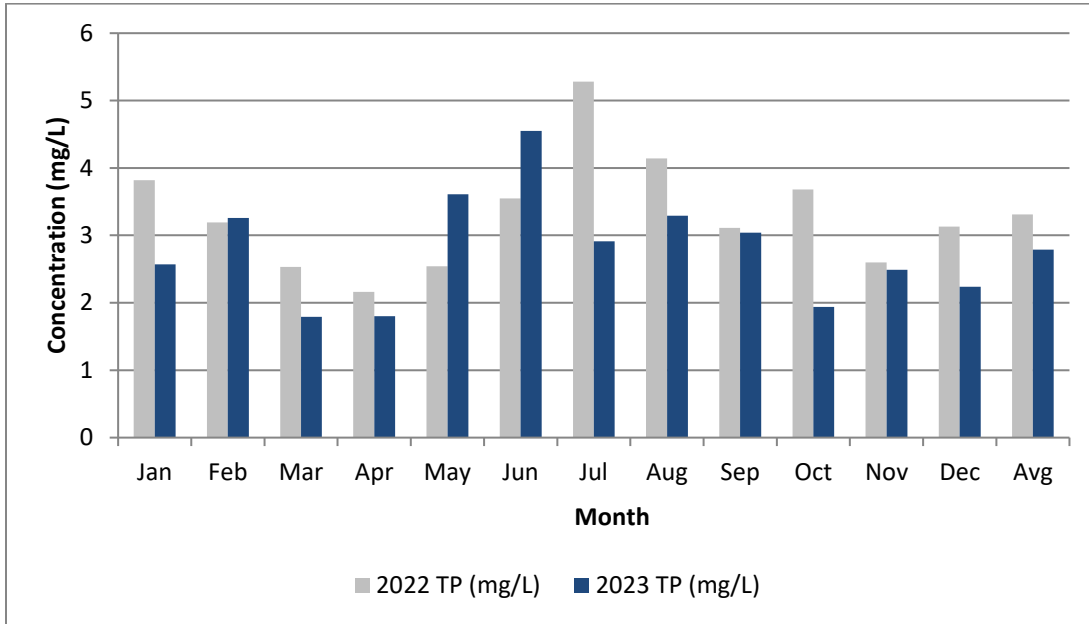
In 2023, the average raw TSS concentration was 53 mg/L, a 49% decrease from 2022. Refer to Figure 5 for a comparison of 2023 monthly raw TSS concentrations to 2022 concentrations.

Figure 5: Raw TSS Concentrations



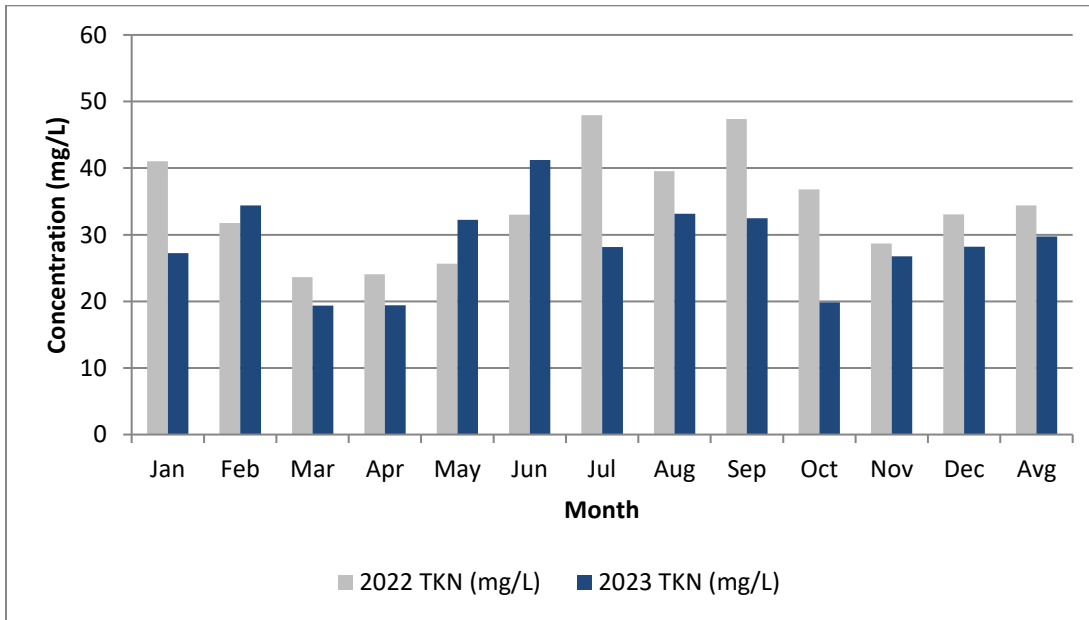
In 2023, the average raw TP concentration was 2.8 mg/L, a 16% decrease from 2022. Refer to Figure 6 for a comparison of 2023 monthly raw TP concentrations to 2022 concentrations.

Figure 6: Raw TP Concentrations



In 2023, the average raw TKN concentration was 30 mg/L, a 13% decrease from 2022. Refer to Figure 7 for a comparison of 2023 monthly raw TKN concentrations to 2022 concentrations.

Figure 7: Raw TKN Concentrations





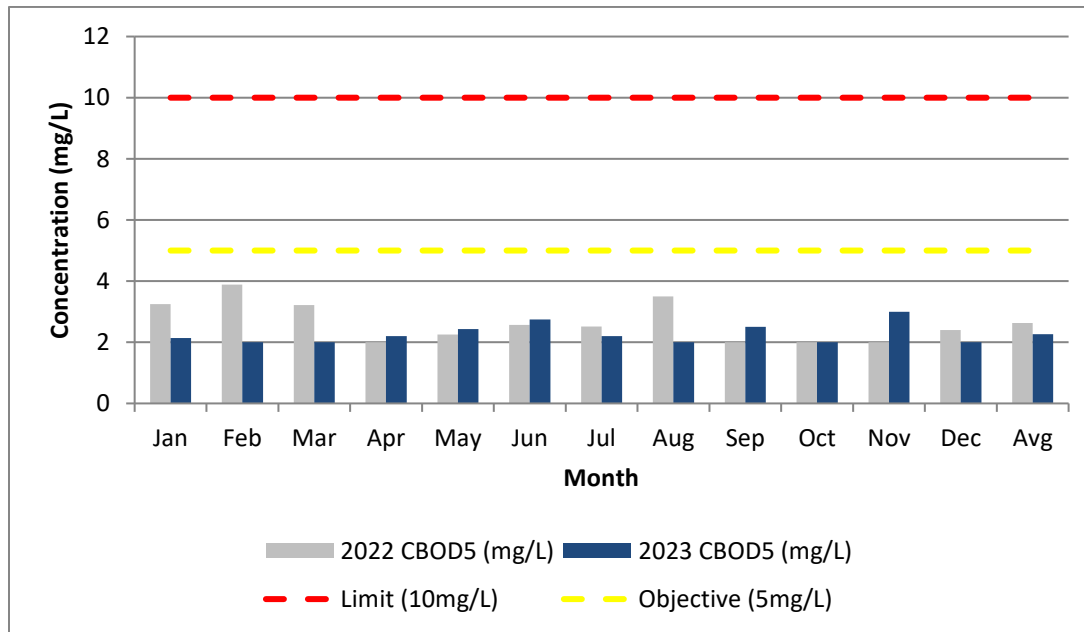
## Comparison to Compliance Limits and Objectives

Effluent from the Lucan WPCP is sampled weekly by composite sample and analyzed for Carbonaceous Biological Oxygen Demand (CBOD<sub>5</sub>), Total Suspended Solids, Total Phosphorous, Total Ammonia Nitrogen (TAN), Total Kjeldahl Nitrogen, Nitrite (NO<sub>2</sub>), Nitrate (NO<sub>3</sub>), Alkalinity, and Unionized Ammonia. Grab samples are collected weekly and tested for E. coli, pH, Dissolved Oxygen (DO) and Temperature.

Monthly average loading limits met the ECA Limits, refer to Appendix B for the data. For details on objective and limit exceedances, refer to ‘Summary of Efforts Made to Achieve Design Objectives’.

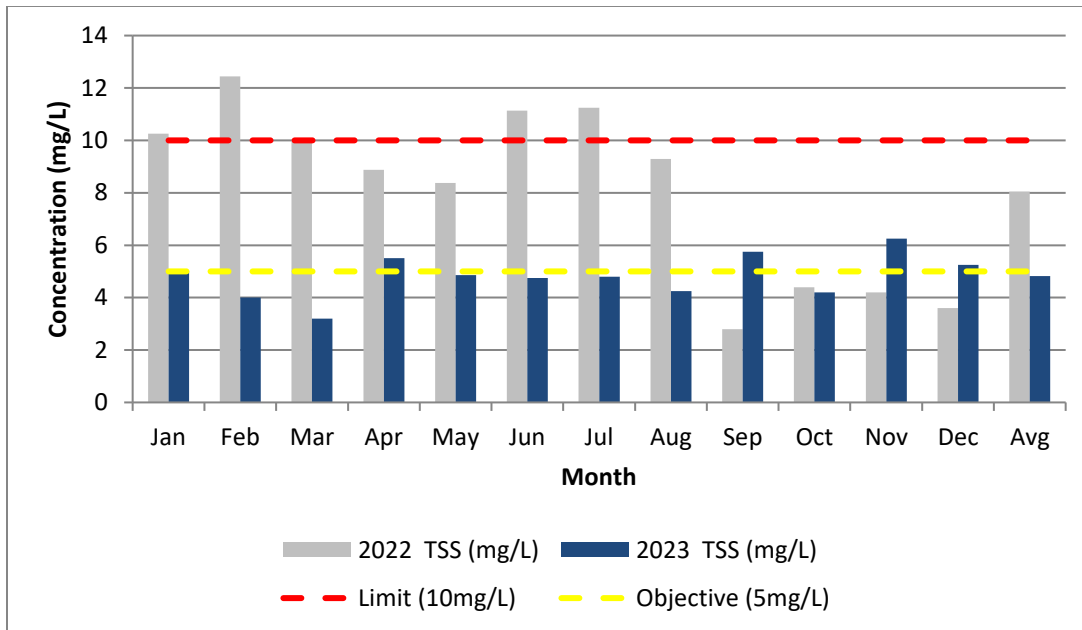
The average monthly effluent CBOD<sub>5</sub> concentration in 2023 was 2.3 mg/L, a 14% decrease from 2022. All objectives and limits were met. Refer to Figure 8 for a comparison of 2023 monthly effluent CBOD<sub>5</sub> concentrations to 2022 concentrations.

Figure 8: Effluent CBOD<sub>5</sub> Concentrations



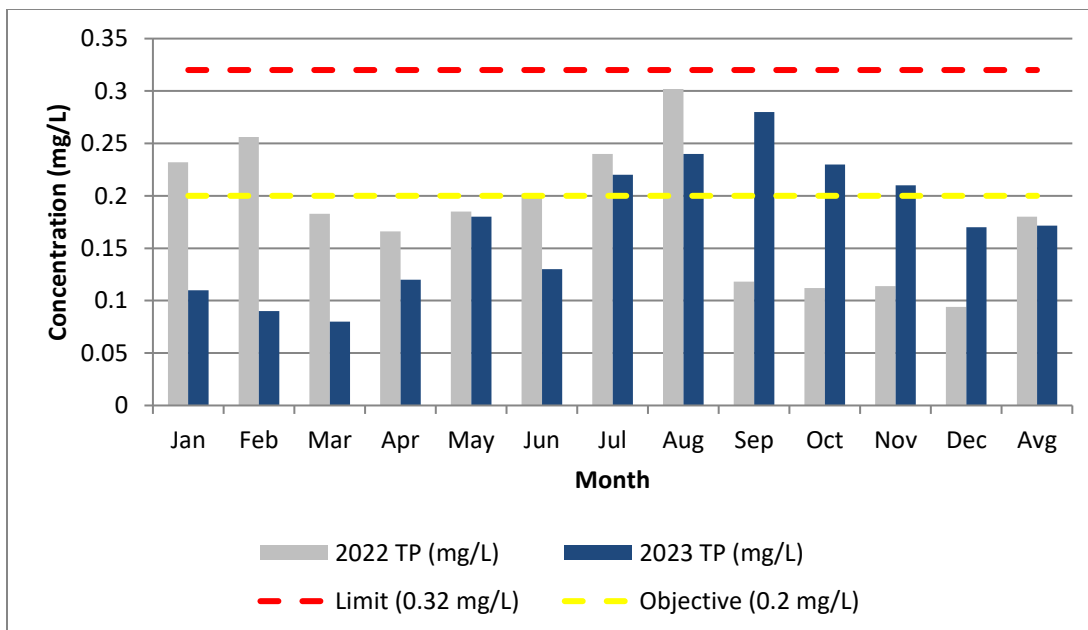
The average monthly effluent TSS concentration in 2023 was 4.8 mg/L, a 40% decrease from 2022. There were objective exceedances in April, September, and November. Note that December’s result is not over the objective, as the significant digits in the monthly average do not exceed the objective. There were no limit exceedances in 2023. Refer to Figure 9 for a comparison of 2023 monthly effluent TSS concentrations to 2022 concentrations.

Figure 9: Effluent TSS Concentrations



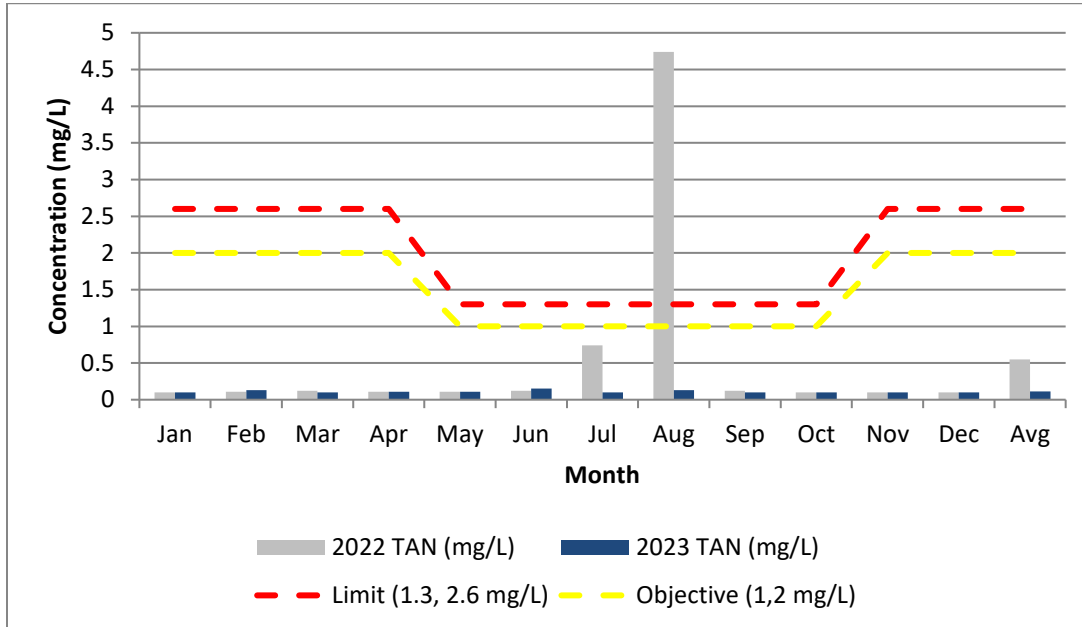
The average monthly effluent TP concentration in 2023 was 0.2 mg/L, a 5% decrease from 2022. There was one objective exceedance in September. Note that July, August, October and November results are not over the objective, as the significant digits in their monthly averages do not exceed the objective. Refer to Figure 10 for a comparison of 2023 monthly effluent TP concentrations to 2022 concentrations.

Figure 10: Effluent TP Concentrations



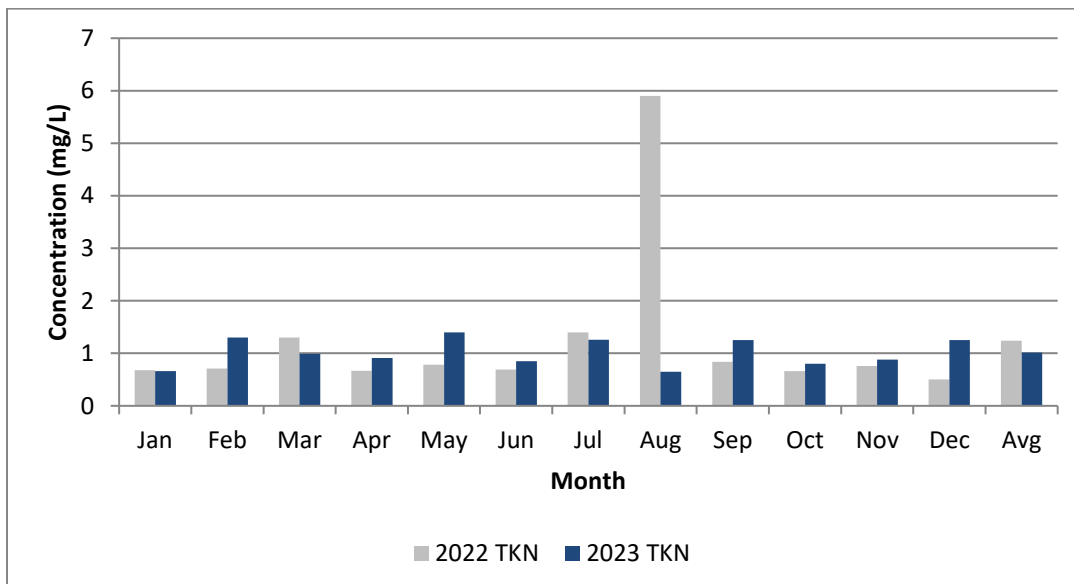
The average monthly effluent TAN concentration in 2023 was 0.1 mg/L, an 80% decrease from 2022. All objectives and limits were met. Refer to Figure 11 for a comparison of 2023 monthly effluent TAN concentrations to 2022 concentrations.

Figure 11: Effluent TAN Concentrations



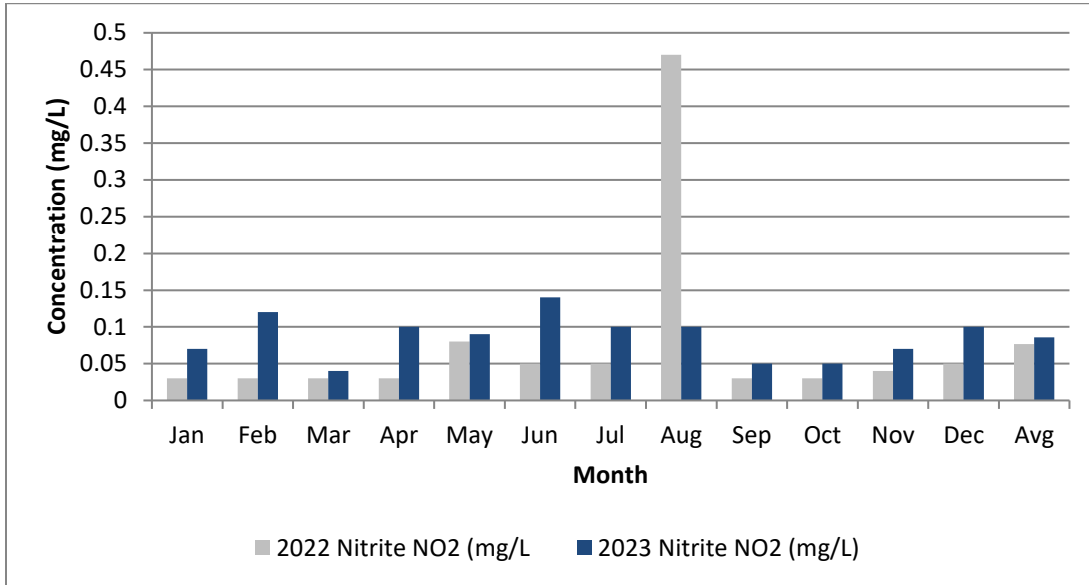
The average monthly effluent TKN concentration in 2023 was 1.0 mg/L, an 18% decrease from 2022. There are no ECA objectives or limits for TKN. Refer to Figure 12 for a comparison of 2023 monthly effluent TKN concentrations to 2022 concentrations.

Figure 12: Effluent TKN Concentrations



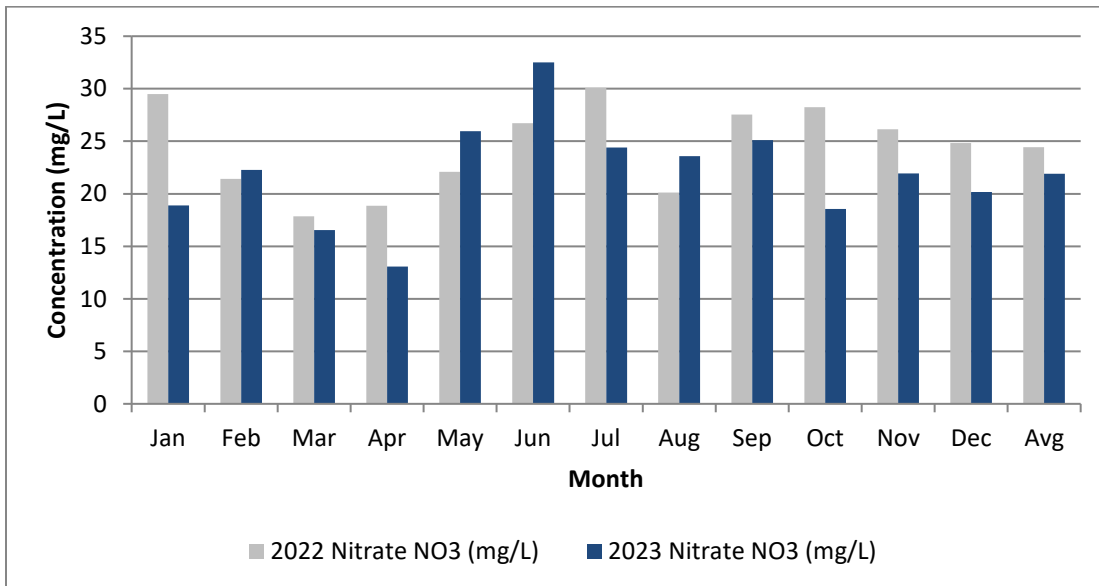
The average monthly effluent NO<sub>2</sub> concentration in 2023 was 0.09 mg/L, a 12% increase from 2022. There are no ECA objectives or limits for NO<sub>2</sub>. Refer to Figure 13 for a comparison of 2023 monthly effluent NO<sub>2</sub> concentrations to 2022 concentrations.

Figure 13: Effluent NO<sub>2</sub> Concentrations



The average monthly effluent NO<sub>3</sub> concentration in 2023 was 22 mg/L, a 12% decrease from 2022. There are no ECA objectives or limits for NO<sub>3</sub>. Refer to Figure 14 for a comparison of 2023 monthly effluent NO<sub>3</sub> concentrations to 2022 concentrations.

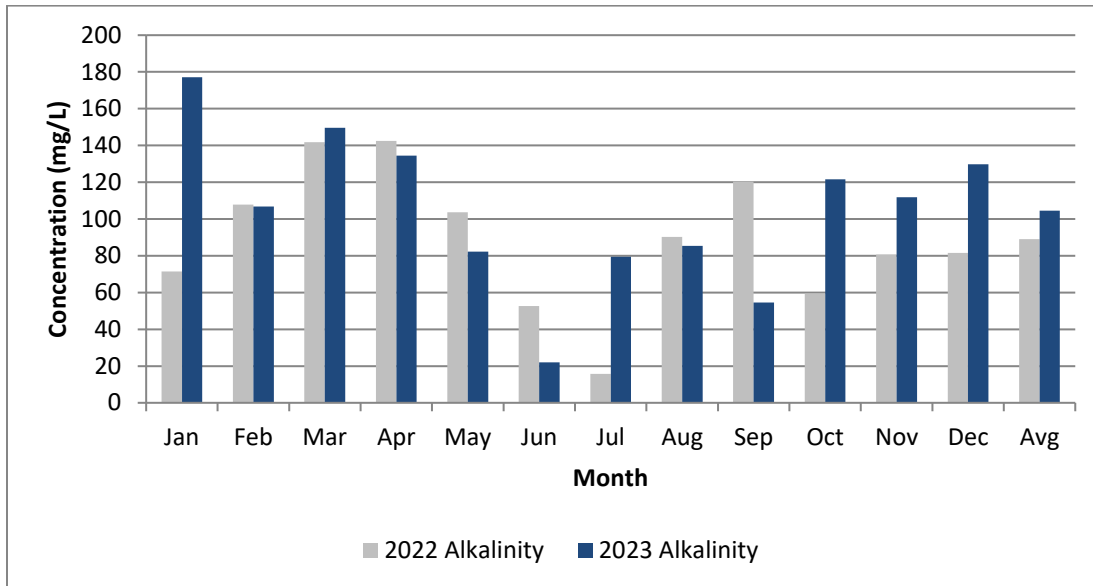
Figure 14: Effluent NO<sub>3</sub> Concentrations



The average monthly effluent Alkalinity concentration in 2023 was 105 mg/L, an 18% increase from 2022. There are no ECA objectives or limits for Alkalinity; however, an operational guideline is a

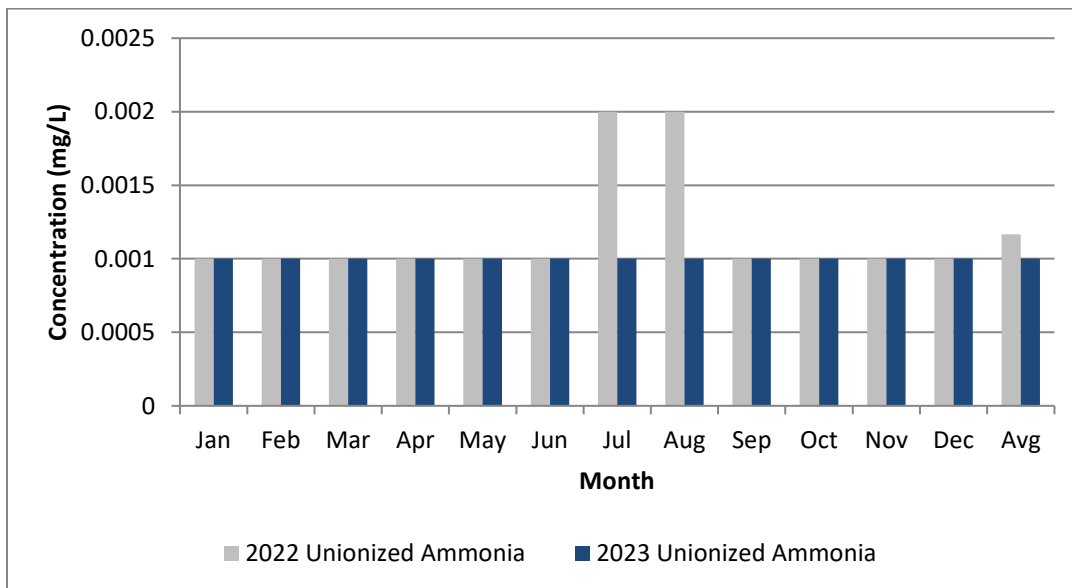
minimum of 40mg/L. Refer to Figure 15 for a comparison of 2023 monthly effluent Alkalinity concentrations to 2022 concentrations.

Figure 15: Effluent Alkalinity Concentrations



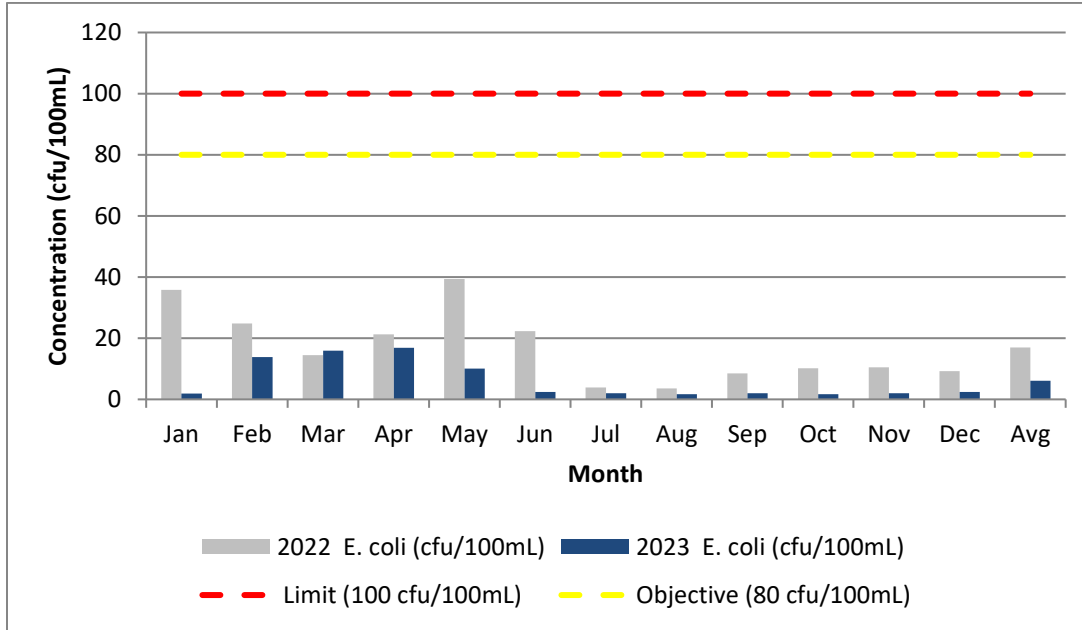
The average monthly Unionized Ammonia concentration in 2023 was 0.001 mg/L, essentially equal to the annual average in 2022 of 0.0012 mg/L. There are no ECA objectives or limits for Unionized Ammonia. Refer to Figure 16 for a comparison of 2023 monthly effluent Unionized Ammonia concentrations to 2022 concentrations.

Figure 16: Effluent Unionized Ammonia Concentrations



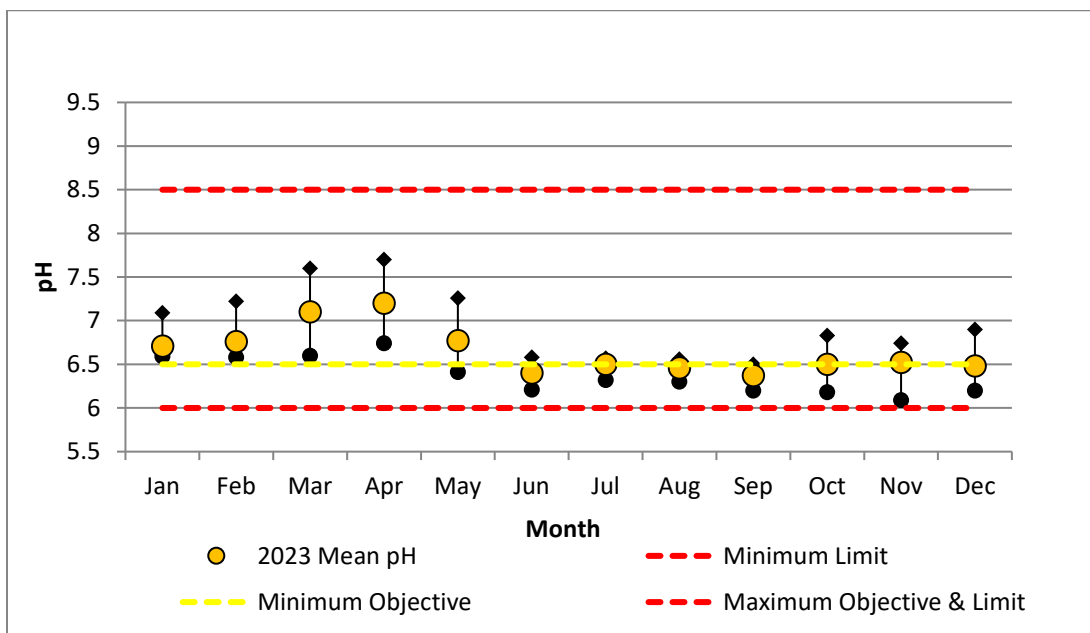
The monthly geometric mean effluent E. coli concentration in 2023 was 6 cfu/100mL, a 64% decrease from the 2022. All limits and objectives were met. Refer to Figure 17 for a comparison of 2023 monthly effluent E. coli concentrations to 2022 concentrations.

Figure 17: Effluent E. coli Concentrations



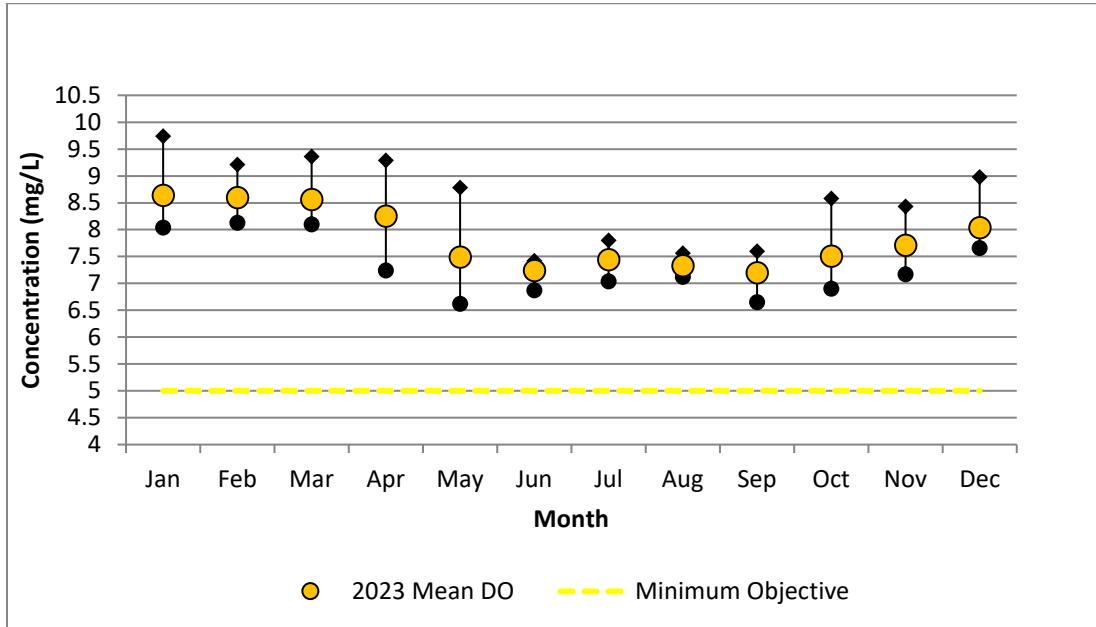
In 2023, pH at the Lucan WPCP ranged from 6.09 to 7.7. All limits were met, however the minimum pH objective was not met from June to December. Refer to Figure 18 for a comparison of 2023 monthly effluent pH values to the objectives and limits.

Figure 18: Effluent pH Values



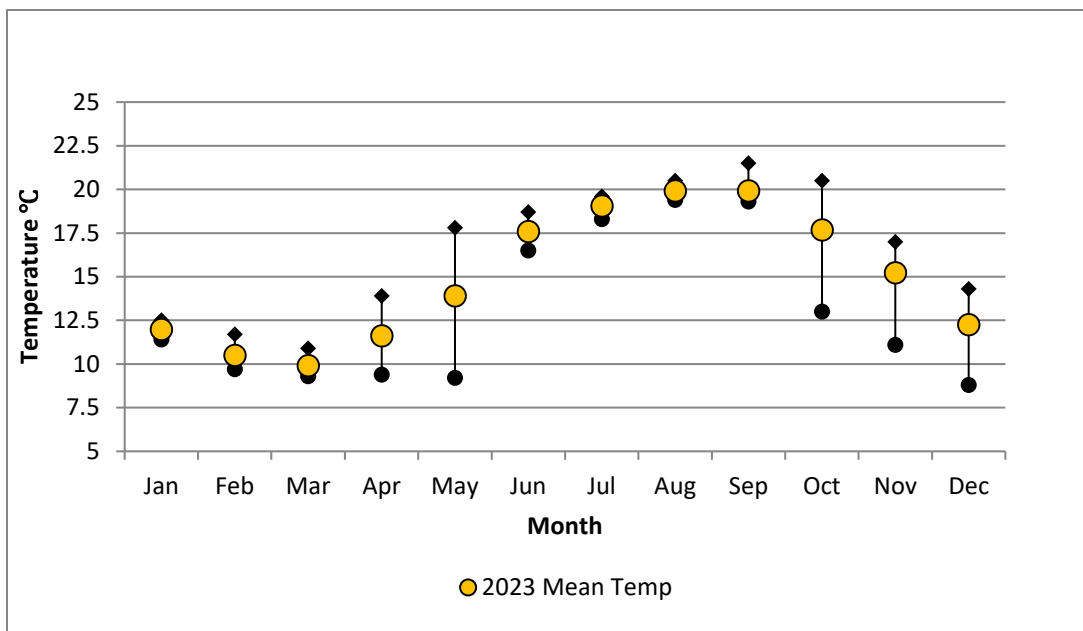
In 2023, DO at the Lucan WPCP ranged from 6.62 to 9.74 mg/L. All values in 2023 met the minimum objective. There is no DO limit. Refer to Figure 19 for a comparison of 2023 monthly effluent DO values to the minimum objective.

Figure 19: Effluent DO Concentrations



In 2023, effluent Temperature at the Lucan WPCP ranged from 8.8 °C to 21.5 °C. There are no objectives or limits for temperature. Refer to Figure 20 for monthly effluent Temperature values in 2023.

Figure 20: Effluent Temperatures



## Deviations from Monitoring Schedule

Deviations from the 2023 sample calendar are outlined in Table 1. Refer to Appendix C for the 2024 sampling schedule.

**Table 1: Summary of Deviations from Monitoring Schedule**

Scheduled Date	Collected Date	Reason for Deviation
March 13	March 14	Scheduling conflicts
April 11	April 10	Adjusted to coincide with sample for 'Outside Normal Operating Conditions' ECA requirement
April 17	April 20	Samples required to be re-taken, due to broken bottle.
May 23	May 22	Adjusted schedule due to statutory holiday
June 26	June 27	Scheduling conflicts
October 3	October 2	Adjusted schedule due to statutory holiday

## Operating Problems & Corrective Actions

A current challenge to operating the Lucan WPCP is lack of sludge storage space. In February 2023, OCWA requested and received permission from the MECP to conduct an emergency sludge haul to remove sludge from the Lucan digesters to the Lucan lagoon. There is an application under review with the MECP at this time for an amendment to the ECA to be able to haul sludge to the lagoon as needed.

Capital and major maintenance recommendations have been submitted by OCWA to the Township of Lucan Biddulph to address aging infrastructure and ongoing maintenance requirements for the WPCP to continue to produce high quality effluent. Items included on the list for 2024 are:

- UV system maintenance and parts contract
- Aeration inspection and clean out
- Replacement of aeration diffusers
- Blower rebuild or replacement
- Auto sampler replacement
- Supernatant pumps rebuild
- Alum piping replacement
- Chestnut and Joseph Street Pumping Stations float replacements
- Joseph Street Pumping Station alarm dialer upgrade

## Maintenance Activities

Preventative and corrective maintenance is assigned and monitored within the Workplace Management System (WMS) program. Refer to Appendix D for the 2023 maintenance summary. Refer to Table 2 for a list of repairs and replacements that occurred in 2023.



Table 2: Major Maintenance in 2023

Major Maintenance Wastewater
Clarifier cover tarp replaced
Disk filter 2 repaired
Blower 1 and 3 repaired
Multiple pump repairs (sanitary, backwash, aeration, RAS)
Effluent pump replacement
Alarm dialer repair – Joseph Street Pumping Station
Wet well and digester clean outs
Check valve repairs – Chestnut Pumping Station

## Effluent Quality Assurance

Effluent quality assurance is evaluated by monitoring parameters and changes throughout the facility's processes. Operational staff monitor plant performance by performing weekly in-house laboratory analysis on raw sewage, mixed liquor and effluent. Tests include: pH, Temperature, Dissolved Oxygen, Phosphorus, Ammonia, Total Suspended Solids, Settleability, and Mixed Liquor Suspended Solids. Chemical dosages and wasting rates are also monitored and recorded. Data collected from these tests provides valuable information to the operators to make the appropriate adjustments in the treatment process and take corrective actions before the plant reaches its effluent limits.

## Calibration Records

Pierce Services & Solutions Inc. calibrated influent flow meter, effluent flow meter, level sensors and level transmitters on April 4, 2023. Flow meters met the accuracy tolerance of within 15% of the actual flow rate. Pierce Services & Solutions Inc. also calibrated the pH analyzer on February 23, 2023. Operational staff complete routine pH meter verifications. Refer to Appendix E for 2023 calibration records.

## Summary of Efforts Made to Achieve Design Objectives

Design objectives were not exceeded more than 50% of the time in 2023 and there were no trends in deterioration of final effluent quality. The average influent flow has exceeded 80% of the rated capacity. Refer to Table 3 for the objectives that were exceeded along with an explanation for the exceedance. The exceedances were not related to hydraulic capacity of the plant.

Table 3: Summary of Objective Exceedances

Month	Parameter	Concentration (mg/L)	Objective (mg/L)	Issue
April	TSS	5.5	5	Temperature changes affecting treatment process
September	TSS	5.8	5	Temperature changes affecting treatment process
November	TSS	6.3	5	Temperature changes affecting treatment process
September	TP	0.28	0.2	Higher TSS concentrations

Month	Parameter	Concentration (mg/L)	Objective (mg/L)	Issue
May	pH	6.41	6.5	1 exceedance due to alum dosing lowering pH
June	pH	6.21-6.43	6.5	8 exceedances due to alum dosing lowering pH
July	pH	6.32-6.44	6.5	2 exceedances due to alum dosing lowering pH
August	pH	6.30-6.42	6.5	4 exceedances due to alum dosing lowering pH
September	pH	6.20-6.43	6.5	10 exceedances due to alum dosing lowering pH
October	pH	6.18-6.25	6.5	5 exceedances due to alum dosing lowering pH
November	pH	6.09-6.31	6.5	3 exceedances due to alum dosing lowering pH
December	pH	6.20-6.44	6.5	6 exceedances due to alum dosing lowering pH

## Sludge Generation

In 2023, the Lucan WPCP generated 2227 m<sup>3</sup> of sludge. This is a 19% decrease compared to the 2022 value of 2762 m<sup>3</sup>. Sludge generated from both the Lucan WPCP and the Granton WWTP (880.67 m<sup>3</sup>) was processed in the Lucan digesters in 2023.

A total of 3107.3 m<sup>3</sup> of sludge was hauled from the Lucan WPCP in 2023. This sludge, with the exception of 469.3 m<sup>3</sup> that was hauled to the Lucan Lagoon, was hauled to multiple NASM approved sites. Refer to Table 4 below for details.

Bio-solids analyses were conducted and showed that the bio-solids met the quality criteria specified in the 'Ontario Guidelines for Sewage Bio-solids Utilization on Agricultural Lands'. All bio-solids analyses were carried out by SGS Lakefield Research Laboratory.

It is estimated that approximately 2360 m<sup>3</sup> of sludge will be generated at the Lucan WPCP in 2024.

Table 4: Sludge Hauling 2023

Date Hauled	Volume Hauled (m <sup>3</sup> )	Location Deposited
February 17, 2023	469.3	Lucan Lagoon
April 27, 2023	88	NASM Site #24995
May 8, 2023	88	NASM Site #24995
May 9, 2023	88	NASM Site #24995
May 25, 2023	44	NASM Site #25086
May 31, 2023	528	NASM Site #25086
June 1, 2023	352	NASM Site #25086
August 31, 2023	394	NASM Site #24404
October 19, 2023	440	NASM Site #60906
November 24, 2023	616	NASM Site #60906

## Complaints

There were no complaints received for the Lucan WPCP in 2023.

## Bypass, Overflows, Spills & Abnormal Discharge Events

The ECA requires additional daily sampling for the Lucan WPCP when the plant operates outside of normal operating conditions. In 2023, there were 43 days where this occurred, 40 of which were due to heavy precipitation and three due to plant maintenance. Upon learning that the Lucan WPCP was operating outside of normal conditions, additional samples were obtained unless regular samples were already scheduled for that day. Refer to Table 5 below for a summary of sample results for samples taken when the Lucan WPCP operated outside of normal conditions. Refer to 'Comparison to Compliance Limits and Objectives' for results that coincided with weekly effluent samples.

Table 5: Sample Results for Operating Outside of Normal Conditions

Date Sample Obtained	Reason for Operating Outside of Normal Conditions	Sample Results							
		CBOD <sub>5</sub> (mg/L)	TSS (mg/L)	TP (mg/L)	TKN (mg/L)	TAN (mg/L)	NO <sub>2</sub> (mg/L)	NO <sub>3</sub> (mg/L)	Alkalinity (mg/L)
January 5	Heavy Rain	<2	7	0.15	<0.5	<0.1	0.04	14.5	164
January 6	Heavy Rain	<2	6	0.12	<0.5	<0.1	0.04	13.5	179
February 9	Maintenance – Clarifier Offline	<2	3	0.08	1.2	<0.1	<0.03	23.4	95
February 10	Maintenance – Clarifier Offline	<2	8	0.18	1.6	0.2	0.29	15.7	128
March 7	Maintenance – Filter Offline	<2	3	0.09	1.4	<0.1	0.05	19.1	123
March 23	Heavy Rain	<2	2	0.09	1.0	<0.1	0.08	16.6	166
March 24	Heavy Rain	<2	3	0.10	0.8	<0.1	<0.03	12.9	171
March 29	Heavy Rain	<2	2	0.07	0.6	<0.1	0.05	14.8	168
March 30	Heavy Rain	<2	2	0.09	1.8	<0.1	0.04	16	159
March 31	Heavy Rain	<2	3	0.09	1.7	<0.1	0.04	17.7	138
April 5	Heavy Rain	2	7	0.14	<0.5	<0.1	<0.03	10.4	164
April 6	Heavy Rain	<2	4	0.08	<0.5	0.1	0.09	10.4	166
April 7	Heavy Rain	<2	5	0.10	0.6	<0.1	0.06	11.1	176
April 12	Heavy Rain	2	6	0.12	1.1	<0.1	0.08	10.6	115
April 13	Heavy Rain	<2	7	0.10	0.6	<0.1	0.15	11.0	123
April 14	Heavy Rain	4	7	0.12	1.4	0.1	0.11	10.5	107
May 4	Heavy Rain	5	6	0.21	1.4	0.1	0.04	18.9	127
May 5	Heavy Rain	2	6	0.19	1.2	0.1	0.04	19	133

Additional daily samples are also required when there is a bypass or overflow event. There were no bypasses or overflows in 2023 in the Lucan WPCP or WWC system.

### Notice of Modification to the Works

There were no 'Notice of Modification to Sewage Works' forms submitted in 2023.

### Summary of Efforts made to achieve conformance with F-5-1

The Township of Lucan Biddulph is a separated collection system, therefore a Pollution Prevention Control Program is not required to be established or maintained.

There is one designed overflow at the Chestnut Pumping Station for the Lucan WWC system. No overflows or bypasses occurred in 2023, therefore no projects were completed to reduce or eliminate bypasses/overflows.

# Appendix A

CLI-ECA Annual Report (Prepared by Township of  
Lucan Biddulph)

# Linear Infrastructure Annual Performance Report

## Lucan Collection System

Prepared by: the Township of Lucan Biddulph

## Section 1: Operating Problems and Corrective Actions

*Requirement for this section:*

*CLI-ECA Schedule E Condition 4.6.4*

*No operating problems.*

## Section 2: Calibration, Maintenance and Repairs

*Requirement for this section:*

*CLI-ECA Schedule E Condition 4.6.5*

*2023 annual flushing.*

- *Chestnut St, Walnut St, Walnut Grove Place, Campanale Way, Gilmore Drive, Hardy Crt, Beech Street, Gibson St, Nicolson St and Willow Ave.*

## Section 3: Alterations to the System

*Requirement for this section:*

*CLI-ECA Schedule E Condition 4.6.7*

*No alterations.*

## Section 4: Community Complaints and Concerns

*Requirement for this section:*

*CLI-ECA Schedule E Condition 4.6.6*

*Aug 24, 137 Alice Street had a concern of the sanitary draining slowly. Staff used a camera from the basement out and found no issues with the sanitary.*

## Section 5: Spills of Sewage

*Requirement for this section:*

*CLI-ECA Schedule E Condition 4.6.3, 4.6.8, 4.6.9*

*No spills.*

# Appendix B

## Monitoring Data



**1221 LUCAN WASTEWATER TREATMENT FACILITY 110002817**

	1 / 2023	2 / 2023	3 / 2023	4 / 2023	5 / 2023	6 / 2023	7 / 2023	8 / 2023	9 / 2023	10 / 2023	11 / 2023	12 / 2023	<--Total-->	<--Avg-->	<--Max-->	<-Criteria-->
<b>Flows</b>																
Raw Flow: Total - Raw Sewage m³/d	43,883.00	35,976.00	56,504.00	60,261.00	35,720.00	27,903.00	32,951.00	36,509.00	34,422.00	48,489.00	46,129.00	54,335.00	513,082.00			0.00
Raw Flow: Total - Lagoon Flow m³/d	946.00	3,501.00	2,665.00	21,126.00	179.00	21.00	11,658.00	1,390.00	25.00	4,649.00	161.00	2,728.00	49,049.00			0.00
Raw Flow: Avg - Raw Sewage m³/d	1,415.58	1,284.86	1,822.71	2,008.70	1,152.26	930.10	1,062.94	1,177.71	1,147.40	1,564.16	1,537.63	1,752.74		1,405.70		1,700.00
Raw Flow: Avg - Lagoon Flow m³/d	30.52	125.04	85.97	704.20	5.77	0.70	376.06	44.84	0.83	149.97	5.37	88.00		134.38		
Raw Flow: Max - Raw Sewage m³/d	2,571.00	2,569.00	2,987.00	3,125.00	1,905.00	1,427.00	1,720.00	2,630.00	1,510.00	3,036.00	2,802.00	2,849.00			3,125.00	0.00
Raw Flow: Max - Lagoon Flow m³/d	372.00	1,516.00	1,314.00	3,662.00	103.00	11.00	3,028.00	471.00	25.00	3,177.00	98.00	1,175.00			3,662.00	0.00
Raw Flow: Count - Raw Sewage m³/d	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00	365.00			0.00
Raw Flow: Count - Lagoon Flow m³/d	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00	365.00			0.00
Eff. Flow: Total - Final Effluent m³/d	43,015.91	34,312.75	55,439.75	58,638.47	34,351.15	26,316.17	31,797.64	35,263.56	32,887.92	46,766.04	43,866.07	52,416.88	495,072.31			0.00
Eff. Flow: Avg - Final Effluent m³/d	1,387.61	1,225.46	1,788.38	1,954.62	1,108.10	877.21	1,025.73	1,137.53	1,096.26	1,508.58	1,462.20	1,690.87		1,356.36		
Eff. Flow: Max - Final Effluent m³/d	2,516.12	2,277.01	2,938.69	3,104.86	1,826.05	1,385.26	1,694.55	2,598.01	1,464.68	3,023.90	2,745.33	2,813.00			3,104.86	0.00
Eff Flow: Count - Final Effluent m³/d	31.00	28.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00	365.00			0.00
<b>Carbonaceous Biochemical Oxygen Demand: CBOD</b>																
Eff: Avg cBOD5 - Final Effluent mg/L	< 2.14	< 2.00	< 2.00	< 2.20	< 2.43	< 2.75	< 2.20	< 2.00	< 2.50	< 2.00	< 3.00	< 2.00		< 2.23	< 3.00	10.00
Eff: # of samples of cBOD5 - Final Effluent	7.00	6.00	10.00	10.00	7.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	70.00			0.00
Loading: cBOD5 - Final Effluent kg/d	< 2.973	< 2.451	< 3.577	< 4.300	< 2.691	< 2.412	< 2.257	< 2.275	< 2.741	< 3.017	< 4.387	< 3.382		< 3.02	< 4.39	17.000
<b>Biochemical Oxygen Demand: BOD5</b>																
Raw: Avg BOD5 - Raw Sewage mg/L	118.20	141.00	56.75	77.25	138.20	169.00	103.40	109.75	111.50	73.80	97.25	89.75		107.15	169.00	0.00
Raw: # of samples of BOD5 - Raw Sewage	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
<b>Total Suspended Solids: TSS</b>																
Raw: Avg TSS - Raw Sewage mg/L	50.80	67.00	43.50	37.25	48.80	75.50	46.80	76.50	46.50	44.40	49.00	53.25		53.28	76.50	0.00
Raw: # of samples of TSS - Raw Sewage	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
Eff: Avg TSS - Final Effluent mg/L	5.00	4.00	3.20	5.50	4.86	4.75	4.80	4.25	5.75	4.20	6.25	5.25		4.71	6.25	10.00
Eff: # of samples of TSS - Final Effluent	7.00	6.00	10.00	10.00	7.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	70.00			0.00
Loading: TSS - Final Effluent kg/d	6.938	4.902	5.723	10.750	5.382	4.167	4.924	4.835	6.304	6.336	9.139	8.877		6.39	10.75	17.000
Percent Removal: TSS - Raw Sewage %	90.16	94.03	92.64	85.23	90.05	93.71	89.74	94.44	87.63	90.54	87.24	90.14		90.46	94.44	0.00
<b>Total Phosphorus: TP</b>																
Raw: Avg TP - Raw Sewage mg/L	2.57	3.26	1.79	1.80	3.61	4.55	2.91	3.28	3.04	1.94	2.49	2.24		2.79	4.55	0.00
Raw: # of samples of TP - Raw Sewage	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
Eff: Avg TP - Final Effluent mg/L	0.11	0.09	0.08	0.12	0.18	0.16	0.22	0.24	0.28	0.23	0.21	0.17		0.16	0.28	0.32
Eff: # of samples of TP - Final Effluent	7.00	6.00	10.00	10.00	7.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	70.00			0.00

Loading: TP - Final Effluent kg/d	0.151	0.114	0.150	0.225	0.198	0.136	0.224	0.273	0.301	0.350	0.311	0.292		0.21	0.35	0.550
Percent Removal: TP - Raw Sewage %	95.77	97.13	95.30	93.62	95.05	96.59	92.50	92.69	90.95	88.03	91.47	92.31		93.45	97.13	0.00

**Nitrogen Series**

Raw: Avg TKN - Raw Sewage mg/L	27.24	34.40	19.35	19.43	32.22	41.23	28.16	33.15	32.48	19.82	26.75	28.20		28.53	41.23	0.00
Raw: # of samples of TKN - Raw Sewage	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00
Eff: Avg TAN - Final Effluent mg/L	< 0.10	< 0.13	< 0.10	< 0.11	< 0.11	< 0.15	< 0.10	< 0.13	< 0.10	< 0.10	< 0.10	< 0.10		< 0.11	< 0.15	2.60
Eff: # of samples of TAN - Final Effluent	7.00	6.00	10.00	10.00	7.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	70.00			0.00
Loading: TAN - Final Effluent kg/d	< 0.139	< 0.163	< 0.179	< 0.215	< 0.127	0.132	< 0.103	< 0.142	< 0.110	< 0.151	< 0.146	< 0.169		< 0.15	< 0.22	2.300
Eff: Avg NO3-N - Final Effluent mg/L	18.90	22.27	16.55	13.08	25.96	32.50	24.40	23.58	25.10	18.54	21.93	20.18		21.91	32.50	0.00
Eff: # of samples of NO3-N - Final Effluent	7.00	6.00	10.00	10.00	7.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	70.00			0.00
Eff: Avg NO2-N - Final Effluent mg/L	0.07	< 0.12	< 0.04	< 0.10	0.09	0.14	0.10	0.10	0.05	0.05	0.07	0.10		0.09	0.14	0.00
Eff: # of samples of NO2-N - Final Effluent	7.00	6.00	10.00	10.00	7.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	70.00			0.00

**Disinfection**

Eff: GMD E. Coli - Final Effluent cfu/100mL	11.86	13.80	15.92	16.88	10.07	2.38	2.00	1.68	2.00	1.74	2.00	2.38				100.00
Eff: # of samples of E. Coli - Final Effluent	5.00	4.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00	52.00			0.00

# Appendix C

## 2024 Sample Calendar



# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 1 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

◀ December	<b>January 2024</b>					February ▶
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 STAT	2 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	3	4	5	6
7	8	9 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	10	11	12	13
14	15	16 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	17	18	19	20
21	22	23 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	24	25	26	27
28	29	30 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	31			

**Rated Capacity: 1700 m<sup>3</sup>/day calculated annually**  
**Outside Normal Operating Conditions: >3600m<sup>3</sup>/day**

- Raw Sample:** Weekly Composite (BOD5, TSS, TP, TKN)
- Final Effluent:** Weekly Composite (CBOD5, TSS, TP, TAN, TKN, NO2, NO3, Alkalinity, Unionized Ammonia)  
Weekly Grab (E. coli, pH, DO, Temperature)
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**Notes:** Initial on date when sample was taken. Add any additional sampling completed for the facility.

**Revision History**

Date	Revision #	Reason for Revision	Revision By
2023-12-20	0	Issued Schedule	Heather Wharram



# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 2 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

<b>◀ January</b>	<b>February 2024</b>					<b>March ▶</b>
<b>Sun</b>	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>
				1	2	3
4	5	6 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	7	8	9	10
11	12	13 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	14	15	16	17
18	19 STAT	20 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	21	22	23	24
25	26	27 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	28	29		

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2023-12-20	0	Issued Schedule	Heather Wharram



# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 3 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

<b>◀ February</b>	<b>March 2024</b>					<b>April ▶</b>
<b>Sun</b>	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>
					1	2
3	4	5 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	6	7	8	9
10	11	12 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	13	14	15	16
17	18	19 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	20	21	22	23
24  31	25	26 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	27	28	29 STAT	30

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# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 4 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

◀ March	<b>April 2024</b>					May ▶
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 STAT	2 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	3	4	5	6
7	8	9 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	10	11	12	13
14	15	16 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	17	18	19	20
21	22	23 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	24	25	26	27
28	29	30 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent				

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2023-12-20	0	Issued Schedule	Heather Wharram



# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 5 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

<b>◀ April</b>	<b>May 2024</b>					<b>June ▶</b>
<b>Sun</b>	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>
			1	2	3	4
5	6	7 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	8	9	10	11
12	13	14 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	15	16	17	18
19	20 STAT	21 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	22	23	24	25
26	27	28 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	29	30	31	

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# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 6 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

<b>◀ May</b>	<b>June 2024</b>					<b>July ▶</b>
<b>Sun</b>	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>
						1
2	3	4 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	5	6	7	8
9	10	11 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	12	13	14	15
16	17	18 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	19	20	21	22
23  30	24	25 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	26	27	28	29

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2023-12-20	0	Issued Schedule	Heather Wharram



# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 7 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

<b>◀ June</b>	<b>July 2024</b>					<b>August ▶</b>
<b>Sun</b>	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>
	1 STAT	2 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	3	4	5	6
7	8	9 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	10	11	12	13
14	15	16 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	17	18	19	20
21	22	23 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	24	25	26	27
28	29	30 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	31			

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# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 8 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

◀ July	<b>August 2024</b>						September ▶
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
				1	2	3	
4	5 STAT	6 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	7	8	9	10	
11	12	13 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	14	15	16	17	
18	19	20 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	21	22	23	24	
25	26	27 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	28	29	30	31	

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# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 9 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

◀ August	<b>September 2024</b>						October ▶
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
1	2 STAT	3 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	4	5	6	7	
8	9	10 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	11	12	13	14	
15	16	17 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	18	19	20	21	
22	23	24 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	25	26	27	28	
29	30						

**Rated Capacity: 1700 m<sup>3</sup>/day calculated annually**  
**Outside Normal Operating Conditions: >3600m<sup>3</sup>/day**

- Raw Sample:** Weekly Composite (BOD5, TSS, TP, TKN)
- Final Effluent:** Weekly Composite (CBOD5, TSS, TP, TAN, TKN, NO2, NO3, Alkalinity, Unionized Ammonia)  
Weekly Grab (E. coli, pH, DO, Temperature)
- Sludge:** Collect Composite (same parameters outlined above) when 'Outside Normal Operating Conditions'
- Mixed Liquor:** Monthly Grab (See Chain of Custody) (Non-ECA, Required for Land Application)  
Monthly Grab from Aeration Cells (MLVSS Testing) (Non-ECA)

**Notes:** Initial on date when sample was taken. Add any additional sampling completed for the facility.

**Revision History**

Date	Revision #	Reason for Revision	Revision By
2023-12-20	0	Issued Schedule	Heather Wharram



# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 10 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

<b>◀ September</b>	<b>October 2024</b>					<b>November ▶</b>
<b>Sun</b>	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>
		1 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	2	3	4	5
6	7	8 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	9	10	11	12
13	14 STAT	15 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	16	17	18	19
20	21	22 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	23	24	25	26
27	28	29 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	30	31		

**Rated Capacity: 1700 m<sup>3</sup>/day calculated annually**  
**Outside Normal Operating Conditions: >3600m<sup>3</sup>/day**

- Raw Sample:** Weekly Composite (BOD5, TSS, TP, TKN)
- Final Effluent:** Weekly Composite (CBOD5, TSS, TP, TAN, TKN, NO2, NO3, Alkalinity, Unionized Ammonia)  
Weekly Grab (E. coli, pH, DO, Temperature)  
Collect Composite (same parameters outlined above) when 'Outside Normal Operating Conditions'
- Sludge:** Monthly Grab (See Chain of Custody) (Non-ECA, Required for Land Application)
- Mixed Liquor:** Monthly Grab from Aeration Cells (MLVSS Testing) (Non-ECA)

**Notes:** Initial on date when sample was taken. Add any additional sampling completed for the facility.

**Revision History**

Date	Revision #	Reason for Revision	Revision By
2023-12-20	0	Issued Schedule	Heather Wharram



# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 11 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

<b>◀ October</b>	<b>November 2024</b>					<b>December ▶</b>
<b>Sun</b>	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>
					1	2
3	4	5 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	6	7	8	9
10	11 STAT	12 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	13	14	15	16
17	18	19 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	20	21	22	23
24	25	26 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	27	28	29	30

**Rated Capacity: 1700 m<sup>3</sup>/day calculated annually**  
**Outside Normal Operating Conditions: >3600m<sup>3</sup>/day**

- Raw Sample:** Weekly Composite (BOD5, TSS, TP, TKN)
- Final Effluent:** Weekly Composite (CBOD5, TSS, TP, TAN, TKN, NO2, NO3, Alkalinity, Unionized Ammonia)  
Weekly Grab (E. coli, pH, DO, Temperature)
- Sludge:** Collect Composite (same parameters outlined above) when 'Outside Normal Operating Conditions'
- Mixed Liquor:** Monthly Grab (See Chain of Custody) (Non-ECA, Required for Land Application)  
Monthly Grab from Aeration Cells (MLVSS Testing) (Non-ECA)

**Notes:** Initial on date when sample was taken. Add any additional sampling completed for the facility.

**Revision History**

Date	Revision #	Reason for Revision	Revision By
2023-12-20	0	Issued Schedule	Heather Wharram



# Sample Schedule 2024 Lucan Water Pollution Control Plant

Rev. Date: 2023-12-20  
Rev.#: 0  
Pages: 12 of 12

Reviewed by: QEMS Representative

Approved by: Operations Management

◀ November	<b>December 2024</b>						January ▶
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
1	2	3 <input type="checkbox"/> Raw <input type="checkbox"/> Sludge <input type="checkbox"/> Mixed Liquor <input type="checkbox"/> Final Effluent	4	5	6	7	
8	9	10 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	11	12	13	14	
15	16	17 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	18	19	20	21	
22	23 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	24	25 STAT	26 STAT	27	28	
29	30 <input type="checkbox"/> Raw <input type="checkbox"/> Final Effluent	31					

**Rated Capacity: 1700 m<sup>3</sup>/day calculated annually**  
**Outside Normal Operating Conditions: >3600m<sup>3</sup>/day**

- Raw Sample:** Weekly Composite (BOD5, TSS, TP, TKN)
- Final Effluent:** Weekly Composite (CBOD5, TSS, TP, TAN, TKN, NO2, NO3, Alkalinity, Unionized Ammonia)  
Weekly Grab (E. coli, pH, DO, Temperature)
- Sludge:** Collect Composite (same parameters outlined above) when 'Outside Normal Operating Conditions'
- Mixed Liquor:** Monthly Grab (See Chain of Custody) (Non-ECA, Required for Land Application)  
Monthly Grab from Aeration Cells (MLVSS Testing) (Non-ECA)

**Notes:** Initial on date when sample was taken. Add any additional sampling completed for the facility.

**Revision History**

Date	Revision #	Reason for Revision	Revision By
2023-12-20	0	Issued Schedule	Heather Wharram

# Appendix D

## Maintenance Summary



Workorder Summary Report

WO #	Asset ID	Asset Description	Location Description	Class	Work Order Description	Workorder Details		
						Status	Schedule Start	Actual Finish
<a href="#">3156557</a>	0000277880	SAMPLER 02 AUTO	1221, Lucan Wastewater System, Process, Process Control & Monitoring	Refurbish/Replace /Repair	Sampler 02 Auto Service (1y) 1221	CLOSE	1/1/23 12:00 AM	4/25/23 10:56 AM
<a href="#">3156566</a>	0000277871	ANALYZER GAS MONITOR	1221, Lucan Wastewater System, Process, Process Control & Monitoring	Refurbish/Replace /Repair	Analyzer Gas Monitor Insp/Service (6m) 1221	CLOSE	1/1/23 12:00 AM	3/21/23 02:53 PM
<a href="#">3156570</a>	0000277851	TANK STORAGE ALUM	1221, Lucan Wastewater System, Process, Secondary Treatment	Inspection	Tank Storage Alum Insp/Service (1y) 1221	CLOSE	1/1/23 12:00 AM	2/4/23 01:16 PM
<a href="#">3156825</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Gas Analyzers Insp (1y) 1221	CLOSE	1/1/23 12:00 AM	3/29/23 11:09 AM
<a href="#">3156829</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Chemical System Flushing (1m) 1221	CLOSE	1/1/23 12:00 AM	2/2/23 08:16 PM
<a href="#">3156832</a>			1221, Lucan Wastewater System	Inspection	PH Probe Insp/Calib (1m) 1221	CLOSE	1/1/23 12:00 AM	1/8/23 11:22 AM
<a href="#">3156837</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	1/1/23 12:00 AM	2/2/23 08:17 PM
<a href="#">3156842</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	UV Channel Flushing (1m) 1221	CLOSE	1/1/23 12:00 AM	2/2/23 08:13 PM
<a href="#">3156976</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power Generation	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	1/1/23 12:00 AM	1/8/23 11:24 AM
<a href="#">3157521</a>			1221, Lucan Wastewater System	Health and Safety	WHMIS/MSDS/NSF Review and	CLOSE	1/1/23 12:00 AM	3/17/23 02:22 PM
<a href="#">3162628</a>			1221, Lucan Wastewater System	Inspection	Sludge Storage Capacity Inspection (6m) 1221	CLOSE	1/1/23 12:00 AM	1/22/23 05:50 PM
<a href="#">3180437</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	1/1/23 12:00 AM	1/8/23 11:23 AM
<a href="#">3202330</a>			1221, Lucan Wastewater System,	Compliance	RP03 Annual Report ECA (1y) 1221	CLOSE	1/7/23 12:00 AM	3/17/23 02:15 PM
<a href="#">3203193</a>			Lucan Wastewater System	Refurbish/Replace /Repair	1221 alum pump line repair January 11 2023	CLOSE		1/11/23 11:22 AM
<a href="#">3203356</a>			1221, Lucan Wastewater System	Compliance	WSEER Quarterly Reporting (3m)	CLOSE	1/12/23 12:00 AM	1/16/23 12:56 PM
<a href="#">3204617</a>			Lucan Wastewater System	Refurbish/Replace /Repair	1221 Cleaning Grit separator and headworks channel -January 18, 30, 2023	CLOSE		1/18/23 12:52 PM
<a href="#">3206123</a>	0000277877	GEAR DRIVE CLASSIFIER	1221, Lucan Wastewater System, Process, Headworks	Refurbish/Replace /Repair	Replaced frozen water scour line on classifier in the headworks building 1221	CLOSE		2/1/23 08:46 AM
<a href="#">3211445</a>	0000277895	FILTER 01	1221, Lucan Wastewater System, Process, Tertiary Treatment	Refurbish/Replace /Repair	Filter #1 Insp/Service (1y) 1221	CLOSE	2/1/23 12:00 AM	6/9/23 01:11 PM
<a href="#">3211448</a>	0000277896	FILTER 02	1221, Lucan Wastewater System, Process, Tertiary Treatment	Refurbish/Replace /Repair	Filter #2 Insp/Service (1y) 1221	CLOSE	2/1/23 12:00 AM	6/9/23 01:13 PM
<a href="#">3211451</a>	0000277899	PUMP CENT 01 RECIRC PUMP	1221, Lucan Wastewater System, Process, Secondary Treatment	Refurbish/Replace /Repair	Pump Cent 01 Recirc Insp/Service (1y) 1221 backwash pump	CLOSE	2/1/23 12:00 AM	5/30/23 07:57 AM
<a href="#">3211454</a>	0000277900	PUMP CENT 02 FILTER 02 RECIRC	1221, Lucan Wastewater System, Process, Secondary Treatment	Refurbish/Replace /Repair	Pump Cent 02 Filter Recirc Insp/Service (1y) 1221 backwash pump	CLOSE	2/1/23 12:00 AM	5/30/23 07:58 AM
<a href="#">3211609</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Spill Kit Inspect (6m) 1221	CLOSE	2/1/23 12:00 AM	2/26/23 09:53 AM
<a href="#">3211611</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Chemical System Flushing (1m) 1221	CLOSE	2/1/23 12:00 AM	3/8/23 03:36 PM
<a href="#">3211614</a>			1221, Lucan Wastewater System	Inspection	PH Probe Insp/Calib (1m) 1221	CLOSE	2/1/23 12:00 AM	2/4/23 01:19 PM
<a href="#">3211619</a>			1221, Lucan Wastewater System	Inspection	Lifting Device Insp (1y) 1221	CLOSE	2/1/23 12:00 AM	5/10/23 02:43 PM
<a href="#">3211623</a>			1221, Lucan Wastewater System	Health and Safety	MSDS Review - (6m) 1221	CLOSE	2/1/23 12:00 AM	3/9/23 11:26 AM
<a href="#">3211630</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	2/1/23 12:00 AM	2/28/23 11:22 AM
<a href="#">3211635</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	UV Channel Flushing (1m) 1221	CLOSE	2/1/23 12:00 AM	3/3/23 02:05 PM
<a href="#">3211746</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power Generation	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	2/1/23 12:00 AM	2/24/23 10:31 AM
<a href="#">3212250</a>			1221, Lucan Wastewater System	Compliance	OG111 OCWA's Fleet Policy Review (1y) 1221/1261	CLOSE	2/1/23 12:00 AM	3/24/23 10:19 AM

<a href="#">3216620</a>			1221, Lucan Wastewater System	Inspection	UPS Inspection (1y) 1221/1261	CLOSE	2/1/23 12:00 AM	2/24/23 10:35 AM
<a href="#">3228162</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	2/1/23 12:00 AM	2/15/23 02:58 PM
<a href="#">3244884</a>			Lucan Wastewater System	Refurbish/Replace/Repair	1221 filter #2 shaft weld required-filter pieces uneven Feb 2023	CLOSE		3/16/23 08:49 PM
<a href="#">3244886</a>	0000277882	DRIVE FINAL CLARIFIER #1	1221, Lucan Wastewater System, Process, Process Control & Monitoring	Refurbish/Replace/Repair	1221 clarifier #1 failure -Feb 2023	CLOSE		2/15/23 02:59 PM
<a href="#">3245655</a>			1221, Lucan Wastewater System, Process, Headworks	Refurbish/Replace/Repair	Mechanical filter #2 wheel slipping on drive shaft 1221	CLOSE		4/21/23 10:34 AM
<a href="#">3245875</a>			Lucan Wastewater System	Refurbish/Replace/Repair	1221 alum line leak repair Feb 14 2023	CLOSE		2/15/23 11:49 AM
<a href="#">3245912</a>	0000277862	BLOWER 01 AIR	1221, Lucan Wastewater System, Process, Secondary Treatment	Refurbish/Replace/Repair	Aeration Blower #1 remove for rebuild or replacement Lucan 1221	CLOSE		2/15/23 03:02 PM
<a href="#">3247884</a>			1221, Lucan Wastewater System	Refurbish/Replace/Repair	installed PLC CPU batteries @ Granton PS, Lucan WWTP, and Lucan Filter panel	CLOSE		2/28/23 03:08 PM
<a href="#">3252837</a>			1221, Lucan Wastewater System	Calibration	Meter Flow Route Insp/Service (1y) 1221	CLOSE	3/1/23 12:00 AM	4/6/23 01:59 PM
<a href="#">3252913</a>	0000277854	METER LEVEL ALUM TANK	1221, Lucan Wastewater System, Process, Process	Calibration	Meter Level Route Insp/Service (1y) 1221	CLOSE	3/1/23 12:00 AM	4/6/23 02:01 PM
<a href="#">3253082</a>			1221, Lucan Wastewater System	Calibration	Flow Meters/Miltronics Insp (1y) 1221	CLOSE	3/1/23 12:00 AM	4/6/23 12:04 PM
<a href="#">3253087</a>			1221, Lucan Wastewater System	Refurbish/Replace/Repair	Chemical System Flushing (1m) 1221	CLOSE	3/1/23 12:00 AM	3/31/23 01:15 PM
<a href="#">3253090</a>			1221, Lucan Wastewater System	Inspection	PH Probe Insp/Calib (1m) 1221	CLOSE	3/1/23 12:00 AM	4/19/23 03:52 PM
<a href="#">3253095</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	3/1/23 12:00 AM	3/24/23 02:44 PM
<a href="#">3253100</a>			1221, Lucan Wastewater System	Refurbish/Replace/Repair	UV Channel Flushing (1m) 1221	CLOSE	3/1/23 12:00 AM	3/31/23 01:15 PM
<a href="#">3253185</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power Generation	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	3/1/23 12:00 AM	3/29/23 11:04 AM
<a href="#">3271149</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	3/1/23 12:00 AM	3/2/23 02:37 PM
<a href="#">3276398</a>			1221, Lucan Wastewater System	Health and Safety	OG109 OCWAs PPE Policy Review (1y) Lucan Biddulph	CLOSE	3/1/23 12:00 AM	6/5/23 09:58 AM
<a href="#">3291300</a>			1221, Lucan Wastewater System,	Refurbish/Replace/Repair	Purchase of Grundfos Submersible pump for Lucan effluent water	CLOSE		5/15/23 01:40 PM
<a href="#">3291553</a>			Lucan Wastewater System	Refurbish/Replace/Repair	1221 Lucan/Granton operator long weekend checks 2023	COMP		12/29/23 12:54 PM
<a href="#">3297673</a>	0000277857	GENERATOR ELECTRIC	1221, Lucan Wastewater System,	Refurbish/Replace/Repair	Generator Electric Insp/Service (1y) 1221	CLOSE	4/1/23 12:00 AM	6/5/23 10:12 AM
<a href="#">3297920</a>			1221, Lucan Wastewater System	Refurbish/Replace/Repair	Generator Insp (6m) 1221	CLOSE	4/1/23 12:00 AM	4/6/23 12:00 PM
<a href="#">3297922</a>			1221, Lucan Wastewater System	Refurbish/Replace/Repair	Chemical System Flushing (1m) 1221	CLOSE	4/1/23 12:00 AM	4/28/23 11:07 AM
<a href="#">3297925</a>			1221, Lucan Wastewater System	Inspection	PH Probe Insp/Calib (1m) 1221	CLOSE	4/1/23 12:00 AM	4/20/23 12:49 PM
<a href="#">3297930</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	4/1/23 12:00 AM	4/28/23 11:03 AM
<a href="#">3297935</a>			1221, Lucan Wastewater System	Refurbish/Replace/Repair	UV Channel Flushing (1m) 1221	CLOSE	4/1/23 12:00 AM	4/28/23 11:04 AM
<a href="#">3298052</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power Generation	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	4/1/23 12:00 AM	4/28/23 11:05 AM
<a href="#">3317917</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	4/1/23 12:00 AM	4/6/23 11:53 AM
<a href="#">3339514</a>			1221, Lucan Wastewater System,	Compliance	WSER Quarterly Reporting (3m) 1221	CLOSE	4/12/23 12:00 AM	4/24/23 03:25 PM
<a href="#">3339855</a>			Lucan Wastewater System	Refurbish/Replace/Repair	1221 Industrial Park chamber pump out Quarterly: Jan/April/July/October 2023	COMP		1/3/24 01:48 PM
<a href="#">3340860</a>			1221, Lucan Wastewater System, Process	Refurbish/Replace/Repair	Purchase and installation of new Aerzen GM50L blower for Lucan WWTP	CLOSE	4/20/23 02:27 PM	8/9/23 08:01 AM
<a href="#">3347081</a>			1221, Lucan Wastewater System	Refurbish/Replace/Repair	Wet Well Insp (6m) 1221	CLOSE	5/1/23 12:00 AM	5/3/23 11:32 AM

<a href="#">3347083</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Chemical System Flushing (1m) 1221	CLOSE	5/1/23 12:00 AM	6/1/23 02:11 PM
<a href="#">3347086</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	5/1/23 12:00 AM	5/17/23 03:50 PM
<a href="#">3347091</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	UV Channel Flushing (1m) 1221	CLOSE	5/1/23 12:00 AM	6/1/23 02:11 PM
<a href="#">3347191</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power Generation	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	5/1/23 12:00 AM	6/1/23 10:35 AM
<a href="#">3347701</a>			1221, Lucan Wastewater System	Compliance	OG35 FEP Review (1y) 1221	CLOSE	5/1/23 12:00 AM	9/11/23 02:27 PM
<a href="#">3365521</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	5/1/23 12:00 AM	5/10/23 02:45 PM
<a href="#">3383705</a>	0000236007	VALVE BALL WASTING	1221, Lucan Wastewater System, Process, Sludge Treatment & Handling	Refurbish/Replace /Repair	1221 WAS actuator-troubleshooting-Troy Ontor Inc	CLOSE		5/4/23 09:51 AM
<a href="#">3384735</a>	0000277887	PUMP SUBMERSIBLE P100 SANITARY PUMP	1221, Lucan Wastewater System, Facility, Service Water	Refurbish/Replace /Repair	Trouble shoot and pulled Sanitary pump 101 for rebuild. 1221	CLOSE		6/23/23 01:26 PM
<a href="#">3384767</a>			1221, Lucan Wastewater System, Process, Process Piping & Valves	Refurbish/Replace /Repair	Purchase and install of 4" WAS Plug Valve	CLOSE		6/5/23 09:17 AM
<a href="#">3386949</a>			1221, Lucan Wastewater System, Process, Sludge Treatment & Handling	Refurbish/Replace /Repair	purchase and installation of pump seals for RAS pump #2 Lucan	CLOSE		6/16/23 12:44 PM
<a href="#">3386950</a>			1221, Lucan Wastewater System, Process, Tertiary Treatment	Refurbish/Replace /Repair	Purchase of UV light bulbs and Sleeves for Lucan and Granton WWTP	CLOSE		7/7/23 10:56 AM
<a href="#">3393073</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Chemical System Flushing (1m) 1221	CLOSE	6/1/23 12:00 AM	6/29/23 11:12 AM
<a href="#">3393076</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	6/1/23 12:00 AM	6/19/23 06:33 AM
<a href="#">3393081</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	UV Channel Flushing (1m) 1221	CLOSE	6/1/23 12:00 AM	6/29/23 11:12 AM
<a href="#">3393182</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	6/1/23 12:00 AM	6/12/23 08:50 AM
<a href="#">3393752</a>			1221, Lucan Wastewater System	Health and Safety	OG110 OCWA's H&S Manual and Policy R	CLOSE	6/1/23 12:00 AM	7/31/23 06:26 AM
<a href="#">3398095</a>			1221, Lucan Wastewater System	Inspection	Sludge Storage Capacity Inspection (6m) 1221	CLOSE	6/1/23 12:00 AM	6/1/23 02:10 PM
<a href="#">3412862</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	6/1/23 12:00 AM	6/7/23 10:31 AM
<a href="#">3441570</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	MCC Route (1y/5y) 1221	CLOSE	7/1/23 12:00 AM	10/18/23 03:37 PM
<a href="#">3441612</a>	0000277877	GEAR DRIVE CLASSIFIER	1221, Lucan Wastewater System, Process, Headworks	Refurbish/Replace /Repair	Gear Drive Classifier Insp/Service (1y) 1221	CLOSE	7/1/23 12:00 AM	10/18/23 03:33 PM
<a href="#">3441616</a>	0000277894	PUMP SUBMERSIBLE P100 FINAL BACKWASH	1221, Lucan Wastewater System, Process, Tertiary Treatment	Refurbish/Replace /Repair	Pump Subm P100 Final Backwash Insp/Service (1y) 1221	COMP	7/1/23 12:00 AM	2/8/24 02:15 PM
<a href="#">3441634</a>	0000277892	PUMP SUBMERSIBLE P107 TREATED EFFLUENT SUPPLY	1221, Lucan Wastewater System, Process, Secondary Treatment	Refurbish/Replace /Repair	Pump Subm P107 Treated Effluent Supply Insp/Service (1y) 1221	COMP	7/1/23 12:00 AM	2/8/24 02:42 PM
<a href="#">3441661</a>	0000277871	ANALYZER GAS MONITOR	1221, Lucan Wastewater System, Process, Process Control & Monitoring	Refurbish/Replace /Repair	Analyzer Gas Monitor Insp/Service (6m) 1221	CLOSE	7/1/23 12:00 AM	8/25/23 10:11 AM
<a href="#">3441665</a>	0000236008	TANK STORAGE FUEL DIESEL GEENRATOR	1221, Lucan Wastewater System, Facility, Power Generation	Refurbish/Replace /Repair	Tank Storage Fuel Diesel Insp/Serv ice (1y) 1221	CLOSE	7/1/23 12:00 AM	8/25/23 10:09 AM
<a href="#">3441883</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Chemical System Flushing (1m) 1221	CLOSE	7/1/23 12:00 AM	7/27/23 08:34 AM
<a href="#">3441886</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	7/1/23 12:00 AM	7/11/23 02:45 PM
<a href="#">3441891</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	UV Channel Flushing (1m) 1221	CLOSE	7/1/23 12:00 AM	8/3/23 07:59 AM

			Wastewater System	/Repair				
<a href="#">3441973</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	7/1/23 12:00 AM	7/27/23 08:30 AM
<a href="#">3460271</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	7/1/23 12:00 AM	7/21/23 01:57 PM
<a href="#">3481452</a>			1221, Lucan Wastewater System,	Compliance	WSER Quarterly Reporting (3m) 1221	CLOSE	7/12/23 12:00 AM	7/25/23 01:03 PM
<a href="#">3489179</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Spill Kit Inspect (6m) 1221	CLOSE	8/1/23 12:00 AM	8/25/23 10:17 AM
<a href="#">3489181</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Chemical System Flushing (1m) 1221	CLOSE	8/1/23 12:00 AM	9/5/23 02:39 PM
<a href="#">3489184</a>			1221, Lucan Wastewater System	Health and Safety	MSDS Review - (6m) 1221	CLOSE	8/1/23 12:00 AM	9/8/23 12:32 PM
<a href="#">3489191</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	8/1/23 12:00 AM	8/10/23 02:27 PM
<a href="#">3489196</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	UV Channel Flushing (1m) 1221	CLOSE	8/1/23 12:00 AM	9/8/23 12:31 PM
<a href="#">3489344</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power Generation	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	8/1/23 12:00 AM	8/25/23 10:04 AM
<a href="#">3505992</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	8/1/23 12:00 AM	8/10/23 02:36 PM
<a href="#">3526129</a>			1221, Lucan Wastewater System, Process, Headworks	Refurbish/Replace /Repair	1221 stones jamming up barscreen rake in headworks 2023	COMP		1/3/24 01:49 PM
<a href="#">3526561</a>			Lucan Wastewater System	Refurbish/Replace /Repair	Alum Line Fixes 2023 - 1221	CLOSE		10/13/23 02:24 PM
<a href="#">3527403</a>			1221, Lucan Wastewater System, Process, Secondary Treatment	Refurbish/Replace /Repair	Purchase and install 2 Goulds suction pumps for final filters	COMP		2/7/24 03:28 PM
<a href="#">3527897</a>	0000277862	BLOWER 01 AIR	1221, Lucan Wastewater System, Process, Secondary Treatment	Refurbish/Replace /Repair	Changed oil in blowers, went for pricing on more oil. 1221	CLOSE		8/31/23 03:28 PM
<a href="#">3533013</a>	0000249130	VALVE RELIEF 01 AIR	1221, Lucan Wastewater System, Process, Piping & Valves	Refurbish/Replace /Repair	Valve Relief Air Insp/Service (1y) 1221	COMP	9/1/23 12:00 AM	2/9/24 03:15 PM
<a href="#">3533211</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Chemical System Flushing (1m) 1221	CLOSE	9/1/23 12:00 AM	10/4/23 09:39 AM
<a href="#">3533214</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	9/1/23 12:00 AM	9/28/23 03:27 PM
<a href="#">3533219</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	UV Channel Flushing (1m) 1221	CLOSE	9/1/23 12:00 AM	9/28/23 03:26 PM
<a href="#">3533308</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power Generation	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	9/1/23 12:00 AM	9/21/23 10:24 AM
<a href="#">3551752</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	9/1/23 12:00 AM	9/8/23 12:34 PM
<a href="#">3571778</a>			Lucan Wastewater System	Refurbish/Replace /Repair	1221 Alum line/piping leaks 2023	COMP		1/3/24 01:49 PM
<a href="#">3582022</a>			1221, Lucan Wastewater System	Inspection	Sludge Depth Testing (1y) 1221	COMP	10/1/23 12:00 AM	3/7/24 01:28 PM
<a href="#">3582025</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Generator Insp (6m) 1221	CLOSE	10/1/23 12:00 AM	10/27/23 08:08 AM
<a href="#">3582027</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Chemical System Flushing (1m) 1221	CLOSE	10/1/23 12:00 AM	10/27/23 08:07 AM
<a href="#">3582030</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	10/1/23 12:00 AM	10/30/23 02:55 PM
<a href="#">3582035</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	UV Channel Flushing (1m) 1221	CLOSE	10/1/23 12:00 AM	10/30/23 02:54 PM
<a href="#">3582152</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power Generation	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	10/1/23 12:00 AM	10/20/23 09:34 AM
<a href="#">3600738</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	10/1/23 12:00 AM	10/4/23 09:38 AM

<a href="#">3620214</a>	0000277872	HEATER NATURAL GAS	1221, Lucan Wastewater System, Facility, Heating	Refurbish/Replace /Repair	Heater Gas Service (1y) 1221	COMP	10/2/23 12:00 AM	2/7/24 09:18 AM
<a href="#">3622692</a>			1221, Lucan Wastewater System, Facility	Compliance	WSER Quarterly Reporting (3m) 1221	CLOSE	10/12/23 12:00 AM	10/20/23 05:09 PM
<a href="#">3624882</a>			Lucan Wastewater System	Refurbish/Replace /Repair	1221 Semi-annual cleaning of wet wells Chestnut and Joseph st with Ct Environmental	CLOSE		10/27/23 08:22 AM
<a href="#">3629971</a>	0000277865	PUMP CENT 01 RAS	1221, Lucan Wastewater System, Process, Secondary	Refurbish/Replace /Repair	Pump Cent 01 RAS Insp/Service (1y) 1221	COMP	11/1/23 12:00 AM	2/7/24 09:20 AM
<a href="#">3629977</a>	0000277867	PUMP CENT 03 RAS AND WASH	1221, Lucan Wastewater System, Process, Secondary	Refurbish/Replace /Repair	Pump Cent 03 Ras And Was Insp/Service (1y) 1221	COMP	11/1/23 12:00 AM	2/7/24 09:21 AM
<a href="#">3630160</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Wet Well Insp (6m) 1221	CLOSE	11/1/23 12:00 AM	11/7/23 08:47 AM
<a href="#">3630162</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Chemical System Flushing (1m) 1221	CLOSE	11/1/23 12:00 AM	12/11/23 02:44 PM
<a href="#">3630165</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	11/1/23 12:00 AM	11/9/23 02:44 PM
<a href="#">3630170</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	UV Channel Flushing (1m) 1221	CLOSE	11/1/23 12:00 AM	12/11/23 02:43 PM
<a href="#">3630264</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	11/1/23 12:00 AM	11/21/23 02:05 PM
<a href="#">3646059</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	11/1/23 12:00 AM	11/5/23 08:00 PM
<a href="#">3671323</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	Chemical System Flushing (1m) 1221	COMP	12/1/23 12:00 AM	1/3/24 01:50 PM
<a href="#">3671326</a>			1221, Lucan Wastewater System	Inspection	Greasing Equipment (1m) 1221	CLOSE	12/1/23 12:00 AM	12/7/23 01:33 PM
<a href="#">3671331</a>			1221, Lucan Wastewater System	Refurbish/Replace /Repair	UV Channel Flushing (1m) 1221	COMP	12/1/23 12:00 AM	1/3/24 01:50 PM
<a href="#">3671439</a>	0000277858	ENGINE DIESEL BACKUP GENERATOR	1221, Lucan Wastewater System, Facility, Power	Inspection	Engine Diesel Lucan WW Insp/Test (1m) 1221	CLOSE	12/1/23 12:00 AM	12/7/23 01:32 PM
<a href="#">3672065</a>			1221, Lucan Wastewater System	Compliance	Operation SOP Manual Review and Update (2y) 1221	COMP	12/1/23 12:00 AM	1/30/24 03:46 PM
<a href="#">3687556</a>			1221, Lucan Wastewater System	Health and Safety	Fire Protection Insp/Service (1m) - 1221	CLOSE	12/1/23 12:00 AM	12/7/23 01:32 PM
<a href="#">3689791</a>			1221, Lucan Wastewater System	Health and Safety	Confined Space Hazard Assessment Review (1y) Lucan & Granton	COMP	12/1/23 12:00 AM	1/29/24 01:44 PM
<a href="#">3705608</a>			1221, Lucan Wastewater System	Compliance	Sampling Calendar Review (1y) 1221/1261	COMP	12/15/23 12:00 AM	12/22/23 11:16 AM

# Appendix E

## Calibration Reports



Pierce Services  
& Solutions Inc.

519.820.4853 Fax 519.824.9402

## Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: April 4, 2023

Equipment Description: Flow Transmitter

Assigned Number: RAS FIT 101

Area Located: Lucan WPCP

AMMS Number: N/A

### Instrument Data

Manufacturer: ABB

Model Number: Magmaster

Type: Magmeter Size: 100 mm

Serial Number: 3K2620000046821

Range: 0-50 l/s

Accuracy: +/- 5%

Method Of Calibration: Standard Verification

Application: Waste Water

### Calibration Data

Input %	Input	Theoretical	Actual	Pass/Fail
0	4.0 mA	0.00 l/s	0.00 l/s	
25	8.0 mA	12.50 l/s	12.51 l/s	Pass
50	12.0 mA	25.00 l/s	25.04 l/s	Pass
75	16.0 mA	37.50 l/s	37.51 l/s	Pass
100	20.0 mA	50.00 l/s	50.00 l/s	Pass
25.14	8.03 mA	12.67 l/s	12.67 l/s	Pass

Confirmed Run Mode: ✓

Placed back in service: ✓

Comments:  
Verification of original calibration only.



Q= 7.67 Q%= 15.34 I= 6.45

**Electronics are beginning to Fail. Recommend Replacement**

Checked By: Greg Pierce CCST

Signature: 



Pierce Services  
& Solutions Inc.

45 Wilton Road  
Guelph, ON N1E 7L6

Phone: 519.820.4853  
Fax: 519.824.9402

## Flowmeter Report

Verification:  X

Calibration:

Client: OCWA

Location: Lucan WPCP

Description: Flow Transmitter

Date: 04-Apr-23

Manufacturer: ABB

Checked By: Greg Pierce

Model: Magmaster

Serial No.: 3K620000408219

Inventory No.: Was FIT 102

Volocity	Input	As Found	As Left	Pass/Fail
0	4.00 mA	0.00 l/s	0.00 l/s	Pass
25	8.0 mA	12.50 l/s	12.50 l/s	Pass
50	12.0 mA	25.00 l/s	25.00 l/s	Pass
70	16.0 mA	37.50 l/s	37.50 l/s	Pass
100	20.0 mA	50.0 l/s	50.0 l/s	Pass

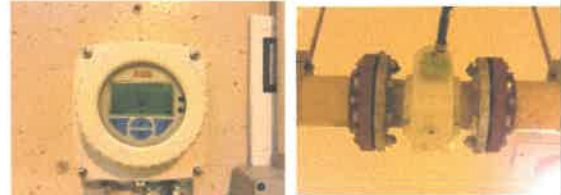
Confirmed Run Mode: X

Returned to service: X

Service Comments:

### Flowmeter Information

Flow Unit: l/s  
 Meter Size: 100 mm  
 Pipe Material: Cast Steel  
 Liner Material: PU  
 Range: 0-50 l/s  
 Tag Number: Park Flow



Comments:

Verification of original calibration

No Alarms

E1 - 0.96 kΩ  
 E2 - 0.91 kΩ  
 E1 - 0.157 V  
 E2 - 0.259 V  
 E12 - -0.103 V  
 CDI - 179.93 mA  
 CDR - 39.30 Ω

Signature: 

Greg Pierce, CCST





Pierce Services  
& Solutions Inc.

519.820.4853 Fax 519.824.9402

## Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: April 4, 2023

Equipment Description: Level Sensor

Assigned Number: Alum Tank Level LIT 101

Area Located: Lucan WPCP

OCWA Number: 0000277854

### Instrument Data

Manufacturer: Milltronics

Model Number: MultiRanger Plus

Type: Ultrasonic

Serial Number: N/A

Range: 0 - 3.100 m

Accuracy: +/- 5%

Method Of Calibration: Standard Measurement

Application: Waste Water

Meter Size: N/A

PASS/FAIL: Pass

### Calibration Data

Input %	Input	As Found	As Left	Pass/Fail
	9.06 mA	0.982 m	0.982 m	Pass

Confirmed Run Mode:

Placed back in service:

Comments:



Checked By: Greg Pierce CCST

Signature:



Pierce Services  
& Solutions Inc.

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## Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: April 4, 2023

Equipment Description: Flow Transmitter

Assigned Number: Effluent Flow Meter LIT 103

Area Located: Lucan WPCP

AMMS Number: N/A

### Instrument Data

Manufacturer: Milltronics

Model Number: MultiRanger Plus

Type: Ultrasonic

Flume: 0.152m Parshall Flume

Range: 0 - 3629 m<sup>3</sup>/d

Accuracy: +/- 5%

Method Of Calibration: Standard Measurement

Application: Waste Water

Meter Size: 6" Parshall Flume

PASS/FAIL: Pass

### Calibration Data

Input %	Input	Theoretical	As Found	% Error
0	0	0	0 m <sup>3</sup> /d	
25	10 cm	866.2 m <sup>3</sup> /d	867 m <sup>3</sup> /d	Pass
50	15 cm	1643.5 m <sup>3</sup> /d	1644 m <sup>3</sup> /d	Pass
75	20 cm	2589.6 m <sup>3</sup> /d	2590 m <sup>3</sup> /d	Pass
100	24.76 cm	3568.2 m <sup>3</sup> /d	3629 m <sup>3</sup> /d	Pass
	21.71 cm	774.66 m <sup>3</sup> /d	774.66 m <sup>3</sup> /d	Pass

Confirmed Run Mode: ✓

Placed back in service: ✓

Comments:



Confirmed with Isco Open Channel Flow Measurement.

Checked By: Greg Pierce CCST

Signature: 



Pierce Services  
& Solutions Inc.

519.820.4853 Fax 519.824.9402

## Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: April 4, 2023

Equipment Description: Level Transmitter

Assigned Number: P/S Level LIT 1001

Area Located: Lucan SPS

OCWA Number: 00000236005

### Instrument Data

Manufacturer: Milltronics

Model Number: 100

Type: Ultrasonic

Serial Number:

Range: 0-50 l/s

Accuracy: +/- 5%

Method Of Calibration: Standard Verification

Application: Waste Water

### Calibration Data

Input %	Input	As Found	As Left	Pass/Fail
0	4.00 m/A	0 m	0 m	Pass
100	20.00 mA	6.553 m	6.553 m	Pass
32.4	9.15 mA	2.11 m	2.11 m	Pass

Confirmed Run Mode:

Placed back in service:

Comments:

Checked By: Greg Pierce CCST

Signature: 



Pierce Services  
& Solutions Inc.

519.820.4853 Fax 519.824.9402

## Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: April 4, 2023

Equipment Description: Level Transmitter

Assigned Number: Lagoon Level LIT 1002

Area Located: Lucan SPS

AMMS Number: N/A

### Instrument Data

Manufacturer: Milltronics

Model Number: 100

Type: Ultrasonic

Serial Number:

Range: 0-50 l/s

Accuracy: +/- 5%

Method Of Calibration: Standard Verification

Application: Waste Water

### Calibration Data

Input %	Input	As Found	As Left	Pass/Fail
0	4.00 mA	0 m	0 m	Pass
100	20.00 mA	6.553 m	6.553 m	Pass
29.35	8.64 mA	1.90 m	1.90 m	Pass

Confirmed Run Mode:

Placed back in service:

Comments:

Checked By: Greg Pierce CCST

Signature: 



Pierce Services  
& Solutions Inc.

519.820.4853 Fax 519.824.9402

## Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: April 4, 2023

Equipment Description: Flow Transmitter

Assigned Number: Plant Flow LIT 1001

Area Located: Lucan SPS

AMMS Number: N/A

### Instrument Data

Manufacturer: Rosemont

Model Number: 872DR12N0M4

Type: Magmeter Size: 200 mm

Serial Number: 0860199395

Range: 0-50.00 l/s

Accuracy: +/- 5%

Method Of Calibration: Standard Verification

Application: Waste Water

### Calibration Data

Input %	Input	Theoretical	Actual	Pass/Fail
0	4.0 mA	0.00 l/s	0.00 l/s	
25	8.0 mA	12.50 l/s	12.50 l/s	Pass
50	12.0 mA	25.00 l/s	25.00 l/s	Pass
75	16.0 mA	37.50 l/s	37.50 l/s	Pass
100	20.0 mA	50.00 l/s	50.00 l/s	Pass
28.2	15.26 mA	32.2 l/s	35.2 l/s	Pass

Confirmed Run Mode:

Placed back in service:

Comments:

Verification of original calibration only.



Flow Tube # 1055805010293005

Q= 35.20 Q%= 70.40 I= 15.26mA

Checked By: Greg Pierce CCST

Signature: 



Pierce Services  
& Solutions Inc.

519.820.4853 Fax 519.824.9402

## Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: April 4, 2023

Equipment Description: Flow Transmitter

Assigned Number: Lagoon Flow FIT 1002

Area Located: Lucan SPS

AMMS Number: N/A

### Instrument Data

Manufacturer: Rosemont

Model Number: 872DR12N0M4

Type: Magmeter Size: 300 mm

Serial Number: 0860199394

Range: 0-300 l/s

Accuracy: +/- 5%

Method Of Calibration: Standard Verification

Application: Waste Water

### Calibration Data

Input %	Input	Theoretical	Actual	Pass/Fail
0	4.0 mA	0.00 l/s	0.00 l/s	
25	8.0 mA	75.0 l/s	75.0 l/s	Pass
50	12.0 mA	150.00 l/s	150.00 l/s	Pass
75	16.0 mA	225.00 l/s	225.00 l/s	Pass
100	20.0 mA	300.00 l/s	300.00 l/s	Pass
4	4.76 mA	14.3 l/s	14.3 l/s	Pass

Confirmed Run Mode:

Placed back in service:

Comments:

Verification of original calibration only.



New flow tube installed, cal number 1176304611427005

Q= 112.35 Q%= 37.45 I= 9.99 mA

Checked By: Greg Pierce CCST

Signature: 



Pierce Services  
& Solutions Inc.

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## Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: April 4, 2023

Equipment Description: Flow Transmitter

Assigned Number: FIT 104

Area Located: Industrial Flow Lucan

AMMS Number: N/A

### Instrument Data

Manufacturer: Siemens

Model Number: Mag 6000

Type: Magmeter      Size: 80 mm

Serial Number: PBD-K5304809

Range: 0-10 l/s

Accuracy: +/- 5%

Method Of Calibration: Standard Verification

Application: Waste Water

### Calibration Data

Input %	Input	Theoretical	Acctual	Pass/Fail
0	4 mA	0.00 l/s	0.00 l/s	
25	8 mA	2.5 l/s	2.5 l/s	Pass
50	12 mA	5 l/s	5 l/s	Pass
75	16.0 mA	7.5 l/s	7.5 l/s	Pass
100	20.0 mA	10 l/s	10 l/s	Pass
8.80%	5.28 mA	0.8 l/s	0.8 l/s	Pass

Confirmed Run Mode:

Placed back in service:

Comments:

Verification of original calibration only.



Checked By: Greg Pierce CCST

Signature: 



**Pierce Services  
& Solutions Inc.**

45 Wilton Road  
Guelph, ON N1E 7L6

Phone: 519.820.4853  
Fax: 519.824.9402

## Instrument Report

Verification: <input type="checkbox"/>	Calibration: <input checked="" type="checkbox"/>
Client: <u>OCWA Lucan</u>	Location: <u>Lucan WWTP</u>
Description: <u>Ph Analyzer</u>	Date: <u>23-Feb-23</u>
Manufacturer: <u>Oakton</u>	Checked By: <u>Greg Pierce</u>
Model: _____	Serial No.: <u>1289272</u>

Input %	Input	As Found	As Left	Pass/Fail
	0.00 mg/l	0	0	Pass
4%		4.09	20	Pass
7%		700	100	Pass
10%		16.06	2	Pass

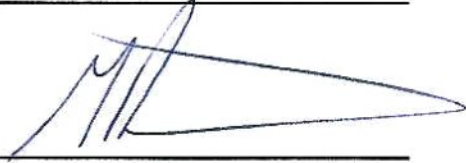
Confirmed Run Mode: X Returned to service: X

Service Comments:  
Instrument Information

Assigned Number: AIT 400  
Measuring Range: 13-Mar  
Application: Water



Comments:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature:   
Greg Pierce, CCST