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The Municipality of Trent Hills

Annual Report

Campbellford Wastewater System 2023

Prepared by

Wastewater Operations Department

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Section 11(4) of the Environmental Compliance Approval no. 8181-AXYQ6K, for the Campbellford Wastewater Treatment Facility states, "The owner shall prepare performance reports on a calendar year basis and submit to the District Manager by March 31 of the calendar year following the period being reported upon. The reports shall contain, but shall not be limited to, the following information pertaining to the reporting period:

- (a) A summary and interpretation of all Influent, Imported Sewage monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;
- (b) A summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this approval, including an overview of the success and adequacy of the Works;
- (c) A summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year;
- (d) A summary of all operating issues encountered and corrective actions taken;
- (e) A summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;
- (f) A summary of any effluent quality assurance or control measures taken;
- (g) A summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;
- (h) A summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:
 - i. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality
 - ii. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;
- (i) A tabulation of the volume of sludge generated, 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;
- (j) A summary of any complaints received and any steps taken to address the complaints;
- (k) A summary of all By-passes, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;
- (l) A summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report status of implementation of all modification.
- (m) A summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the following year following that for which the report is submitted, and a summary of efforts made to achieve conformance with Procedure F-5-5 and establish/maintain a Pollution Prevention and Control Plan (PPCP)
- (n) Any changes or updates to the schedule for completion of construction and commissioning operation of major process (es)/Equipment groups in the Proposed Works.

Section 1 – ECA Condition 11 (4) (a)

A summary of all monitoring data collected at the Campbellford Wastewater Treatment Facility (WWTF) during the reporting period is located in Appendix III. The summary or Performance Report provides Flow data, Raw sewage, Imported sewage and Final effluent analytical results and an Effluent loadings summary.

Below is a summary of Influent and Imported Sewage Data. During the spring and winter, months in the reporting year flows are elevated due to infiltration and inflow, which historically is consistent. The Municipality of Trent Hills developed the Sanitary Sewer Maintenance Program in 2020 in an effort to build on the existing program that has been in place in the past. This program outlines schedules, guidelines and standards to assess infrastructure, prevent future sewer blockages and to reduce inflow. Repairs to the collection system are completed annually in conjunction with the flushing and CCTV program. Municipal staff continue with sump pump and roof leader inspections focusing in on areas of concern in 2023. Maintenance and repairs continue on an annual basis in the sewer main located in the core wall along the Trent River.

Campbellford WWTF - Monthly Average Influent Flows 2023												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Total Monthly Flow m3	176819	121338	128787	167956	101628	77035	82511	79055	68087	66027	57943	66798
Average Daily Flow m3	5703.8	4333	4154	5598	3278	2567	2661.6	2550	2269	2129	1931	2154
Minimum Daily Flow m3	2066	2027	2500	2599	2136	1983	2317	2105	1972	1962	1631	1695
Maximum Daily Flow m3	11157	6059	6857	8502	5758	4352	3399	3444	2578	2309	2431	3554

The chart below summarizes the Monthly Influent Monitoring.

Campbellford WWTF - Monthly Average Influent Monitoring 2023												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
pH	7.64	7.67	7.59	7.62	7.51	7.71	7.51	7.53	7.48	7.58	7.95	7.80
Temperature	6.12	5.73	6.51	8.74	12.45	17.35	21.24	20.99	20.65	17.17	12.20	9.16
BOD	151.00	120.00	125.00	85.00	105.00	227.00	195.00	124.00	115.00	82.00	76.00	162.00
Phosphorous	1.43	1.73	2.07	1.55	1.95	3.44	2.48	2.28	2.28	1.57	1.40	2.10
Total Suspended Solids	144.00	123.00	145.00	108.00	146.00	263.00	230.00	166.00	150.00	135.00	117.00	139.00
Total Kjeldahl Nitrogen	17.30	16.10	20.10	14.20	21.60	21.60	19.50	21.70	21.80	15.80	16.40	21.50

Below is the Monthly Imported Sewage Receiving Rates and monitoring.

Campbellford WWTF - Monthly Total Imported Sewage Received (m3) 2023													
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total Received
Total Received (m3)	932.8	1215.05	2167.74	1342.09	1455.72	1597.96	1634.47	1456.27	988.68	876.58	911.34	1422.82	16036.97

Campbellford WWTF - Monthly Imported Sewage Lab Analysis 2023													
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Average
BOD	68	23	76	199	58	69	202	190	38	57	57	90	94.27
Total Suspended Solids	24	4	14	21	17	6	19	8	5	8	3	8	12
Total Phosphorous	3.18	3.31	3.77	3.62	3.08	3.45	2.75	3.41	3.36	2.41	3.38	3.12	3.25
TKN	630	458	486	456	462	487	622	487	473	560	484	484	510
Ammonia + Ammonium	580	441	464	450	458	475	515	490	478	508	458	468	483

Below are results from Quarterly Leachate Related Final Effluent Sampling as outlined in Schedule D of ECA #8181-AXYQ6K.

Campbellford WWTF -Leachate Related Quarterly Effluent Sampling 2023						
	Jan	April	July	October		Average
Boron	0.032	0.066	0.091	0.111		0.075
Cobalt	0.000063	0.000144	0.000108	0.000082		0.000099
Magnesium	5.32	7.21	5.82	6.41		6.19
Manganese	0.00941	0.00957	0.00271	0.0047		0.0065975
Potassium	3.21	4.61	6.68	9.12		5.91
Strontium	0.204	0.277	0.192	0.19		0.21575
Bis(2-ethylexyl) Phthalate	<2	<2	<2	<2		<2

The Municipality of Trent Hills was approached in July of 2022 by Empire Cheese for permission to process their wastewater from their manufacturing facility in Trent Hills. The Municipality continued to receive wastewater from Empire Cheese throughout 2023. As requested from the MECP, the chart below outlines the added loadings on the plant. Plant staff continue to sample the wastewater on a monthly basis, there have been no negative impacts on the plant to speak of.

The following table provides a monthly summary of the pH of the effluent. Non – compliance is deemed to have occurred when any singular measurement is outside the required range of 6.0 to 9.5, as specified in Condition 7(1) Schedule C of the ECA.

Campbellford WWTF -Monthly pH Results Effluent Monitoring 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum pH	6.50	7.60	7.37	7.14	7.43	7.35	7.40	6.86	7.02	7.07	7.41	7.30
Maximum pH	8.58	8.32	8.18	8.88	8.10	8.09	7.94	8.14	8.17	8.20	8.54	8.39
Average pH	7.69	7.87	7.91	8.07	7.76	7.67	7.66	7.59	7.56	7.60	7.96	7.85

The above results show that the pH was maintained between 6.50 and 8.07 for the 2023 reporting period, which is within the compliance range of 6.0 to 9.5 specified in the ECA.

Campbellford WWTF -Monthly Temperature Results Effluent Monitoring 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum Temperature *C	3.90	4.40	5.90	6.70	10.50	17.20	21.80	21.60	19.60	15.10	8.90	8.50
Maximum Temperature *C	7.00	7.80	7.60	10.90	15.90	21.60	23.40	23.20	22.00	22.00	15.60	10.50
Average Temperature *C	5.72	5.83	6.68	9.20	13.41	18.71	22.54	22.23	20.80	17.76	12.35	9.30

There is no compliance range for the final effluent temperature, however the ECA requires that samples are collected and tested on-site for final effluent temperature, so the results have been included in this report.

Section 3 - ECA Condition 11(4) (c)

All monitoring during 2023 was in accordance with ECA 8181-AXYQ6K.

There was no deviation from the monitoring schedule other than the fact that we continue to monitor the centrate entering the plant that is not specified in the updated ECA and Campbellford WWTF also monitors digested sludge quality and dewatered biosolids to optimize plant processes.

A sample calendar is located in Appendix I located at the end of this report.

Section 4 – ECA Condition 11(4) (d)

Although the Campbellford WWTF operated efficiently and within compliant limits as set out in ECA #8181-AXYQ6K Condition 7(1) Schedule C there were a few notable operational challenges of note.

1. Flows increased slightly in 2023 due in part to issues in the core wall that have since been resolved.
2. The plant continues to receive landfill leachate from the Brighton landfill and operations staff continue to operate the plant to accommodate the imported sewage and respond to operational changes. Operators have been able to schedule Imported Sewage (leachate) to minimize the impact on the plant.
3. The plant continued to process wastewater from Empire Cheese, a local food processor. Due to the wastewater having a high concentration of BOD, TSS, TP, Operators have to closely monitor each step of the process to avoid negative impacts on the process. An increase in bio-solids production was recognized as was expected in the original pilot.

Section 5 – C of A Condition 11 (4) (e)

Municipality of Trent Hills maintenance activities are based on the Worktech program. Preventative maintenance schedules have been set up by automatically generating work orders on a Monthly, Quarterly, Bi-Annual or Annual basis for all pieces of equipment. This is based on the manufacturers recommended schedule and/or regulatory schedules.

Corrective or breakdown maintenance is completed as soon as problems are identified and are listed in the chart below. Each piece of equipment is visually inspected daily as part of general plant checks as well as the performance that is trended through SCADA.

Work orders are completed and entered into Worktech for historical purposes and this ensures that routine and preventative maintenance procedures are followed.

Preventative Maintenance Work Orders Completed

Summary of all Normal and Emergency Repairs 2023	
Month	Repair
January	Carmichael on site for boiler repairs. Clean entire boiler system and complete the annual maintenance. STI on site to grout various manholes Raw sewage pump 1 plugged and required maintenance Change motor on boiler recirculation line.
February	Aeration system failure due to extreme cold temperatures.
March	Radio communication installed at Inkerman PS to connect to SCADA
April	
May	
June	Repair UV Rack 1 Bank B
July	
August	Repair UV Bank B LMWS repair/weld scum trap on Primary Clarifier 1 Actuator installed on centrifuge inline conveyor. Repair Primary clarifier center ring. Repair Check valve #3 at Main PS.
September	Weld inspection on hatch MH3 in East side core wall. Install new 3 way valve on digester heat exchanger.
October	Access ladder repaired at SPS#4 Riverside Trail MCC installed in place in Centrifuge building as part of electrical upgrade. Atlas Copco on site for annual maintenance of Aeration blowers,
November	New grinder installed. Upon commissioning the screen motor was not operational. Motor required being sent back to manufacturer.
December	Trent Security install new alarm system at plant. Will complete commissioning in January 2024. Boiler issues due to problem with expansion tank. Able to repair, annual maintenance will be scheduled for early 2024.

Section 6 – EC A Condition 11 (4) (f)

Effluent control measures include daily plant checks and flow monitoring, in-house sampling and testing for operational parameters such as suspended solids, pH, soluble phosphorous and dissolved oxygen at least three times weekly. In house testing provides real time results, which enhance process and operational performance. All in house sampling and analysis is performed by certified operators utilizing methods and protocols for sampling, analysis and recording as specified in the Ministry’s Procedure F–10-1, “Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works”, the Ministry’s publication, “Standard Methods for the Examination of Water and Wastewater”.

Staff are also conducting a complete solids inventory at least once per week to further optimize plant process. Solids inventory in the plant is being maintained on a consistent balance.

All effluent samples collected during the reporting period to meet C of A sampling requirements were analyzed by SGS Lakefield, with the exception of pH and temperature. SGS Lakefield has been deemed by the Canadian Association for Laboratory Accreditation (CALA) to be an accredited laboratory, meeting strict provincial guidelines including an extensive quality assurance/quality control program.

Section 7 – ECA Condition 11(4) (g)

The Worktech system automatically generates work orders and schedules calibration and certification of Flowmeters and lab equipment.

These calibrations are carried out by a certified, third party qualified technician and performed on an annual basis. A copy of the 2023 Annual Calibration Record for the raw sewage flow meter is located in Appendix II.

Imported Sewage volume measured by haul truck volumes.

Section 8 – ECA Condition 11(4) (h)

The following table provides continuous efforts made to meet Effluent Objectives:

Efforts Made to Meet the Effluent Objectives of Condition 6
1. Sampling effluent as per the C of A
2. Visual inspection of the plant and processes while performing rounds.
3. Ensuring that Alum is being dosed
4. Closely monitoring solids inventory in the plant as well as detention times
5. Operations staff closely monitor MCRT and waste accordingly
6. Monitoring treatment processes through regular in house lab routines
7. Monitoring and further integrating SCADA
8. Performing preventative maintenance and completing work orders
9. Calibrating laboratory equipment according to manufacturer’s recommendations
10. By conducting flow monitoring, flushing and CCTV in collection system we are working to reduce flows to the wastewater plant and ease the stress on the process during times of increased flow.

All effluent **objectives** are in the Tables in Section 2 of this annual report. All objectives were met during the reporting period.

Condition 6 – Effluent Objectives, subsection (1) (b) states: *The Owner shall use best efforts to: ensure that the effluent from the works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or discoloration on the receiving waters.*”

There were no incidences throughout the reporting period of Condition 6 (1) (b)

Condition 6 – Effluent Objectives, subsection (1) (c) states, “The Owner shall design and undertake everything practicable to operate the Sewage Treatment Plant in accordance to the following objectives: c. Annual Average Daily Influent Flow is within the Rated Capacity of the Sewage Treatment Plant.”

The following table provides a comparison of the rated capacity of the works to the actual flow data obtained during the 2023 reporting period.

Campbellford WWTF - Monthly Effluent Monitoring Flows 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Daily Flow m3/d	5703	4333	4154	5598	3278	2567	2661	2550	2269	2129	1931	2154
Rated Capacity m3/d	6600	6600	6600	6600	6600	6600	6600	6600	6600	6600	6600	6600

The above table shows that the Campbellford WWTF ECA rated capacity was not exceeded during any month in 2023. The Annual Average Daily Influent Flow of 3277 m3/day is 49% of the Rated Capacity of the Sewage Treatment Plant of 6600 m3/d.

Section 9 – ECA Condition 11 (4) (i)

During the 2023 reporting period, 7081 m3 of biosolids were hauled and disposed of from the Campbellford Wastewater Treatment Facility. This amount is 18% higher than 6001 m3 in 2022. This increase is due in part to receiving wastewater from Empire Cheese as well as a slight increase in Imported Sewage processed. We expect the amount of biosolids generated for the next reporting period to remain consistent with present rates.

The final disposal method for the biosolids produced are being accepted at a certified composting facility, Sun Global Energy, 740 Phillipston Rd., Belleville, ON.

In December the Municipality encountered a slight issue with the disposal of biosolids due to SUS Global being shut down for approximately one month. We were able to temporarily store extra bins on site and there are ongoing discussions with area shareholders regarding alternative disposal if required.

Tabulated below is a summary of the volumes of biosolids disposed of during the 2023 reporting period.

Campbellford WWTF -Biosolids Summary 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Volume m3	699.55	231.37	594.03	571.44	456.28	633.82	590.83	884.43	722.27	579.14	572.97	545.50
Total Volume m3												7081.63
Average m3 per Month												590

Section 10 – ECA Condition 11 (4) (j)

There were no community complaints received during the 2023 reporting period.

Section 11 – ECA Condition 11 (4) (k)

There were no by-pass, spills or abnormal discharge events during the 2023 reporting period.

Section 12 – ECA Condition 11 (4) (l)

No Notice of Modifications to Sewage Works completed in 2023.

Section 13 – ECA Condition 11 (4) (m)

The Campbellford sewer system has not experienced Bypass/Overflow situations in recent years and has worked towards 85% of the sewer being separated at this point. In efforts to eliminate the possibility of Overflow/Bypass events as well as Inflow and Infiltration in the system, the Municipality has a multi-year plan in place to flush and CCTV a portion of the system each year. This means that all areas of the wastewater collection systems in Trent Hills are flushed, and CCTV inspected over a seven (7) year maintenance cycle. Areas identified for repair, are completed immediately or in some situations are identified for future rehabilitation.

During periods of elevated flow, municipal staff complete flow monitoring to identify areas of concern. The core wall, which has been an area of concern in the past, is being inspected on an annual basis and repairs completed as required.

In 2020, the Trent Hills Sanitary Sewer Maintenance Program was developed to include the existing work being completed as well as a maintenance schedule, standards, etc. in an effort to assess infrastructure, prevent sewer blockages and reduce inflow. This program included the introduction of the Manhole Inspection program.

The Municipal budget for CCTV and flushing will remain at \$57,000 for the three (3) systems within the Municipality of Trent Hills and \$23,000 for repairs.

Section 14 – ECA Condition 11 (4) (n)

No changes or updates for 2023.

Wastewater System Effluent Regulations

The Wastewater Systems Effluent Regulations (WSER) is a federal regulation under the Fisheries Act that came into effect on January 1, 2013.

These regulations apply to a wastewater system that:

- Is designed to collect an average daily volume (ADV) of 100m³ or more of influent, or
- Collects an average daily volume (ADV) of 100m³ or more of influent during any calendar year.

An owner or operator must calculate, for each calendar year, the Average Daily Volume of effluent deposited via the system's final discharge point according to the following formula:

Sum of daily effluent volumes deposited (m³) / number of days in calendar year (365 days)

Note: The formula uses the number of days in the calendar year **Not** the number of days discharging.

Sampling and reporting requirements are dependent on the system type and its annual average daily volume of effluent. In 2023, the Campbellford Wastewater Treatment Plant deposited 3271 m³ average daily effluent volumes.

The quarterly reports monitoring reports were submitted to Environment Canada as required, annual toxicity and required sampling were completed and the plant met all quality standards in 2023.

Any questions regarding the information contained in this report should be directed to the undersigned at 705-653-1870

Troy Stephens

Troy Stephens,
Wastewater Treatment/Collection Head Operator,
Municipality of Trent Hills

APPENDIX I

Sample Calendar 2024

January 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Please Initial on date that sample is collected.	1	2	3	4	5	6
	Collect Weekly Raw and Final	Collect Weekly Raw and Final	Monthly: Dewatered Digested Sludge and Imported Sewage			
7	8	9	10	11	12	13
	Collect Weekly Raw and Final	Collect Annual WSER Acute Lethality	Collect Quarterly Centrate and Final Effluent (Leachate Related)			
14	15	16	17	18	19	20
	Collect Weekly Raw and Final					
21	22	23	24	25	26	27
	Collect Weekly Raw and Final					
28	29	30	31		Operator Signature: _____	
	Collect Weekly Raw and Final					

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

February 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Please Initial on date that sample is collected.				1	2	3
4	5	6	7	8	9	10
	Collect Weekly Raw and Final		Monthly: Dewatered Digested Sludge and Imported Sewage			
11	12	13	14	15	16	17
	Collect Weekly Raw and Final					
18	19	20	21	22	23	24
	Collect Weekly Raw and Final	Collect Weekly Raw and Final				
26	28	27	28	29	Operator Signature: _____	
	Collect Weekly Raw and Final					

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

March 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Please Initial on date that sample is collected.					1	2
3	4 Collect Weekly Raw and Final	5	6 Monthly: Dewatered Digested Sludge and Imported Sewage	7	8	9
10	11 Collect Weekly Raw and Final	12	13	14	15	16
17	18 Collect Weekly Raw and Final	19	20	21	22	23
24	25 Collect Weekly Raw and Final	26	27	28	29	30 Operator Signature:
31						

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

April 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Please Initial on date that sample is collected.	1	2 Collect Weekly Raw and Final	3 Monthly: Dewatered Digested Sludge and Imported Sewage	4	5	6
7	8 Collect Weekly Raw and Final	9	10 Collect Quarterly Centrate and Final Effluent (Leachate Related)	11	12	13
14	15 Collect Weekly Raw and Final	16	17	18	19	20
21	22 Collect Weekly Raw and Final	23	24	25	26	27
28	29 Collect Weekly Raw and Final	30				Operator Signature:

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

May 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Please Initial on date that sample is collected.			1 Monthly: Dewatered Digested Sludge and Imported Sewage	2	3	4
5	6 Collect Weekly Raw and Final	7	8	9	10	11
12	13 Collect Weekly Raw and Final	14	15	16	17	18
19	20	21 Collect Weekly Raw and Final	22	23	24	25
26	27 Collect Weekly Raw and Final	28	29	30	31	Operator Signature: _____

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

June 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Please Initial on date that sample is collected.						1
2	3 Collect Weekly Raw and Final	4	5 Monthly: Dewatered Digested Sludge and Imported Sewage	6	7	8
9	10 Collect Weekly Raw and Final	11	12	13	14	15
16	17 Collect Weekly Raw and Final	18	19	20	21	22
23	24 Collect Weekly Raw and Final	25	26	27	28	29 Operator Signature: _____
30						

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

July 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Please Initial on date that sample is collected.	1	2	3	4	5	6
		Collect Weekly Raw and Final	Monthly: Dewatered Digested Sludge and Imported Sewage			
7	8	9	10	11	12	13
	Collect Weekly Raw and Final		Collect Quarterly Centrate and Final Effluent (Leachate Related)			
14	15	16	17	18	19	20
	Collect Weekly Raw and Final					
21	22	23	24	25	26	27
	Collect Weekly Raw and Final					
28	29	30	31	Operator Signature: _____		
	Collect Weekly Raw and Final					

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

August 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Please Initial on date that sample is collected.		1		1	2	3
4	5	6	7	8	9	10
		Collect Weekly Raw and Final	Monthly: Dewatered Digested Sludge and Imported Sewage			
11	12	13	14	15	16	17
	Collect Weekly Raw and Final					
18	19	20	21	22	23	24
	Collect Weekly Raw and Final					
25	26	27	28	29	30	31
	Collect Weekly Raw and Final					Operator Signature: _____

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

September 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Please Initial on date that sample is collected.	2	3 Collect Weekly Raw and Final	4 Monthly: Dewatered Digested Sludge and Imported Sewage	5	6	7
8	9 Collect Weekly Raw and Final	10	11	12	13	14
15	16 Collect Weekly Raw and Final	17	18	19	20	21
22	23 Collect Weekly Raw and Final	24	25	26	27	28
29	30 Collect Weekly Raw and Final				Operator Signature: _____	

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

October 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Please Initial on date that sample is collected.		2	3 Monthly: Dewatered Digested Sludge and Imported Sewage	4	5	6
7	8 Collect Weekly Raw and Final	9	10 Collect Quarterly Centrate and Final Effluent (Leachate Related)	11	12	13
14	15	16 Collect Weekly Raw and Final	17	18	19	20
21	22 Collect Weekly Raw and Final	23	24	25	26	27
28	29 Collect Weekly Raw and Final	30	31	Operator Signature: _____		

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

November 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Please Initial on date that sample is collected.					1	2
3	4 Collect Weekly Raw and Final	5	6 Monthly: Dewatered Digested Sludge and Imported Sewage	7	8	9
10	11 Collect Weekly Raw and Final	12	13	14	15	16
17	18 Collect Weekly Raw and Final	19	20	21	22	23
24	25 Collect Weekly Raw and Final	26	27	28	29	30 Operator Signature: _____

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

December 2024						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Please Initial on date that sample is collected.	2 Collect Weekly Raw and Final	3	4 Monthly: Dewatered Digested Sludge and Imported Sewage	5	6	7
8	9 Collect Weekly Raw and Final	10	11	12	13	14
15	16 Collect Weekly Raw and Final	17	18	19	20	21
22	23 Collect Weekly Raw and Final	24	25	26	27	28
29	30 Collect Weekly Raw and Final	31	Happy New Year!		Operator Signature: _____	

Weekly – Final Effluent – Composite for TP, TAN, cBOD5, TSS, Unionized Ammonia – Grab for E. Coli – Raw Sewage – Composite cBODs, TP, TSS, TKN	* On Site Effluent Testing – at least 3 times/week (Mon-Fri)
Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS	
Monthly – Imported Sewage – BOD5, TSS, TP, TKN – Dewatered Sludge Cake – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, pH, alkalinity Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium – Secondary Digested Sludge – Grab for TS, Volatile Solids, Volatile Acids, pH and alkalinity	
Quarterly Effluent – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis (2-ethylhexyl) Phthalate	
Quarterly Requirement – Centrate – BODs, COD, Total P, TSS, TKN	
Statutory Holiday	WSER Annual – Final Effluent – Acute Lethality (Rainbow Trout)

APPENDIX II

Calibration Record

Tower Electronics Canada Inc. Calibration Certificate

Customer:
 Troy Stephens
 Wastewater Collection/Treatment Plant Head Operator
 Municipality of Trent Hills
 705-653-1870

Meter Information
 Date of Test: 2023-05-11
 Location: Campbellford WWTP
 Meter Under Test: Polymer Pumped Flow
 Client Tag: n/a
 Manufacturer: Krohne
 Model: IFC 010D
 Serial Number: S06 12182
 Totalizer As Found: 6370.14m3
 Totalizer As Left: 0.35m3

Calibration by:
 Dan Matchett

Standards:
 Fluke 289 S/N 96220182 NIST Cal Due April 2024
 Krohne GS8B S/N U1927700082907 NIST Cal Due April 2024

Programming Parameters:
 DN Size: DN25
 Cal Factor: GKL 5.1841
 Zero Cal: 0
 Allowable Error: 15%
 Calibration Due: May-24

Instrument Type
 Magnetic Flow Meter

Method of verification
 Secondary VSE/Velocity Simulation

Units: LPS
Zero: 0.00
Span: 0.53
Totalizer: n/a

Flow Test					
Sim Setting	Sim Flow LPS	Meter Display	Current Output	Disp Error%	mA Error %
0	0.000	0.000	4.002	0.000	0.050
A	0.190	0.153	8.637	6.938	10.959
B	0.390	0.385	15.628	0.900	0.459
Average Error%				2.61	3.82
Result:				PASS	PASS

Totalizer Test		
Sim Flow Rate	0.390	LPS
Start Totalizer	0.319	LPS
End Totalizer	0.350	LPS
Volume Simulated	0.031	M3
Time(Seconds)	80.650	
Calculated Totalizer(MUT)	0.031	
Error%	-1.442	
Result:	PASS	

Comments:
 Transmitter was faulty on arrival, swapped transmitter.
 Unit passes verification.

APPENDIX III

Performance Summary

2023 Campbellford WWTF Performance Summary																	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot	Avg	Min	Max	Criteria
Flows																	
Effluent Flow Total (m3)	176819	121338	128787	167956	101628	77035	82511	79055	68087	66027	57943	66798	1193984				
Effluent Flow Avg. (m3/d)	5703.8	4333	4154	5598	3278	2567	2661.6	2550	2269	2129	1931	2154		3277.37			6600
Effluent Flow Min. (m3/d)	2066	2027	2500	2599	2136	1983	2317	2105	1972	1962	1631	1695			1631		
Effluent Flow Max. (m3/d)	11157	6059	6857	8502	5758	4352	3399	3444	2578	2309	2431	3554				11157	
Raw Temperature																	
Min	4.80	4.60	5.80	6.90	10.50	15.80	20.10	20.50	19.50	14.60	9.10	8.20			4.60		
Max	7.70	6.40	7.90	10.10	15.40	19.20	22.10	22.30	22.20	20.00	15.10	10.60				22.30	
Avg.	6.12	5.73	6.51	8.74	12.45	17.35	21.24	20.99	20.65	17.17	12.20	9.16		13.19			
Raw pH																	
Min	6.42	7.15	6.27	6.82	6.90	7.26	7.36	6.05	6.55	7.16	7.62	7.22			6.05		
Max	8.71	7.91	8.21	8.42	7.97	8.08	7.69	8.10	7.89	7.88	8.40	8.27				8.71	
Avg.	7.64	7.67	7.59	7.62	7.51	7.71	7.51	7.53	7.48	7.58	7.95	7.80		7.63			
Final Temperature																	
Min	3.90	4.40	5.90	6.70	10.50	17.20	21.80	21.60	19.60	15.10	8.90	8.50			3.90		
Max	7.00	7.80	7.60	10.90	15.90	21.60	23.40	23.20	22.00	22.00	15.60	10.50				23.40	
Avg.	5.72	5.83	6.68	9.20	13.41	18.71	22.54	22.23	20.80	17.76	12.35	9.30		13.71			
Final pH																	
Min	6.50	7.60	7.37	7.14	7.43	7.35	7.40	6.86	7.02	7.07	7.41	7.30			6.50		>6
Max	8.58	8.32	8.18	8.88	8.10	8.09	7.94	8.14	8.17	8.20	8.54	8.39				8.88	<9.5
Average	7.69	7.87	7.91	8.07	7.76	7.67	7.66	7.59	7.56	7.60	7.96	7.85		7.77			
# of Samples	13.00	12.00	13.00	13.00	13.00	14.00	12.00	13.00	14.00	13.00	13.00	15.00		158.00			
CBOD																	
Effluent Avg cBOD5 mg/L	5.00	5.00	5.00	3.00	3.40	6.00	8.00	3.00	4.00	3.00	3.00	3.00		4.28			25.00
Loading cBOD5 kg/d	35.64	21.66	18.69	13.06	8.19	20.54	21.29	7.65	10.21	7.45	5.79	6.46		14.72			
Effluent # Samples	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			
BOD5																	
Raw BOD5 mg/L	151.00	120.00	125.00	85.00	105.00	227.00	195.00	124.00	115.00	82.00	76.00	162.00		130.58			
Raw # Samples	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			
TSS																	
Raw Avg. TSS	144.00	123.00	145.00	108.00	146.00	263.00	230.00	166.00	150.00	135.00	117.00	139.00		155.50			
Raw # Samples	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			
Effluent Avg. TSS	4.00	4.00	5.00	4.00	3.40	7.00	6.00	4.00	5.00	6.00	5.00	5.00		4.87			25.00
Effluent # Samples	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			
Loading TSS kg/d	21.67	16.25	20.77	22.39	11.47	17.33	17.03	10.83	11.91	12.77	10.14	9.69		15.19			
Percent Removal TSS	97.35	96.93	96.54	96.28	97.65	97.42	97.22	97.44	96.50	95.60	95.53	96.75		96.77			
Total Phosphorous																	
Raw Avg. TP	1.43	1.73	2.07	1.55	1.95	3.44	2.48	2.28	2.28	1.57	1.40	2.10		2.02			
Raw # Samples	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			
Effluent Avg. TP	0.08	0.13	0.15	0.09	0.16	0.20	0.15	0.12	0.14	0.11	0.14	0.13		0.13			0.34
Effluent # Samples	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			
Loading TP kg/d	0.48	0.55	0.61	0.47	0.50	0.52	0.39	0.30	0.31	0.26	0.26	0.28		0.41			
Percent Removal TP	94.10	92.60	92.80	94.50	92.50	94.10	94.00	95.00	94.00	93.00	90.00	93.00		93.30			
Annual Total Effluent Loading														149.65			819.00
Nitrogen																	
Raw Avg. TKN	17.30	16.10	20.10	14.20	21.60	21.60	19.50	21.70	21.80	15.80	16.40	21.50		18.97			
Raw # Samples	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			
Effluent Avg. TAN	0.40	0.90	0.10	0.10	0.10	0.10	0.10	0.20	0.10	0.12	0.10	0.10		0.20			5-W,20-S
Effluent # Samples	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			
Loading TAN	7.98	5.20	0.42	0.55	0.32	0.51	0.26	0.68	0.22	0.21	0.19	0.21		1.40			
Unionized Ammonia	0.004	0.009	0.001	0.002	0.001	0.001	0.002	0.008	0.002	0.002	0.002	0.001		0.003			
Disinfection																	
GMD Ecoli	5.00	2.00	2.00	2.00	5.80	9.00	4.00	9.00	3.00	7.00	1.00	7.00		4.73			200.00
Effluent # Samples	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			
Dewatering																	
Sludge Dewatered m3	699.55	231.37	594.03	571.44	456.28	633.82	590.83	884.43	722.27	579.14	572.97	545.50		7081.63			
m3/hr	15.86	17.95	15.16	17.86	15.60	16.09	18.88	19.06	18.93	17.09	18.06	18.52		17.42			
Landfill Total kg	47600	11550	28230	25210	25720	25080	27590	51100	20140	37160	23260	25160.00		347800.00			
kg/m3	68.04	49.92	47.52	44.11	56.36	39.56	46.69	57.58	27.88	64.16	40.59	46		49.04			
Centrate total m3	597.02	194.56	512.82	505.03	370.23	620.67	531.54	738.17	442.87	494.48	525.18	504.64		6037.21			

