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The Municipality of Trent Hills

ANNUAL REPORT

Hastings Wastewater System 2023

Prepared by

Wastewater Operations Department

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Section 11(4) of the Environmental Compliance Approval no.7754-B3GQNP, for the Hastings 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)

Section 1 – ECA Condition 11 (4) (a)

A summary of all monitoring data collected at the Hastings Wastewater Treatment Facility (WWTF) during the reporting period can be found in Appendix I. The Performance Report provides Flow data, Raw sewage and Final effluent analytical results and an Effluent loadings summary. It is important to note that flow is measured at the Hastings Wastewater Treatment Facility in the final effluent with a Milltronics OCM III measuring device. Below is a summary of the Influent Data. During the spring and winter months in the reporting year flows are elevated due to infiltration and inflow, which historically is consistent. The flushing and CCTV program is being followed up immediately with repairs and problem areas of infiltration are being identified.

Hastings WWTF -Monthly Average Effluent Flows 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total Monthly Flow m3	32930	33420	40936	45973	26264	17360	15843	15780	12252	11287	11554	14723
Average Daily Flow m3	1062	1194	1321	1532	847	579	511	509	408	364	385	475
Minimum Daily Flow m3	605	586	750	845	565	476	437	404	312	269	313	388
Maximum Daily Flow m3	2286	1916	2317	3239	1519	927	624	738	543	419	454	475

The chart below summarizes the Monthly Influent Monitoring.

Hastings WWTF -Monthly Average Influent Monitoring 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
pH	7.83	7.93	7.67	7.8	7.42	7.53	7.36	6.94	7.7	7.6	7.42	7.62
Temperature	9.4	8.7	7.7	9.9	12.2	16	18.2	18.8	19	17.8	15.2	11.7
Total Suspended Solids	72	142	73	96	91	183	165	261	730	263	1270	3260
Total Phosphorous	0.93	2.54	1.53	0.59	1.96	3.55	3.05	3.28	5.44	5.01	15.3	20.8
Total Kjeldahl Nitrogen	10.9	26.7	14.9	6.2	16.4	28.2	25.9	27.2	32.9	41.2	36.3	30

Imported Sewage

Hastings WWTF -Monthly Imported Sewage Received 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly Total m3	0	0	450	258	504	756	714	840	546	168	210	0

Hastings WWTF -Monthly Imported Sewage Monitoring Monitoring 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
BOD5			63	62	45	47	28	43	40	39	62	
Total Suspended Solids			13	13	11	10	19	4	5	27	3	
Total Phosphorous			3.31	3.37	3.55	4.66	3.44	3.41	3.51	2.75	3.25	
Total Kjeldahl Nitrogen			476	483	469	474	460	467	548	479	539	
Total Ammonia			432	472	456	464	490	491	480	503	474	

The Hastings WWTF is only required to sample during months when Imported Sewage is being received.

Section 2 – ECA Condition 11 (4) (b)

The facility operated both adequately and successfully with respect to operation of the wastewater treatment process. There were no difficulties with respect to maintaining compliance with the Environmental Compliance Approval (ECA) effluent quality requirements.
Effluent quantity and quality criteria stipulated in ECA Condition 7(1) Schedule C are summarized as follow:

Hastings WWTF -Monthly Average cBOD5 Effluent Monitoring 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Effluent Average cBOD5 mg/L	3	3	5	4.5	4	3.25	4.2	2.25	2.5	2.8	4	4
Monthly Average cBOD5 Concentration Objective mg/L	15	15	15	15	15	15	15	15	15	15	15	15
Monthly Average cBOD5 Concentration Limit mg/L	25	25	25	25	25	25	25	25	25	25	25	25
cBOD5 Average Daily Loading kg/D	3.89	4.77	6.93	7.66	4.5	4.05	2.3	1.27	1.63	1.45	1.54	1.9
cBOD5 Average Daily Loading Objective kg/D	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
cBOD5 Average Daily Loading Limit kg/D	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5

Hastings WWTF -Monthly Average Total Suspended Solids Effluent Monitoring 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Effluent Average TSS mg/L	3	5	12	11	6	5	9	2.5	9	6.6	5	5
Monthly Average TSS Concentration Objective mg/L	20	20	20	20	20	20	20	20	20	20	20	20
Monthly Average TSS Concentration Limit mg/L	25	25	25	25	25	25	25	25	25	25	25	25
TSS Average Daily Loading kg/D	3.187	5.371	15.84	17.24	5.71	2.74	4.7	1.52	3.77	1.63	1.92	2.25
TSS Average Daily Loading Objective kg/D	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2
TSS Average Daily Loading Limit kg/D	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5

The Results tabulated above show that there were no effluent non-compliance events in accordance with the Environmental Compliance Approval for the 2023 reporting period.

The following table provides a summary of the monthly average total phosphorous concentrations in the final effluent discharged to the Trent River. The compliance limit for monthly average total phosphorous concentration in the facility ECA is 1.0 mg/L. The table also summarizes the monthly loading of total phosphorous. The Monthly Average Daily Effluent Loading Limit of total phosphorous for the Hastings WWTF is 1.1 kg/d and this value was not exceeded during any month in 2023.

Hastings WWTF -Monthly Average Total Phosphorous Effluent Monitoring 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Effluent Average Total Phosphorous mg/L	0.06	0.07	0.17	0.14	0.11	0.08	0.12	0.07	0.15	0.08	0.12	0.06
Monthly Average Total Phosphorous Concentration Objective mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Monthly Average Total Phosphorous Concentration Limit mg/L	1	1	1	1	1	1	1	1	1	1	1	1
Total Phosphorous Average Daily Loading kg/D	0.061	0.084	0.224	0.211	0.117	0.045	0.062	0.036	0.061	0.029	0.046	0.033
Total Phosphorous Average Daily Loading Objective kg/D	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Total Phosphorous Average Daily Loading Limit kg/D	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Hastings WWTF -Monthly Average Total Chlorine Residual Effluent Monitoring 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Effluent Average Total Chlorine Residual mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Monthly Average Total Chlorine Residual Objective mg/L	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

The above table illustrates that the Hastings plant met the Objective of 0.02 mg/L in 12 out of 12 months in 2023

Hastings WWTF -Monthly e.Coli Geometric Mean Density (GMD) Effluent Monitoring 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Effluent e.Coli GMD CFU/100mL	42	32	65	87	7	24.5	28	36	35	8.6	13	8.1
Monthly e.Coli GMD Objective CFU/100mL	150	150	150	150	150	150	150	150	150	150	150	150

The Hastings plant met the E.coli Objective of 150 CFU/ 100 mL in 12 out of 12 months in 2023

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.

Hastings WWTF -Monthly pH Effluent Monitoring 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum pH	7.3	7.2	7.03	7.38	6.67	6.99	6.64	6.53	6.93	6.65	6.9	7.04
Maximum pH	8.17	8.21	8.09	8.28	7.85	7.84	7.79	7.52	7.91	8.04	7.98	8.91
Average pH	7.82	7.85	7.69	7.88	7.43	7.47	7.22	6.87	7.51	7.5	7.57	7.78

The above results show that the pH was maintained between 6.53 and 8.91 for the 2023 reporting period, which is within the compliance range of 6.0 to 9.5 specified in the ECA.

Hastings WWTF -Monthly Temperature (*C) Effluent Monitoring 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum Temperature *C	6.1	4.2	5	6.5	10.6	14	20.4	19.7	18.3	14.2	9.8	7.6
Maximum Temperature *C	10.1	8.2	9.5	12.3	16.6	20.4	22.2	21.7	23.1	20.6	13.6	12
Average Temperature *C	7.8	6.2	6.5	10.1	13.2	18.2	21	20.7	20.3	16.6	11.6	9.6

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)

There were no deviations from the monitoring schedule in ECA # 7754-B3GQNP. A sample calendar is located in Appendix II located at the end of this report.

Section 4 – ECA Condition 11(4) (d)

Although the Hastings WWTF operated efficiently and within compliant limits as set out in ECA #7754- B3GQNP Condition 7(1) Schedule C, there were a few notable operational challenges of note.

1. During the spring when the temperatures are their lowest and flows have increased, we see a slight elevation in Suspended solids and continue to have issues with the ORP analyzers during this time of year. Operations staff are aware of these changes and are able to make process changes accordingly. The Municipality is presently in the planning stages to upgrade the disinfection system.
2. There was a large increase in flows in the spring of 2023 due to Inflow and Infiltration, namely along Cedar Dr. Multiple areas were located by CCTV and repaired with a grouting compound. There were also four laterals throughout the town that were identified and repaired. Sump pump inspections continued on the South side of the town.
3. There has been an increase in biosolids over the past few years and with current storage, an approved hauler has been required to haul to an approved storage lagoon during times when haulers are unable to remove the waste. Trent Hills is currently examining options to increase storage of biosolids.

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 *102*

Summary of all Normal and Emergency Repairs 2023	
Month	Repair
January	Replace PRV on Sodium Bisulphite system STI on site grouting manholes Commission Main Pumping Station Electrical Panel
February	Install new block heater sensor on generator at North Pump Station
March	Set up radio communication for North PS and Homewood PS Manual Transfer Switch installed at Homewood PS
May	STI on site to grout various areas on Cedar Dr. Aerator 4 removed to replace Mixer motor
June	Replace diffuser socks and clamps on Digester 3 Aerator 4 replaced and back in service
July	Replace electrical wiring on Digester Blower 1 due to electrical short Grinder removed from grit channel and determined to require replacement. Ordered and expect to arrive in 2024
August	Replace ORP sensor on chlorine side.
September	New electrical panel installed in chemical room Begin electrical upgrade in main plant to transfer to the new MCC
October	Install operating nuts on valves at Homewood to eliminate confined space Repair and replace alum lines in basement.
November	Trent Security install new alarm system Unplug pump 1 at North PS

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".

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 final effluent V-Notch weir flow meter is located in Appendix III.

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 at minimum 3 times weekly.
3. Ensuring that Alum is being dosed
4.Monitor chemical system, verify ORP sensors are in calibration to ensure proper disinfection
5. Calibrating laboratory equipment according to manufacturer's recommendations
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. Closely monitoring solids inventory in the plant as well as detention times
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.

The tables in Section 2 illustrate that all effluent **objectives** were met during the reporting period for CBOD, Total Suspended Solids and Total Phosphorous. The objective for E.Coli and Total Chlorine Residual met the objective in 12 out of 12 months.

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.

Hastings WWTF -Average Daily Flow m3/D 2023												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Daily Flow m3/D	1062	1194	1321	1532	847	579	511	509	408	364	385	475
Rated Capacity m3/D	1060	1060	1060	1060	1060	1060	1060	1060	1060	1060	1060	1060

The above table shows that the Hastings WWTF ECA rated capacity was exceeded in January, February, March and April 2023. The Annual Average Daily Influent Flow of 765 m3/day is 72% of the Rated Capacity of the Sewage Treatment Plant of 1060 m3/d. As stated below in Section 13, the Municipality continues to monitor flows, identifies problem areas, and follows up with repairs.

Section 9 – ECA Condition 11 (4) (i)

During the 2023 reporting period, 905 m3 of biosolids were hauled and disposed from the Hastings Wastewater Treatment Facility. This amount is lower than 1488 m3 in 2022 and 1200 m3 in 2021. 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 is land application on NASM certified land. Tabulated below is a summary of the volumes of biosolids, the dates and the location of where biosolids were disposed of during the 2023 reporting period.

Hastings - Sites Applied with Biosolids 2023

Date 2023	Farmer/ Landowner	NASM Plan	Lot	Con	Municipality	Ward	Field #	Application Method	Total Volume (m3)	Area Spread (ha)
April 25	GFL Storage Facility (Smith's)	ECA# S-3708-42	19	6	Township of Loyalist	Ernestown			40	
May 9	Stockdale, Cam - Home	24026	18-19	6	Township of Asphodel-Norwood	Asphodel	3	Injection	360	2.77
May 24	GFL Storage Facility (Smith's)	ECA# S-3708-42	19	6	Township of Loyalist	Ernestown			25	
Oct 13-16	Stockdale, David - Crop Division	24464	2-3	4	Township of Douro-Dummer	Dummer	7	Surface, Crop Residue	480	4.36
								Totals	905	7.13

17.6 ac

Section 10 – ECA Condition 11 (4) (j)

There are no community complaints to report for this 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)

There were no Notice of Modification to Sewage Works forms completed during the 2023 reporting period.

Section 13 – ECA Condition 11 (4) (m)

The Hastings sewer system has not experienced Bypass/Overflow situations in recent years and the Sewer system is 100% separated. 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 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.

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 Hastings Wastewater Treatment Plant deposited 762 m3 average daily effluent volumes.

The quarterly reports monitoring reports were submitted to Environment Canada as required and required sampling was 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 705-653-7113

Troy Stephens

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

APPENDIX I

2023 Hastings WWTF Performance Report

Hastings WWTF 2023 Annual Performance Summary

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average	Mn	Max	Criteria
Flows																	
Effluent Flow Total (m3)	32930	33420	40936	45973	26264	17360	15843	15780	12252	11287	11554	14723	278322				
Effluent Flow Avg. (m3/d)	1062	1194	1321	1532	847	579	511	509	408	364	385	475		765.58			1060
Effluent Flow Min. (m3/d)	605	586	750	845	565	476	437	404	312	269	313	388			269		
Effluent Flow Max. (m3/d)	2286	1916	2317	3239	1519	927	624	738	543	419	454	475				3239	
Raw Temperature																	
Min	8.3	5.7	5.6	7.8	10	14.5	17.2	17.8	18	15.8	13.2	10.3			5.6		
Max.	11.4	11.1	11.3	12.4	13.9	17.1	20.4	21.3	20.3	19.6	18	13.9				21.3	
Avg.	9.4	8.7	7.7	9.9	12.2	16	18.2	18.8	19	17.8	15.2	11.7		13.7			
Raw pH																	
Min.	7.16	7.75	6.87	7.54	6.96	7.1	6.9	6.42	7.15	7.01	7.2	7.13			6.42		
Max.	8.08	8.33	8.1	7.96	7.87	7.83	7.74	7.24	8.16	8.1	7.65	8.5				8.5	
Avg.	7.83	7.93	7.67	7.8	7.42	7.53	7.36	6.94	7.7	7.6	7.42	7.62		7.57			
# of Samples	13	12	14	12	13	14	13	14	12	13	13	12	155				
BOD																	
Raw BOD mg/L	55	143	63	55	99	235	130	136	264	394	630	933		261.42			
Raw BOD Loading	51.77	119.8	47.7	35.89	116.85	406.1	254.37	267.17	646.42	1082.12	1635.79	1964.47		552.37			
Effluent CBOD																	
Effluent Average cBOD5 mg/L	3	3	5	4.5	4	3.25	4.2	2.25	2.5	2.8	4	4		3.54			25
Loading cBOD5 kg/d	3.89	4.77	6.93	7.66	4.5	4.05	2.3	1.27	1.63	1.45	1.54	1.9		3.49			26.5
TSS																	
Raw Avg. TSS	72	142	73	96	91	183	165	261	730	263	1270	3260		550.5			
Raw # Samples	1	1	1	1	1	1	1	1	1	1	1	1	12				
Effluent Avg. TSS	3	5	12	11	6	5	9	2.5	9	6.6	5	5		6.6			25
Effluent # Samples	5	4	4	4	5	4	5	4	4	5	4	4	52				
Loading TSS kg/d	3.187	5.371	15.84	17.24	5.71	2.74	4.7	1.52	3.77	1.63	1.92	2.25		5.49			26.5
Percent Removal TSS	95.9	96.5	83.6	89.6	93.5	97.3	94.6	99.1	98.8	97.5	99.7	99.9		95.5			
Total Phosphorous																	
Raw Avg. TP	0.93	2.54	1.53	0.59	1.96	3.55	3.05	3.28	5.44	5.01	15.3	20.8		5.33			
Raw # Samples	1	1	1	1	1	1	1	1	1	1	1	1	12				
Effluent Avg. TP	0.06	0.07	0.17	0.14	0.11	0.08	0.12	0.07	0.15	0.08	0.12	0.06		0.10			1
Effluent # Samples	5	4	4	4	5	4	5	4	4	5	4	4	52				
Loading TP	0.061	0.084	0.224	0.211	0.117	0.045	0.062	0.036	0.061	0.029	0.046	0.033		0.084			1.1
Percent Removal TP	93.87	97.24	88.88	76.61	92.95	97.8	96	97.86	97.24	98.4	99.2	99.6		94.6			
Nitrogen																	
Raw Avg. TKN mg/l	10.9	26.7	14.9	6.2	16.4	28.2	25.9	27.2	32.9	41.2	36.3	30		24.73			
Raw # Samples TKN	1	1	1	1	1	1	1	1	1	1	1	1	12				
Effluent Avg. TKN mg/l	1.3	0.7	1	1.75	2.7	5.4	0.58	2.2	0.5	0.96	1.42	1.3		1.65			
Effluent Avg. TAN mg/l	0.5	0.125	0.27	1.02	2.3	4.27	0.1	0.125	0.1	0.1	0.1	0.1		0.76			
Loading TAN kg/d	0.489	0.239	0.44	2.04	4.74	3.27	0.05	0.102	0.041	0.036	0.038	0.047		0.96			
Unionized Ammonia	0.006	0.001	0.002	0.024	0.013	0.028	0.001	0.001	0.001	0.001	0.001	0.001		0.007			
Effluent # Samples TAN	5	4	4	4	5	4	5	4	4	5	4	4	52				
Nitrite + Nitrate NO3-N																	
Min.	5.04	5.44	4.87	3.87	0.23	0.19	26.5	26.3	34.7	22.8	23.7	15.7			0.19		
Max.	11.1	12.2	7.85	9.83	13.3	31.7	38.2	42.8	42.6	29.7	26.3	19.1				42.8	
Average	8.5	7.84	6.77	6.57	8.69	18.8	32.3	34.5	37.7	25.7	25.1	17.8		19.19			
NO3-N # Samples	5	4	4	4	5	4	5	4	4	5	4	4	52				
Nitrite NO2-N																	
Min.	<0.03	0.06	0.04	0.03	0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03			0.03		
Max.	0.1	0.2	2.62	1.42	0.19	0.14	0.04	0.07	<0.03	<0.03	0.04	0.04				2.62	
Average	0.05	0.14	0.92	0.5	0.06	0.06	0.03	0.05	<0.03	<0.03	0.03	0.03		0.16			
NO2-N # Samples	5	4	4	4	5	4	5	4	4	5	4	4	52				
Effluent pH																	
Min	7.3	7.2	7.03	7.38	6.67	6.99	6.64	6.53	6.93	6.65	6.9	7.04			6.53		6
Max	8.17	8.21	8.09	8.28	7.85	7.84	7.79	7.52	7.91	8.04	7.98	8.91				8.91	9.5
Average	7.82	7.85	7.69	7.88	7.43	7.47	7.22	6.87	7.51	7.5	7.57	7.78		7.55			
# of Samples	13	12	13	13	14	14	13	14	12	13	13	15	159				
Effluent Temperature																	
Min.	6.1	4.2	5	6.5	10.6	14	20.4	19.7	18.3	14.2	9.8	7.6			4.2		
Max.	10.1	8.2	9.5	12.3	16.6	20.4	22.2	21.7	23.1	20.6	13.6	12				23.1	
Avg.	7.8	6.2	6.5	10.1	13.2	18.2	21	20.7	20.3	16.6	11.6	9.6		13.48			
Disinfection																	
Chlorine Used kg/d	3.6	2.98	4.3	7.88	3.69	1.9	2.69	2.96	2.44	1.81	2.19	1.97		3.20			
Chlorine Used Total L	880.9	658.1	1052.6	1863.8	903.6	449.5	657.8	723.3	577.3	442.7	519	482.1	9210.7				
Dosage	3.64	2.94	3.32	5.91	4.27	3.28	5.15	5.8	5.99	4.96	5.7	4.1		4.59			
Effluent # Samples	5	4	4	4	5	4	5	4	4	5	4	4	52				
GMD Ecoli	42	32	65	87	7	24.5	28	36	35	8.6	13	8.1		32.18			150
UVT	98	73.4	76.3	73.1	73.2	59	68.3	68.1	66.2	75.8	73.1	72.1		73.05			
Dechlorination																	
Sodium Bisulphite Total L	659.8	588.3	693.1	846.8	579.4	472.8	441.2	579.9	409.5	257.2	289.3	346.9	6164.2				
Total Chlorine Residual	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02		0.01			0.02
# of Samples	13	12	14	13	13	14	13	14	12	13	13	15	159				
Sludge Hauled m3	0	0	0	40	385	0	0	0	0	480	0	0	905				
Alum																	
Alum Used Total kg	778.1	702.8	871.9	1062	1069.5	1035	1069.5	1184.2	1146	1109	617	576.6	11221.6				
Average Dosage	28.2	24.95	23.75	27.38	43.49	60.8	67.96	76.72	94.92	99.05	54.15	40.24		53.47			
Imported Sewage																	

Northumberland County	0	0	450	258	504	756	714	840	546	168	210	0	4446	370.5			
Just In Time																	
Total Imported Sewage	0	0	450	258	504	756	714	840	546	168	210	0	4446	370.5			
BOD5			63	62	45	47	28	43	40	39	62			48			
Total Suspended Solids			13	13	11	10	19	4	5	27	3			11.67			
Total Phosphorous			3.31	3.37	3.55	4.66	3.44	3.41	3.51	2.75	3.25			3.47			
TKN			476	483	469	474	460	467	548	479	539			488			
Ammonia + Ammonium			432	472	456	464	490	491	480	503	474			474			
Leachate Related Effluent Sampling																	
Boron	0.102			0.051			0.358			0.21				0.180			
Cobalt	0.000104			0.000166			0.000391			0.000149				0.000203			
Magnesium	7.63			6.04			8.7			7.16				7.38			
Manganese	0.00571			0.00894			0.003			0.00442				0.00552			
Potassium	6.01			3.95			17.4			11.4				9.69			
Strontium	0.306			0.254			0.272			0.213				0.26125			
Bis(2-ethylhexyl) Phthalate	<2			<2			<2			<2				<2			

APPENDIX II

2024 Hastings WWTF Sample Schedule

January 2024

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

	Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
	Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
	Monthly – Raw Sewage – Composite for BOD's, TSS, Total P, TKN – Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.coli – Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
	Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
	Statutory Holiday / Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

February 2024

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

	Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
	Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
	Monthly – Raw Sewage – Composite for BOD's, TSS, Total P, TKN – Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.Coli – Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
	Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
	Statutory Holiday / Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

March 2024

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

- Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
- Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
- Monthly – Raw Sewage – Composite for BOD's, TSS, Total P, TKN
  - Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.Coli
  - Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
- Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
- Statutory Holiday
- Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

April 2024

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

- Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
- Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
- Monthly – Raw Sewage – Composite for BOD's, TSS, Total P, TKN
  - Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.Coli
  - Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
- Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
- Statutory Holiday
- Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

May 2024

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

	Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
	Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
	Monthly– Raw Sewage – Composite for BOD's, TSS, Total P, TKN – Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.Coli – Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
	Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
	Statutory Holiday / Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

June 2024

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Please Initial on date that sample is collected.						1
2	3 Collect Weekly Final Effluent Samples	4	5 Collect Monthly Raw, Sludge, and Imported Sewage (if required)	6	7	8
9	10 Collect Weekly Final Effluent Samples		12	13	14	15
16	17 Collect Weekly Final Effluent Samples	18	19 Collect Bi-Monthly Sludge	20	21	22
23 / 30	24 Collect Weekly Final Effluent Samples	25	26	27	28	29 Operator Signature: _____

	Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
	Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
	Monthly– Raw Sewage – Composite for BOD's, TSS, Total P, TKN – Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.Coli – Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
	Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
	Statutory Holiday / Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

July 2024

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

	Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
	Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
	Monthly – Raw Sewage – Composite for BOD's, TSS, Total P, TKN – Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.Coli – Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
	Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
	Statutory Holiday
	Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

August 2024

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

	Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
	Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
	Monthly – Raw Sewage – Composite for BOD's, TSS, Total P, TKN – Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.Coli – Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
	Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
	Statutory Holiday
	Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

September 2024

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

- Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
- Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
- Monthly – Raw Sewage – Composite for BOD's, TSS, Total P, TKN
  - Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.Coli
  - Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
- Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
- Statutory Holiday
- Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

October 2024

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

- Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
- Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
- Monthly – Raw Sewage – Composite for BOD's, TSS, Total P, TKN
  - Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.Coli
  - Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
- Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
- Statutory Holiday
- Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

November 2024

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

	Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
	Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
	Monthly – Raw Sewage – Composite for BOD's, TSS, Total P, TKN – Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.Coli – Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
	Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
	Statutory Holiday
	Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

December 2024

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

	Weekly – Final Effluent – Composite for cBOD5, TSS, Total P, TKN, Total Ammonia Nitrogen, Nitrite, and Nitrate, Unionized Ammonia, E. Coli, pH, Temp., Total Residual Chlorine
	Bi-weekly WSER Requirements – Final Effluent Composite for CBODs, TSS
	Monthly – Raw Sewage – Composite for BOD's, TSS, Total P, TKN – Sewage Sludge – Grab for TS, Volatile Solids, Total P, TKN, NH3 + NH4, as N, NO2 & NO3 as N, Metal Scan (AS, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sn) and potassium and E.Coli – Imported Sewage (if receiving in calendar month) – BOD5, TSS, TP, TKN
	Quarterly Final (Leachate Related) – Boron, Cobalt, Magnesium, Manganese, Potassium, Strontium, Bis Phthalate
	Statutory Holiday
	Annual Leachate Monitoring (if receiving in year) – see ECA and contact lab to prepare bottles

APPENDIX III

2023 Hastings WWTF Calibration Report

Tower Electronics Canada Inc. Calibration Certificate

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

Calibration by:
Dan Matchett

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

Instrument Type
Open Channel

Meter Information

Date of Test:	2023-05-11
Location:	Hastings WWTP
Meter Under Test	Effluent Flow
Client Tag:	n/a
Manufacturer:	Miltronics
Model:	OCMIII
Serial Number:	05020C022466
Totalizer As Found:	650114m3
Totalizer As Left:	650134m3
Acceptable Error:	15%

Programming Parameters:

Max Flow	3916.8CMD
Max Head	0.254M
Primary Device	V-Notch 90 Degrees
Allowable Error:	15%
Calibration Due:	May-24

Method of verification
Head/Level Simulation

Units:	CMD
Zero:	0.00
Span:	3916.80
Totalizer:	M3

Flow Test

Head Applied	Sim Flow	Meter Display	Current Output	Disp Error%	mA Error %
0.000	0.000	0.080	4.012	0.000	0.300
0.050	66.700	79.330	4.339	0.322	1.557
0.125	658.700	702.000	6.883	1.105	2.873
0.200	2132.900	2248.000	13.075	2.939	2.849
0.250	3726.000	3925.000	20.023	5.081	4.175
			Average Error%	1.89	2.35
			Result:	PASS	PASS

Totalizer Test

Sim Flow Rate	3726.000	CMD
Start Totalizer	650126.000	M3
End Totalizer	650131.000	M3
Volume Simulated	5.000	M3
Time(Seconds)	107.870	
Calculated Totalizer(MUT)	4.652	
Error%	7.483	
Result:	PASS	

Comments:
Unit passes verification.
Primary device installation conditions conforms to ISCO Open Channel Flow Measurement Handbook Chapter 3 guidelines.
Exponent 2.5. Range at zero 109.99CM, Blanking 61.0169CM, Max Head 0.254M

APPENDIX IV

2023 Hastings WWTF Biosolids Reports

Hastings - Sites Applied with Biosolids 2023

Date 2023	Farmer/ Landowner	NASM Plan	Lot	Con	Municipality	Ward	Field #	Application Method	Total Volume (m3)	Area Spread (ha)
April 25	GFL Storage Facility (Smith's)	ECA# S-3708-42	19	6	Township of Loyalist	Ernestown			40	
May 9	Stockdale, Cam - Home	24026	18-19	6	Township of Asphodel-Norwood	Asphodel	3	Injection	360	2.77
May 24	GFL Storage Facility (Smith's)	ECA# S-3708-42	19	6	Township of Loyalist	Ernestown			25	
Oct 13-16	Stockdale, David - Crop Division	24464	2-3	4	Township of Douro-Dummer	Dummer	7	Surface, Crop Residue	480	4.36
								Totals	**905**	**7.13**

17.6 ac

APPENDIX V

2023 Hastings WWTF Annual Leachate Sampling

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Project : PO#410-H

24-July-2023

Mun of Trent Hills (Hastings WWTF)
Attn : Scott White

66 Front Street, P.O. Box 1030
Campbellford, ON
K0L-1L0, Canada

Phone: 705-653-1900
Fax:705-653-0558

Date Rec. : 05 July 2023
LR Report: **CA14235-JUL23**

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: 3BF49 Northumberland County Leachate (13:15)	6: 3BF49 Northumberland County Leachate (12:00)
Sample Date & Time					04-Jul-23 13:15	05-Jul-23 12:00
Temperature Upon Receipt [°C]	---	---	---	---	20.0	20.0
Biochemical Oxygen Demand (BOD5) [mg/L]	17-Jul-23	16:21	24-Jul-23	10:24	18 UAL	---
Total Suspended Solids [mg/L]	10-Jul-23	14:27	11-Jul-23	14:49	15	---
pH [No unit]	06-Jul-23	16:02	07-Jul-23	13:10	7.74	---
Temperature @ pH [°C]	06-Jul-23	16:02	07-Jul-23	13:10	20.8	---
Alkalinity [mg/L as CaCO3]	06-Jul-23	16:02	07-Jul-23	13:10	3260	---
Conductivity [uS/cm]	06-Jul-23	16:02	07-Jul-23	13:10	8170	---
Total Dissolved Solids [mg/L]	06-Jul-23	17:58	07-Jul-23	13:07	3560	---
Chemical Oxygen Demand [mg/L]	11-Jul-23	08:40	24-Jul-23	13:09	590	---
Total Kjeldahl Nitrogen [as N mg/L]	06-Jul-23	16:25	11-Jul-23	13:41	462	---
Ammonia+Ammonium (N) [as N mg/L]	06-Jul-23	18:47	11-Jul-23	10:00	503	---
4AAP-Phenolics [mg/L]	07-Jul-23	07:49	07-Jul-23	12:58	0.048	---
Dissolved Organic Carbon [mg/L]	07-Jul-23	07:27	11-Jul-23	11:44	283	---
Hydrogen Sulphide [mg/L]	07-Jul-23	10:47	12-Jul-23	14:13	< 0.02	---
Sulphide [mg/L]	07-Jul-23	10:47	12-Jul-23	14:12	0.12	---
Chloride [mg/L]	11-Jul-23	14:51	11-Jul-23	19:59	540	---
Sulphate [mg/L]	11-Jul-23	14:49	11-Jul-23	19:59	28	---
Nitrite (as N) [mg/L]	10-Jul-23	12:36	12-Jul-23	19:51	< 0.3	---
Nitrate (as N) [mg/L]	10-Jul-23	12:36	12-Jul-23	19:51	< 0.6	---
Nitrate + Nitrite (as N) [mg/L]	10-Jul-23	12:36	12-Jul-23	19:51	< 0.6	---
Aluminum (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	0.106	---
Arsenic (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	0.0160	---
Beryllium (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	< 0.000007	---
Boron (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	4.58	---
Cadmium (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	0.000045	---
Calcium (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	206	---
Chromium (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	0.0637	---
Copper (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	0.0034	---
Lead (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	0.00020	---
Iron (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	1.91	---
Magnesium (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	79.9	---
Potassium (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	288	---
Selenium (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	0.00063	---
Silver (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	< 0.00005	---

0003409959

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Project : PO#410-H
LR Report : CA14235-JUL23

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: 3BF49 Northumberland County Leachate (13:15)	6: 3BF49 Northumberland County Leachate (12:00)
Zinc (total) [mg/L]	11-Jul-23	13:10	13-Jul-23	16:01	0.020	---
Oil & Grease (total) [mg/L]	08-Jul-23	09:33	11-Jul-23	08:10	---	< 2

UAL - Unreliable: Sample Age Exceeds Normal Limit

Note:
- Hydrogen Sulphide (H2S) calculated using lab results for pH, temperature and conductivity.
- The initial BOD result was outside of the acceptable range for the dilutions used. The analysis was repeated; however, the recommended holding time of 7 days was exceeded.
- Some reporting limits may be elevated due to sample matrix interferences.

Patti Stark
Project Specialist,
Environment, Health & Safety