Municipality of Leamington
live | play | work

Leamington Pollution Control Center
2024 Annual Report

Submitted to:
Ontario Ministry of the Environment, Conservation and Parks
March 2025

Table of Contents

Appendices

Symbols & Abbreviations

CBOD	Carbonaceous Biochemical Oxygen Demand (5-day) (mg/l)
kg/d	kilograms per day
m^3	cubic meters
m^3/d	cubic meters per day
mg/l	milligrams per litre
MIGD	million imperial gallons per day
Ml	megalitres
pH	Negative logarithm of the hydrogen ion concentration
SS	Suspended Solids (mg/l)
t	tonne
TP	Total Phosphorus (mg/l as P)
UV	Ultra Violet (light)

Executive Summary

This annual report was prepared to summarize the Leamington Pollution Control Centre (LPCC) 2024 operations. The report is being submitted to the Ontario Ministry of the Environment, Conservation and Parks (MECP), in addition to the monthly reports (R1) submitted each month during 2024, to satisfy the requirements of Environmental Compliance Approval (ECA) number 8491-AQBJ73, issued on March 23, 2018.

The LPCC is a conventional activated sludge plant that treats the combined influent from the municipal sewer system, imported sewage, leachate from the closed Essex-Windsor Solid Waste Landfill #2 and wastewater from Highbury Canco Ltd. (formerly H.J. Heinz Corporation).

In 2024, the LPCC treated a total of 6,732,059 m^3 of sewage; an average of 18,383 m^3/day. The average effluent quality for the LPCC was:

Contaminant	Concentrations (mg/l unless otherwise noted)		
	ECA Limit (monthly average)	Annual Effluent Monthly Average	Maximum Effluent Monthly Average
C.B.O.D.	15.0	3.1	5.3
Suspended Solids	15.0	8.8	11.9
Total Phosphorus	1.0	0.46	0.91
E.coli (org/100mL)	200	4	17
pH (pH units)	6.0 – 9.5	7.7	range 6.9 – 8.0
Contaminant	**Loadings (kg/d)**		
	ECA Limit (monthly average)	Annual Effluent Monthly Average	Maximum Effluent Monthly Average
C.B.O.D.	525	58	89.5
Suspended Solids	525	164	269
Total Phosphorus	35	7.7	14

During 2024, there were no plant overflow events, however, there were three (3) bypass events on April 8, July 15 and December 31. Each of the events resulted in a bypass of the UV disinfection system and were reported to Spills Action Centre and to MECP through quarterly reports.

In 2024, LPCC produced 6,741 tonnes of N-Viro lime stabilized biosolids, at an average of 64% solids. This final product was applied to farmland in Essex County and surrounding areas.

1.0 Summary of Performance

This report was prepared to summarize the Leamington Pollution Control Centre (LPCC) 2024 operations. This report is being submitted to the Ontario Ministry of the Environment, Conservation and Parks (MECP), in addition to the monthly reports (R1) submitted during 2024, to satisfy the requirements of Environmental Compliance Approval (ECA) number 8491-AQBJ73 issued on March 23, 2018.

The LPCC is a conventional activated sludge facility that treats the combined influent from the municipal sewer system, imported sewage from licensed haulers, leachate from the closed Essex-Windsor Solid Waste Authority Landfill #2 and the wastewater stream from Highbury Canco Ltd. (formerly H.J. Heinz Corporation). The facility has an average day rated capacity of 35,000 m^3/day with a peak flow rate of 70,000 m^3/day. The facility also includes an offline storage basin (OSB) that allows the full amount of the headworks capacity to be utilized for a peak flow rate of 105,000 m^3/day. The facility includes preliminary treatment (screening and grit removal), two primary clarifiers, two aeration tanks, two secondary clarifiers, UV disinfection and sludge processing. UV disinfection is operated continuously throughout the year. Phosphorus removal is achieved through dosing of aluminum sulphate and supplementary suspended solids removal is achieved through dosing of polymer as required throughout the year.

Primary settled sludge and waste activated sludge are dewatered by centrifugation and neutralized with alkaline additive prior to being heated to form the final N-Viro biosolids product. The final biosolids product is managed by Walker Industries Inc. and is applied to farmland in Essex County and surrounding areas.

Monthly plant average results, flow measurements, and other relevant 2024 operating data for the LPCC are provided in **Appendix A**. This data includes any plant overflows/bypasses and the influent and final effluent sample analytical results. All sample results are based on twenty-four (24) hour composite samples collected by automatic samplers. Influent samples are collected following screening and grit removal, while final effluent samples are collected following disinfection. Also included in **Appendix A** is a monthly tabulation of imported sewage, and landfill leachate volumes and analytical data. Historical data and trends for 2015 through 2024 for ECA required parameters is provided in **Appendix B**.

Monthly dewatering data and N-Viro product processing data for the LPCC are included in **Appendix D**. This data provides monthly averages of the volume of sludge pumped, sludge characteristics, amount of centrifuged sludge cake removed (on a wet and dry basis) and the amounts of polymer and lime used in dewatering. Quarterly sample results for the LPCC N-Viro biosolids are also provided in **Appendix D**.

2.0 Plant Operations

2.1 Monitoring Data and Schedule

2.1.1 Influent, Imported Sewage and Landfill Leachate

Wastewater inflows at the LPCC are comprised of municipal sewage, imported sewage from septic tanks and holding tanks throughout Essex County, landfill leachate via force main from the Essex-Windsor Solid Waste Authority closed Landfill #2 and process wastewater from Highbury Canco Ltd. In 2024, the LPCC treated a total of 6,732,059 m^3 of wastewater; an average of 18,383 m^3/day. This average daily influent flow is within the rated capacity of the LPCC of 35,000 m^3/day and represents approximately 53% of plant rated capacity. The peak daily flow of 50,403 m^3/day was recorded in August and represents 72% of peak plant rated capacity.

Flows from the various sources are provided in Table 1. The total municipal flow reported includes the volume of imported sewage and landfill leachate, however, LPCC has included those volumes in the table for ECA reporting purposes.

Table 1: 2024 Influent Volumes

Source	Volume (m^3)
Municipal	4,839,646
Highbury Canco	1,892,413
Imported Sewage	42,407
Landfill Leachate	35,582

Landfill leachate daily flows ranged from 49 to 157 m^3/day, which is well below the ECA limit of 860 m^3/day. Detailed monthly volumes for all wastewater streams and associated plant data are included in **Appendix A**, while historical data and trending for ECA required parameters only is provided in **Appendix B**.

2.1.2 Final Effluent

Final effluent from the LPCC is discharged through a parshall flume prior to entering the final outfall sewer. The final outfall sewer travels approximately 1.2 km along the bank of the Selkirk Drain from the LPCC to Lake Erie where it is released to the environment. In 2024, a total of 6,732,059 m^3 of effluent was released to Lake Erie.

The final effluent parshall flume does not currently provide accurate flow measurements due to high levels in Lake Erie. On March 27, 2018, the MECP provided direction to the LPCC related to the final effluent parshall flume and approval to report on sewage flows from the plant using data recorded from the influent flow meter.

Monthly effluent water quality results for the LPCC are provided in **Appendix A**. Historical data and trending for ECA required parameters is provided in **Appendix B**. A

summary of the results when compared to the ECA effluent objectives and limits is provided in Table 2 and 3.

Table 2: Final Effluent Design Objectives

Contaminant	ECA Objective (monthly average)	Result Summary
C.B.O.D.	10.0 mg/L	All monthly average results were below 10 mg/L
Suspended Solids	10.0 mg/L	Five months exceeded the 10 mg/L objective
Total Phosphorus	0.8 mg/L	One month exceeded the 0.8 mg/L objective
E.coli	150 CFU/100mL	All monthly average results were below 150 CFU/100mL
pH	6.5 – 8.5 pH units (single result)	6.9 min, 8.0 max – all results met ECA objective

In 2024, the LPCC was in compliance with the MECP Effluent Objectives, as specified in Condition 6 of the ECA, with the exception of five (5) monthly average TSS results and one monthly average total phosphorus result, as identified above. All objectives were met for more than 50% of the year.

Table 3: Final Effluent Compliance Limits

Contaminant	Concentrations (mg/l)		
	ECA Limit (monthly average)	Annual Effluent Monthly Average	Maximum Effluent Monthly Average
C.B.O.D.	15.0	3.1	5.3
Suspended Solids	15.0	8.8	11.9
Total Phosphorus	1.0	0.46	0.91
E.coli	200 CFU/100 mL	4	17
pH	6.0 – 9.5 (single result)	range 6.9 – 8.0	
Contaminant	**Loadings (kg/d)**		
	ECA Limit (monthly average)	**Annual Effluent Monthly Average**	**Maximum Effluent Monthly Average**
C.B.O.D.	525	58	89.5
Suspended Solids	525	164	269
Total Phosphorus	35	7.7	14

In 2024, the LPCC was in compliance with the MECP Effluent Limits, as specified in Condition 7 and Schedule C of the ECA.

2.1.3 Annual Comparisons

Annual average wastewater characteristics and flow data for 2015 through 2024 are presented in **Appendix B**.

2.1.4 Monitoring Schedule

The 2024 monitoring schedule is provided in **Appendix C**. All grab and composite samples were collected and analyzed on Tuesday's, however it should be noted that composite sampling took place over the previous 24 hour period. In 2024, there were nine (9) deviations from the sampling schedule as outlined below:

- On July 2 there was no E.Coli result reported as the courier did not deliver the samples to the lab on time and by the time we were advised of the issued it was too late to resample that week.
- The septage hauler sample was collected on July 7 instead of July 6.
- On August 26 the total influent and total effluent samples were accidentally disposed before cBOD/BOD could be done. The influent was resampled on August 27 and the federal cBOD result from August 26 was used for the effluent result.
- On September 3, October 8 and October 14 there were no E.Coli results reported because the courier did not deliver the samples to the lab on time. An additional sample was taken on September 5 and October 17 but no additional sample was taken for the October 8 incident.
- Samples were collected on December 23, 2024, and January 2, 2025 due to the laboratory holiday schedule.

The 2025 monitoring schedule is provided in **Appendix C**. All grab and composite samples are scheduled to be collected on Wednesday's for the 2025 calendar year.

2.2 Operating Problems & Corrective Actions

There were no major operational concerns at the LPCC in 2024.

2.3 Maintenance Summary

Routine maintenance is carried out on all equipment at the LPCC. The *Allmax Antero* computerized maintenance program is used to maintain an inventory of all equipment at the plant, develop work orders for routine maintenance and provide a record of all maintenance and repairs carried out. Sample work orders are provided in **Appendix E**.

In addition to routine preventative maintenance, LPCC completed the following activities in 2024:

- Four (4) new Archimedes screw pumps and ancillary equipment including new upper and lower bearings were installed in the lower pumping station.

- One (1) new turbo blower was installed in December 2024 to provide system redundancy. Blower commissioning is scheduled for February 2025. One existing centrifugal blower was decommissioned and removed during the construction.
- Completed biofilter repairs and media replacement to improve odour control efficiency.
- Continued work on the wastewater masterplan to guide the planning and implementation of strategic wastewater infrastructure improvements over the next 20-year planning horizon. The masterplan is expected to be finalized by spring 2025.

2.4 Effluent Quality Assurance & Control Measures

Ongoing internal QA/QC activities are routinely undertaken in the laboratory to ensure accuracy of test results. QA/QC results for samples that are sent to an external accredited laboratory are reported on the lab certificates of analyses. There were no unusual QA/QC issues identified in 2024.

2.5 Monitoring Equipment – Calibration and Maintenance

Flow measuring devices are calibrated by an independent entity on an annual basis. Sampling devices are calibrated on a regular basis by in-house staff to ensure adequate samples are taken. Maintenance on all devices is part of the regular preventive maintenance program discussed in Section 2.3. Specific information regarding the calibration of flow meters and the maintenance of effluent monitoring equipment is provided in **Appendix E**.

2.6 Biosolids Management

A total of 53,444 m^3 of raw sludge, averaging 3.9% solids, was dewatered during the year. The dewatered centrifuged cake (average 30% solids) was combined with alkaline admixture (cement kiln dust) and heat dried to form 6,741 tonnes of N-Viro stabilized biosolids (averaging 64% solids).

Operating data for the LPCC biosolids process is provided in **Appendix D**. The LPCC biosolids currently meets all criteria as set by the Ontario Ministry of Agriculture, Food & Rural Affairs (OMAFRA) and the MECP. Detailed quarterly analysis reports are provided in **Appendix D**.

For 2025, LPCC anticipates that raw sludge and N-Viro biosolid volumes will increase by approximately 2-5%.

2.7 Complaints

Two (2) odour complaints were received during the 2024 calendar year. A summary of each complaint and associated follow up is provided below:

Date	Nature of Complaint	Follow-up
June 9/24	Odour – smell from pollution control plant June 9, noticed smell at 10 am.	Operators were cleaning the offline storage basin over the weekend which may have contributed to odours in the area. Cleaning was completed by 11 am on June 10, 2024, and odours were monitored following the maintenance activities.
Aug 27/24	Odour – very bad odour from pollution control plant started at 230 pm.	At the time of the complaint, fertilizer was being loaded and transferred off-site. The plant was also receiving higher loadings from the local processing season. LPCC staff contacted the complainant however did not receive a call back.

Complaints are logged on the Complaint Form and filed in the Complaint Binder in the LPCC Administration building. The Complaint Form is forwarded to the MECP within two (2) days of receiving the complaint as required by Condition 3.1 of ECA Air #2964-AN3R54, issued on September 20, 2017.

2.8 By-Passes, Overflows and Spills

The facility includes an offline storage basin (OSB) that allows the full amount of the headworks capacity to be utilized for a peak flow rate of 105,000 m^3/day. During periods of high flow, excess flow is diverted to the OSB. After the storm event, the OSB is emptied, and the flow is directed back the treatment plant.

During 2024, there were no plant overflow events, however, there were three (3) bypass events on April 8, July 15 and December 31. Each of the events resulted in a bypass of the UV disinfection system and were reported to Spills Action Centre and to MECP through quarterly reports. Bypass data is provided in **Appendix A.**

There were no on-site spills during 2024.

2.9 Notice of Modifications to Sewage Works

In 2024, the lower pump station upgrade project was completed, and one new turbo blower was installed. The turbo blower was not commissioned in 2024. These modifications were made to the sewage works under Condition 10, Limited Operational Flexibility and Notices of Modifications to Sewage Works are provided in **Appendix F**.

2.10 Procedure F-5-1

No sewer separation projects were completed in 2024.

2.11 Staffing

Staff at the LPCC includes the Manager of Environmental Services, PCC Supervisor, six (6) Wastewater Operators, one (1) Mechanic, and one (1) Laboratory Technician.

LPCC staff participated in 650 hours of formal training programs during the year. This included both in-house training provided by LPCC staff on the operation of the plant, and California State University Study programs, virtual webinars and courses, etc.

Appendix A
2024 Monitoring Data

Leamington PCC Annual Plant Data 2024

Flow Data	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Average	Yearly Total
Municipal Flow (m^3)	639,155	395,556	405,449	542,799	453,598	372,205	322,890	350,466	302,775	319,330	309,443	425,979	**403,304**	**4,839,646**
Highbury Flow (m^3)	143,102	101,922	95,493	81,875	98,811	121,034	214,783	348,542	335,860	169,927	102,750	78,316	**157,701**	**1,892,413**
Total Plant Flow (m^3)	782,258	497,478	500,942	624,674	552,409	493,238	537,673	699,008	638,635	489,256	412,193	504,295	**561,005**	**6,732,059**
Daily High (m^3)	50,403	25,844	23,175	37,008	32,576	21,741	34,732	40,899	25,469	23,814	21,472	36,483	**50,403**	**max daily**
Daily Low (m^3)	13,035	12,738	12,216	13,781	12,693	12,458	10,417	10,455	19,640	10,664	9,660	10,491	**9,660**	**min daily**
Daily Average (m^3)	25,234	17,154	16,159	20,822	17,820	16,441	17,344	22,549	21,288	15,782	13,740	16,268	**18,383**	**average**
Plant Overflow (hrs)	0	0	0	0	0	0	0	0	0	0	0	0		**0**
Overflow Volume (m^3)	0	0	0	0	0	0	0	0	0	0	0	0		**0**
No. of Overflow Occurrences	0	0	0	0	0	0	0	0	0	0	0	0		**0**
Plant Bypass (hrs)	0	0	0	0.32	0	0	1.5	0	0	0	0	0.16		**2**
Bypass Volume (m^3)	0	0	0	262	0	0	801	0	0	0	0	208		**1,271**
No. of Bypass Occurrences	0	0	0	1	0	0	1	0	0	0	0	1		**3**

Final Effluent	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Average
pH	7.6	7.7	7.6	7.6	7.5	7.7	7.8	7.6	7.8	7.7	7.8	7.6	**7.7**
T.S.S. (mg/l)	10.5	11.5	8.1	10.3	8.2	11.8	6.0	5.9	7.9	6.6	7.3	11.9	**8.8**
C.O.D. (mg/l)	21.0	26.8	24.8	26.2	35.2	28.3	20.2	18.5	25.2	19.0	21.4	26.2	**24.4**
C.B.O.D. (mg/l)	2.8	4.1	2.1	3.2	5.3	3.9	2.6	3.0	2.9	2.1	2.4	3.4	**3.1**
B.O.D. (mg/l)	3.7	5.2	3.0	3.7	6.0	4.4	3.0	3.2	3.3	2.4	3.1	4.1	**3.8**
TAN (mg/l)	0.09	0.08	0.08	0.56	1.48	0.23	0.09	0.06	0.15	0.10	0.18	0.34	**0.29**
TKN-N (mg/l)	1.8	2.5	2.2	2.2	4.7	2.7	2.4	2.8	2.1	2.2	2.2	2.7	**2.5**
Total-P (mg/l)	0.28	0.47	0.25	0.34	0.54	0.91	0.41	0.33	0.46	0.60	0.42	0.48	**0.46**
NO2-N (mg/l)	0.23	0.34	0.36	0.94	0.52	0.22	0.04	0.04	0.09	0.06	0.07	0.09	**0.250**
NO3-N (mg/l)	7.9	8.1	7.2	12.4	7.6	7.5	6.1	4.5	5.1	10.5	7.2	6.9	**7.57**
Conductivity (µS/cm)	1142	1190	962	974	958	689	722	664	704	807	897	1004	**893**
Alkalinity (mg/l)	169	183	162	169	158	139	136	126	137	114	128	138	**147**
Chloride (mg/l)	289	259	212	226	236	223	197	170	149	167	179	233	**212**
E. Coli (CFU/100 ml)	2	5	2	2	4	2	1	5	2	2	7	17	**4**
Temperature (°C) (grab)	13	14	15	15	19	23	25	26	25	21	19	15	**19.0**
pH (grab)	7.3	7.3	7.2	7.3	7.1	7.1	7.4	7.4	7.4	7.4	7.4	7.3	**7.3**
Unionized Ammonia (µg/L)	0.43	0.40	0.35	2.88	7.41	1.27	1.35	0.83	2.03	0.94	1.54	1.67	**1.76**
Boron (µg/L)		180			150			67			90		**121.8**
Cobalt (µg/L)		<0.50			<0.50			<0.50			<0.50		**<0.50**
Magnesium (µg/L)		17,000			14,000			11,000			13,000		**13,750**
Manganese (µg/L)		9.9			6.8			6.5			12.0		**8.8**
Potassium (µg/L)		15,000			12,000			26,000			16,000		**17,250**
Strontium (µg/L)		820			720			330			630		**625**
Bis (2-ethylhexyl) Phthlate (µg/L)		<1.0			<1			<1			<1		**<1**
TSS Loading (kg/d)	269	197	130	205	146	197	102	142	165	96	101	223	**164**
CBOD5 Loading (kg/d)	68.7	70.0	36.2	63.1	89.5	65.2	40.4	71.2	60.6	31.3	33.2	61.8	**58**
Total-P Loading (kg/d)	5.5	7.4	3.8	6.6	9.4	14.0	5.9	6.4	9.5	8.1	5.6	10.3	**7.7**

Combined Influent	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Average
pH	7.5	7.3	7.2	7.6	7.4	7.1	7.1	6.9	7.0	7.1	7.1	7.3	**7.2**
T.S.S. (mg/l)	155	254	255	200	208	229	206	315	666	473	370	276	**301**
C.O.D. (mg/l)	323	590	723	479	470	1,006	694	666	754	742	982	608	**670**
B.O.D. (mg/l)	150	253	305	180	216	350	254	311	308	375	411	347	**288**
TAN (mg/l)	10.4	16.1	14.4	13.8	14.0	17.8	15.2	13.4	13.4	16.1	18.7	16.9	**15.0**
TKN-N (mg/l)	19.8	24.9	28.6	23.4	26.1	37.2	28.6	28.0	29.2	28.3	36.5	28.5	**28.3**
Total-P (mg/l)	3.7	5.8	6.5	4.9	4.1	6.6	5.0	5.2	8.7	7.3	7.2	5.8	**5.9**
Soluble-P (mg/l)	1.5	2.5	2.6	1.4	1.6	1.4	2.4	1.3	2.3	3.0	3.5	1.7	**2.1**
NO2-N (mg/l)	0.18	0.18	0.17	0.23	0.39	0.04	0.03	0.03	0.09	0.13	0.07	0.16	**0.143**
NO3-N (mg/l)	3.9	5.0	4.8	4.8	7.5	7.4	6.3	7.6	4.5	4.9	3.4	4.7	**5.39**
Conductivity (µS/cm)	1,256	1,230	1,043	1,004	1,000	767	728	700	761	1,000	989	1,009	**957**
Alkalinity (mg/l)	248	284	259	263	270	271	193	182	200	224	230	270	**241**
Chloride (mg/l)	359	274	226	215	240	243	201	176	165	184	193	214	**224**

Highbury Influent	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Average
pH	7.6	7.1	6.5	7.4	7.5	6.8	7.7	6.4	6.1	7.1	6.7	7.4	**7.0**
T.S.S. (mg/l)	222	261	348	171	192	215	161	299	709	310	277	197	**280**
C.O.D. (mg/l)	835	1,007	2,012	1,008	896	1,289	686	677	661	911	1,283	867	**1,011**
B.O.D. (mg/l)	400	563	771	325	398	609	320	383	314	476	534	580	**473**
NH3-N (mg/l)	0.57	1.03	1.19	0.75	0.50	0.96	0.68	1.00	1.14	1.62	1.20	0.84	**1.0**
TKN-N (mg/l)	10.5	11.7	17.2	12.0	13.4	21.0	11.6	13.8	17.4	11.8	30.4	15.3	**15.5**
Total-P (mg/l)	2.5	2.7	3.4	2.6	1.9	3.2	2.8	4.5	6.3	4.0	4.5	3.2	**3.5**
Conductivity (µS/cm)	553	664	596	607	524	594	439	434	437	559	581	678	**555**
Alkalinity (mg/l)	114	130	101	113	120	140	110	71	83	80	98	107	**106**
Chloride (mg/l)	140	153	126	156	159	177	145	167	121	117	121	172	**146**

Imported Sewage	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Yearly Total
Septage Waste (Imp gals)	610,815	733,080	991,910	1,069,236	991,760	847,048	738,980	784,913	657,659	736,770	546,170	619,870	**9,328,211**
													Average
pH	8.6	7.5	7.6	7.5	7.5	7.6	8.0	6.7	7.4	7.4	7.3	7.4	**7.5**
T.S.S. (mg/l)	176.4	3,568.5	1,017.5	301.2	992.0	735.0	1,132.8	4,660.0	14,214.0	3,082.6	8,838.5	2,052.0	**3,398**
B.O.D. (mg/l)	199	1,366	689	252	498	278	704	2,865	4,504	1,164	3,372	1,207	**1,425**
TKN-N (mg/l)	81.6	133.9	76.8	82.6	68.3	72.1	84.5	140.0	255.0	92.9	207.3	77.3	**114**
Total-P (mg/l)	10.6	37.6	11.9	14.6	22.3	14.5	19.1	59.5	91.0	34.9	31.3	77.2	**35.4**

Leachate Data	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Yearly Total
Total (m^3)	4,832	4,557	3,424	4,398	3,927	3,107	2,914	1,506	1,721	1,712	1,468	2,015	**35,582**
Average (m^3/d)	155.9	157.2	110.4	146.6	126.7	103.6	94.0	48.6	57.4	55.2	48.9	65.0	**97.5**

PLANT BYPASS REPORT

Municipality of Leamington
live | play | work

Municipality of Leamington
111 Erie Street North
Leamington, ON N8H 2Z9

Level IV Wastewater Treatment
System ID# 120001069
ECA 8491-AQBJ73

Leamington Pollution Control Centre
435 Seacliff Drive East
Leamington, ON N8H 3V7

Operator(s) on Duty: Allan Whittal, Aaron Rahn **Date:** April 8/24

Reason for Bypass: Planned ☐ Emergency/Unplanned ☒

Structural ☐ Mechanical ☐ Electrical/PLC ☒ Design Flow Exceedance ☐

Treatment Process(es) gone through prior to Bypass:

Primary ☒ Aeration ☒ Secondary ☒ Disinfection ☐

Treatment Process(es) Bypassed: Disinfection

Did final effluent pass through approved effluent disposal facilities? Yes ☑

Sample Collected: Yes ☑
Was sample collected in addition to regular final effluent samples? Yes ☐ No ☑ Comp Sampler.

Bypass Start Time: 8:35 am **Bypass End Time:** 8:54 am

Bypass Duration (min): 19 Min **Bypass Total (m^3):** 262.2 m^3

Bypass volume to be calculated using bypass duration and average flow rate to the plant (FMRS-1) from PCC SCADA

Notifications	Start of Bypass		End of Bypass	
	Time	Contact Person	Time	Contact Person
Spills Action Centre			0942	Brenda
1-800-268-6060				
MOECC/SAC Reference #			1-5imØ1X	
Medical Officer of Health			10:02 am	
519-258-2146			Voice Mail.	
Union Water Supply System			0950	Nathan
519-326-4447 (operator)				
Wheatley Water Treatment			0952	
519-326-2020 (Security One)				

Ask Security One to contact the plant operator and request the operator call PCC back (provide contact #). When the operator calls back, provide them the details of the event and obtain a number to call when the event ends.

Leamington Area Drip Irrig.	0959	S.B Email.		

Text notification of overflow event to 519-796-1354 and 519-796-7741 during day time hours.
If event takes place overnight or on weekends/holidays, text these numbers the following business day.

Other actions taken/comments:
(Note any efforts to maximize flow through downstream treatment, why bypass was not avoided, or any other related information)

1. Charles returned call from Roy Whaley (Wheatley PUC) to report details of bypass @ 1015 am
No call back from medical officer (Apr 10/24)

When bypass event is completed, form must be emailed to the designated PCC ORO and the PCC Supervisor.
Completed form must be left in the PCC Supervisor mail slot.
Completed form must be mailed to MOE-WATER-SARWIN@ontario.ca and Ec.FA-LP-On.ec@canada.ca

Bypass Sample Results

Parameter	April 8, 2024
CBOD5	4.0 mg/L
BOD5	4.2 mg/L
TSS	8.0 mg/L
TAN	0.09 mg/L
NO2	0.286 mg/L
NO3	8.0 mg/L
TKN	2.3 mg/L
TP	0.22 mg/L
pH	7.7 pH units

973-4510

PLANT BYPASS REPORT

Municipality of Leamington
live | play | work

Municipality of Leamington
111 Erie Street North
Leamington, ON N8H 2Z9

Level IV Wastewater Treatment
System ID# 120001069
ECA 8491-AQBJ73

Leamington Pollution Control Centre
435 Seacliff Drive East
Leamington, ON N8H 3V7

Operator(s) on Duty: Alen Dyck **Date:** July 15/24

Reason for Bypass: Planned ☐ Emergency/Unplanned ☐

Structural ☐ Mechanical ☐ Electrical/PLC ☑ Design Flow Exceedance ☐

Treatment Process(es) gone through prior to Bypass:

Primary ☑ Aeration ☑ Secondary ☑ Disinfection ☐

Treatment Process(es) Bypassed: UV Disinfection

Did final effluent pass through approved effluent disposal facilities? Yes ☑

Sample Collected: Yes ☑
Was sample collected in addition to regular final effluent samples? Yes ☐ No ☑

Bypass Start Time: 0412 **Bypass End Time:** 0541

Bypass Duration (min): 89 **Bypass Total (m^3):** 801 m^3

Bypass volume to be calculated using bypass duration and average flow rate to the plant (FMRS-1) from PCC SCADA

Notifications	Start of Bypass		End of Bypass		
	Time	Contact Person	Time	Contact Person	
Spills Action Centre	0643	~~DHARA~~	0643	DHARA	DHARA
1-800-268-6060					
MOECC/SAC Reference #	1-8X6JI8				
Medical Officer of Health				A.I. Elizabeth	
519-258-2146					
Union Water Supply System			0655	Sara	
519-326-4447 (operator)					
Wheatley Water Treatment			0658	Randy Sec. 1	
519-326-2020 (Security One)					
Ask Security One to contact the plant operator and request the operator call PCC back (provide contact #). When the operator calls back, provide them the details of the event and obtain a number to call when the event ends.					
Leamington Area Drip Irrig.			0710	Didn't go through	
Text notification of overflow event to 519-796-1354 and 519-796-7741 during day time hours. If event takes place overnight or on weekends/holidays, text these numbers the following business day.					

Other actions taken/comments:
(Note any efforts to maximize flow through downstream treatment, why bypass was not avoided, or any other related information)

When bypass event is completed, form must be emailed to the designated PCC ORO and the PCC Supervisor.
Completed form must be left in the PCC Supervisor mail slot.
Completed form must be mailed to MOE-WATER-SARWIN@ontario.ca and Ec.FA-LP-On.ec@canada.ca

Bypass Sample Results

Parameter	July 15, 2024
CBOD5	1.2 mg/L
BOD5	1.6 mg/L
TSS	5.5 mg/L
TAN	0.08 mg/L
NO2	0.035 mg/L
NO3	5.5 mg/L
TKN	1.62 mg/L
TP	0.38 mg/L
pH	7.8 pH units

PLANT BYPASS REPORT

Municipality of Leamington
live | play | work

Municipality of Leamington
111 Erie Street North
Leamington, ON N8H 2Z9

Level IV Wastewater Treatment
System ID# 120001069
ECA 8491-AQBJ73

Leamington Pollution Control Centre
435 Seacliff Drive East
Leamington, ON N8H 3V7

Operator(s) on Duty: STEPHEN PARKINSON **Date:** DECEMBER 31, 2024

Reason for Bypass: Planned ☐ Emergency/Unplanned ☐

Structural ☐ Mechanical ☐ Electrical/PLC ☒ Design Flow Exceedance ☐

Treatment Process(es) gone through prior to Bypass:

Primary ☒ Aeration ☒ Secondary ☒ Disinfection ☐

Treatment Process(es) Bypassed: DISINFECTION

Did final effluent pass through approved effluent disposal facilities? Yes ☐

Sample Collected: Yes ☒
Was sample collected in addition to regular final effluent samples? Yes ☒ No ☐

Bypass Start Time: 12:24 **Bypass End Time:** 13:01

Bypass Duration (min): 9 MINUTES 47 SECONDS **Bypass Total (m^3):** 208.432 m^3

Bypass volume to be calculated using bypass duration and average flow rate to the plant (FMRS-1) from PCC SCADA

Notifications	Start of Bypass		End of Bypass	
	Time	Contact Person	Time	Contact Person
Spills Action Centre	~~ONLINE~~ S.P.		~~ONLINE~~ S.P.	
1-800-268-6060	15:12	AARON DAYA	15:12	AARON DAYA
MOECC/SAC Reference #	1-FFMDZ7			
Medical Officer of Health	13:34	CAROL	13:34	CAROL
519-258-2146				
Union Water Supply System	13:30	BOB HUNTER	13:30	BOB HUNTER
519-326-4447 (operator)				
Wheatley Water Treatment	-CURRENTLY OUT		OF COMMISSION	
519-326-2020 (Security One)				
Ask Security One to contact the plant operator and request the operator call PCC back (provide contact #). When the operator calls back, provide them the details of the event and obtain a number to call when the event ends.				
Leamington Area Drip Irrig.	13:29		13:29	
Text notification of overflow event to 519-796-1354 and 519-796-7741 during day time hours. If event takes place overnight or on weekends/holidays, text these numbers the following business day.				

Other actions taken/comments:
(Note any efforts to maximize flow through downstream treatment, why bypass was not avoided, or any other related information)

When bypass event is completed, form must be emailed to the designated PCC ORO and the PCC Supervisor.
Completed form must be left in the PCC Supervisor mail slot.
Completed form must be mailed to MOE-WATER-SARWIN@ontario.ca and Ec.FA-LP-On.ec@canada.ca

Bypass Sample Results

Parameter	December 31, 2024
CBOD5	4.3 mg/L
BOD5	5.9 mg/L
TSS	19 mg/L
TAN	0.13 mg/L
NO2	0.033 mg/L
NO3	7.2 mg/L
TKN	2.77 mg/L
TP	0.68 mg/L
pH	7.4 pH units

Appendix B
Annual Comparison Data and Trends
2015-2024

Leamington PCC Annual Data Comparison

Flows	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Municipal Flow (m^3)	4,942,024	4,976,507	4,953,354	5,277,231	5,268,775	5,046,195	5,427,198	4,433,038	4,958,735	4,839,646
Highbury Flow (m^3)	1,561,429	1,717,926	2,021,265	1,910,259	2,282,962	1,691,898	1,804,170	2,070,062	2,343,189	1,892,413
Total Plant Flow (m^3)	6,503,453	6,694,433	6,974,619	7,187,490	7,551,737	6,738,093	7,231,368	6,503,101	7,301,923	6,732,059
Daily High (m^3)	44,218	37,447	37,121	40,899	42,012	37,598	39,143	30,648	41,017	50,403
Daily Low (m^3)	7,927	8,885	10,957	10,441	11,375	9,994	10,085	4,965	10,488	9,660
Daily Average (m^3)	17,798	18,297	19,134	19,729	20,711	18,416	19,792	17,831	19,992	18,383
Overflow time (hrs)	10	26	11	23.7	0	0.58	0	0	68	0
Overflow Volume (m^3)	15,797	43,483	17,363	8,568	0	359	0	0	122,322	0
No. of Overflow Occurrences	4	8	1	2	0	2	0	0	1	0

Other Wastewater Inputs	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Imported Sewage (m^3)	14,495	19,205	21,387	21,476	22,433	29,687	41,513	29,784	42,147	42,407
Landfill Leachate (m^3)	29,776	31,487	35,614	37,835	28,704	29,191	22,816	28,885	32,143	35,582

*volumes are already accounted for in Municipal and Total Plant Flows shown above

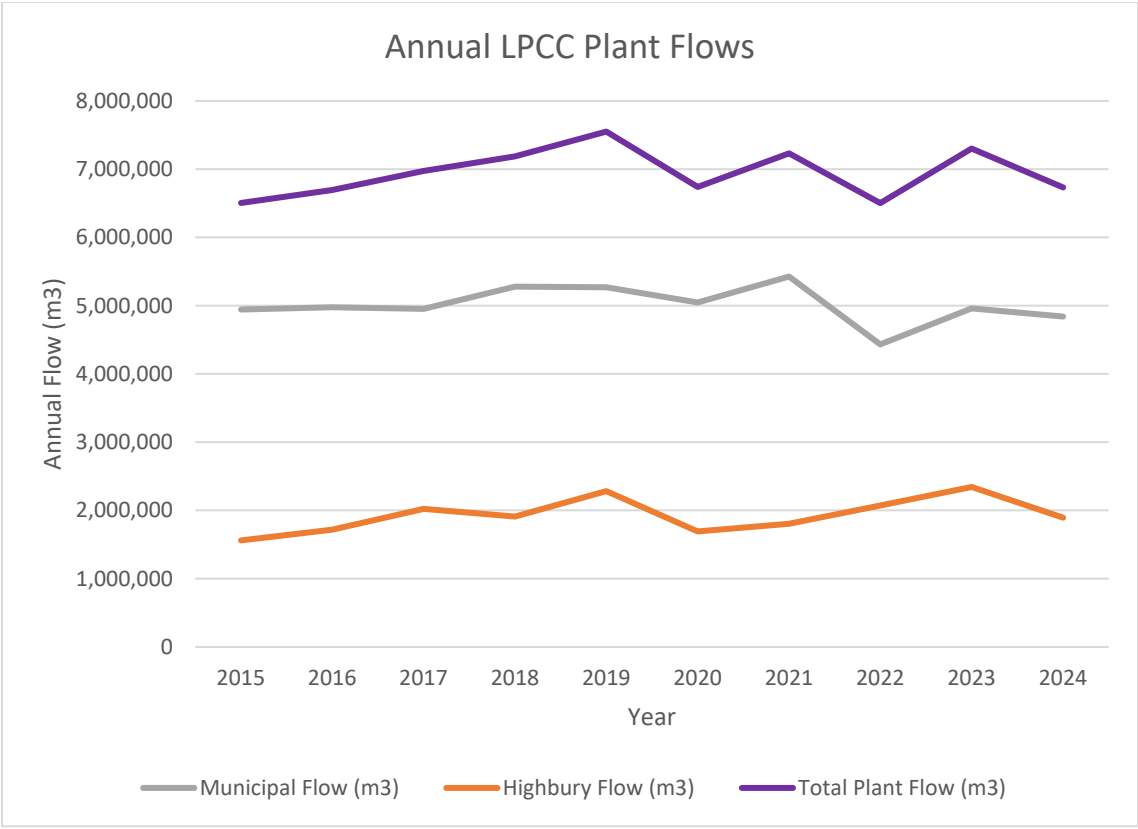
Combined Influent	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
pH	7.3	7.2	7.3	7.0	7.1	7.1	7.0	7.0	7.1	7.2
T.S.S. (mg/l)	264	317	326	385	336	269	360	274	271	301
B.O.D. (mg/l)	192	242	246	325	248	277	313	289	265	288
TAN (mg/l)	9.7	10.1	10.3	10.0	9.4	12.5	11.3	13.2	12.4	15.0
TKN-N (mg/l)	14.6	18.0	19.4	19.4	16.3	22.7	24.3	24.6	23.8	28.3
Total-P (mg/l)	4.9	5.4	4.4	3.6	2.9	3.6	3.4	3.3	4.9	5.9
NO3-N (mg/l)	6.3	6.3	5.9	2.4	1.2	1.2	3.9	4.3	3.8	5.4
Conductivity (µS/cm)	1,142	987	889	947	883	976	1,029	937	875	957
Chloride (mg/l)	228	186	194	257	272	235	303	240	215	224

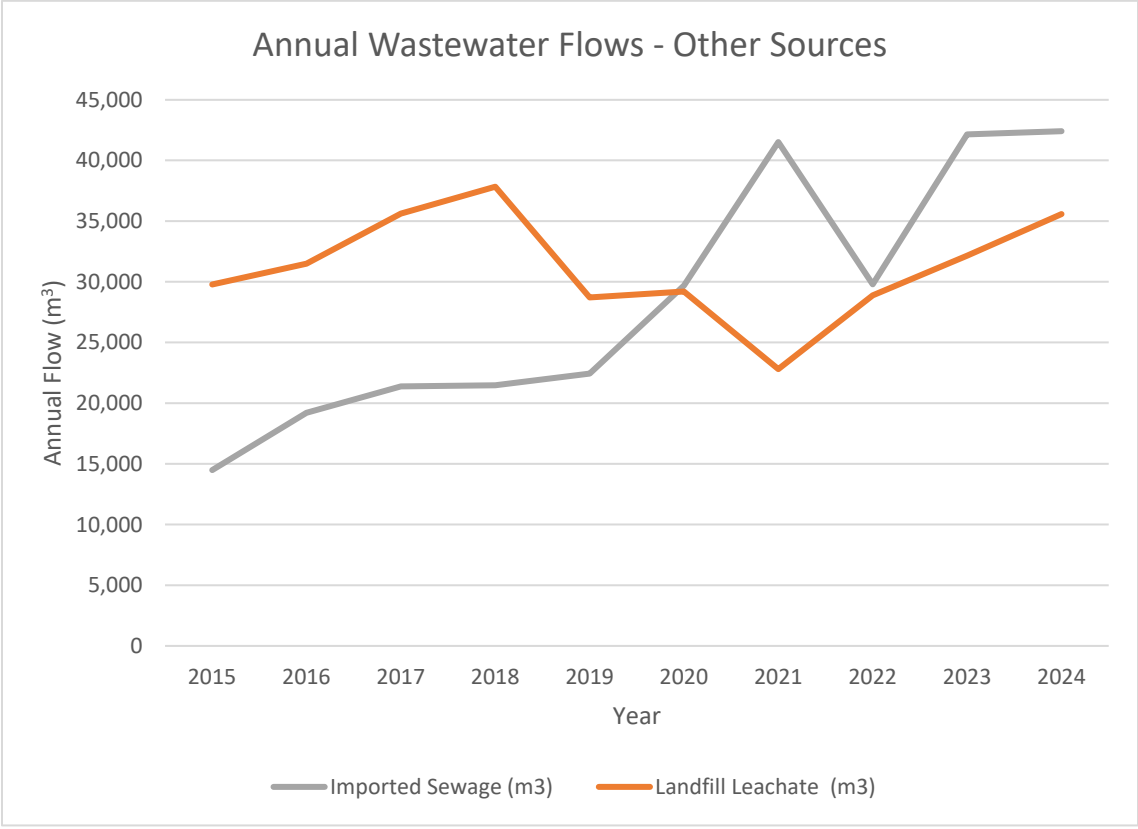
Imported Sewage	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
B.O.D. (mg/l)	-	-	-	1,622	1,244	1,744	685	1,814	1,749	1,425
T.S.S. (mg/l)	-	-	-	4,947	2,343	4,423	1,955	2,737	3,444	3,398
Total-P (mg/l)	-	-	-	45	27	40	28	31	30	35
TKN-N (mg/l)	-	-	-	228	109	202	126	172	118	114

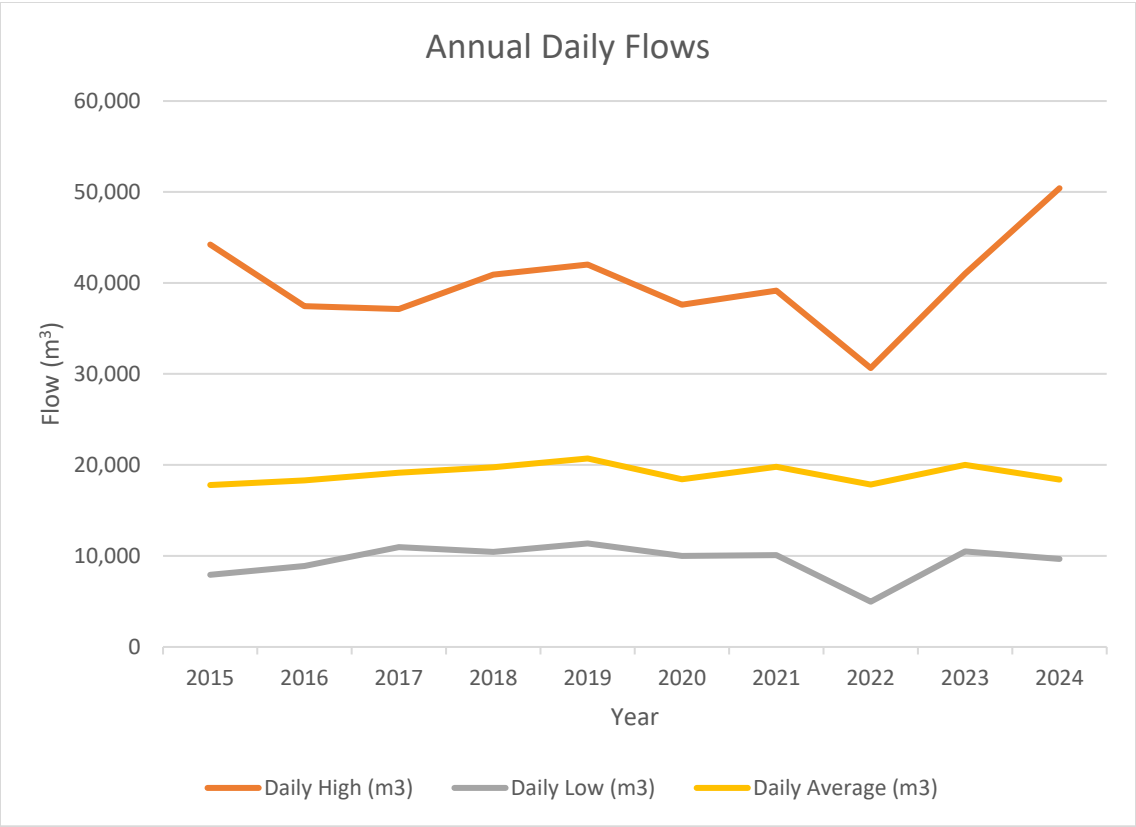
Leamington PCC Annual Data Comparison

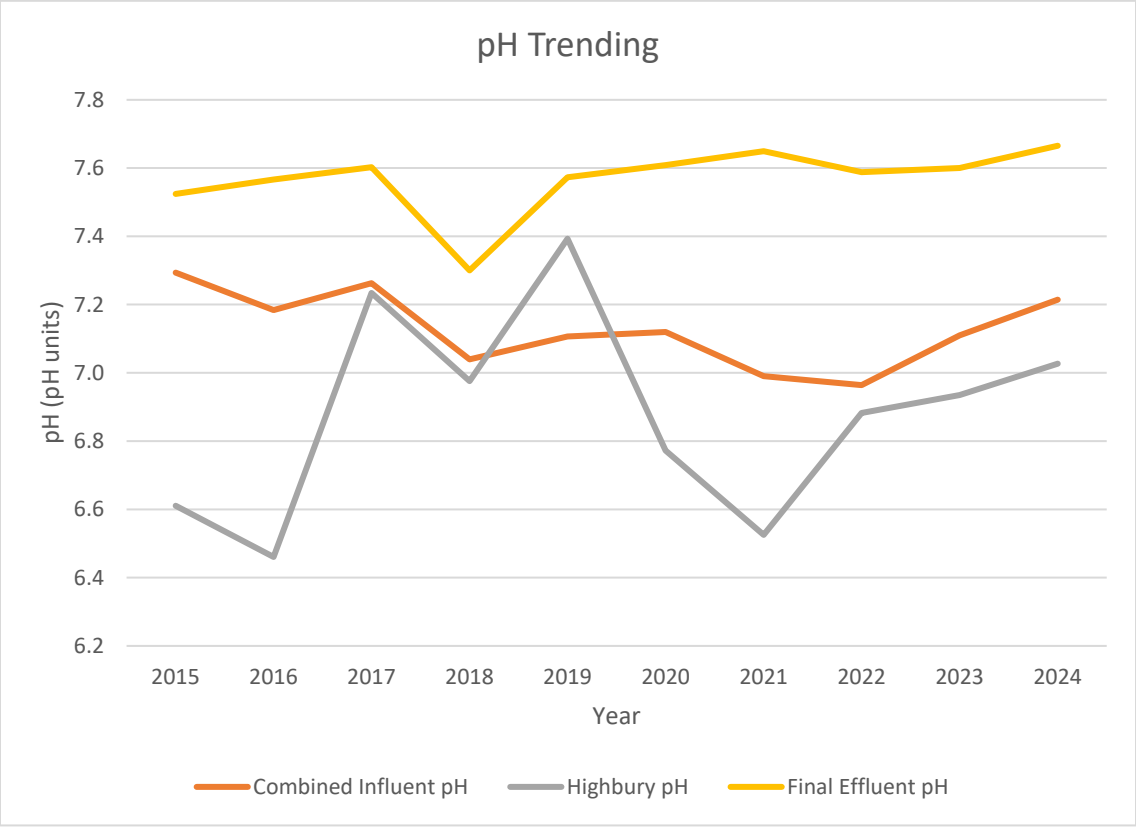
Highbury Influent	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
pH	6.6	6.5	7.2	7.0	7.4	6.8	6.5	6.9	6.9	7.0
T.S.S. (mg/l)	182	268	232	310	208	283	288	235	258	280
B.O.D. (mg/l)	431	510	448	528	395	504	448	404	378	473
TAN (mg/l)	0.79	1.1	0.66	0.62	0.71	0.61	0.58	0.60	0.67	0.95
TKN-N (mg/l)	7.0	9.5	8.9	9.7	7.7	10.2	13.8	10.6	12.3	15.5
Total-P (mg/l)	3.7	4.2	2.6	2.3	1.7	2.2	2.0	1.6	2.6	3.5
Conductivity (µS/cm)	573	538	481	513	523	569	538	505	480	555
Chloride (mg/l)	97	100	95	123	151	136	153	129	130	146

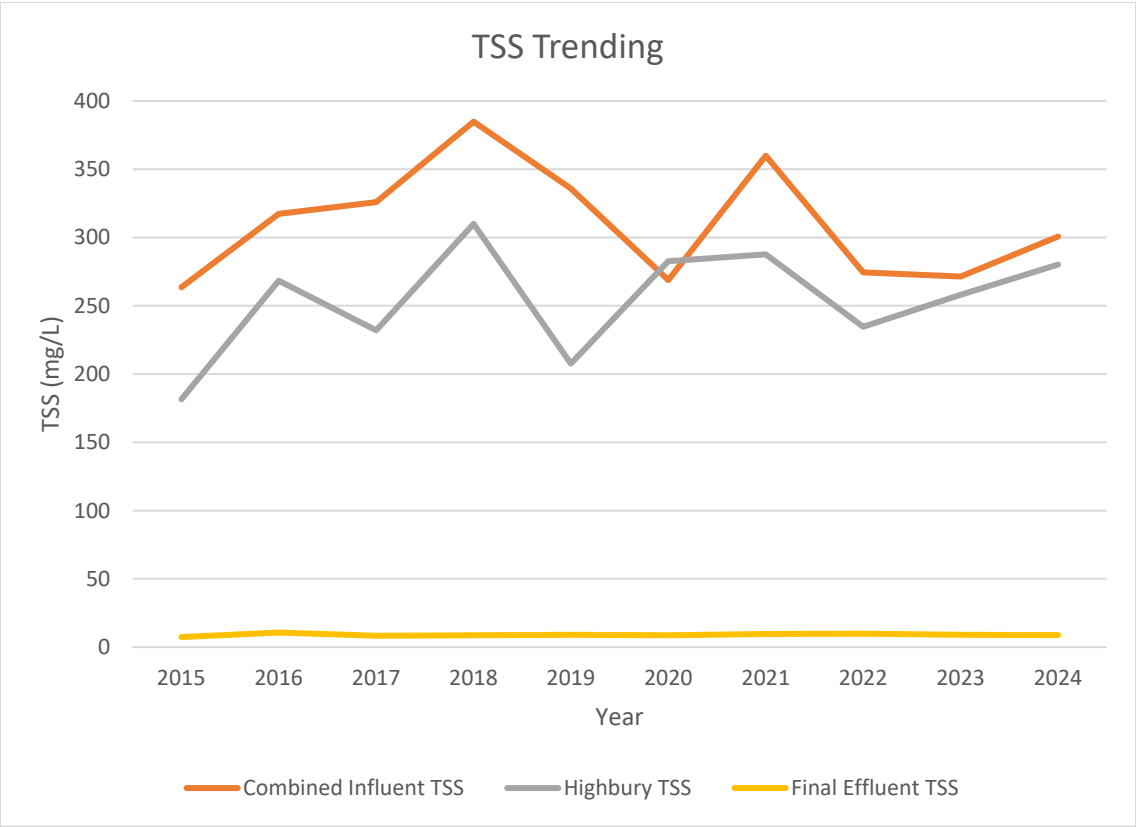
Final Effluent	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
pH	7.5	7.6	7.6	7.3	7.6	7.6	7.6	7.6	7.6	7.7
T.S.S. (mg/l)	7.4	10.7	8.3	8.7	9.0	8.6	9.6	9.9	9.0	8.8
C.B.O.D. (mg/l)	1.8	3.3	2.6	4.3	3.2	3.1	2.7	3.5	2.9	3.1
TAN (mg/l)	0.13	0.66	1.6	3.1	2.8	0.14	0.12	0.30	0.18	0.29
TKN-N (mg/l)	0.8	1.6	3.0	5.3	4.4	1.7	2.5	2.8	2.4	2.5
Total-P (mg/l)	0.24	0.35	0.18	0.12	0.12	0.18	0.16	0.32	0.29	0.46
NO2-N (mg/l)	0.106	0.119	0.517	1.7	0.91	0.076	0.76	0.33	0.11	0.25
NO3-N (mg/l)	16.7	17.8	15.5	8.0	7.3	10.3	10.0	8.4	5.4	7.6
E. Coli (CFU/100 ml)	3	3	4	4	3	4	4	12	4	4
Temperature (°C) (grab)	-	-	-	17.6	18.0	18.2	18.5	18.8	18.4	19.0
pH (grab)	-	-	-	7.3	7.3	7.3	7.3	7.2	7.2	7.3
Unionized Ammonia (ug/L)	-	-	-	17.9	16.0	0.93	0.84	1.9	0.9	1.8
Boron (mg/l)	-	-	-	0.09	0.10	0.12	0.13	0.13	0.10	0.12
Cobalt (mg/l)	-	-	-	0.001	0.001	0.0003	0.0003	0.0003	0.0005	<0.0005
Magnesium (mg/l)	-	-	-	13.0	10.5	13.0	15.0	14	43	13.75
Manganese (mg/l)	-	-	-	0.015	0.010	0.008	0.010	0.006	0.014	0.0088
Potassium (mg/l)	-	-	-	13.8	9.9	14.8	15.2	15.9	47.5	17.25
Strontium (mg/l)	-	-	-	0.70	0.75	0.67	0.79	0.64	0.67	0.625
Bis (2-ethylhexyl) Phthlate (ug/l)	-	-	-	0.18	0.23	0.10	0.23	0.35	0.50	<0.001
TSS Loading (kg/d)	131	203	162	173	186	160	190	179	176	164
CBOD5 Loading (kg/d)	32	69	51	86	67	58	55	63	56	58
Total-P Loading (kg/d)	4.0	6.8	3.5	2.2	2.5	3.2	3.2	5.2	5.6	7.7

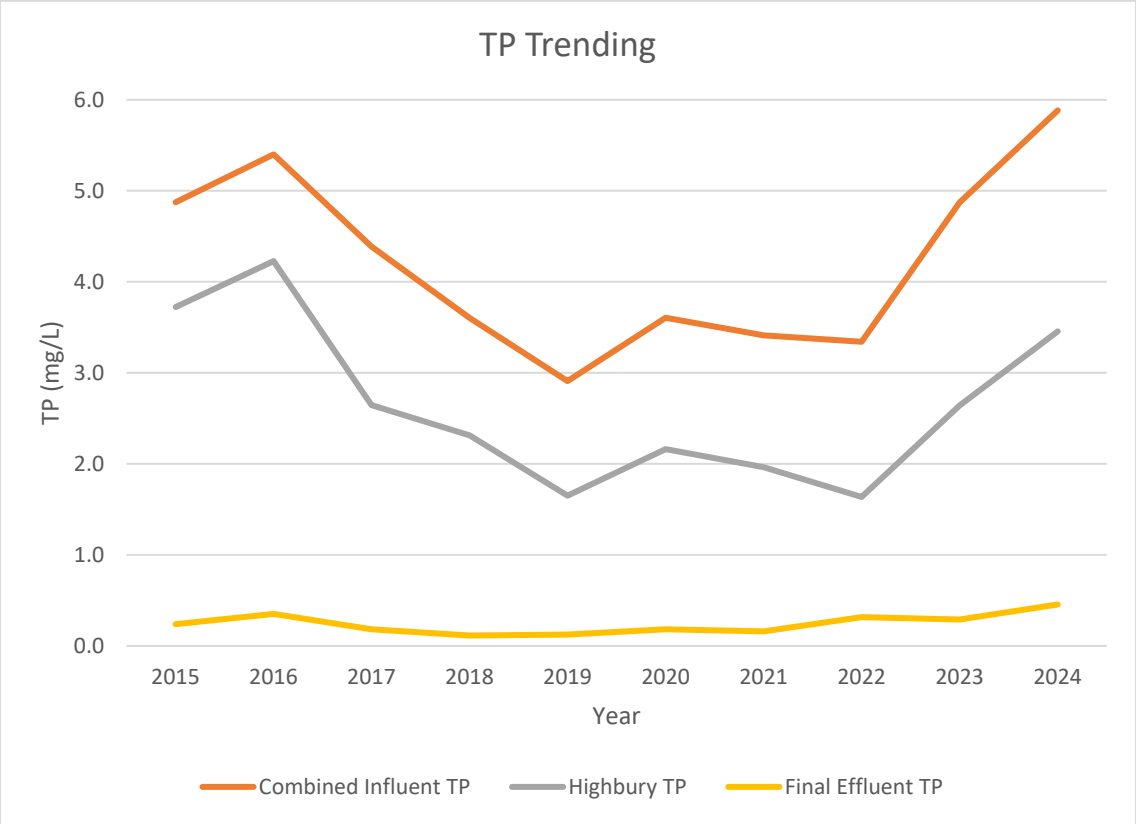

Annual LPCC Plant Flows
8,000,000
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
Annual Flow (m3)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Municipal Flow (m3)
Highbury Flow (m3)
Total Plant Flow (m3)

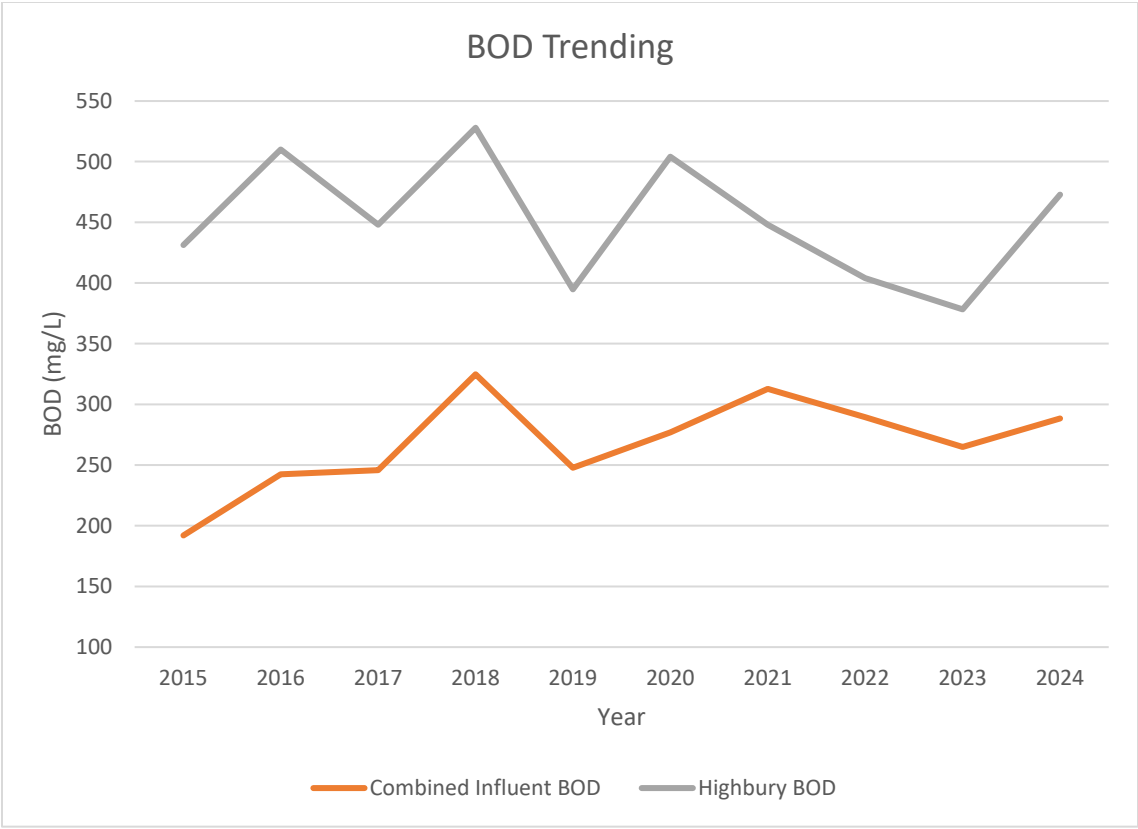

Annual Wastewater Flows - Other Sources
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Annual Flow (m³)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Imported Sewage (m3)
Landfill Leachate (m3)

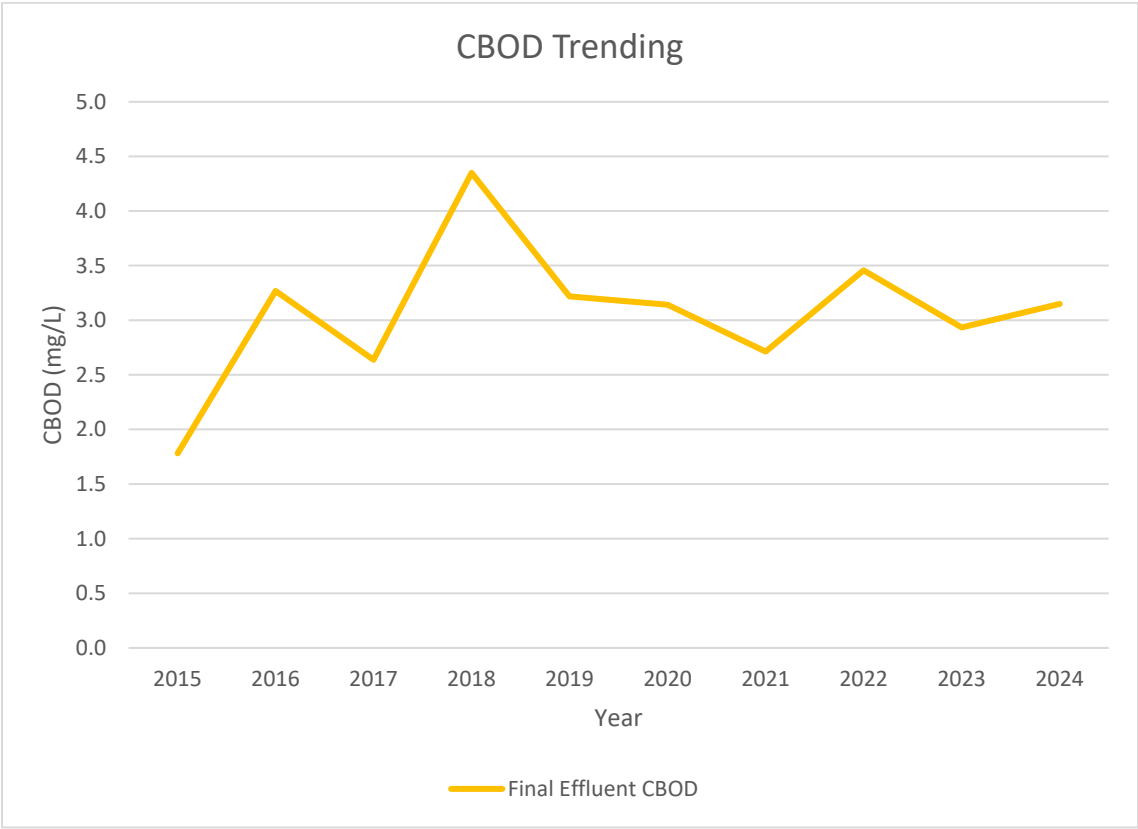

Annual Daily Flows
60,000
50,000
40,000
30,000
20,000
10,000
0
Flow (m³)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Daily High (m3)
Daily Low (m3)
Daily Average (m3)

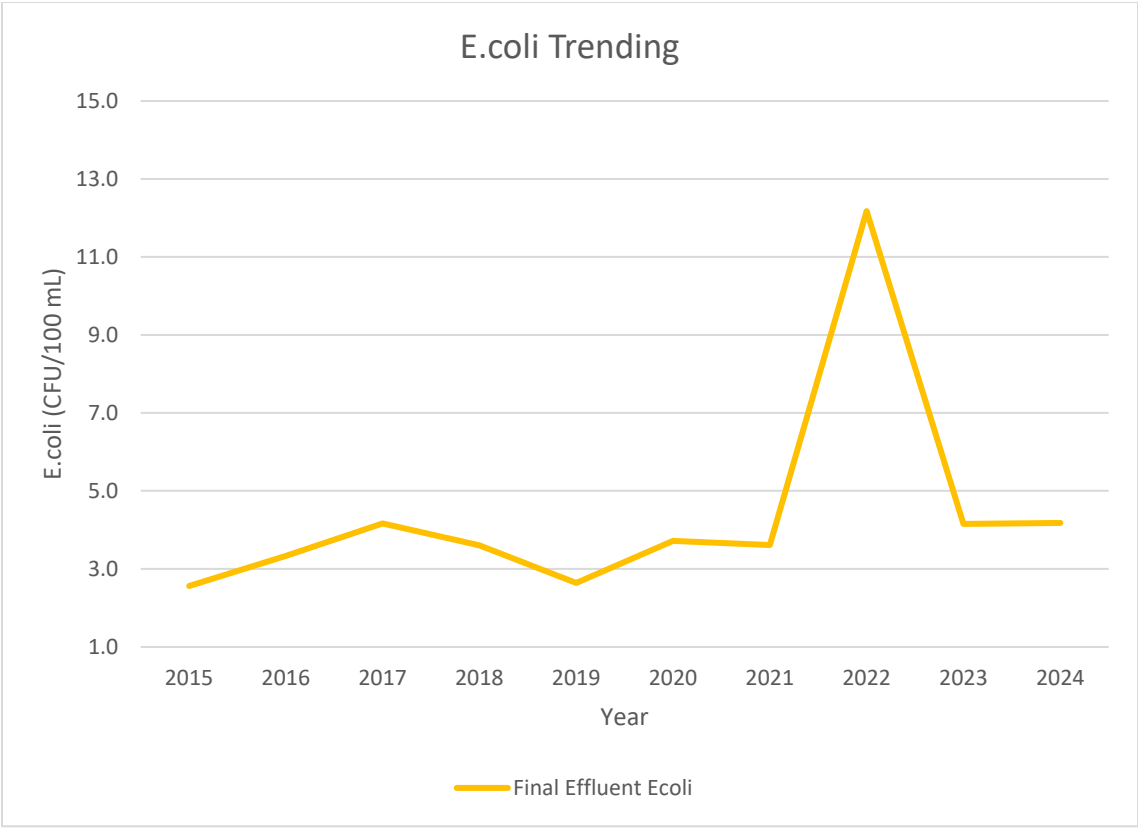

pH Trending
7.8
7.6
7.4
7.2
7.0
6.8
6.6
6.4
6.2
pH (pH units)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Combined Influent pH
Highbury pH
Final Effluent pH

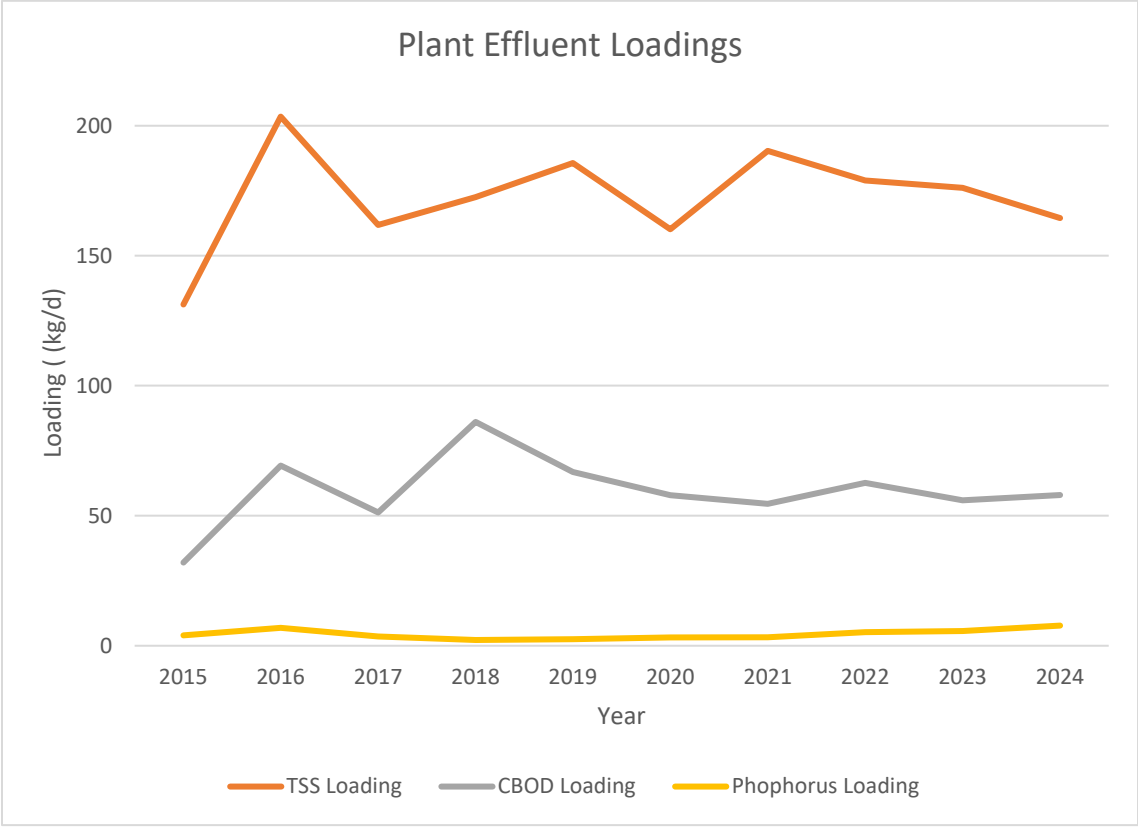

TSS Trending
400
350
300
250
200
150
100
50
0
TSS (mg/L)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Combined Influent TSS
Highbury TSS
Final Effluent TSS

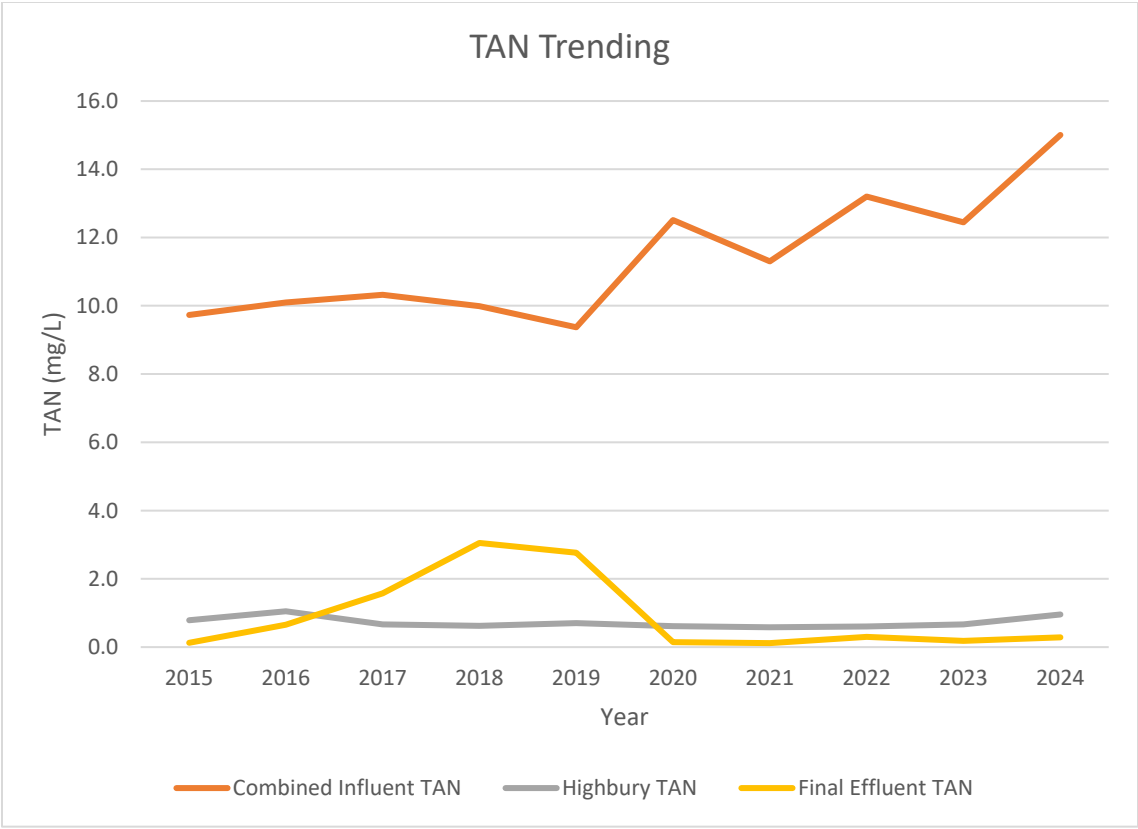

TP Trending
6.0
5.0
4.0
3.0
2.0
1.0
0.0
TP (mg/L)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Combined Influent TP
Highbury TP
Final Effluent TP

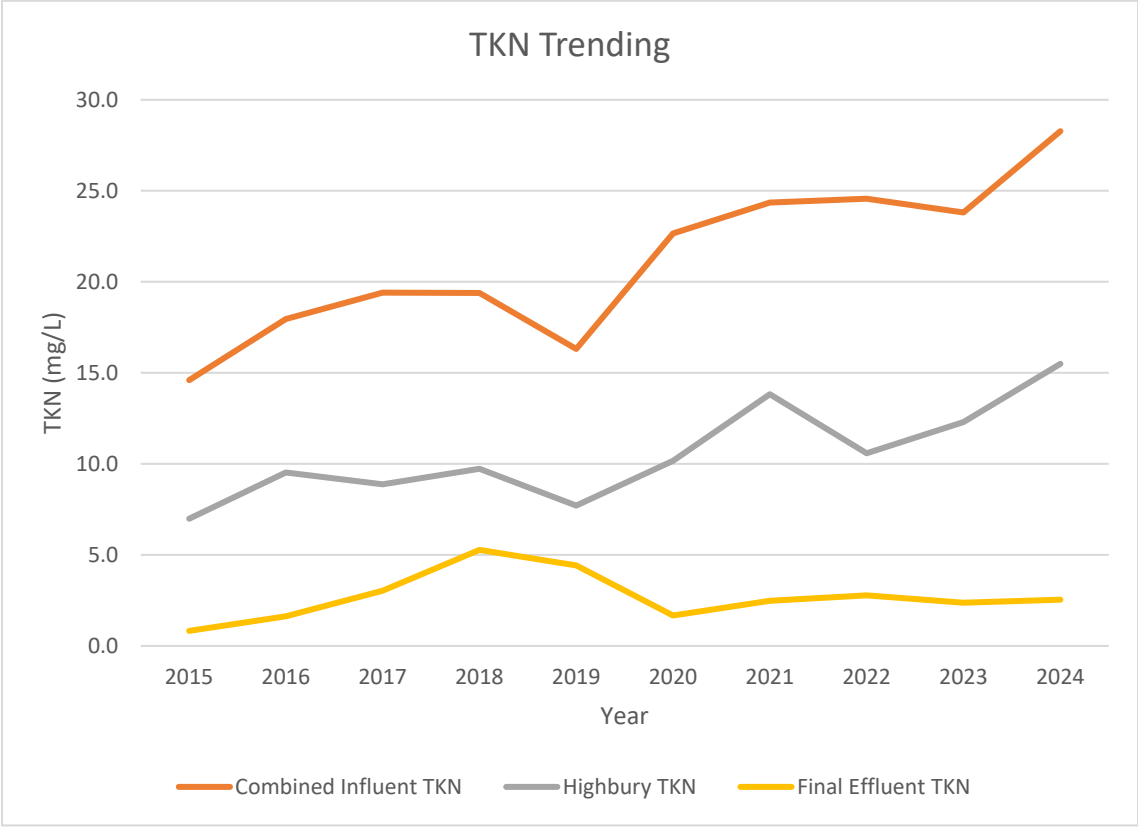

BOD Trending
550
500
450
400
350
300
250
200
150
100
BOD (mg/L)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Combined Influent BOD
Highbury BOD

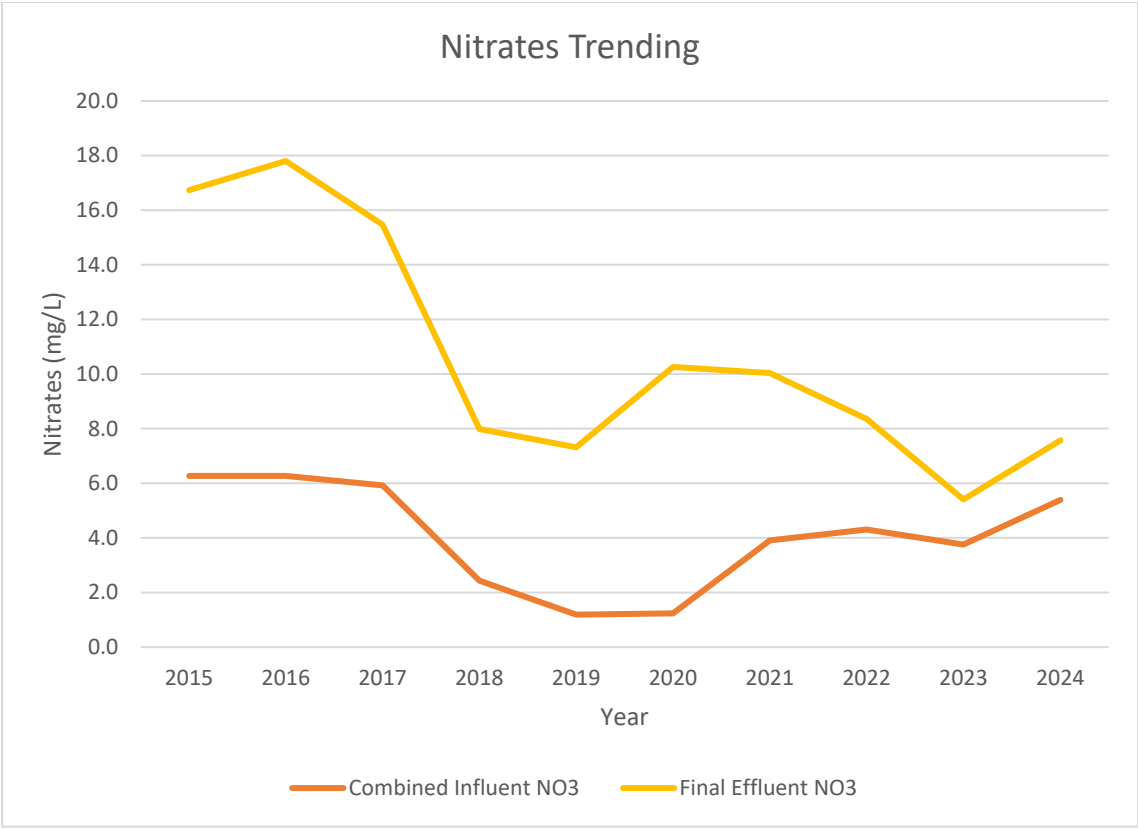

CBOD Trending
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
CBOD (mg/L)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Final Effluent CBOD

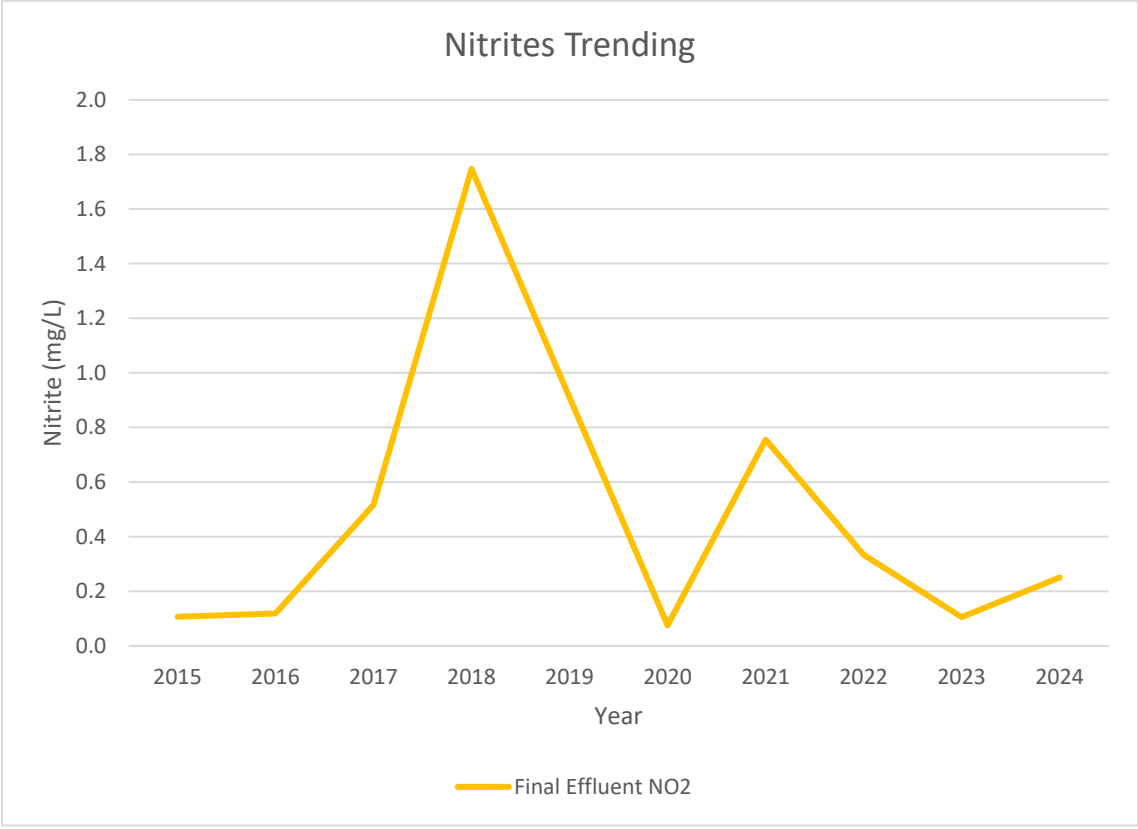

E.coli Trending
15.0
13.0
11.0
9.0
7.0
5.0
3.0
1.0
E.coli (CFU/100 mL)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Final Effluent Ecoli

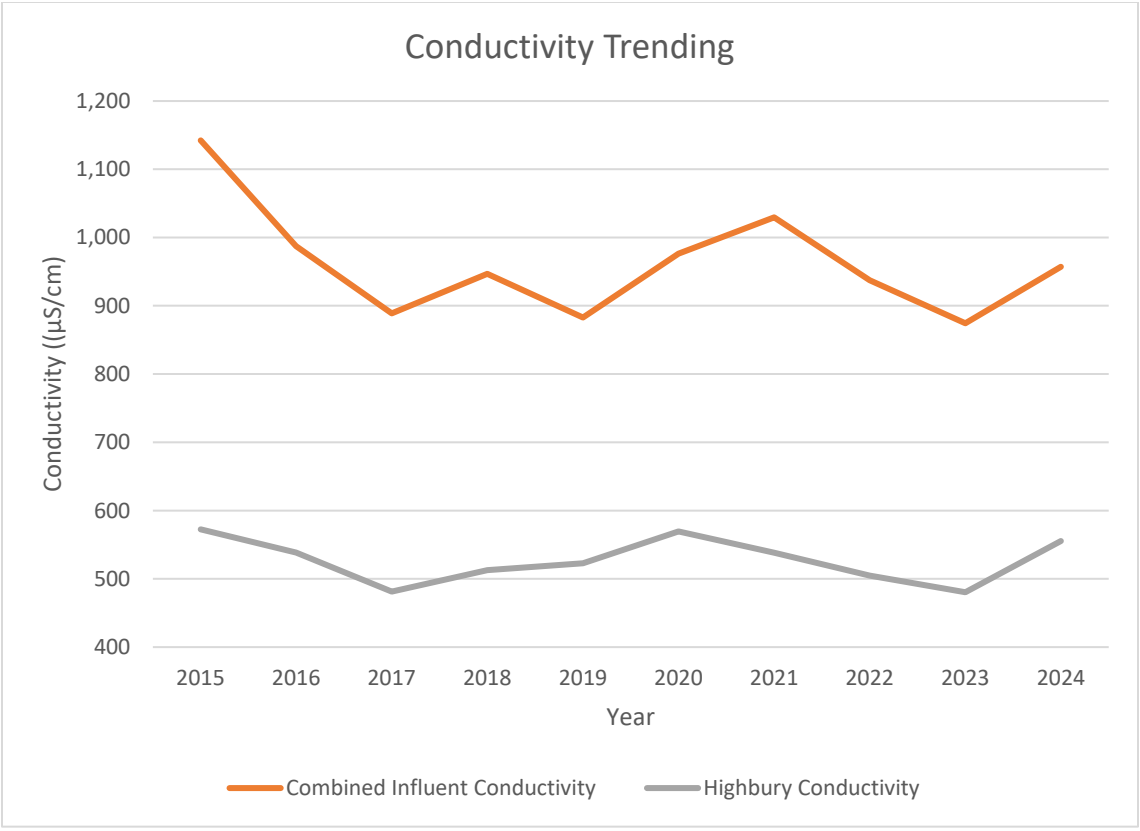

Plant Effluent Loadings
200
150
100
50
0
Loading ((kg/d)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
TSS Loading
CBOD Loading
Phophorus Loading

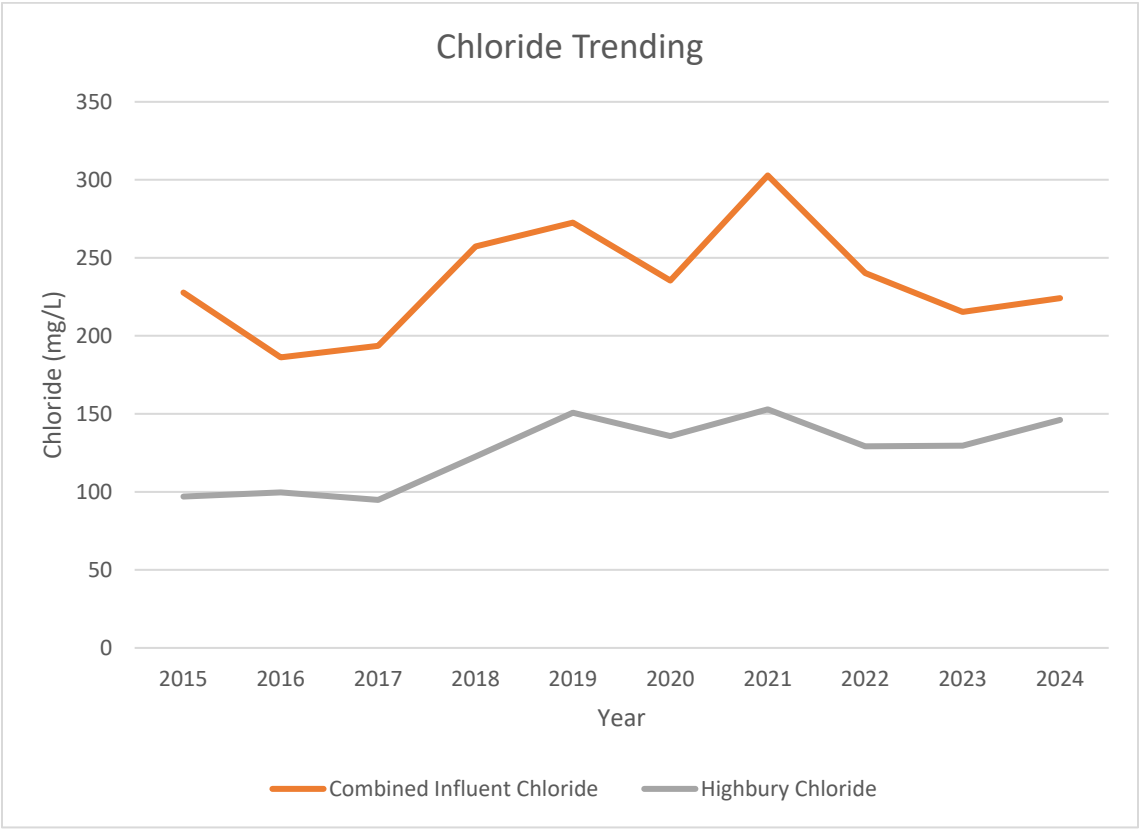

TAN Trending
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
TAN (mg/L)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Combined Influent TAN
Highbury TAN
Final Effluent TAN


TKN Trending
30.0
25.0
20.0
15.0
10.0
5.0
0.0
TKN (mg/L)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Combined Influent TKN
Highbury TKN
Final Effluent TKN


Nitrates Trending
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Nitrates (mg/L)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Combined Influent NO3
Final Effluent NO3


Nitrites Trending
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Nitrite (mg/L)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Final Effluent NO2


Conductivity Trending
1,200
1,100
1,000
900
800
700
600
500
400
Conductivity ((µS/cm)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Combined Influent Conductivity
Highbury Conductivity


Chloride Trending
350
300
250
200
150
100
50
0
Chloride (mg/L)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Combined Influent Chloride
Highbury Chloride

Appendix C
2024 and 2025 Sampling Schedules

Municipality of Leamington
live | play | work

Environmental Services
435 Seacliff Drive East
Leamington, ON
info@leamington.ca
519-326-9860

2024 Sampling Schedule

In order to meet the requirements of ECA #8491-AQBJ73 the following tests must be completed according to the tables below. Additional tests are completed as needed for plant operations.

Total Influent

Parameter	Sample Type	Frequency
BOD5	Composite	Weekly (Tuesday)
Total Suspended Solids		
Total Phosphorus		
TKN		
TAN	Composite/Grab	
Nitrates		
pH		
Conductivity		
Chlorides		

Imported Sewage

Parameter	Sample Type	Frequency
BOD5	Grab	Weekly (Tuesday)
Total Suspended Solids		
Total Phosphorus		
TKN		

Overflow of Raw Sewage from Plant

Parameter	Sample Type	Frequency
BOD5	Grab	By occurrence/ every 8 hrs
Total Suspended Solids		
Total Phosphorus		
TKN		

Municipality of Leamington
live | play | work

Environmental Services
435 Seacliff Drive East
Leamington, ON
info@leamington.ca
519-326-9860

Total Effluent

Parameter	Sample Type	Frequency
CBOD5	Composite	Weekly (Tuesday)
Low Level TSS		
Total Phosphorus		
TAN		
TKN		Monthly (2nd Tuesday)
Nitrites		
Nitrates		
E. Coli	Grab	Weekly (Tuesday)
pH	Grab	Weekly (Monday)
Temperature	Grab	Weekly (Monday)
Unionized Ammonia	As Calculated	Weekly (Tuesday)
Boron	Grab	Quarterly (3rd week of Feb, May, Aug and Nov)
Cobalt		
Magnesium		
Manganese		
Potassium		
Strontium		
Bis (2-ethylhexyl) Phthalate		

Bypass Event The owner shall collect daily samples of the Final Effluent, inclusive of the event except when the event occurs on a scheduled monitoring day. Samples analyzed for all effluent parameters except, E.Coli, Toxicity, Grab PH, Grab Temperature, unionized ammonia and Metals.

Municipality of Leamington
live | play | work

Environmental Services
435 Seacliff Drive East
Leamington, ON
info@leamington.ca
519-326-9860

2025 Sampling Schedule

In order to meet the requirements of ECA #8491-AQBJ73 the following tests must be completed according to the tables below. Additional tests are completed as needed for plant operations.

Total Influent

Parameter	Sample Type	Frequency
BOD5	Composite	Weekly (Wednesday)
Total Suspended Solids		
Total Phosphorus		
TKN		
TAN	Composite/Grab	
Nitrates		
pH		
Conductivity		
Chlorides		

Imported Sewage

Parameter	Sample Type	Frequency
BOD5	Grab	Weekly (Tuesday)
Total Suspended Solids		
Total Phosphorus		
TKN		

Overflow of Raw Sewage from Plant

Parameter	Sample Type	Frequency
BOD5	Grab	By occurrence/ every 8 hrs
Total Suspended Solids		
Total Phosphorus		
TKN		

Municipality of Leamington
live | play | work

Environmental Services
435 Seacliff Drive East
Leamington, ON
info@leamington.ca
519-326-9860

Total Effluent

Parameter	Sample Type	Frequency
CBOD5	Composite	Weekly (Wednesday)
Total Suspended Solids		
Total Phosphorus		
TAN		
TKN		Monthly (2nd Wednesday)
Nitrites		
Nitrates		
E. Coli	Grab	Weekly (Wednesday)
pH	Grab	Weekly (Tuesday)
Temperature	Grab	Weekly (Tuesday)
Unionized Ammonia	As Calculated	Weekly (Wednesday)
Boron	Grab	Quarterly (3rd week of Feb, May, Aug and Nov)
Cobalt		
Magnesium		
Manganese		
Potassium		
Strontium		
Bis (2-ethylhexyl) Phthalate		

Bypass Event The owner shall collect daily samples of the Final Effluent, inclusive of the event except when the event occurs on a scheduled monitoring day. Samples analyzed for all effluent parameters except, E.Coli, Toxicity, Grab PH, Grab Temperature, unionized ammonia and Metals.

Appendix D
2024 Biosolids Data and Laboratory Certificates of Analyses

Biosolids 2024 Year-End N-Viro Data

2024	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Totals	Average
CENTRIFUGE TOTALS														
Machine Hours	162	196	204	192	150	182	138	319	421	207	162	134	2,466	205
Feed m^3	3,120	3,353	4,882	4,293	3,527	4,295	3,720	8,251	6,248	3,872	3,895	3,989	53,444	4,454
Feed % sol.	4.2	4.2	3.0	3.7	3.4	3.5	3.0	2.7	6.7	5.4	3.6	3.3		3.9
% Volatile	72.4	75.0	76.4	76.6	74.2	46.3	76.4	50.5	36.9	50.4	67.0	72.1		64.5
TDS	131	138	132	152	113	131	108	217	403	190	134	117	1,966	164
Cake % Sol.	31.4	26.9	25.5	27.7	29.6	28.7	29.6	28.3	38.9	34.9	29.5	28.7		30.0
Poly. Used kg Liq.	2,998	2,990	3,194	3,076	2,386	3,054	2,244	5,659	8,252	3,776	2,913	2,300	42,842	3,570
Poly. kg/tds	23.2	22.4	24.7	20.9	21.3	23.2	21.8	30.0	21.8	20.5	22.6	19.7		22.7
Dewatered Sludge to Landfill (tonne)	0	0	0	0	0.0	0	0	0	0	0	0	0	0	
CSP MIXER														
Cake by Calc. kg	447,529	515,243	518,370	547,540	388,578	461,918	362,560	755,587	1,039,995	545,070	454,255	414,030	6,450,675	537,556
AA Used kg	207,993	315,743	277,659	158,817	136,824	229,479	121,115	226,710	225,758	106,370	128,481	149,385	2,284,331	190,361
AA Received tonne	81.0	171.0	292.4	193.7	131.6	242.4	98.8	247.6	276.7	131.7	102.5	98.0	2,067	172
Infeed Solids % to Dryer/Bypass	48.4	50.0		47.6	49.2	53.3	50.7	48.1	51.1	51.9	48.4	50.9		50.0
FINAL PRODUCT														
Temp. Hi	58.5	64.9	76.8	63.9	64.5	74.7	64.4	60.9	57.4	56.5	57.6	55.7		63
Temp. Lo	56.5	62.6	74.6	62.0	61.7	71.7	62.1	61.1	55.5	54.0	55.3	53.1		61
pH	12.5	12.5	12.5	12.5	12.5	12.6	12.4	12.5	12.5	12.5	12.3	12.4		12.5
% Solids	58.2	64.5	76.4	62.5	64.9	71.2	59.7	61.2	68.8	66.8	58.9	55.4		64.1
Tonnes Produced	637.1	717.9	545.1	487.6	396.9	528.2	382.0	725.5	915.7	442.9	463.7	498.7	6,741	562

Attachment 1 – Leamington Quarterly Sampling Results

2024 CFIA Quarterly Testing			Leamington Q1	Leamington Q2	Leamington RETEST	Leamington Q3	Leamington Q4
			790774	803047	807188	811313	819459
A&L Laboratory Test Results			E3 Labs	E3 Labs	E3 Labs	E3 Labs	E3 Labs
Leamington							
			2024-03-27	July 22 2024	August 26	Oct 3, 2024	January 7, 2025
METAL REGULATIONS	**DWB**						
	CFIA	**Max 45 yr**	**Max application rate 3500 kg/ha dry weight**				
Trace Elements (Max)	**ppm (mg/kg)**						
Arsenic (mg/kg)	**75**	**95**	4.0	3.9	4.2	5.7	4.2
Cadmium (mg/kg)	**20**	**25**	6.3	4.60	5.40	3.30	4.00
Chromium (mg/kg)	**1100**	**1330**	27.4	29.9	28.1	34.3	34.7
Cobalt (mg/kg)	**150**	**188**	3.4	3.70	4.10	4.90	4.60
Copper (mg/kg)	**850**	**952**	49.7	47.9	45.2	45.2	47.6
Lead (mg/kg)	**500**	**635**	285.0	202.0	254.0	151.0	208.0
Mercury (mg/kg)	**5.0**	**6.3**	<0.08	0.1	<0.05	<0.05	<0.05
Molybdenum (mg/kg)	**20**	**25**	9.4	10.60	9.60	12.10	13.80
Nickel (mg/kg)	**180**	**228**	27.7	25.2	29.8	42.9	33.7
Selenium (mg/kg)	**14**	**18**	5.5	3.00	4.00	3.30	3.10
Zinc (mg/kg)	**1850**	**2348**	236.0	223.0	219.0	178.0	239.0
Thallium		**5.56**	<0.50	<0.50	<0.50	<0.5	<0.5
Vanadium		**825**	123.0	99.0	143.0	152.0	138.0
PATHOGEN REGULATIONS							
CFIA Maximum Levels	**CFIA**						
Pathogen	**Maximum**						
E.Coli MPN/g	**<1000**		<2	<2	<2	<2	<2
Salmonella (P-A/25g(ml)	**Negative**		Negative	Negative	Negative	Negative	Negative
CFIA LABEL							
AGRICULTURAL ANALYSIS	**DWB**	**DWB**					
Total Nitrogen (%)	**DWB**	**DWB**	1.70	1.8	1.4	1.9	1.8
Phosphorus as P_2O_5 (%)	**DWB**	**DWB**	0.70	0.8	0.8	0.7	0.6
Potassium as K_2O (%)	**DWB**	**DWB**	4.50	2.0	3.6	2.1	2.3
Water Insoluble N (WIN) %	**DWB**	**DWB**	0.70	0.5	0.6	0.8	0.3
Magnesium (%)	**DWB**	**DWB**	0.90	1.1	1.0	1.0	1.1
Calcium (%)	**DWB**	**DWB**	21.20	26.1	23.6	23.1	25.6
Sulfur %			3.10	2.7	3.2	2.3	2.8
Ammonia (%)							0.05
Total Solids	**%**	**%**	67.8	64.9	68.9	64.3	64.5
Agricultural Analysis "As Is"	**24-29 Label**	**Back up Label**					
Total Nitrogen (%)	**0.8**	**0.5**	1.2	1.2	1.0	1.2	1.2
Phosphorus as P_2O_5 (%)	**0.4**	**0.3**	0.5	0.5	0.5	0.5	0.4
Potassium as K_2O (%)	**2.2**	**1.8**	3.1	1.3	2.5	1.3	1.5
Water Insoluble N (WIN) %			0.5	0.3	0.4	0.5	0.2
Magnesium (%)	**0.5**	**0.5**	0.6	0.7	0.7	0.6	0.7
Calcium (%)	**10**	**10**	14.4	16.9	16.3	14.9	16.5
Sulfur	**1.0**	**0.9**	2.1	1.8	2.2	1.5	1.8
Ammonia							0.03
Organic Matter (%)	**24**	**24**	23.2	27.6	23.1	23.7	26.70
Neutralizing Value	**35**	**35**	45.8	53.9	47.9	51.4	58.3
Moisture (Max %)	**40**	**42**	32.2	35.1	31.1	35.7	35.5
Finess #10 mesh %	**90**	**90**	99.9	99.9	100.0	100.0	99.9
Finess #60 mesh %			87.3	92.4	93.3	89.1	92.1
Finess #100 mesh %	**45**	**45**	79.0	85.0	77.8	77.0	86.4
Free Lime CaO %	20	**20**	25.7	30.2	26.8	28.8	32.6
Soil Neutralization Ability							
TNV*	**%**	**%**	45.8	53.9	47.9	51.4	58.3
ECCE**			42.3	51.4	46.0	48.0	55.5
Lime:Blend	Ratio	Ratio	1.5	1.2	1.4	1:1.3	1.2
*TNV - Total Neutralizing Value							
Other							
pH			13.1	12.6	12.6	12.1	12.3
Bulk Density	kg/m3		668.0	661.0	809.0	806.0	689.0
PFAS Numbers	ng/g						
Bureau Veritas ID				**ZSC245**		**AGRA91**	
Sampling Date				**7/8/2024**		**10/21/2024**	
Bureau Veritas Job #				**C4L3187V2R**		**CAX2690V1**	
PFOS	ng/g			4.8		<0.86	
PFOA	ng/g			<0.72		<0.72	

Attachment 2: E3 Laboratory Certificate

E3 Laboratories Inc.

Sample ID: Leamington Q1 2024 Comp.
Project: N-Viro Systems (Leamington)
Lab ID: 790774
Date Collected: 2024-03-26
Date Received: 2024-03-27
Date Reported: 2024-04-10

Trace Elements (Max)	CFIA ppm (mg/kg)	
Arsenic (mg/kg)	75	3.97
Boron (mg/Kg)		41.4
Cadmium (mg/kg)	20	6.30
Chromium (mg/kg)	1100	27.4
Cobalt (mg/Kg)	150	3.40
Copper (mg/Kg)		49.7
Lead (mg/kg)	500	255
Mercury (mg/kg)	5.0	<0.05
Molybdenum (mg/kg)	20	9.40
Nickel (mg/kg)	180	27.7
Selenium (mg/kg)	14	5.50
Zinc (mg/kg)	1850	236
Thallium (mg/kg)	12 mg/kg @19000 kg/ha	<0.50
Vanadium (mg/kg)	1400 mg/kg @19000 kg/ha	123

Pathogens	CFIA Maximum	
E.Coli MPN/g dry	<1000	<2
Salmonella (P/A)	<3	Negative

AGRICULTURAL ANALYSIS

"Dry"		
Total Nitrogen (%)		1.7
Phosphorus as P_2O5 (%)		0.7
Potassium as K_2O (%)		4.5
Water Insoluble N (WIN) %		0.7
Magnesium (%)		0.9
Calcium (%)		21.2
Sulfur (%)		3.1
Total Solids (%)		67.6

Agricultural Analysis "As Is"	CFIA Label	
Total Nitrogen (%)	1	1.1
Phosphorus as P_2O5 (%)	0.6	0.5
Potassium as K_2O (%)	2.5	3.0
Water Insoluble N (WIN) %	0.6	0.4
Magnesium (%)	0.5	0.6
Calcium (%)	12	14.4
Sulfur (%)	1.0	2.1
"Dry"		
Organic Matter (%)	25.0	23.2
Neutralizing Value (TNV)	35	45.6
Moisture (%)		32.2
Finess #10 mesh %	90	99.9
Finess #60 mesh %	50	67.3
Finess #100 mesh %	45	79.0
Bulk Density (kg/m3)		666

Total Neutralizing Value (TNV)	%	45.6
Free Lime CaO	%	25.7
ECCE	%	42.3
Lime:Blend	Ratio*	1.5

*Assume Agricultural Index = 64

Other		
pH	>12	13.06

Results relate only to items tested as received.

All work has been performed using accepted testing methodologies, except where otherwise agreed to by the client in writing. Our total liability in connection with this work shall be limited to the amount paid by the client.

Nilou Ghazi, Ph.D., P.Eng.

Attachment 2: E3 Laboratory Certificate

E3 Laboratories Inc.

Sample ID: Leamington Q2 2024 Comp.
Project: N-Viro Systems (Leamington)
Lab ID: 803047
Date Collected: 2024-07-22
Date Received: 2024-07-23
Date Reported: 2024-08-09

Trace Elements (Max)	CFIA ppm (mg/kg)	
Arsenic (mg/kg)	75	3.94
Boron (mg/Kg)		42.3
Cadmium (mg/kg)	20	4.60
Chromium (mg/kg)	1100	29.9
Cobalt (mg/Kg)	150	3.70
Copper (mg/Kg)		47.9
Lead (mg/kg)	500	202
Mercury (mg/kg)	5.0	0.07
Molybdenum (mg/kg)	20	10.6
Nickel (mg/kg)	180	25.2
Selenium (mg/kg)	14	3.00
Zinc (mg/kg)	1850	223
Thallium (mg/kg)	12 mg/kg @19000 kg/ha	<0.50
Vanadium (mg/kg)	1400 mg/kg @19000 kg/ha	99.0

Pathogens	CFIA Maximum	
E.Coli MPN/g dry	<1000	<2
Salmonella (P/A)	<3	Negative

AGRICULTURAL ANALYSIS

"Dry"		
Total Nitrogen (%)		1.6
Phosphorus as P_2O5 (%)		0.6
Potassium as K_2O (%)		2.0
Water Insoluble N (WIN) %		0.5
Magnesium (%)		1.1
Calcium (%)		26.1
Sulfur (%)		2.7
Total Solids (%)		64.9

Agricultural Analysis "As Is"	CFIA Label	
Total Nitrogen (%)	1	1.2
Phosphorus as P_2O5 (%)	0.6	0.5
Potassium as K_2O (%)	2.5	1.3
Water Insoluble N (WIN) %	0.6	0.3
Magnesium (%)	0.5	0.7
Calcium (%)	12	16.9
Sulfur (%)	1.0	1.5
"Dry"		
Organic Matter (%)	25.0	27.6
Neutralizing Value (TNV)	35	53.9
Moisture (%)		35.1
Finess #10 mesh %	90	99.9
Finess #60 mesh %	50	92.4
Finess #100 mesh %	45	85.0
Bulk Density (kg/m3)		661

Total Neutralizing Value (TNV)	%	53.9
Free Lime CaO	%	30.2
ECCE	%	51.4
Lime:Blend	Ratio*	1.2

*Assume Agricultural Index = 64

Other		
pH	>12	12.56

Results relate only to items tested as received.

All work has been performed using accepted testing methodologies, except where otherwise agreed to by the client in writing. Our total liability in connection with this work shall be limited to the amount paid by the client.

Nilou Ghazi, Ph.D., P.Eng.

Attachment 2: E3 Laboratory Certificate

E3 Laboratories Inc.

Sample ID: Leamington Q3 2024 Comp.
Project: N-Viro Systems (Leamington)
Lab ID: 811313
Date Collected: 2024-10-03
Date Received: 2024-10-04
Date Reported: 2024-10-24

Trace Elements (Max)	CFIA ppm (mg/kg)	
Arsenic (mg/kg)	75	5.70
Boron (mg/Kg)		44.3
Cadmium (mg/kg)	20	3.30
Chromium (mg/kg)	1100	34.3
Cobalt (mg/Kg)	150	4.90
Copper (mg/Kg)		45.2
Lead (mg/kg)	500	151
Mercury (mg/kg)	5.0	<0.05
Molybdenum (mg/kg)	20	12.1
Nickel (mg/kg)	180	42.9
Selenium (mg/kg)	14	3.30
Zinc (mg/kg)	1850	176
Thallium (mg/kg)	12 mg/kg @19000 kg/ha	<0.50
Vanadium (mg/kg)	1400 mg/kg @19000 kg/ha	152

Pathogens	CFIA Maximum	
E.Coli MPN/g dry	<1000	<2
Salmonella (P/A)	<3	Negative

AGRICULTURAL ANALYSIS

"Dry"		
Total Nitrogen (%)		1.9
Phosphorus as P_2O5 (%)		0.7
Potassium as K_2O (%)		2.1
Water Insoluble N (WIN) %		0.6
Magnesium (%)		1.0
Calcium (%)		23.1
Sulfur (%)		2.3
Total Solids (%)		64.3

Agricultural Analysis "As Is"	CFIA Label	
Total Nitrogen (%)	1	1.2
Phosphorus as P_2O5 (%)	0.6	0.5
Potassium as K_2O (%)	2.5	1.3
Water Insoluble N (WIN) %	0.6	0.5
Magnesium (%)	0.5	0.6
Calcium (%)	12	14.9
Sulfur (%)	1.0	1.5
"Dry"		
Organic Matter (%)	25.0	23.7
Neutralizing Value (TNV)	35	51.4
Moisture (%)		35.7
Finess #10 mesh %	90	100.0
Finess #60 mesh %	50	89.1
Finess #100 mesh %	45	77.0
Bulk Density (kg/m3)		506

Total Neutralizing Value (TNV)	%	51.4
Free Lime CaO	%	26.6
ECCE	%	45.0
Lime:Blend	Ratio*	1.3

*Assume Agricultural Index = 64

Other

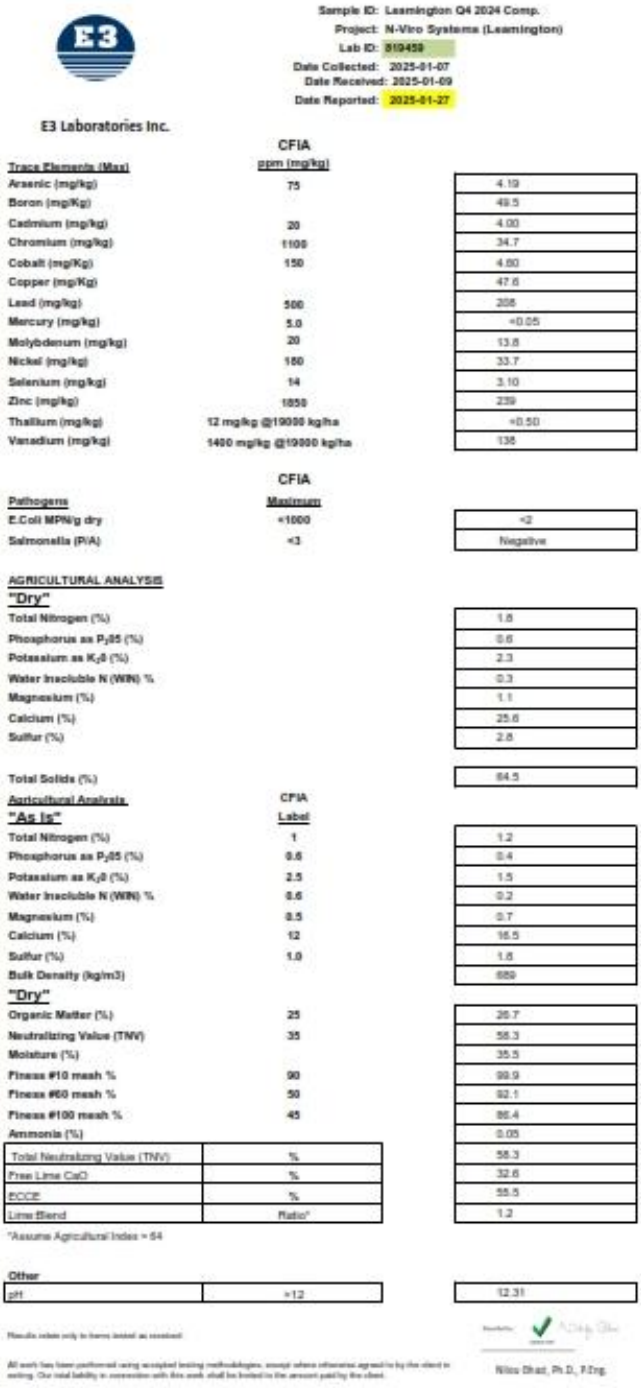
pH	>12	12.10

Results relate only to items tested as received.

All work has been performed using accepted testing methodologies, except where otherwise agreed to by the client in writing. Our total liability in connection with this work shall be limited to the amount paid by the client.

Nilou Ghazi, Ph.D., P.Eng.

Attachment 2: E3 Laboratory Certificate



Sample ID: Leamington Q4 2024 Comp.
Project: N-Viro Systems (Leamington)
Lab ID: 819459
Date Collected: 2025-01-07
Date Received: 2025-01-09
Date Reported: 2025-01-27

E3 Laboratories Inc.

Trace Elements (Max)	CFIA ppm (mg/kg)	
Arsenic (mg/kg)	75	4.19
Boron (mg/Kg)		48.5
Cadmium (mg/kg)	20	4.00
Chromium (mg/kg)	1100	34.7
Cobalt (mg/Kg)	150	4.80
Copper (mg/Kg)		47.6
Lead (mg/kg)	500	208
Mercury (mg/kg)	5.0	<0.05
Molybdenum (mg/kg)	20	13.8
Nickel (mg/kg)	180	33.7
Selenium (mg/kg)	14	3.10
Zinc (mg/kg)	1850	239
Thallium (mg/kg)	12 mg/kg @19000 kg/ha	<0.50
Vanadium (mg/kg)	1400 mg/kg @19000 kg/ha	138

Pathogens	CFIA Maximum	
E.Coli MPN/g dry	<1000	<2
Salmonella (P/A)	<3	Negative

AGRICULTURAL ANALYSIS

"Dry"		
Total Nitrogen (%)		1.6
Phosphorus as P_2O5 (%)		0.6
Potassium as K_2O (%)		2.3
Water Insoluble N (WIN) %		0.3
Magnesium (%)		1.1
Calcium (%)		25.6
Sulfur (%)		2.6
Total Solids (%)		64.5

Agricultural Analysis "As Is"	CFIA Label	
Total Nitrogen (%)	1	1.2
Phosphorus as P_2O5 (%)	0.6	0.4
Potassium as K_2O (%)	2.5	1.5
Water Insoluble N (WIN) %	0.6	0.2
Magnesium (%)	0.5	0.7
Calcium (%)	12	16.5
Sulfur (%)	1.0	1.6
Bulk Density (kg/m3)		689
"Dry"		
Organic Matter (%)	25	26.7
Neutralizing Value (TNV)	35	58.3
Moisture (%)		35.5
Finess #10 mesh %	90	99.9
Finess #60 mesh %	50	92.1
Finess #100 mesh %	45	86.4
Ammonia (%)		0.05
Total Neutralizing Value (TNV)	%	58.3
Free Lime CaO	%	32.6
ECCE	%	55.5
Lime Blend	Ratio*	1.2

*Assume Agricultural Index = 64

Other		
pH	>12	12.31

Results relate only to items tested as received.

All work has been performed using accepted testing methodologies, except where otherwise agreed to by the client in writing. Our total liability in connection with this work shall be limited to the amount paid by the client.

Nitin Dhall, Ph.D., P.Eng.

E3 Laboratories Inc.
SS#4, 360 York Rd., Unit 10, Niagara-on-the-Lake, Ontario L0S 1J0
Email: info@e3labs.ca
Tel: (905) 641-9000, Fax: (905) 641-9001

CERTIFICATE OF ANALYSIS

Walker Environmental Group Inc.
Misty Croney
P.O. Box 100
Thorold
L2V 3Y8
Tel: 905-329-4285 Fax: E-mail
Email: misty.croney@lpconsulting.ca

Work Order No.:2658175
Received : 2024-03-27
PO Number: NVLP10423
Reported: 2024-04-11
Project Name: N-Viro Systems Canada LP (Sarnia)
Chain of Custody No.: 2658175

Client Sample ID	Sample Date	Lab ID	Parameter	Result	Unit	RDL	Date Analyzed	Method
Sarnia Q1 2024 Composite	2024-03-26	**790773**	Ammonia (Total)	656	mg/Kg	0.03	2024-04-03	APHA 4500
			Arsenic	3.83	mg/Kg	1.00	2024-04-02	Hydr/Vap Gen EPA3050
			Boron	44.4	mg/Kg	1.0	2024-04-04	EPA 3050B
			Cadmium	5.4	mg/Kg	0.3	2024-04-04	EPA 3050B
			Calcium	198000	mg/Kg	100	2024-04-04	EPA 3050B
			Chromium	27.5	mg/Kg	0.3	2024-04-04	EPA 3050B
			Cobalt	3.6	mg/Kg	0.3	2024-04-04	EPA 3050B
			Copper	70.6	mg/Kg	2.0	2024-04-04	EPA 3050B
			E.coli	<2	MPN/g dry	2	2024-03-27	MPN
			Lead	241	mg/Kg	0.4	2024-04-04	EPA 3050B
			Magnesium	9280	mg/Kg	500	2024-04-04	EPA 3050B
			Mercury	0.12	mg/Kg	0.08	2024-04-02	Hydr/Vap Gen EPA3050
			Moisture	44.4	%	0.1	2024-04-02	Moisture Handbook
			Molybdenum	8.0	mg/Kg	0.3	2024-04-04	EPA 3050B
			Nickel	27.3	mg/Kg	1.0	2024-04-04	EPA 3050B
			Organic Matter-Total	37.3	%	0.1	2024-04-03	APHA 2540E,G (GRAV)
			pH	12.80	SU	N/A	2024-04-03	E3530
			Phosphorus	3450	mg/Kg	5.0	2024-04-04	EPA 3050B
			Potassium	26900	mg/Kg	2	2024-04-04	EPA 3050B
			Salmonella	Negative	P/A (25g)		2024-03-27	TMECC 07.02
			Selenium	5.7	mg/Kg	0.2	2024-04-02	Hydr/Vap Gen EPA3050
			Sulfur	26800	mg/Kg	3.0	2024-04-04	EPA 3050B
			Thallium	<0.50	mg/Kg	0.50	2024-04-04	EPA 3050B
			Total Nitrogen	21600	mg/Kg		2024-04-03	AOAC 955.04
			TS (Total Solids)	55.6	%	0.1	2024-04-02	APHA 2540 B mod
			Vanadium	113	mg/Kg	0.3	2024-04-04	EPA 3050B
			Water Insol.Nitrogen	8620	mg/Kg		2024-04-08	AOAC 955.04
			Zinc	267	mg/Kg	2.0	2024-04-04	EPA 3050B

Reported by: Niloufar Ghazi

Nilou Ghazi, Ph.D.,P.Eng.
Laboratory Manager

E3 Laboratories Inc.
SS#4, 360 York Rd., Unit 10, Niagara-on-the-Lake, Ontario L0S 1J0
Email: info@e3labs.ca
Tel: (905) 641-9000, Fax: (905) 641-9001

CERTIFICATE OF ANALYSIS

Walker Environmental Group Inc.
Misty Croney
P.O. Box 100
Thorold
L2V 3Y8
Tel: 905-329-4285 Fax: E-mail
Email: misty.croney@lpconsulting.ca

Work Order No.:2658175
Received : 2024-03-27
PO Number: NVLP10423
Reported: 2024-04-11
Project Name: N-Viro Systems Canada LP (Sarnia)
Chain of Custody No.: 2658175

Quality Control Summary

Lab ID	Analyte	QC Recovery	QC limits	Spike Recovery	Spike Limits	Dup RPD	Dup Limits	Blank
790773	Ammonia (Total)	98	80-120	102	80-120	0	0-20	<0.03
	Arsenic	105	80-120	96	70-130	0	0-20	<1.00
	Boron	94	80-120	97	70-130	8	0-20	<1.0
	Cadmium	99	80-120	90	70-130	0	0-20	<0.3
	Calcium	93	80-120	93	70-130	1	0-20	<100
	Chromium	96	80-120	89	70-130	2	0-20	<0.3
	Cobalt	97	80-120	85	70-130	5	0-20	<0.3
	Copper	94	80-120	83	70-130	0	0-20	<2.0
	E.coli	N/A	N/A	N/A	N/A		0-20	
	Lead	92	80-120	94	70-130	2	0-20	<0.4
	Magnesium	93	80-120	93	70-130	3	0-20	<500
	Mercury	89	80-120	96	70-130	0	0-20	<0.08
	Moisture	104				0		
	Molybdenum	97	80-120	89	70-130	0	0-20	<0.3
	Nickel	98	80-120	86	70-130	0	0-20	<1.0
	Organic Matter-Total							
	pH	96	97-103	N/A	N/A	0	0-20	N/A
	Phosphorus	82	80-120	74	80-120	8	0-8.12	<5.0
	Potassium	103	80-120	92	70-130	8	0-20	<2
	Salmonella							
	Selenium	103	80-120	99	70-130	0	0-20	<0.2
	Sulfur	95	80-120	76	70-130	7	0-10	<3.0
	Thallium	96	80-120	85	70-130	0	0-20	<0.50
	Total Nitrogen	100	80-120	106	80-120	7	0-20	0
	TS (Total Solids)	99	80-120	N/A	N/A	0	0-20	<0.1
	Vanadium	96	80-120	90	70-130	3	0-20	<0.3
	Water Insol.Nitrogen	98		103		3		0
	Zinc	96	80-120	84	70-130	8	0-20	<2.0

E3 Laboratories Inc.
SS#4, 360 York Rd., Unit 10, Niagara-on-the-Lake, Ontario L0S 1J0
Email: info@e3labs.ca
Tel: (905) 641-9000, Fax: (905) 641-9001

CERTIFICATE OF ANALYSIS

Municipality of Leamington
Sherry Badz
111 Erie Street North
Leamington
N8H 2Z9
Tel: 519-326-9860 Fax:
Email: sbadz@leamington.ca

Work Order No.:2662353
Received : 2024-07-23
PO Number:
Reported: 2024-07-31
Project Name: NPRI
Chain of Custody No.: 2662353

Client Sample ID	Sample Date	Lab ID	Parameter	Result	Unit	RDL	Date Analyzed	Method
Leamington Q2 N-Rich	2024-07-22	**803046**	Ammonia (Total)	307	mg/L	0.03	2024-07-30	APHA 4500

Reported by:

Nilou Ghazi, Ph.D.,P.Eng.
Laboratory Manager

E3 Laboratories Inc.
SS#4, 360 York Rd., Unit 10, Niagara-on-the-Lake, Ontario L0S 1J0
Email: info@e3labs.ca
Tel: (905) 641-9000, Fax: (905) 641-9001

CERTIFICATE OF ANALYSIS

Municipality of Leamington
Sherry Badz
111 Erie Street North
Leamington
N8H 2Z9
Tel: 519-326-9860 Fax:
Email: sbadz@leamington.ca

Work Order No.:2662353
Received : 2024-07-23
PO Number:
Reported: 2024-07-31
Project Name: NPRI
Chain of Custody No.: 2662353

Quality Control Summary

Lab ID	Analyte	QC Recovery	QC limits	Spike Recovery	Spike Limits	Dup RPD	Dup Limits	Blank
803046	Ammonia (Total)	101	80-120	106	80-120	1	0-20	<0.03

E3 Laboratories Inc.
SS#4, 360 York Rd., Unit 10, Niagara-on-the-Lake, Ontario L0S 1J0
Email: info@e3labs.ca
Tel: (905) 641-9000, Fax: (905) 641-9001

CERTIFICATE OF ANALYSIS

Municipality of Leamington
Sherry Badz
111 Erie Street North
Leamington
N8H 2Z9
Tel: 519-326-9860 Fax:
Email: sbadz@leamington.ca

Work Order No.:2665148
Received : 2024-10-04
PO Number:
Reported: 2024-10-11
Project Name: NPRI
Chain of Custody No.: 2665148

Client Sample ID	Sample Date	Lab ID	Parameter	Result	Unit	RDL	Date Analyzed	Method
Leamington Q3	2024-10-03	**811314**	Ammonia (Total)	356	mg/L	0.03	2024-10-08	APHA 4500

Reported by:

Nilou Ghazi, Ph.D.,P.Eng.
Laboratory Manager

E3 Laboratories Inc.
SS#4, 360 York Rd., Unit 10, Niagara-on-the-Lake, Ontario L0S 1J0
Email: info@e3labs.ca
Tel: (905) 641-9000, Fax: (905) 641-9001

CERTIFICATE OF ANALYSIS

Municipality of Leamington
Sherry Badz
111 Erie Street North
Leamington
N8H 2Z9
Tel: 519-326-9860 Fax:
Email: sbadz@leamington.ca

Work Order No.:2665148
Received : 2024-10-04
PO Number:
Reported: 2024-10-11
Project Name: NPRI
Chain of Custody No.: 2665148

Quality Control Summary

Lab ID	Analyte	QC Recovery	QC limits	Spike Recovery	Spike Limits	Dup RPD	Dup Limits	Blank
811314	Ammonia (Total)	104	80-120	100	80-120	3	0-20	<0.03

E3 Laboratories Inc.
SS#4, 360 York Rd., Unit 10, Niagara-on-the-Lake, Ontario L0S 1J0
Email: info@e3labs.ca
Tel: (905) 641-9000, Fax: (905) 641-9001

CERTIFICATE OF ANALYSIS

Municipality of Leamington
Sherry Badz
111 Erie Street North
Leamington
N8H 2Z9
Tel: 519-326-9860 Fax:
Email: sbadz@leamington.ca

Work Order No.:2668054
Received : 2025-01-09
PO Number:
Reported: 2025-01-16
Project Name: NPRI
Chain of Custody No.: 2668054

Client Sample ID	Sample Date	Lab ID	Parameter	Result	Unit	RDL	Date Analyzed	Method
Biosolids Product	2025-01-07	**819460**	Ammonia (Total)	507	mg/L	0.03	2025-01-15	APHA 4500

Reported by:

Nilou Ghazi, Ph.D.,P.Eng.
Laboratory Manager

E3 Laboratories Inc.
SS#4, 360 York Rd., Unit 10, Niagara-on-the-Lake, Ontario L0S 1J0
Email: info@e3labs.ca
Tel: (905) 641-9000, Fax: (905) 641-9001

CERTIFICATE OF ANALYSIS

Municipality of Leamington
Sherry Badz
111 Erie Street North
Leamington
N8H 2Z9
Tel: 519-326-9860 Fax:
Email: sbadz@leamington.ca

Work Order No.:2668054
Received : 2025-01-09
PO Number:
Reported: 2025-01-16
Project Name: NPRI
Chain of Custody No.: 2668054

Quality Control Summary

Lab ID	Analyte	QC Recovery	QC limits	Spike Recovery	Spike Limits	Dup RPD	Dup Limits	Blank
819460	Ammonia (Total)	99	80-120	97	80-120	1	0-20	<0.03

Your P.O. #: NVLP10457
Your Project #: PFAS LEAMINGTON
Site Location: PFAS TESTING
Your C.O.C. #: C#997816-01-01

Attention: Tom Harz

Leamington Pollution Control Centre
435 Seacliff Drive East
Leamington, ON
Canada N8H 3V7

Report Date: 2024/07/25
Report #: R8249875
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4L3187
Received: 2024/07/12, 13:11

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Moisture	1	N/A	2024/07/13	CAM SOP-00445	Carter 2nd ed 70.2 m
PFAS in Soil by SPE/LCMS (1)	1	2024/07/16	2024/07/17	CAM SOP-00981	EPA Draft 1633, 8/21
Total Solids	1	N/A	2024/07/15	CAM SOP-00428	SM 24 2540 G m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Per- and polyfluoroalkyl substances (PFAS) identified as surrogates on the certificate of analysis represent the extracted internal standard.

Your P.O. #: NVLP10457
Your Project #: PFAS LEAMINGTON
Site Location: PFAS TESTING
Your C.O.C. #: C#997816-01-01

Attention: Tom Harz

Leamington Pollution Control Centre
435 Seacliff Drive East
Leamington, ON
Canada N8H 3V7

Report Date: 2024/07/25
Report #: R8249875
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4L3187
Received: 2024/07/12, 13:11

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Jolanta Goralczyk, Project Manager
Email: Jolanta.Goralczyk@bureauveritas.com
Phone# (905)817-5751

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4L3187
Report Date: 2024/07/25

Leamington Pollution Control Centre
Client Project #: PFAS LEAMINGTON
Site Location: PFAS TESTING
Your P.O. #: NVLP10457
Sampler Initials: SJ

RESULTS OF ANALYSES OF SOIL

Bureau Veritas ID		ZSC245			
Sampling Date		2024/07/08 11:00			
COC Number		C#997816-01-01			
	UNITS	N-RICH LEAMINGTON	RDL	MDL	QC Batch
Inorganics					
Moisture	%	34	1.0	0.50	9513558
Total Solids	%	66	1	1	9512806

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

PERFLUOROALKYL SUBSTANCES (SOIL)

Bureau Veritas ID		ZSC245			
Sampling Date		2024/07/08 11:00			
COC Number		C#997816-01-01			
	UNITS	N-RICH LEAMINGTON	RDL	MDL	QC Batch
Perfluorinated Compounds					
Perfluorobutanoic acid (PFBA)	ng/g	<0.66	8.0	0.66	9517852
Perfluoropentanoic acid (PFPeA)	ng/g	<0.31	4.0	0.31	9517852
Perfluorohexanoic acid (PFHxA)	ng/g	1.5	2.0	0.22	9517852
Perfluoroheptanoic acid (PFHpA)	ng/g	<0.27	2.0	0.27	9517852
Perfluorooctanoic acid (PFOA)	ng/g	<0.36	2.0	0.36	9517852
Perfluorononanoic acid (PFNA)	ng/g	<0.49	2.0	0.49	9517852
Perfluorodecanoic acid (PFDA)	ng/g	<0.30	2.0	0.30	9517852
Perfluoroundecanoic acid (PFUnA)	ng/g	<0.31	2.0	0.31	9517852
Perfluorododecanoic acid (PFDoA)	ng/g	<0.30	2.0	0.30	9517852
Perfluorotridecanoic acid (PFTrDA)	ng/g	<0.40	2.0	0.40	9517852
Perfluorotetradecanoic acid(PFTeDA)	ng/g	<0.25	2.0	0.25	9517852
Perfluorobutanesulfonic acid (PFBS)	ng/g	<0.18	1.8	0.18	9517852
Perfluoropentanesulfonic acid PFPeS	ng/g	<0.26	1.9	0.26	9517852
Perfluorohexanesulfonic acid(PFHxS)	ng/g	<0.22	1.8	0.22	9517852
Perfluoroheptanesulfonic acid PFHpS	ng/g	<0.45	1.9	0.45	9517852
Perfluorooctanesulfonic acid (PFOS)	ng/g	4.8	1.9	0.28	9517852
Perfluorononanesulfonic acid (PFNS)	ng/g	<0.40	1.9	0.40	9517852
Perfluorodecanesulfonic acid (PFDS)	ng/g	<0.20	1.9	0.20	9517852
Perfluorododecanesulfonic acid	ng/g	<0.63	1.9	0.63	9517852
4:2 Fluorotelomer sulfonic acid	ng/g	<0.94	7.5	0.94	9517852
6:2 Fluorotelomer sulfonic acid	ng/g	<2.4	15	2.4	9528506
8:2 Fluorotelomer sulfonic acid	ng/g	<1.5	7.7	1.5	9517852
Perfluorooctane Sulfonamide (PFOSA)	ng/g	<0.18	2.0	0.18	9517852
MeFOSA	ng/g	<0.30	2.0	0.30	9517852
EtFOSA	ng/g	<0.13	2.0	0.13	9517852
MeFOSAA	ng/g	<0.46	2.0	0.46	9517852
EtFOSAA	ng/g	<0.59	2.0	0.59	9517852
MeFOSE	ng/g	<5.2	40	5.2	9528506
EtFOSE	ng/g	<12	40	12	9528506
Hexafluoropropyleneoxide dimer acid	ng/g	<0.77	8.0	0.77	9517852

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

PERFLUOROALKYL SUBSTANCES (SOIL)

Bureau Veritas ID		ZSC245			
Sampling Date		2024/07/08 11:00			
COC Number		C#997816-01-01			
	UNITS	N-RICH LEAMINGTON	RDL	MDL	QC Batch
4,8-Dioxa-3H-perfluorononanoic acid	ng/g	<0.77	7.6	0.77	9517852
Perfluoro-3-methoxypropanoic acid	ng/g	<0.24	4.0	0.24	9517852
Perfluoro-4-methoxybutanoic acid	ng/g	<0.50	4.0	0.50	9517852
Nonafluoro-3,6-dioxaheptanoic acid	ng/g	<5.4	40	5.4	9517852
9Cl-PF3ONS (F-53B Major)	ng/g	<0.82	7.5	0.82	9517852
11Cl-PF3OUdS (F-53B Minor)	ng/g	<0.96	7.6	0.96	9517852
Perfluoro2ethoxyethanesulfonic acid	ng/g	<0.63	3.6	0.63	9517852
3-Perfluoropropylpropanoic acid	ng/g	<2.6	10	2.6	9517852
2H2H3H3H-Perfluorooctanoic acid	ng/g	<8.9	50	8.9	9517852
3-Perfluoroheptylpropanoic acid	ng/g	<8.5	50	8.5	9517852
Surrogate Recovery (%)					
13C2-4:2-Fluorotelomersulfonic Acid	%	92			9517852
13C2-6:2-Fluorotelomersulfonic Acid	%	56			9528506
13C2-8:2-Fluorotelomersulfonic Acid	%	75			9517852
13C2D4-10:2Fluorotelomersulfonic Ac	%	80			9517852
13C2-Perfluorodecanoic acid	%	140			9517852
13C2-Perfluorododecanoic acid	%	38			9517852
13C2-Perfluorohexadecanoic acid	%	30			9517852
13C2-Perfluorohexanoic acid	%	107			9517852
13C2-Perfluorotetradecanoic acid	%	34			9517852
13C3-HFPO-DA	%	39			9517852
13C3-Perfluorobutanesulfonic acid	%	35			9517852
13C3-Perfluorobutanoic Acid	%	94			9517852
13C3-Perfluorohexanesulfonic Acid	%	42			9517852
13C4-Perfluorobutanoic acid	%	41			9517852
13C4-Perfluoroheptanoic acid	%	46			9517852
13C4-Perfluorooctanesulfonic acid	%	113			9517852
13C4-Perfluorooctanoic acid	%	114			9517852
13C5-Perfluorohexanoic Acid	%	41			9517852
13C5-Perfluorononanoic acid	%	130			9517852
13C5-Perfluoropentanoic acid	%	40			9517852

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

PERFLUOROALKYL SUBSTANCES (SOIL)

Bureau Veritas ID		ZSC245			
Sampling Date		2024/07/08 11:00			
COC Number		C#997816-01-01			
	UNITS	N-RICH LEAMINGTON	RDL	MDL	QC Batch
13C6-Perfluorodecanoic Acid	%	42			9517852
13C7-Perfluoroundecanoic Acid	%	37			9517852
13C8-Perfluorooctane Sulfonamide	%	52			9517852
13C8-Perfluorooctanesulfonic Acid	%	44			9517852
13C8-Perfluorooctanoic Acid	%	43			9517852
13C9-Perfluorononanoic Acid	%	42			9517852
18O2-Perfluorohexanesulfonic acid	%	114			9517852
D3-MeFOSA	%	26			9517852
D3-MeFOSAA	%	60			9517852
D5-EtFOSA	%	22			9517852
D5-EtFOSAA	%	39			9517852
D7-MeFOSE	%	5.7 (1)			9528506
D9-EtFOSE	%	2.4 (1)			9528506

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Extracted internal standard analyte recovery exceeds control limits. This may result in increased variability of the associated native analyte result.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	27.0°C

Sample was analyzed using Bureau Veritas' accredited standard operating procedure for solids, however the submitted matrix (biosolids) has not specifically been subjected to Bureau Veritas' standard validation process. Analysis performed with client consent.

Sample(s) received at a temperature above 10 C. Analysis performed with client's consent.

Sample ZSC245 [N-RICH LEAMINGTON] : Per- and polyfluoroalkyl substances (PFAS): Detection limits were adjusted for high moisture content.
Sample ZSC245, PFAS in Soil by SPE/LCMS: Test repeated.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4L3187
Report Date: 2024/07/25

Leamington Pollution Control Centre
Client Project #: PFAS LEAMINGTON
Site Location: PFAS TESTING
Your P.O. #: NVLP10457
Sampler Initials: SJ

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9513558	R1P	RPD	Moisture	2024/07/13	6.7		%	20
9517852	YZU	Matrix Spike	13C2-4:2-Fluorotelomersulfonic Acid	2024/07/17		79	%	20 - 150
			13C2-8:2-Fluorotelomersulfonic Acid	2024/07/17		79	%	20 - 150
			13C2D4-10:2Fluorotelomersulfonic Ac	2024/07/17		88	%	20 - 150
			13C2-Perfluorodecanoic acid	2024/07/17		152	%	30 - 999
			13C2-Perfluorododecanoic acid	2024/07/17		103	%	20 - 150
			13C2-Perfluorohexadecanoic acid	2024/07/17		110	%	20 - 150
			13C2-Perfluorohexanoic acid	2024/07/17		145	%	30 - 999
			13C2-Perfluorotetradecanoic acid	2024/07/17		111	%	20 - 150
			13C3-HFPO-DA	2024/07/17		103	%	20 - 150
			13C3-Perfluorobutanesulfonic acid	2024/07/17		91	%	20 - 150
			13C3-Perfluorobutanoic Acid	2024/07/17		136	%	30 - 999
			13C3-Perfluorohexanesulfonic Acid	2024/07/17		102	%	20 - 150
			13C4-Perfluorobutanoic acid	2024/07/17		105	%	20 - 150
			13C4-Perfluoroheptanoic acid	2024/07/17		108	%	20 - 150
			13C4-Perfluorooctanesulfonic acid	2024/07/17		165	%	30 - 999
			13C4-Perfluorooctanoic acid	2024/07/17		159	%	30 - 999
			13C5-Perfluorohexanoic Acid	2024/07/17		105	%	20 - 150
			13C5-Perfluorononanoic acid	2024/07/17		149	%	30 - 999
			13C5-Perfluoropentanoic acid	2024/07/17		104	%	20 - 150
			13C6-Perfluorodecanoic Acid	2024/07/17		103	%	20 - 150
			13C7-Perfluoroundecanoic Acid	2024/07/17		109	%	20 - 150
			13C8-Perfluorooctane Sulfonamide	2024/07/17		99	%	20 - 150
			13C8-Perfluorooctanesulfonic Acid	2024/07/17		90	%	20 - 150
			13C8-Perfluorooctanoic Acid	2024/07/17		103	%	20 - 150
			13C9-Perfluorononanoic Acid	2024/07/17		104	%	20 - 150
			18O2-Perfluorohexanesulfonic acid	2024/07/17		161	%	30 - 999
			D3-MeFOSA	2024/07/17		65	%	20 - 150
			D3-MeFOSAA	2024/07/17		102	%	20 - 150
			D5-EtFOSA	2024/07/17		48	%	20 - 150
			D5-EtFOSAA	2024/07/17		115	%	20 - 150
			Perfluorobutanoic acid (PFBA)	2024/07/17		106	%	40 - 150
			Perfluoropentanoic acid (PFPeA)	2024/07/17		104	%	40 - 150
			Perfluorohexanoic acid (PFHxA)	2024/07/17		105	%	40 - 150
			Perfluoroheptanoic acid (PFHpA)	2024/07/17		104	%	40 - 150
			Perfluorooctanoic acid (PFOA)	2024/07/17		101	%	40 - 150
			Perfluorononanoic acid (PFNA)	2024/07/17		104	%	40 - 150
			Perfluorodecanoic acid (PFDA)	2024/07/17		103	%	40 - 150
			Perfluoroundecanoic acid (PFUnA)	2024/07/17		104	%	40 - 150
			Perfluorododecanoic acid (PFDoA)	2024/07/17		108	%	40 - 150
			Perfluorotridecanoic acid (PFTrDA)	2024/07/17		97	%	40 - 150
			Perfluorotetradecanoic acid(PFTeDA)	2024/07/17		104	%	40 - 150
			Perfluorobutanesulfonic acid (PFBS)	2024/07/17		108	%	40 - 150
			Perfluoropentanesulfonic acid PFPeS	2024/07/17		100	%	40 - 150
			Perfluorohexanesulfonic acid(PFHxS)	2024/07/17		104	%	40 - 150
			Perfluoroheptanesulfonic acid PFHpS	2024/07/17		111	%	40 - 150
			Perfluorooctanesulfonic acid (PFOS)	2024/07/17		111	%	40 - 150
			Perfluorononanesulfonic acid (PFNS)	2024/07/17		111	%	40 - 150
			Perfluorodecanesulfonic acid (PFDS)	2024/07/17		107	%	40 - 150
			Perfluorododecanesulfonic acid	2024/07/17		109	%	40 - 150

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			4:2 Fluorotelomer sulfonic acid	2024/07/17		103	%	40 - 150
			8:2 Fluorotelomer sulfonic acid	2024/07/17		108	%	40 - 150
			Perfluorooctane Sulfonamide (PFOSA)	2024/07/17		107	%	40 - 150
			MeFOSA	2024/07/17		98	%	40 - 150
			EtFOSA	2024/07/17		105	%	40 - 150
			MeFOSAA	2024/07/17		109	%	40 - 150
			EtFOSAA	2024/07/17		109	%	40 - 150
			Hexafluoropropyleneoxide dimer acid	2024/07/17		105	%	40 - 150
			4,8-Dioxa-3H-perfluorononanoic acid	2024/07/17		111	%	40 - 150
			Perfluoro-3-methoxypropanoic acid	2024/07/17		110	%	40 - 150
			Perfluoro-4-methoxybutanoic acid	2024/07/17		107	%	40 - 150
			Nonafluoro-3,6-dioxaheptanoic acid	2024/07/17		88	%	40 - 150
			9Cl-PF3ONS (F-53B Major)	2024/07/17		114	%	40 - 150
			11Cl-PF3OUdS (F-53B Minor)	2024/07/17		110	%	40 - 150
			Perfluoro2ethoxyethanesulfonic acid	2024/07/17		105	%	40 - 150
			3-Perfluoropropylpropanoic acid	2024/07/17		70	%	40 - 150
			2H2H3H3H-Perfluorooctanoic acid	2024/07/17		97	%	40 - 150
			3-Perfluoroheptylpropanoic acid	2024/07/17		109	%	40 - 150
9517852	YZU	RPD	Perfluorobutanoic acid (PFBA)	2024/07/17	1.8		%	30
			Perfluoropentanoic acid (PFPeA)	2024/07/17	0.12		%	30
			Perfluorohexanoic acid (PFHxA)	2024/07/17	1.1		%	30
			Perfluoroheptanoic acid (PFHpA)	2024/07/17	0.16		%	30
			Perfluorooctanoic acid (PFOA)	2024/07/17	7.4		%	30
			Perfluorononanoic acid (PFNA)	2024/07/17	0.94		%	30
			Perfluorodecanoic acid (PFDA)	2024/07/17	1.3		%	30
			Perfluoroundecanoic acid (PFUnA)	2024/07/17	2.4		%	30
			Perfluorododecanoic acid (PFDoA)	2024/07/17	0.81		%	30
			Perfluorotridecanoic acid (PFTrDA)	2024/07/17	0.91		%	30
			Perfluorotetradecanoic acid(PFTeDA)	2024/07/17	2.5		%	30
			Perfluorobutanesulfonic acid (PFBS)	2024/07/17	2.6		%	30
			Perfluoropentanesulfonic acid PFPeS	2024/07/17	0.14		%	30
			Perfluorohexanesulfonic acid(PFHxS)	2024/07/17	2.6		%	30
			Perfluoroheptanesulfonic acid PFHpS	2024/07/17	4.6		%	30
			Perfluorooctanesulfonic acid (PFOS)	2024/07/17	4.8		%	30
			Perfluorononanesulfonic acid (PFNS)	2024/07/17	6.7		%	30
			Perfluorodecanesulfonic acid (PFDS)	2024/07/17	4.9		%	30
			Perfluorododecanesulfonic acid	2024/07/17	7.8		%	0
			4:2 Fluorotelomer sulfonic acid	2024/07/17	2.8		%	30
			8:2 Fluorotelomer sulfonic acid	2024/07/17	9.9		%	30
			Perfluorooctane Sulfonamide (PFOSA)	2024/07/17	0.018		%	30
			MeFOSA	2024/07/17	4.0		%	30
			EtFOSA	2024/07/17	1.8		%	30
			MeFOSAA	2024/07/17	4.1		%	30
			EtFOSAA	2024/07/17	1.2		%	30
			Hexafluoropropyleneoxide dimer acid	2024/07/17	4.7		%	30
			4,8-Dioxa-3H-perfluorononanoic acid	2024/07/17	3.6		%	30
			Perfluoro-3-methoxypropanoic acid	2024/07/17	1.3		%	0
			Perfluoro-4-methoxybutanoic acid	2024/07/17	0.59		%	0
			Nonafluoro-3,6-dioxaheptanoic acid	2024/07/17	7.7		%	0
			9Cl-PF3ONS (F-53B Major)	2024/07/17	0.95		%	30

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			11Cl-PF3OUdS (F-53B Minor)	2024/07/17	0.86		%	30
			Perfluoro2ethoxyethanesulfonic acid	2024/07/17	0.24		%	0
			3-Perfluoropropylpropanoic acid	2024/07/17	5.6		%	30
			2H2H3H3H-Perfluorooctanoic acid	2024/07/17	6.0		%	30
			3-Perfluoroheptylpropanoic acid	2024/07/17	7.2		%	30
9517852	YZU	QC Standard	13C2-4:2-Fluorotelomersulfonic Acid	2024/07/17		115	%	20 - 150
			13C2-8:2-Fluorotelomersulfonic Acid	2024/07/17		106	%	20 - 150
			13C2D4-10:2Fluorotelomersulfonic Ac	2024/07/17		98	%	20 - 150
			13C2-Perfluorodecanoic acid	2024/07/17		138	%	30 - 999
			13C2-Perfluorododecanoic acid	2024/07/17		105	%	20 - 150
			13C2-Perfluorohexadecanoic acid	2024/07/17		105	%	20 - 150
			13C2-Perfluorohexanoic acid	2024/07/17		142	%	30 - 999
			13C2-Perfluorotetradecanoic acid	2024/07/17		101	%	20 - 150
			13C3-HFPO-DA	2024/07/17		113	%	20 - 150
			13C3-Perfluorobutanesulfonic acid	2024/07/17		105	%	20 - 150
			13C3-Perfluorobutanoic Acid	2024/07/17		137	%	30 - 999
			13C3-Perfluorohexanesulfonic Acid	2024/07/17		106	%	20 - 150
			13C4-Perfluorobutanoic acid	2024/07/17		108	%	20 - 150
			13C4-Perfluoroheptanoic acid	2024/07/17		107	%	20 - 150
			13C4-Perfluorooctanesulfonic acid	2024/07/17		139	%	30 - 999
			13C4-Perfluorooctanoic acid	2024/07/17		143	%	30 - 999
			13C5-Perfluorohexanoic Acid	2024/07/17		107	%	20 - 150
			13C5-Perfluorononanoic acid	2024/07/17		151	%	30 - 999
			13C5-Perfluoropentanoic acid	2024/07/17		108	%	20 - 150
			13C6-Perfluorodecanoic Acid	2024/07/17		106	%	20 - 150
			13C7-Perfluoroundecanoic Acid	2024/07/17		110	%	20 - 150
			13C8-Perfluorooctane Sulfonamide	2024/07/17		101	%	20 - 150
			13C8-Perfluorooctanesulfonic Acid	2024/07/17		104	%	20 - 150
			13C8-Perfluorooctanoic Acid	2024/07/17		105	%	20 - 150
			13C9-Perfluorononanoic Acid	2024/07/17		103	%	20 - 150
			18O2-Perfluorohexanesulfonic acid	2024/07/17		151	%	30 - 999
			D3-MeFOSA	2024/07/17		78	%	20 - 150
			D3-MeFOSAA	2024/07/17		107	%	20 - 150
			D5-EtFOSA	2024/07/17		66	%	20 - 150
			D5-EtFOSAA	2024/07/17		103	%	20 - 150
			Perfluorobutanoic acid (PFBA)	2024/07/17		103	%	40 - 150
			Perfluoropentanoic acid (PFPeA)	2024/07/17		102	%	40 - 150
			Perfluorohexanoic acid (PFHxA)	2024/07/17		104	%	40 - 150
			Perfluoroheptanoic acid (PFHpA)	2024/07/17		105	%	40 - 150
			Perfluorooctanoic acid (PFOA)	2024/07/17		103	%	40 - 150
			Perfluorononanoic acid (PFNA)	2024/07/17		99	%	40 - 150
			Perfluorodecanoic acid (PFDA)	2024/07/17		105	%	40 - 150
			Perfluoroundecanoic acid (PFUnA)	2024/07/17		97	%	40 - 150
			Perfluorododecanoic acid (PFDoA)	2024/07/17		101	%	40 - 150
			Perfluorotridecanoic acid (PFTrDA)	2024/07/17		106	%	40 - 150
			Perfluorotetradecanoic acid(PFTeDA)	2024/07/17		103	%	40 - 150
			Perfluorobutanesulfonic acid (PFBS)	2024/07/17		103	%	40 - 150
			Perfluoropentanesulfonic acid PFPeS	2024/07/17		100	%	40 - 150
			Perfluorohexanesulfonic acid(PFHxS)	2024/07/17		125	%	40 - 150
			Perfluoroheptanesulfonic acid PFHpS	2024/07/17		114	%	40 - 150

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Perfluorooctanesulfonic acid (PFOS)	2024/07/17		104	%	40 - 150
			Perfluorononanesulfonic acid (PFNS)	2024/07/17		108	%	40 - 150
			Perfluorodecanesulfonic acid (PFDS)	2024/07/17		102	%	40 - 150
			Perfluorododecanesulfonic acid	2024/07/17		89	%	40 - 150
			4:2 Fluorotelomer sulfonic acid	2024/07/17		107	%	40 - 150
			8:2 Fluorotelomer sulfonic acid	2024/07/17		110	%	40 - 150
			Perfluorooctane Sulfonamide (PFOSA)	2024/07/17		110	%	40 - 150
			MeFOSA	2024/07/17		95	%	40 - 150
			EtFOSA	2024/07/17		103	%	40 - 150
			MeFOSAA	2024/07/17		106	%	40 - 150
			EtFOSAA	2024/07/17		102	%	40 - 150
			Hexafluoropropyleneoxide dimer acid	2024/07/17		100	%	40 - 150
			4,8-Dioxa-3H-perfluorononanoic acid	2024/07/17		102	%	40 - 150
			Perfluoro-3-methoxypropanoic acid	2024/07/17		106	%	40 - 150
			Perfluoro-4-methoxybutanoic acid	2024/07/17		106	%	40 - 150
			Nonafluoro-3,6-dioxaheptanoic acid	2024/07/17		111	%	40 - 150
			9Cl-PF3ONS (F-53B Major)	2024/07/17		99	%	40 - 150
			11Cl-PF3OUdS (F-53B Minor)	2024/07/17		95	%	40 - 150
			Perfluoro2ethoxyethanesulfonic acid	2024/07/17		106	%	40 - 150
			3-Perfluoropropylpropanoic acid	2024/07/17		89	%	40 - 150
			2H2H3H3H-Perfluorooctanoic acid	2024/07/17		100	%	40 - 150
			3-Perfluoroheptylpropanoic acid	2024/07/17		95	%	40 - 150
9517852	YZU	Spiked Blank	13C2-4:2-Fluorotelomersulfonic Acid	2024/07/17		98	%	20 - 150
			13C2-8:2-Fluorotelomersulfonic Acid	2024/07/17		94	%	20 - 150
			13C2D4-10:2Fluorotelomersulfonic Ac	2024/07/17		90	%	20 - 150
			13C2-Perfluorodecanoic acid	2024/07/17		113	%	30 - 999
			13C2-Perfluorododecanoic acid	2024/07/17		97	%	20 - 150
			13C2-Perfluorohexadecanoic acid	2024/07/17		99	%	20 - 150
			13C2-Perfluorohexanoic acid	2024/07/17		116	%	30 - 999
			13C2-Perfluorotetradecanoic acid	2024/07/17		102	%	20 - 150
			13C3-HFPO-DA	2024/07/17		103	%	20 - 150
			13C3-Perfluorobutanesulfonic acid	2024/07/17		101	%	20 - 150
			13C3-Perfluorobutanoic Acid	2024/07/17		109	%	30 - 999
			13C3-Perfluorohexanesulfonic Acid	2024/07/17		101	%	20 - 150
			13C4-Perfluorobutanoic acid	2024/07/17		106	%	20 - 150
			13C4-Perfluoroheptanoic acid	2024/07/17		107	%	20 - 150
			13C4-Perfluorooctanesulfonic acid	2024/07/17		119	%	30 - 999
			13C4-Perfluorooctanoic acid	2024/07/17		116	%	30 - 999
			13C5-Perfluorohexanoic Acid	2024/07/17		103	%	20 - 150
			13C5-Perfluorononanoic acid	2024/07/17		107	%	30 - 999
			13C5-Perfluoropentanoic acid	2024/07/17		102	%	20 - 150
			13C6-Perfluorodecanoic Acid	2024/07/17		103	%	20 - 150
			13C7-Perfluoroundecanoic Acid	2024/07/17		103	%	20 - 150
			13C8-Perfluorooctane Sulfonamide	2024/07/17		94	%	20 - 150
			13C8-Perfluorooctanesulfonic Acid	2024/07/17		91	%	20 - 150
			13C8-Perfluorooctanoic Acid	2024/07/17		107	%	20 - 150
			13C9-Perfluorononanoic Acid	2024/07/17		114	%	20 - 150
			18O2-Perfluorohexanesulfonic acid	2024/07/17		118	%	30 - 999
			D3-MeFOSA	2024/07/17		89	%	20 - 150
			D3-MeFOSAA	2024/07/17		91	%	20 - 150

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			D5-EtFOSA	2024/07/17		81	%	20 - 150
			D5-EtFOSAA	2024/07/17		97	%	20 - 150
			Perfluorobutanoic acid (PFBA)	2024/07/17		106	%	40 - 150
			Perfluoropentanoic acid (PFPeA)	2024/07/17		107	%	40 - 150
			Perfluorohexanoic acid (PFHxA)	2024/07/17		108	%	40 - 150
			Perfluoroheptanoic acid (PFHpA)	2024/07/17		105	%	40 - 150
			Perfluorooctanoic acid (PFOA)	2024/07/17		102	%	40 - 150
			Perfluorononanoic acid (PFNA)	2024/07/17		101	%	40 - 150
			Perfluorodecanoic acid (PFDA)	2024/07/17		103	%	40 - 150
			Perfluoroundecanoic acid (PFUnA)	2024/07/17		109	%	40 - 150
			Perfluorododecanoic acid (PFDoA)	2024/07/17		106	%	40 - 150
			Perfluorotridecanoic acid (PFTrDA)	2024/07/17		100	%	40 - 150
			Perfluorotetradecanoic acid(PFTeDA)	2024/07/17		102	%	40 - 150
			Perfluorobutanesulfonic acid (PFBS)	2024/07/17		105	%	40 - 150
			Perfluoropentanesulfonic acid PFPeS	2024/07/17		106	%	40 - 150
			Perfluorohexanesulfonic acid(PFHxS)	2024/07/17		109	%	40 - 150
			Perfluoroheptanesulfonic acid PFHpS	2024/07/17		115	%	40 - 150
			Perfluorooctanesulfonic acid (PFOS)	2024/07/17		111	%	40 - 150
			Perfluorononanesulfonic acid (PFNS)	2024/07/17		109	%	40 - 150
			Perfluorodecanesulfonic acid (PFDS)	2024/07/17		107	%	40 - 150
			Perfluorododecanesulfonic acid	2024/07/17		106	%	40 - 150
			4:2 Fluorotelomer sulfonic acid	2024/07/17		106	%	40 - 150
			8:2 Fluorotelomer sulfonic acid	2024/07/17		101	%	40 - 150
			Perfluorooctane Sulfonamide (PFOSA)	2024/07/17		108	%	40 - 150
			MeFOSA	2024/07/17		100	%	40 - 150
			EtFOSA	2024/07/17		102	%	40 - 150
			MeFOSAA	2024/07/17		111	%	40 - 150
			EtFOSAA	2024/07/17		102	%	40 - 150
			Hexafluoropropyleneoxide dimer acid	2024/07/17		102	%	40 - 150
			4,8-Dioxa-3H-perfluorononanoic acid	2024/07/17		106	%	40 - 150
			Perfluoro-3-methoxypropanoic acid	2024/07/17		112	%	40 - 150
			Perfluoro-4-methoxybutanoic acid	2024/07/17		108	%	40 - 150
			Nonafluoro-3,6-dioxaheptanoic acid	2024/07/17		98	%	40 - 150
			9Cl-PF3ONS (F-53B Major)	2024/07/17		97	%	40 - 150
			11Cl-PF3OUdS (F-53B Minor)	2024/07/17		93	%	40 - 150
			Perfluoro2ethoxyethanesulfonic acid	2024/07/17		105	%	40 - 150
			3-Perfluoropropylpropanoic acid	2024/07/17		93	%	40 - 150
			2H2H3H3H-Perfluorooctanoic acid	2024/07/17		106	%	40 - 150
			3-Perfluoroheptylpropanoic acid	2024/07/17		105	%	40 - 150
9517852	YZU	Method Blank	13C2-4:2-Fluorotelomersulfonic Acid	2024/07/17		120	%	20 - 150
			13C2-8:2-Fluorotelomersulfonic Acid	2024/07/17		103	%	20 - 150
			13C2D4-10:2Fluorotelomersulfonic Ac	2024/07/17		104	%	20 - 150
			13C2-Perfluorodecanoic acid	2024/07/17		119	%	30 - 999
			13C2-Perfluorododecanoic acid	2024/07/17		94	%	20 - 150
			13C2-Perfluorohexadecanoic acid	2024/07/17		99	%	20 - 150
			13C2-Perfluorohexanoic acid	2024/07/17		132	%	30 - 999
			13C2-Perfluorotetradecanoic acid	2024/07/17		93	%	20 - 150
			13C3-HFPO-DA	2024/07/17		103	%	20 - 150
			13C3-Perfluorobutanesulfonic acid	2024/07/17		99	%	20 - 150
			13C3-Perfluorobutanoic Acid	2024/07/17		125	%	30 - 999

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			13C3-Perfluorohexanesulfonic Acid	2024/07/17		96	%	20 - 150
			13C4-Perfluorobutanoic acid	2024/07/17		101	%	20 - 150
			13C4-Perfluoroheptanoic acid	2024/07/17		98	%	20 - 150
			13C4-Perfluorooctanesulfonic acid	2024/07/17		119	%	30 - 999
			13C4-Perfluorooctanoic acid	2024/07/17		126	%	30 - 999
			13C5-Perfluorohexanoic Acid	2024/07/17		98	%	20 - 150
			13C5-Perfluorononanoic acid	2024/07/17		125	%	30 - 999
			13C5-Perfluoropentanoic acid	2024/07/17		98	%	20 - 150
			13C6-Perfluorodecanoic Acid	2024/07/17		97	%	20 - 150
			13C7-Perfluoroundecanoic Acid	2024/07/17		100	%	20 - 150
			13C8-Perfluorooctane Sulfonamide	2024/07/17		93	%	20 - 150
			13C8-Perfluorooctanesulfonic Acid	2024/07/17		102	%	20 - 150
			13C8-Perfluorooctanoic Acid	2024/07/17		99	%	20 - 150
			13C9-Perfluorononanoic Acid	2024/07/17		99	%	20 - 150
			18O2-Perfluorohexanesulfonic acid	2024/07/17		129	%	30 - 999
			D3-MeFOSA	2024/07/17		68	%	20 - 150
			D3-MeFOSAA	2024/07/17		95	%	20 - 150
			D5-EtFOSA	2024/07/17		60	%	20 - 150
			D5-EtFOSAA	2024/07/17		93	%	20 - 150
			Perfluorobutanoic acid (PFBA)	2024/07/17	<0.066		ng/g	
			Perfluoropentanoic acid (PFPeA)	2024/07/17	<0.031		ng/g	
			Perfluorohexanoic acid (PFHxA)	2024/07/17	<0.022		ng/g	
			Perfluoroheptanoic acid (PFHpA)	2024/07/17	<0.027		ng/g	
			Perfluorooctanoic acid (PFOA)	2024/07/17	<0.036		ng/g	
			Perfluorononanoic acid (PFNA)	2024/07/17	<0.049		ng/g	
			Perfluorodecanoic acid (PFDA)	2024/07/17	<0.030		ng/g	
			Perfluoroundecanoic acid (PFUnA)	2024/07/17	<0.031		ng/g	
			Perfluorododecanoic acid (PFDoA)	2024/07/17	<0.030		ng/g	
			Perfluorotridecanoic acid (PFTrDA)	2024/07/17	<0.040		ng/g	
			Perfluorotetradecanoic acid(PFTeDA)	2024/07/17	<0.025		ng/g	
			Perfluorobutanesulfonic acid (PFBS)	2024/07/17	<0.018		ng/g	
			Perfluoropentanesulfonic acid PFPeS	2024/07/17	<0.026		ng/g	
			Perfluorohexanesulfonic acid(PFHxS)	2024/07/17	<0.022		ng/g	
			Perfluoroheptanesulfonic acid PFHpS	2024/07/17	<0.045		ng/g	
			Perfluorooctanesulfonic acid (PFOS)	2024/07/17	<0.028		ng/g	
			Perfluorononanesulfonic acid (PFNS)	2024/07/17	<0.040		ng/g	
			Perfluorodecanesulfonic acid (PFDS)	2024/07/17	<0.020		ng/g	
			Perfluorododecanesulfonic acid	2024/07/17	<0.063		ng/g	
			4:2 Fluorotelomer sulfonic acid	2024/07/17	<0.094		ng/g	
			8:2 Fluorotelomer sulfonic acid	2024/07/17	<0.15		ng/g	
			Perfluorooctane Sulfonamide (PFOSA)	2024/07/17	<0.018		ng/g	
			MeFOSA	2024/07/17	<0.030		ng/g	
			EtFOSA	2024/07/17	<0.013		ng/g	
			MeFOSAA	2024/07/17	<0.046		ng/g	
			EtFOSAA	2024/07/17	<0.059		ng/g	
			Hexafluoropropyleneoxide dimer acid	2024/07/17	<0.077		ng/g	
			4,8-Dioxa-3H-perfluorononanoic acid	2024/07/17	<0.077		ng/g	
			Perfluoro-3-methoxypropanoic acid	2024/07/17	<0.024		ng/g	
			Perfluoro-4-methoxybutanoic acid	2024/07/17	<0.050		ng/g	
			Nonafluoro-3,6-dioxaheptanoic acid	2024/07/17	<0.54		ng/g	

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			9Cl-PF3ONS (F-53B Major)	2024/07/17	<0.082		ng/g	
			11Cl-PF3OUdS (F-53B Minor)	2024/07/17	<0.096		ng/g	
			Perfluoro2ethoxyethanesulfonic acid	2024/07/17	<0.063		ng/g	
			3-Perfluoropropylpropanoic acid	2024/07/17	<0.26		ng/g	
			2H2H3H3H-Perfluorooctanoic acid	2024/07/17	<0.89		ng/g	
			3-Perfluoroheptylpropanoic acid	2024/07/17	<0.85		ng/g	
9528506	YZU	QC Standard	13C2-6:2-Fluorotelomersulfonic Acid	2024/07/23		127	%	20 - 150
			D7-MeFOSE	2024/07/23		83	%	20 - 150
			D9-EtFOSE	2024/07/23		70	%	20 - 150
			6:2 Fluorotelomer sulfonic acid	2024/07/23		100	%	40 - 150
			MeFOSE	2024/07/23		99	%	40 - 150
			EtFOSE	2024/07/23		101	%	40 - 150
9528506	YZU	Spiked Blank	13C2-6:2-Fluorotelomersulfonic Acid	2024/07/23		100	%	20 - 150
			D7-MeFOSE	2024/07/23		86	%	20 - 150
			D9-EtFOSE	2024/07/23		82	%	20 - 150
			6:2 Fluorotelomer sulfonic acid	2024/07/23		93	%	40 - 150
			MeFOSE	2024/07/23		96	%	40 - 150
			EtFOSE	2024/07/23		95	%	40 - 150
9528506	YZU	RPD	6:2 Fluorotelomer sulfonic acid	2024/07/23	5.5		%	30
			MeFOSE	2024/07/23	1.1		%	30
			EtFOSE	2024/07/23	0.42		%	30
9528506	YZU	Method Blank	13C2-6:2-Fluorotelomersulfonic Acid	2024/07/23		121	%	20 - 150
			D7-MeFOSE	2024/07/23		84	%	20 - 150
			D9-EtFOSE	2024/07/23		78	%	20 - 150
			6:2 Fluorotelomer sulfonic acid	2024/07/23	<0.12		ng/g	
			MeFOSE	2024/07/23	<0.26		ng/g	
			EtFOSE	2024/07/23	<0.59		ng/g	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4L3187
Report Date: 2024/07/25

Leamington Pollution Control Centre
Client Project #: PFAS LEAMINGTON
Site Location: PFAS TESTING
Your P.O. #: NVLP10457
Sampler Initials: SJ

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

Marian Godax, Senior Analyst

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

Page of

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#39476 N-Viro Systems Canada Inc.	Company Name:	#36047 Leamington Pollution Control Centre	Quotation #:	C42469	Bureau Veritas Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	Tom Hartz	P.O. #:	NVLP10457		997816
Address:	3865 Thorold Townline Rd.	Address:	435 Seacliff Drive East	Project:	PFAS Leamington	COC #:	Project Manager:
	Thorold ON L2V 3Y8		Leamington ON N8H 3V7	Project Name:	PFAS Testing	C#997816-01-01	Jolanta Goralczyk
Tel:	Fax:	Tel:	(902) 220-5930 Fax:	Site #:	Leamington PCC		
Email:	apinvoices@walkerind.com	Email:	tharz@walkerind.com; misty.croney@lpconsulting.ca	Sampled By:	Sherry [redacted] Jason		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558. ☐ Storm Sewer Bylaw
- ☐ MISA Municipality _____
- ☐ PWQO ☐ Reg 406 Table _____
- ☐ Other _____

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? _____

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	PFAS in Soil by SPE/LCMS	# of Bottles	Comments
1		N-Rich Leamington	July 8/24	11:00 Am	BS	X	1	
2								
3								
4								
5								
6								
7								
8								
9								
10								

NONT-2024-07-1275

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT:
(will be applied if Rush TAT is not specified): U

Standard TAT = 5-7 Working days for most tests..

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ ☐
Rush Confirmation Number: _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Sherry [redacted]	24/7/08	1130 hr	[redacted]	24/07/12	13:11	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
	27/27/27	Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS.

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Your P.O. #: NVLP10457
Your Project #: PFAS-N-VIRO
Site Location: LEAMINGTON PCC
Your C.O.C. #: C#1015713-01-01

Attention: Tom Harz

Leamington Pollution Control Centre
435 Seacliff Drive East
Leamington, ON
Canada N8H 3V7

Report Date: 2024/11/16
Report #: R8408393
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4X2690
Received: 2024/10/22, 11:03

Sample Matrix: Biosolids
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Moisture	1	N/A	2024/10/24	CAM SOP-00445	Carter 2nd ed 70.2 m
PFAS in Soil by SPE/LCMS (1)	1	2024/11/04	2024/11/05	CAM SOP-00981	EPA Draft 1633, 8/21
Total Solids	1	N/A	2024/10/25	CAM SOP-00428	SM 24 2540 G m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Per- and polyfluoroalkyl substances (PFAS) identified as surrogates on the certificate of analysis represent the extracted internal standard.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Your P.O. #: NVLP10457
Your Project #: PFAS-N-VIRO
Site Location: LEAMINGTON PCC
Your C.O.C. #: C#1015713-01-01

Attention: Tom Harz

Leamington Pollution Control Centre
435 Seacliff Drive East
Leamington, ON
Canada N8H 3V7

Report Date: 2024/11/16
Report #: R8408393
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4X2690
Received: 2024/10/22, 11:03

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Jolanta Goralczyk, Project Manager
Email: Jolanta.Goralczyk@bureauveritas.com
Phone# (905)817-5751

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4X2690
Report Date: 2024/11/16

Leamington Pollution Control Centre
Client Project #: PFAS-N-VIRO
Site Location: LEAMINGTON PCC
Your P.O. #: NVLP10457
Sampler Initials: SB

RESULTS OF ANALYSES OF BIOSOLIDS

Bureau Veritas ID		AGRA91			
Sampling Date		2024/10/21 10:30			
COC Number		C#1015713-01-01			
	UNITS	**LEAMINGTON N-RICH**	**RDL**	**MDL**	**QC Batch**
Inorganics					
Moisture	%	32	1.0	0.50	9722986
Total Solids	%	68	1	1	9719906

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4X2690
Report Date: 2024/11/16

Leamington Pollution Control Centre
Client Project #: PFAS-N-VIRO
Site Location: LEAMINGTON PCC
Your P.O. #: NVLP10457
Sampler Initials: SB

PERFLUOROALKYL SUBSTANCES (BIOSOLIDS)

Bureau Veritas ID		AGRA91			
Sampling Date		2024/10/21 10:30			
COC Number		C#1015713-01-01			
	UNITS	LEAMINGTON N-RICH	RDL	MDL	QC Batch
Perfluorinated Compounds					
Perfluorobutanoic acid (PFBA)	ng/g	<3.4	16	3.4	9743992
Perfluoropentanoic acid (PFPeA)	ng/g	<0.64	8.0	0.64	9743992
Perfluorohexanoic acid (PFHxA)	ng/g	<0.52	4.0	0.52	9743992
Perfluoroheptanoic acid (PFHpA)	ng/g	<0.70	4.0	0.70	9743992
Perfluorooctanoic acid (PFOA)	ng/g	<0.72	4.0	0.72	9743992
Perfluorononanoic acid (PFNA)	ng/g	<0.70	4.0	0.70	9743992
Perfluorodecanoic acid (PFDA)	ng/g	<0.98	4.0	0.98	9743992
Perfluoroundecanoic acid (PFUnA)	ng/g	<0.52	4.0	0.52	9743992
Perfluorododecanoic acid (PFDoA)	ng/g	<0.66	4.0	0.66	9743992
Perfluorotridecanoic acid (PFTrDA)	ng/g	<0.38	4.0	0.38	9743992
Perfluorotetradecanoic acid(PFTeDA)	ng/g	<0.34	4.0	0.34	9743992
Perfluorobutanesulfonic acid (PFBS)	ng/g	<0.38	3.6	0.38	9743992
Perfluoropentanesulfonic acid PFPeS	ng/g	<0.40	3.8	0.40	9743992
Perfluorohexanesulfonic acid(PFHxS)	ng/g	<0.42	3.6	0.42	9743992
Perfluoroheptanesulfonic acid PFHpS	ng/g	<0.62	3.8	0.62	9743992
Perfluorooctanesulfonic acid (PFOS)	ng/g	<0.86	3.8	0.86	9743992
Perfluorononanesulfonic acid (PFNS)	ng/g	<0.80	3.8	0.80	9743992
Perfluorodecanesulfonic acid (PFDS)	ng/g	<0.76	3.8	0.76	9743992
Perfluorododecanesulfonic acid	ng/g	<1.2	3.8	1.2	9743992
4:2 Fluorotelomer sulfonic acid	ng/g	<3.0	15	3.0	9743992
6:2 Fluorotelomer sulfonic acid	ng/g	<2.2	15	2.2	9743992
8:2 Fluorotelomer sulfonic acid	ng/g	<5.4	15	5.4	9743992
Perfluorooctane Sulfonamide (PFOSA)	ng/g	<0.42	4.0	0.42	9743992
MeFOSA	ng/g	<1.1	4.0	1.1	9743992
EtFOSA	ng/g	<0.90	4.0	0.90	9743992
MeFOSAA	ng/g	<1.6	4.0	1.6	9743992
EtFOSAA	ng/g	<1.4	4.0	1.4	9743992
MeFOSE	ng/g	<3.6	40	3.6	9743992
EtFOSE	ng/g	<2.4	40	2.4	9743992
Hexafluoropropyleneoxide dimer acid	ng/g	<2.6	16	2.6	9743992

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

PERFLUOROALKYL SUBSTANCES (BIOSOLIDS)

Bureau Veritas ID		AGRA91			
Sampling Date		2024/10/21 10:30			
COC Number		C#1015713-01-01			
	UNITS	LEAMINGTON N-RICH	RDL	MDL	QC Batch
4,8-Dioxa-3H-perfluorononanoic acid	ng/g	<2.0	15	2.0	9743992
Perfluoro-3-methoxypropanoic acid	ng/g	<3.0	8.0	3.0	9743992
Perfluoro-4-methoxybutanoic acid	ng/g	<1.0	8.0	1.0	9743992
Nonafluoro-3,6-dioxaheptanoic acid	ng/g	<22	80	22	9743992
9Cl-PF3ONS (F-53B Major)	ng/g	<2.4	15	2.4	9743992
11Cl-PF3OUdS (F-53B Minor)	ng/g	<2.8	15	2.8	9743992
Perfluoro2ethoxyethanesulfonic acid	ng/g	<1.3	7.2	1.3	9743992
3-Perfluoropropylpropanoic acid	ng/g	<1.9	20	1.9	9743992
2H2H3H3H-Perfluorooctanoic acid	ng/g	<28	100	28	9743992
3-Perfluoroheptylpropanoic acid	ng/g	<34	100	34	9743992
Surrogate Recovery (%)					
13C2-4:2-Fluorotelomersulfonic Acid	%	222 (1)			9743992
13C2-6:2-Fluorotelomersulfonic Acid	%	250 (1)			9743992
13C2-8:2-Fluorotelomersulfonic Acid	%	205 (1)			9743992
13C2-Perfluorodecanoic acid	%	110			9743992
13C2-Perfluorododecanoic acid	%	60			9743992
13C2-Perfluorohexanoic acid	%	77			9743992
13C2-Perfluorotetradecanoic acid	%	63			9743992
13C3-HFPO-DA	%	104			9743992
13C3-Perfluorobutanesulfonic acid	%	79			9743992
13C3-Perfluorobutanoic Acid	%	83			9743992
13C3-Perfluorohexanesulfonic Acid	%	95			9743992
13C4-Perfluorobutanoic acid	%	81			9743992
13C4-Perfluoroheptanoic acid	%	119			9743992
13C4-Perfluorooctanesulfonic acid	%	89			9743992
13C4-Perfluorooctanoic acid	%	107			9743992
13C5-Perfluorohexanoic Acid	%	93			9743992
13C5-Perfluorononanoic acid	%	119			9743992
13C5-Perfluoropentanoic acid	%	95			9743992

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Extracted internal standard analyte recovery exceeds control limits. This may result in increased variability of the associated native analyte result.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

PERFLUOROALKYL SUBSTANCES (BIOSOLIDS)

Bureau Veritas ID		AGRA91			
Sampling Date		2024/10/21 10:30			
COC Number		C#1015713-01-01			
	UNITS	LEAMINGTON N-RICH	RDL	MDL	QC Batch
13C6-Perfluorodecanoic Acid	%	96			9743992
13C7-Perfluoroundecanoic Acid	%	63			9743992
13C8-Perfluorooctane Sulfonamide	%	91			9743992
13C8-Perfluorooctanesulfonic Acid	%	94			9743992
13C8-Perfluorooctanoic Acid	%	92			9743992
13C9-Perfluorononanoic Acid	%	95			9743992
18O2-Perfluorohexanesulfonic acid	%	91			9743992
D3-MeFOSA	%	35			9743992
D3-MeFOSAA	%	101			9743992
D5-EtFOSA	%	26			9743992
D5-EtFOSAA	%	70			9743992
D7-MeFOSE	%	6.2 (1)			9743992
D9-EtFOSE	%	3.2 (1)			9743992

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Extracted internal standard analyte recovery exceeds control limits. This may result in increased variability of the associated native analyte result.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.7°C

Sample was analyzed using Bureau Veritas' accredited standard operating procedure for solids, however the submitted matrix (biosolids) has not specifically been subjected to Bureau Veritas' standard validation process. Analysis performed with client consent.

Sample AGRA91 [LEAMINGTON N-RICH] : Per- and polyfluoroalkyl substances (PFAS): Due to the nature of the sample matrix, sample required dilution. Detection limits were adjusted accordingly. Detection limits were also adjusted for high moisture content.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4X2690
Report Date: 2024/11/16

Leamington Pollution Control Centre
Client Project #: PFAS-N-VIRO
Site Location: LEAMINGTON PCC
Your P.O. #: NVLP10457
Sampler Initials: SB

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9722986	MYG	RPD	Moisture	2024/10/24	5.8		%	20
9743992	VCT	QC Standard	13C2-4:2-Fluorotelomersulfonic Acid	2024/11/05		112	%	20 - 150
			13C2-6:2-Fluorotelomersulfonic Acid	2024/11/05		115	%	20 - 150
			13C2-8:2-Fluorotelomersulfonic Acid	2024/11/05		113	%	20 - 150
			13C2-Perfluorodecanoic acid	2024/11/05		82	%	30 - 999
			13C2-Perfluorododecanoic acid	2024/11/05		101	%	20 - 150
			13C2-Perfluorohexanoic acid	2024/11/05		82	%	30 - 999
			13C2-Perfluorotetradecanoic acid	2024/11/05		90	%	20 - 150
			13C3-HFPO-DA	2024/11/05		104	%	20 - 150
			13C3-Perfluorobutanesulfonic acid	2024/11/05		109	%	20 - 150
			13C3-Perfluorobutanoic Acid	2024/11/05		82	%	30 - 999
			13C3-Perfluorohexanesulfonic Acid	2024/11/05		105	%	20 - 150
			13C4-Perfluorobutanoic acid	2024/11/05		103	%	20 - 150
			13C4-Perfluoroheptanoic acid	2024/11/05		101	%	20 - 150
			13C4-Perfluorooctanesulfonic acid	2024/11/05		84	%	30 - 999
			13C4-Perfluorooctanoic acid	2024/11/05		80	%	30 - 999
			13C5-Perfluorohexanoic Acid	2024/11/05		106	%	20 - 150
			13C5-Perfluorononanoic acid	2024/11/05		79	%	30 - 999
			13C5-Perfluoropentanoic acid	2024/11/05		103	%	20 - 150
			13C6-Perfluorodecanoic Acid	2024/11/05		101	%	20 - 150
			13C7-Perfluoroundecanoic Acid	2024/11/05		99	%	20 - 150
			13C8-Perfluorooctane Sulfonamide	2024/11/05		89	%	20 - 150
			13C8-Perfluorooctanesulfonic Acid	2024/11/05		101	%	20 - 150
			13C8-Perfluorooctanoic Acid	2024/11/05		102	%	20 - 150
			13C9-Perfluorononanoic Acid	2024/11/05		102	%	20 - 150
			18O2-Perfluorohexanesulfonic acid	2024/11/05		82	%	30 - 999
			D3-MeFOSA	2024/11/05		75	%	20 - 150
			D3-MeFOSAA	2024/11/05		100	%	20 - 150
			D5-EtFOSA	2024/11/05		68	%	20 - 150
			D5-EtFOSAA	2024/11/05		97	%	20 - 150
			D7-MeFOSE	2024/11/05		77	%	20 - 150
			D9-EtFOSE	2024/11/05		73	%	20 - 150
			Perfluorobutanoic acid (PFBA)	2024/11/05		104	%	40 - 150
			Perfluoropentanoic acid (PFPeA)	2024/11/05		105	%	40 - 150
			Perfluorohexanoic acid (PFHxA)	2024/11/05		104	%	40 - 150
			Perfluoroheptanoic acid (PFHpA)	2024/11/05		104	%	40 - 150
			Perfluorooctanoic acid (PFOA)	2024/11/05		106	%	40 - 150
			Perfluorononanoic acid (PFNA)	2024/11/05		108	%	40 - 150
			Perfluorodecanoic acid (PFDA)	2024/11/05		108	%	40 - 150
			Perfluoroundecanoic acid (PFUnA)	2024/11/05		102	%	40 - 150
			Perfluorododecanoic acid (PFDoA)	2024/11/05		102	%	40 - 150
			Perfluorotridecanoic acid (PFTrDA)	2024/11/05		113	%	40 - 150
			Perfluorotetradecanoic acid(PFTeDA)	2024/11/05		110	%	40 - 150
			Perfluorobutanesulfonic acid (PFBS)	2024/11/05		104	%	40 - 150
			Perfluoropentanesulfonic acid PFPeS	2024/11/05		104	%	40 - 150
			Perfluorohexanesulfonic acid(PFHxS)	2024/11/05		106	%	40 - 150
			Perfluoroheptanesulfonic acid PFHpS	2024/11/05		104	%	40 - 150
			Perfluorooctanesulfonic acid (PFOS)	2024/11/05		103	%	40 - 150
			Perfluorononanesulfonic acid (PFNS)	2024/11/05		103	%	40 - 150
			Perfluorodecanesulfonic acid (PFDS)	2024/11/05		105	%	40 - 150

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Perfluorododecanesulfonic acid	2024/11/05		96	%	40 - 150
			4:2 Fluorotelomer sulfonic acid	2024/11/05		108	%	40 - 150
			6:2 Fluorotelomer sulfonic acid	2024/11/05		105	%	40 - 150
			8:2 Fluorotelomer sulfonic acid	2024/11/05		110	%	40 - 150
			Perfluorooctane Sulfonamide (PFOSA)	2024/11/05		106	%	40 - 150
			MeFOSA	2024/11/05		106	%	40 - 150
			EtFOSA	2024/11/05		108	%	40 - 150
			MeFOSAA	2024/11/05		103	%	40 - 150
			EtFOSAA	2024/11/05		112	%	40 - 150
			MeFOSE	2024/11/05		104	%	40 - 150
			EtFOSE	2024/11/05		105	%	40 - 150
			Hexafluoropropyleneoxide dimer acid	2024/11/05		109	%	40 - 150
			4,8-Dioxa-3H-perfluorononanoic acid	2024/11/05		110	%	40 - 150
			Perfluoro-3-methoxypropanoic acid	2024/11/05		103	%	40 - 150
			Perfluoro-4-methoxybutanoic acid	2024/11/05		105	%	40 - 150
			Nonafluoro-3,6-dioxaheptanoic acid	2024/11/05		115	%	40 - 150
			9Cl-PF3ONS (F-53B Major)	2024/11/05		110	%	40 - 150
			11Cl-PF3OUdS (F-53B Minor)	2024/11/05		110	%	40 - 150
			Perfluoro2ethoxyethanesulfonic acid	2024/11/05		103	%	40 - 150
			3-Perfluoropropylpropanoic acid	2024/11/05		96	%	40 - 150
			2H2H3H3H-Perfluorooctanoic acid	2024/11/05		94	%	40 - 150
			3-Perfluoroheptylpropanoic acid	2024/11/05		92	%	40 - 150
9743992	VCT	Spiked Blank	13C2-4:2-Fluorotelomersulfonic Acid	2024/11/05		91	%	20 - 150
			13C2-6:2-Fluorotelomersulfonic Acid	2024/11/05		92	%	20 - 150
			13C2-8:2-Fluorotelomersulfonic Acid	2024/11/05		88	%	20 - 150
			13C2-Perfluorodecanoic acid	2024/11/05		82	%	30 - 999
			13C2-Perfluorododecanoic acid	2024/11/05		100	%	20 - 150
			13C2-Perfluorohexanoic acid	2024/11/05		79	%	30 - 999
			13C2-Perfluorotetradecanoic acid	2024/11/05		84	%	20 - 150
			13C3-HFPO-DA	2024/11/05		100	%	20 - 150
			13C3-Perfluorobutanesulfonic acid	2024/11/05		98	%	20 - 150
			13C3-Perfluorobutanoic Acid	2024/11/05		79	%	30 - 999
			13C3-Perfluorohexanesulfonic Acid	2024/11/05		97	%	20 - 150
			13C4-Perfluorobutanoic acid	2024/11/05		98	%	20 - 150
			13C4-Perfluoroheptanoic acid	2024/11/05		98	%	20 - 150
			13C4-Perfluorooctanesulfonic acid	2024/11/05		84	%	30 - 999
			13C4-Perfluorooctanoic acid	2024/11/05		82	%	30 - 999
			13C5-Perfluorohexanoic Acid	2024/11/05		96	%	20 - 150
			13C5-Perfluorononanoic acid	2024/11/05		83	%	30 - 999
			13C5-Perfluoropentanoic acid	2024/11/05		99	%	20 - 150
			13C6-Perfluorodecanoic Acid	2024/11/05		95	%	20 - 150
			13C7-Perfluoroundecanoic Acid	2024/11/05		100	%	20 - 150
			13C8-Perfluorooctane Sulfonamide	2024/11/05		86	%	20 - 150
			13C8-Perfluorooctanesulfonic Acid	2024/11/05		96	%	20 - 150
			13C8-Perfluorooctanoic Acid	2024/11/05		97	%	20 - 150
			13C9-Perfluorononanoic Acid	2024/11/05		99	%	20 - 150
			18O2-Perfluorohexanesulfonic acid	2024/11/05		83	%	30 - 999
			D3-MeFOSA	2024/11/05		74	%	20 - 150
			D3-MeFOSAA	2024/11/05		98	%	20 - 150
			D5-EtFOSA	2024/11/05		65	%	20 - 150

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			D5-EtFOSAA	2024/11/05		93	%	20 - 150
			D7-MeFOSE	2024/11/05		70	%	20 - 150
			D9-EtFOSE	2024/11/05		65	%	20 - 150
			Perfluorobutanoic acid (PFBA)	2024/11/05		100	%	40 - 150
			Perfluoropentanoic acid (PFPeA)	2024/11/05		100	%	40 - 150
			Perfluorohexanoic acid (PFHxA)	2024/11/05		100	%	40 - 150
			Perfluoroheptanoic acid (PFHpA)	2024/11/05		100	%	40 - 150
			Perfluorooctanoic acid (PFOA)	2024/11/05		100	%	40 - 150
			Perfluorononanoic acid (PFNA)	2024/11/05		99	%	40 - 150
			Perfluorodecanoic acid (PFDA)	2024/11/05		102	%	40 - 150
			Perfluoroundecanoic acid (PFUnA)	2024/11/05		96	%	40 - 150
			Perfluorododecanoic acid (PFDoA)	2024/11/05		96	%	40 - 150
			Perfluorotridecanoic acid (PFTrDA)	2024/11/05		108	%	40 - 150
			Perfluorotetradecanoic acid(PFTeDA)	2024/11/05		102	%	40 - 150
			Perfluorobutanesulfonic acid (PFBS)	2024/11/05		96	%	40 - 150
			Perfluoropentanesulfonic acid PFPeS	2024/11/05		98	%	40 - 150
			Perfluorohexanesulfonic acid(PFHxS)	2024/11/05		97	%	40 - 150
			Perfluoroheptanesulfonic acid PFHpS	2024/11/05		98	%	40 - 150
			Perfluorooctanesulfonic acid (PFOS)	2024/11/05		94	%	40 - 150
			Perfluorononanesulfonic acid (PFNS)	2024/11/05		95	%	40 - 150
			Perfluorodecanesulfonic acid (PFDS)	2024/11/05		99	%	40 - 150
			Perfluorododecanesulfonic acid	2024/11/05		89	%	40 - 150
			4:2 Fluorotelomer sulfonic acid	2024/11/05		99	%	40 - 150
			6:2 Fluorotelomer sulfonic acid	2024/11/05		99	%	40 - 150
			8:2 Fluorotelomer sulfonic acid	2024/11/05		100	%	40 - 150
			Perfluorooctane Sulfonamide (PFOSA)	2024/11/05		100	%	40 - 150
			MeFOSA	2024/11/05		98	%	40 - 150
			EtFOSA	2024/11/05		97	%	40 - 150
			MeFOSAA	2024/11/05		96	%	40 - 150
			EtFOSAA	2024/11/05		98	%	40 - 150
			MeFOSE	2024/11/05		97	%	40 - 150
			EtFOSE	2024/11/05		100	%	40 - 150
			Hexafluoropropyleneoxide dimer acid	2024/11/05		100	%	40 - 150
			4,8-Dioxa-3H-perfluorononanoic acid	2024/11/05		98	%	40 - 150
			Perfluoro-3-methoxypropanoic acid	2024/11/05		99	%	40 - 150
			Perfluoro-4-methoxybutanoic acid	2024/11/05		100	%	40 - 150
			Nonafluoro-3,6-dioxaheptanoic acid	2024/11/05		108	%	40 - 150
			9Cl-PF3ONS (F-53B Major)	2024/11/05		101	%	40 - 150
			11Cl-PF3OUdS (F-53B Minor)	2024/11/05		99	%	40 - 150
			Perfluoro2ethoxyethanesulfonic acid	2024/11/05		103	%	40 - 150
			3-Perfluoropropylpropanoic acid	2024/11/05		91	%	40 - 150
			2H2H3H3H-Perfluorooctanoic acid	2024/11/05		96	%	40 - 150
			3-Perfluoroheptylpropanoic acid	2024/11/05		95	%	40 - 150
9743992	VCT	RPD	Perfluorobutanoic acid (PFBA)	2024/11/05	4.1		%	30
			Perfluoropentanoic acid (PFPeA)	2024/11/05	4.1		%	30
			Perfluorohexanoic acid (PFHxA)	2024/11/05	6.2		%	30
			Perfluoroheptanoic acid (PFHpA)	2024/11/05	2.9		%	30
			Perfluorooctanoic acid (PFOA)	2024/11/05	5.8		%	30
			Perfluorononanoic acid (PFNA)	2024/11/05	4.0		%	30
			Perfluorodecanoic acid (PFDA)	2024/11/05	5.4		%	30

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Perfluoroundecanoic acid (PFUnA)	2024/11/05	3.4		%	30
			Perfluorododecanoic acid (PFDoA)	2024/11/05	1.9		%	30
			Perfluorotridecanoic acid (PFTrDA)	2024/11/05	7.5		%	30
			Perfluorotetradecanoic acid(PFTeDA)	2024/11/05	10		%	30
			Perfluorobutanesulfonic acid (PFBS)	2024/11/05	1.7		%	30
			Perfluoropentanesulfonic acid PFPeS	2024/11/05	5.4		%	30
			Perfluorohexanesulfonic acid(PFHxS)	2024/11/05	4.3		%	30
			Perfluoroheptanesulfonic acid PFHpS	2024/11/05	1.2		%	30
			Perfluorooctanesulfonic acid (PFOS)	2024/11/05	0.52		%	30
			Perfluorononanesulfonic acid (PFNS)	2024/11/05	0.083		%	30
			Perfluorodecanesulfonic acid (PFDS)	2024/11/05	2.8		%	30
			Perfluorododecanesulfonic acid	2024/11/05	0.46		%	0
			4:2 Fluorotelomer sulfonic acid	2024/11/05	3.7		%	30
			6:2 Fluorotelomer sulfonic acid	2024/11/05	4.6		%	30
			8:2 Fluorotelomer sulfonic acid	2024/11/05	4.4		%	30
			Perfluorooctane Sulfonamide (PFOSA)	2024/11/05	3.8		%	30
			MeFOSA	2024/11/05	3.9		%	30
			EtFOSA	2024/11/05	1.1		%	30
			MeFOSAA	2024/11/05	2.8		%	30
			EtFOSAA	2024/11/05	3.7		%	30
			MeFOSE	2024/11/05	3.5		%	30
			EtFOSE	2024/11/05	3.1		%	30
			Hexafluoropropyleneoxide dimer acid	2024/11/05	2.6		%	30
			4,8-Dioxa-3H-perfluorononanoic acid	2024/11/05	1.6		%	30
			Perfluoro-3-methoxypropanoic acid	2024/11/05	4.7		%	0
			Perfluoro-4-methoxybutanoic acid	2024/11/05	4.2		%	0
			Nonafluoro-3,6-dioxaheptanoic acid	2024/11/05	5.0		%	0
			9Cl-PF3ONS (F-53B Major)	2024/11/05	1.6		%	30
			11Cl-PF3OUdS (F-53B Minor)	2024/11/05	1.1		%	30
			Perfluoro2ethoxyethanesulfonic acid	2024/11/05	5.9		%	0
			3-Perfluoropropylpropanoic acid	2024/11/05	2.0		%	30
			2H2H3H3H-Perfluorooctanoic acid	2024/11/05	3.8		%	30
			3-Perfluoroheptylpropanoic acid	2024/11/05	5.1		%	30
9743992	VCT	Method Blank	13C2-4:2-Fluorotelomersulfonic Acid	2024/11/05		110	%	20 - 150
			13C2-6:2-Fluorotelomersulfonic Acid	2024/11/05		112	%	20 - 150
			13C2-8:2-Fluorotelomersulfonic Acid	2024/11/05		105	%	20 - 150
			13C2-Perfluorodecanoic acid	2024/11/05		76	%	30 - 999
			13C2-Perfluorododecanoic acid	2024/11/05		94	%	20 - 150
			13C2-Perfluorohexanoic acid	2024/11/05		79	%	30 - 999
			13C2-Perfluorotetradecanoic acid	2024/11/05		85	%	20 - 150
			13C3-HFPO-DA	2024/11/05		97	%	20 - 150
			13C3-Perfluorobutanesulfonic acid	2024/11/05		105	%	20 - 150
			13C3-Perfluorobutanoic Acid	2024/11/05		77	%	30 - 999
			13C3-Perfluorohexanesulfonic Acid	2024/11/05		98	%	20 - 150
			13C4-Perfluorobutanoic acid	2024/11/05		97	%	20 - 150
			13C4-Perfluoroheptanoic acid	2024/11/05		93	%	20 - 150
			13C4-Perfluorooctanesulfonic acid	2024/11/05		79	%	30 - 999
			13C4-Perfluorooctanoic acid	2024/11/05		76	%	30 - 999
			13C5-Perfluorohexanoic Acid	2024/11/05		96	%	20 - 150
			13C5-Perfluorononanoic acid	2024/11/05		77	%	30 - 999

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			13C5-Perfluoropentanoic acid	2024/11/05		96	%	20 - 150
			13C6-Perfluorodecanoic Acid	2024/11/05		97	%	20 - 150
			13C7-Perfluoroundecanoic Acid	2024/11/05		95	%	20 - 150
			13C8-Perfluorooctane Sulfonamide	2024/11/05		83	%	20 - 150
			13C8-Perfluorooctanesulfonic Acid	2024/11/05		93	%	20 - 150
			13C8-Perfluorooctanoic Acid	2024/11/05		97	%	20 - 150
			13C9-Perfluorononanoic Acid	2024/11/05		98	%	20 - 150
			18O2-Perfluorohexanesulfonic acid	2024/11/05		78	%	30 - 999
			D3-MeFOSA	2024/11/05		64	%	20 - 150
			D3-MeFOSAA	2024/11/05		92	%	20 - 150
			D5-EtFOSA	2024/11/05		63	%	20 - 150
			D5-EtFOSAA	2024/11/05		89	%	20 - 150
			D7-MeFOSE	2024/11/05		73	%	20 - 150
			D9-EtFOSE	2024/11/05		67	%	20 - 150
			Perfluorobutanoic acid (PFBA)	2024/11/05	<0.17		ng/g	
			Perfluoropentanoic acid (PFPeA)	2024/11/05	<0.032		ng/g	
			Perfluorohexanoic acid (PFHxA)	2024/11/05	<0.026		ng/g	
			Perfluoroheptanoic acid (PFHpA)	2024/11/05	<0.035		ng/g	
			Perfluorooctanoic acid (PFOA)	2024/11/05	<0.036		ng/g	
			Perfluorononanoic acid (PFNA)	2024/11/05	<0.035		ng/g	
			Perfluorodecanoic acid (PFDA)	2024/11/05	<0.049		ng/g	
			Perfluoroundecanoic acid (PFUnA)	2024/11/05	<0.026		ng/g	
			Perfluorododecanoic acid (PFDoA)	2024/11/05	<0.033		ng/g	
			Perfluorotridecanoic acid (PFTrDA)	2024/11/05	<0.019		ng/g	
			Perfluorotetradecanoic acid(PFTeDA)	2024/11/05	<0.017		ng/g	
			Perfluorobutanesulfonic acid (PFBS)	2024/11/05	<0.019		ng/g	
			Perfluoropentanesulfonic acid PFPeS	2024/11/05	<0.020		ng/g	
			Perfluorohexanesulfonic acid(PFHxS)	2024/11/05	<0.021		ng/g	
			Perfluoroheptanesulfonic acid PFHpS	2024/11/05	<0.031		ng/g	
			Perfluorooctanesulfonic acid (PFOS)	2024/11/05	<0.043		ng/g	
			Perfluorononanesulfonic acid (PFNS)	2024/11/05	<0.040		ng/g	
			Perfluorodecanesulfonic acid (PFDS)	2024/11/05	<0.038		ng/g	
			Perfluorododecanesulfonic acid	2024/11/05	<0.058		ng/g	
			4:2 Fluorotelomer sulfonic acid	2024/11/05	<0.15		ng/g	
			6:2 Fluorotelomer sulfonic acid	2024/11/05	<0.11		ng/g	
			8:2 Fluorotelomer sulfonic acid	2024/11/05	<0.27		ng/g	
			Perfluorooctane Sulfonamide (PFOSA)	2024/11/05	<0.021		ng/g	
			MeFOSA	2024/11/05	<0.054		ng/g	
			EtFOSA	2024/11/05	<0.045		ng/g	
			MeFOSAA	2024/11/05	<0.081		ng/g	
			EtFOSAA	2024/11/05	<0.072		ng/g	
			MeFOSE	2024/11/05	<0.18		ng/g	
			EtFOSE	2024/11/05	<0.12		ng/g	
			Hexafluoropropyleneoxide dimer acid	2024/11/05	<0.13		ng/g	
			4,8-Dioxa-3H-perfluorononanoic acid	2024/11/05	<0.099		ng/g	
			Perfluoro-3-methoxypropanoic acid	2024/11/05	<0.15		ng/g	
			Perfluoro-4-methoxybutanoic acid	2024/11/05	<0.051		ng/g	
			Nonafluoro-3,6-dioxaheptanoic acid	2024/11/05	<1.1		ng/g	
			9Cl-PF3ONS (F-53B Major)	2024/11/05	<0.12		ng/g	
			11Cl-PF3OUdS (F-53B Minor)	2024/11/05	<0.14		ng/g	

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Perfluoro2ethoxyethanesulfonic acid	2024/11/05	<0.066		ng/g	
			3-Perfluoropropylpropanoic acid	2024/11/05	<0.096		ng/g	
			2H2H3H3H-Perfluorooctanoic acid	2024/11/05	<1.4		ng/g	
			3-Perfluoroheptylpropanoic acid	2024/11/05	<1.7		ng/g	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4X2690
Report Date: 2024/11/16

Leamington Pollution Control Centre
Client Project #: PFAS-N-VIRO
Site Location: LEAMINGTON PCC
Your P.O. #: NVLP10457
Sampler Initials: SB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Colm McNamara, Senior Analyst, Liquid Chromatography

Louise Harding, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

C4X2690
2024/10/22 11:03

Bureau Veritas
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

Page of

NONT-2024-10-4973

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Lab Only:
Company Name:	#39476 N-Viro Systems Canada Inc.	Company Name:	#36047 Leamington Pollution Control Centre	Quotation #:	C42469	Bottle Order #:
Attention:	Accounts Payable	Attention:	Tom Hartz	P.O. #:		1015713
Address:	3865 Thorold Townline Rd.	Address:	435 Seacliff Drive East	Project:		
	Thorold ON L2V 3Y8		Leamington ON N8H 3V7	Project Name:	PFAS - N-Viro	COC #:
Tel:	Fax:	Tel:	(902) 220-5930 Fax:	Site #:	Leamington PCC	Project Manager:
Email:	apinvoices@walkerind.com	Email:	tharz@walkerind.com; misty.croney@ipconsulting.ca	Sampled By:	Sherry Board	C#1015713-01-01 Jolanta Goralczyk

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558. ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO ☐ Reg 406 Table ___
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: X
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered	PFAS in Soil by SPE/LCMS	# of Bottles	Comments
1		Leamington N-Rich	OCT 21/24	10:30 A	BS		X	1	
2									
3									
4									
5									
6									
7									
8									
9									
10									

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
Sherry Board	24/10/21	11:00 A	BIRLW	24/10/22	11:03		Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes ✓	No
								6/7/6	Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Appendix E
Preventive Maintenance Work Orders
& Calibration Certificates

Work Order Number
1

Leamington Pollution Control Centre

Antero Work Order

2024-01-10 10:35:55 AM

Work Order Info

Status	Type	Priority	Interval Days
Active	Scheduled	Low	7
Last Completed	**Date Scheduled**	**Days to Complete**	**Date Delinquent**
	1-8-2024	7	1-15-2024

Equipment/Task

Equipment **PG-EQUIP-Plant Equipment for PM**

Location **PG - Plant Grounds**

Task **PG-WKLY-INSP General Weekly Plant Checks Inspection #2**

The following tasks are to complete inspections noted below as part of Weekly Plant Checks #2 Inspection.

If you are unsure of the tasks or specific safety requirement(s), discuss with your Supervisor and JHSC (for safety related items) first. Follow all Plant SOPs. Lockout equipment where required.
Any comments shall be noted on the Work Order. Sign and date once the tasks are completed.

- Refer to the operating manual for the equipment as needed for maintenance, general information, and troubleshooting tips.

Work below is to be checked off, date, initial, cleaned and or changed if needed once completed.

1. Monday: Rotate Secondary Waste Pump - # _____
   - Open WSLP-M1 or M2 depending on which pump you are starting and close WSLP-M1 depending on which pump you are stopping.
2. Monday: Rotate Non-Potable Pumps & Strainers - # ____
   First turn on strainer that was off, then open suction valve, then open discharge valve.
   2nd strainer being turned off needs to be cleaned first -
   - Turn strainer to hand, close discharge valve and wait 7mins.
   - Turn strainer to off.
   - Close suction valve.
   - Open then close drain valve on strainer to relief any pressure.
   - Rotate duty non potable pump.
   - Open drain valve for 2 to 3 minutes to remove any settled solids.
3. Monday: Rotate Alum Pumps - #_____.
   - Verify correct valve setup before rotating

- Clean backend of Fine Bar Screens & splitter box after applying lockout devices.
  <u>This includes removing any debris on rollers or bracketing</u>. This is done daily.

Mon		Tues		Wed		Thurs		Fri	

4. Headwork's Screening blg. air make-up intake filter, check & change if needed (turn off unit first) - ____
5. Pump water out of FMRS1 ____ and FMRS2 ____ chambers

Completed Information

Completed Notes (Req) ☐ **Attention Required**

Date Completed (Req) _____ Completed By _____

Labor

Labor Class	Labor Account	Est. Hours	Act. Hours
PO - Plant Operator or as Assigned	Facility Maintenance	3.00	

Work Order Number
7

Leamington Pollution Control Centre

Antero Work Order

2024-01-10 10:35:55 AM

Work Order Info

Status	Type	Priority	Interval Days
Active	Scheduled	Low	7
Last Completed	**Date Scheduled**	**Days to Complete**	**Date Delinquent**
	1-8-2024	0	1-8-2024

Equipment/Task

Equipment **PG-EQUIP-Plant Equipment for PM**

Location **PG - Plant Grounds**

Task **PG-WKLY-INSP General Weekly Plant Check Inspection #1**

The following tasks are to complete inspections noted below as part of Weekly Plant Checks #1 Inspection.

If you are unsure of the tasks or specific safety requirement(s), discuss with your Supervisor and JHSC (for safety related items) first. Follow all Plant SOPs. Lockout equipment where required.
Any comments shall be noted on the Work Order. Sign and date once the tasks are completed.

- Refer to the operating manual for the equipment as needed for maintenance, general information, and troubleshooting tips.

To complete the weekly checs:

1. Test UV air compressor dump valve - _____
2. Run Eyewash/Shower for 2 minutes and clean bowl, shower, and eye covers (where supplied):

UV		Shop		Chem		Lab	

NOTE: For Lab and Chemical building, get assistance to hold pail under the showers to flush. Run shower long enough to flush out. Connect drain line for flushing eyewash and remove once completed. Clean up any water as neccessary.

4. Check admin. washrooms, lunchroom and restock supplies -
5. Remove Garbage from Admin. electrical room on Wed - ___ Fri - ___
6. Remove Reyclables from Admin to bins outside back door once per week - _____
   - Corrugated cardboard goes out to large bin for monthly pickup.
   - **Do not** put plastic bags into any bins or to roadside for pickup. They are not recycleable.

Completed Information

Completed Notes (Req)

☐ **Attention Required**

Date Completed (Req) _____

Completed By _____

Labor

Labor Class	Labor Account	Est. Hours	Act. Hours
PO - Plant Operator or as Assigned	Facility Maintenance	2.00	
ASP - Assistant Plant Operator or as Assigned	Facility Maintenance	2.00	
DPF - Days Plant Floater or as Assigned	Facility Maintenance	2.00	

Verification report Promag 400

Plant operator: Mario Burgos EH

Device information

Location	Leamington PCC
Device tag	USP_FIT-1
Module name	Promag W
Nominal diameter	DN1200 / 48"
Device name	Promag 400
Order code	53WT2-HP0B1RK2BBAA
Serial number	7604D419000
Firmware version	02.01.02

Calibration

Calibration factor	1.33780
Zero point	-1.0

Verification information

Operating time (counter)	413d21h34m23s
Date/time (manually recorded)	14.05.24 11:07
Verification ID	8
Verification mode	Standard verification

Overall verification result*

☑ Passed	Details see next page

*Result of the complete device functionality test via Heartbeat Technology

Confirmation

Heartbeat Verification verifies the function of the flowmeter within the specified measuring tolerance, over the useful lifetime of the device, with a total test coverage > 94 %, and complies with the requirements for traceable verification according to DIN EN ISO 9001:2008 – Section 7.6 a. (attested by TÜV-SÜD Industrieservices GmbH)

Notes

2024-05-14	Mario Burgos	
Date	Operator's signature	Inspector's signature

Verification report Promag 400

Plant operator: Mario Burgos EH

Device identification and verification identification

Serial number	7604D419000
Device tag	USP_FIT-1
Verification ID	8

Sensor		☑ Passed
Shot time symmetry		☑ Passed
Hold voltage symmetry		☑ Passed
Coil current loss		☑ Passed
Coil current stability		☑ Passed
Coil resistance		☑ Passed
E1 electrode cable		☑ Passed
E2 electrode cable		☑ Passed
EPD electrode cable		? Not done
Sensor electronic module (ISEM)		☑ Passed
Supply voltage		☑ Passed
Internal voltages		☑ Passed
Linearity and reference voltage		☑ Passed
Offset of electrode measuring circuit		☑ Passed
Hold voltage feedback		☑ Passed
Shot voltage feedback		☑ Passed
Electronic current loss		☑ Passed
Coil circuit measurement		☑ Passed
Shot control circuit		☑ Passed
Electrode signal integrity		☑ Passed
System status		☑ Passed
I/O module		☑ Passed
Input/output 1		☑ Passed
Input/output 2		? Not done
Input/output 3		? Not done

Appendix F
Notice of Modification to Sewage Works

Ontario

Ministry of the Environment, Conservation and Parks

Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA ON-SITE PRIOR TO THE SCHEDULED IMPLEMENTATION DATE.

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility

(Insert the ECA's owner, number and issuance date and notice number, which should start with "01" and consecutive numbers thereafter)

ECA Number	Issuance Date (mm/dd/yy)	Notice number (if applicable)
8491-AQBJ73	03/23/2018	

ECA Owner	Municipality
The Corporation of the Municipality of Leamington	The Corporation of the Municipality of Leamington

Part 2: Description of the modifications as part of the Limited Operational Flexibility

(Attach a detailed description of the sewage works)

Four (4) new Archimedes spiral screw pumps with a capacity of 430 L/s replaced four existing screw pumps with a capacity of 410 L/s. The increase in pumping capacity does not impact the plant rated capacity of 35,000 m3/d.

The new ECA description is a Lower Pumping Station with four (4) screw pumps, each pump having a Peak Instantaneous Flow Rate of 430 L/s.

Description shall include:

1. A detail description of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. Confirmation that the anticipated environmental effects are negligible.
3. List of updated versions of, or amendments to, all relevant technical documents that are affected by the modifications as applicable, i.e. submission of documentation is not required, but the listing of updated documents is (design brief, drawings, emergency plan, etc.)

Part 3 – Declaration by Professional Engineer

I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:

1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario;
2. Has been designed in accordance with the Limited Operational Flexibility as described in the ECA;
3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act; and other appropriate regulations.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name (Print)	PEO License Number
Carston Gregory	100204154
Signature	Date (mm/dd/yy)
	12/10/2024

Name of Employer: Dillon Consulting Limited

Part 4 – Declaration by Owner

I hereby declare that:

1. I am authorized by the Owner to complete this Declaration;
2. The Owner consents to the modification; and
3. This modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA.
4. The Owner has fulfilled all applicable requirements of the *Environmental Assessment Act*.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name of Owner Representative (Print)	Owner representative's title (Print)
Shannon Belleau, P.Eng.	**Manager of Environmental Services**
Owner Representative's Signature	Date (mm/dd/yy)
	12/10/2024

Ontario

Ministry of the Environment, Conservation and Parks

Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA ON-SITE PRIOR TO THE SCHEDULED IMPLEMENTATION DATE.

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility

(Insert the ECA's owner, number and issuance date and notice number, which should start with "01" and consecutive numbers thereafter)

ECA Number	Issuance Date (mm/dd/yy)	Notice number (if applicable)
8491-AQBJ73	03/23/2018	

ECA Owner	Municipality
The Corporation of the Municipality of Leamington	The Corporation of the Municipality of Leamington

Part 2: Description of the modifications as part of the Limited Operational Flexibility

(Attach a detailed description of the sewage works)

Installation of one (1) new dual-core high speed turbo blower with a capacity of 183 m3/min to replace one (1) centrifugal air blowers with a flow rate of 86 m3/min.

Existing ECA description (following 2021 blower replacement) is: "two (2) high speed turbo blowers with a flow rate of 183 m3/min, three (3) centrifugal air blowers one (1) with the flow rate of 172 m3/min each and two (2) with a flow rate of 86 m3/min each to supply air to the aeration system via an arrangement of headers, lateral piping and droplegs."

The revised ECA description is: Existing ECA description is: "three (3) high speed turbo blowers with a flow rate of 183 m3/min, two (2) centrifugal air blowers one (1) with the flow rate of 172 m3/min and one (1) with a flow rate of 86 m3/min to supply air to the aeration system via an arrangement of headers, lateral piping and droplegs."

Description shall include:
1. A detail description of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. Confirmation that the anticipated environmental effects are negligible.
3. List of updated versions of, or amendments to, all relevant technical documents that are affected by the modifications as applicable, i.e. submission of documentation is not required, but the listing of updated documents is (design brief, drawings, emergency plan, etc.)

Part 3 – Declaration by Professional Engineer

I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:
1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario;
2. Has been designed in accordance with the Limited Operational Flexibility as described in the ECA;
3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act; and other appropriate regulations.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name (Print)	PEO License Number
Cristina Alfano, P.Eng.	**100521617**
Signature: Digitally signed by Alfano, Cristina Location: London, ON	Date (mm/dd/yy): **10/07/2024**
Name of Employer: AECOM	

Part 4 – Declaration by Owner

I hereby declare that:
1. I am authorized by the Owner to complete this Declaration;
2. The Owner consents to the modification; and
3. This modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA.
4. The Owner has fulfilled all applicable requirements of the *Environmental Assessment Act*.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name of Owner Representative (Print)	Owner representative's title (Print)
Shannon Belleau, P.Eng.	**Manager of Environmental Services**
Owner Representative's Signature	Date (mm/dd/yy): 10/07/2024