CLEAN HARBORS CANADA INC.

2022 ANNUAL LANDFILL

OPERATIONS REPORT

Submitted By: Stan Yuha

Title: Facility Manager

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Appendices

Annual Landfill Operations Report – Clean Harbors Ryley

1.0 Introduction

Clean Harbors Canada Inc. (Clean Harbors) owns and operates the industrial waste management facility located at SE/4 and NE/4 9-50-17 W4M, Ryley, Alberta under Alberta Environment and Parks (AEP) Approval No. 10348-03-01. The facility consists of a Class I Industrial Landfill and a Hazardous Waste/Recyclable Storage and Processing Facility. This document has been prepared to fulfill the annual reporting requirements specified in Section 4.6.60 of the approval.

The reporting requirements outlined in Section 4.6.60 have been summarized in the concordance table below (Table A). Table A references the relevant approval requirements and the corresponding sections, figures, table and/or appendices that address each requirement.

TABLE A Reporting Requirements – Annual Landfill Operations Report

Approval Section Number	Requirement	Location Herein
4.6.60(a)	Name and contact information of person responsible for the facility	Section 2
4.6.60(b)	Summary of all information collected as required in TABLE 4.6-D	Section 3
4.6.60(b)(i)	Quantity and type of waste received	Section 3.1, Appendix A
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4.6.60(b)(iii)	General location of waste deposited	Section 3.3, Appendix B
4.6.60(b)(iv)	Leachate head	Section 3.4, Appendix C
4.6.60(b)(v)	Leachate analysis, as per TABLE 4.4-A	Section 3.5, Appendix D
4.6.60(b)(vi)	Volume of leachate removed from the leachate collection system	Section 3.6, Appendix E
4.6.60(b)(vii)	Leak detection liquid analysis, as per TABLE 4.4-A	Section 3.7, Appendix F
4.6.60(b)(viii)	Volume of leak detection liquid removed from the leak detection system	Section 3.8, Appendix G
4.6.60(b)(ix)	Final cover	Section 3.9
4.6.60(c)	Summary of the results of any audit conducted in accordance with 4.1.7	Section 4, Appendix H
4.6.60(d)	Summary of the operations of the waste stabilization area	Section 5, Appendix I
4.6.60(e)	Summary of the performance of the run-on and run-off control systems, including a comparison to the limits in TABLES 4.3-B and 4.3-C	Section 6

Approval Section Number	Requirement	Location Herein
4.6.60(f)	Summary of the performance of the leachate collection system, including a comparison to the maximum acceptable leachate head	Section 7
4.6.60(g)	Summary of the performance of the leak detection system, including a comparison to the action leakage rate limit	Section 8
4.6.60(h)	The Response Action Plan for the leak detection system pursuant to 4.4.10	Section 9, Appendix J
4.6.60(i)	Annual Dugout and Water Well Sampling Program Report pursuant to 4.5.4	Section 10, Appendix K
4.6.60(j)	Summary of all revisions to the Landfill Operations Plan pursuant to 4.6.33(b)	Section 11, Appendix L
4.6.60(k)	Any groundwater remedial action taken pursuant to 4.6.34(r)	Section 12
4.6.60(l)	Summary of records of landfill inspections pursuant to 4.6.53	Section 13, Appendix M
4.6.60(m)(i), (ii) & (iii)	Summary of operational issues, emergencies and actions taken	Section 14
4.6.60(n)(i) & (ii)	Summary of records of public complaints and approval holder's responses	Section 15, Appendix Q
4.6.60(o)	Up-to-date financial security estimate pursuant to 5.1.2	Section 16, Appendix N
4.6.60(p)(i), (ii), (iii) & (iv)	Updated site development plan showing the status of the landfill progression at the end of the operating year, including contour mapping, location of active & inactive disposal areas, areas where final cover has been placed & location of new landfill cells constructed	Section 17, Appendix O
4.6.60(q)	Annual Landfill Cell Closure Report pursuant to 7.1.7	Section 18, Appendix P
4.6.60(r)	Summary of contraventions reported pursuant to 2.1.1 related to landfill operations	Section 19, Appendix Q
4.6.60(s)	Any other information as required in writing by the Director	Section 20

2.0 Facility Contact Information

The primary contact for the Facility is:

Stan Yuha, Facility Manager
PO Box 390
Ryley, AB T0B 4A0

Phone: (780) 662-2509
Mobile: (780) 717-9606

3.0 Summary of Information Collected as Required in TABLE 4.6-D

3.1 Quantity and type of waste received.

In 2022, the facility landfilled a total of 157,895.011 tonnes of waste. 94,420.029 tonnes were hazardous waste. Non-hazardous waste landfilled totaled 64,474,982 tonnes.

The full description of the waste landfilled at the Facility by IWIC code and Transportation of Dangerous Goods numbers can be found in Appendix A.

There were no operational or other issues associated with the disposal of the waste.

3.2 Quantity and type of material removed.

No waste was removed from the landfill in 2022.

3.3 General location of waste deposited.

In late 2022, Clean Harbors changed from a manual survey method to an Unmanned Aerial Survey. The year-end survey was conducted on January 6, 2023, and the report is included in the TetraTech Technical Memo – Remaining Airspace – January 6, 2023.

140,010 cubic metres of landfill capacity was consumed in 2022. Cell 3C, 3D and Cell 4 had an increase of 116,119 cubic metres. Cell 3E had an increase of 2,509 cubic metres. The Tipping Pad area had an increase of 21,382 cubic metres placed. All other cells are either inactive or capped.

The December 31, 2021 Challenger Geomatics survey report and the January 6, 2023, Technical Memo - Remaining Airspace containing the Site Survey by Clean Harbors Industrial Services – Unmanned Aerial Systems is included as Appendix B.

3.4 Leachate head

Approval 1.0348-03 sets out the following limits regarding leachate head in the landfill cells.

4.4.3 Subject to 4.4.4, the approval holder shall not exceed the maximum acceptable leachate head in any landfill cell.

4.4.4 Subsequent to a storm event, the leachate head in any landfill cell shall not exceed the maximum acceptable leachate head for more than fourteen (14) days, unless otherwise authorized in writing by the Director.

4.4.6 The approval holder shall monitor the leachate collection and leak detection systems as required in TABLE 4.6-D and for all parameters specified in TABLE 4.4-A, subject to 4.4.8 and 4.4.9.

The “maximum acceptable leachate head” is defined by Section 1.1.2(jjj) as:

"the maximum depth of leachate above the lowest part of the primary liner, not including the sumps or leachate collection pipe trenches, and is:

(i) 1.0 m in each of the existing landfill cells, and
(ii) 0.3 m in each of the new landfill cells

during active landfill life, landfill cell closure, final landfill closure, and post-closure;"

Section 1.1.2(cc) defines existing cells as:

"existing landfill cells" means Cell 1, Cell 2, Cell 3A, Cell 3B and Cell 3C as described in application No. 005-10348;"

Cell 1 was capped prior to the creation of the *Standards for Landfills in* Alberta and does not have the capability to measure leachate head. The leachate volume from Cell 1 has been steadily decreasing since capping was completed. The Cell 1 primary sump is pumped periodically throughout the year to remove any leachate accumulation. In 2022, 1570 litres of leachate were removed from Cell 1.

The leachate head monitoring data for Cells 2, 3A, 3B, 3C, 3D, 3E and 4 is provided in Appendix C.

3.5 Leachate Analysis

TABLE 4.6-D of the approval requires that the landfill leachate from each primary leachate collection sump be analyzed at least once every quarter year for the parameters outlined in TABLE 4.4-A, unless insufficient sample volume is available.

Appendix D contains a table showing the Field pH and Electrical Conductivity and the laboratory analytical reports for the parameters in TABLE 4.4-A.

3.6 Volume of Leachate Removed from Leachate Collection System

The approval requires that leachate be removed from the leachate collection systems to maintain the leachate head level as described in Section 3.4 above.

Appendix E contains a table showing the volume of leachate removed from each of the landfill cells in 2022.

3.7 Leak Detection Liquid Analysis

TABLE 4.6-D of the approval requires that the leak detection liquid from each landfill cell be analyzed at least once every quarter year for the parameters outlined in TABLE 4.4-A, unless insufficient sample volume is available.

Appendix F contains a table showing the Field pH and Electrical Conductivity and the laboratory analytical reports for the parameters in TABLE 4.4-A.

3.8 Volume of Leak Detection Liquid Removed

TABLE 4.6-D requires that the volume of leak detection liquid removed be monitored and recorded at least each working day as removed. Cell 1 has been capped for approximately 20 years and generated only 6725 litres in 2022.

Appendix G contains a table showing the volume of leak detection liquid removed from the leak detection systems of each landfill cell in 2022.

3.9 Final Cover

No final cover was applied to the cells in 2022.

4.0 Summary of Results of Any Audit Performed in Accordance with 4.1.7

The third-party compliance audit was conducted in 2021. A copy of that Audit Report is in Appendix H. The next compliance audit will take place in 2024.

5.0 Summary of the Operations of the Waste Stabilization Area

In 2022, 13,001.102 tonnes of waste were processed through the Stabilization Facility. This volume was broken down as follows:

1.	Hazardous Waste Solidified	8238.053 tonnes
2.	Non-hazardous Waste Solidified	2669.121 tonnes
3.	Encapsulation (with cement)	615.106 tonnes
4.	pH adjustment	70.681 tonnes
5.	Sulfur treatment	818.97 tonnes
6.	Quenched	589.171 tonnes

There were no operational issues encountered during 2022.

The thickness tests conducted on the two stabilization vessels can be found in Appendix I.

6.0 Summary of the Performance of Run-on and Run-off Systems

The run-on and run-off control systems performed in accordance with the design plan. Water was discharged from Pond B in July 2022 and from Pond C in April and May 2022. A Summary of the analytical results for each Pond is shown in the Tables below. The Industrial Wastewater Report has been submitted which includes the required Annual Sampling as per TABLE 4.3-E.

No water was discharged from the tank farm area.

Pond B – 2022 Summary of analytical results

Parameter	Limit	April 19 - Not discharged	July 4
pH	6.0 – 9.5	8.01	8.19
COD, mg/L	50	60	35
Total Dissolved Solids, mg/L	2500	1170	732
Total Suspended Solids, mg/L	25	30.6	3.8
Ammonia, Total Dissolved (as N) mg/L	5	0.244	0.0218
Chloride, mg/L	250	69.3	37.3
Sodium, mg/L	200	277	188
Sulphate, mg/L	500	604	348
Oil or other substances	No visible sheen	No visible sheen	No visible sheen
Rainbow Trout	50% or greater survival	Pass	Pass
Daphnia Magna		Pass	Pass

Pond C – 2022 Summary of Analytical Results

Parameter	Limit	April 19	May 5
pH	6.0 – 9.5	7.97	8.34
COD, mg/L	50	42	43
Total Dissolved Solids, mg/L	2500	440	739
Total Suspended Solids, mg/L	25	8.2	7.8
Ammonia, Total Dissolved (as N) mg/L	5	0.0186	0.0224
Chloride, mg/L	250	52	57
Sodium, mg/L	200	91.6	170
Sulphate, mg/L	500	167	356
Oil or other substances	No visible sheen	No visible sheen	No Visible Sheen
Rainbow Trout	50% or greater survival	Pass	Pass
Daphnia Magna		Pass	Pass

7.0 Summary of the Performance of the Leachate Collection System

The leachate collection systems performed as designed. There were the normal maintenance issues of meter and pump servicing or replacement, in the winter months some heat trace lines failed and transfer lines froze. These issues were dealt with to restore normal operation as quickly as possible. Cell 3A lines plugged off October 21. Replacement insulated line was ordered but the supplier ordered the wrong piping and had to re-order the correct material. This resulted in the line being out of service until into 2023.

The relevant approval clauses and definitions regarding leachate head are included in Section 3.4 of this report. The tabular report of leachate head values is in Appendix C. Section 4.4.4,

states that “subsequent to a storm event, the leachate head in any landfill cell shall not exceed the maximum acceptable leachate head for more than fourteen (14) days, unless otherwise authorized in writing by the Director. At no time in 2022 was the fourteen-day time frame exceeded between precipitation events.

The flow rates of precipitation into the collection trench and sump are dependent upon the composition and permeability of the waste in the landfill cell. This impacts the length of time required to achieve the desired leachate head level after precipitation events.

No leachate was used for dust control in 2022.

8.0 Summary of the Performance of the Leak Detection System

The Leak Detection Systems functioned as designed during 2022. There were no problems with the systems other than those mentioned in the previous section – pump replacement, meter service, heat trace failures, line plugging and replacement.

Cell 1 is not designed to monitor leak detection liquid in the same manner as Cells 2 to 4. The leak detection liquid drains continuously via gravity feed to a leachate manhole. A submersible pump is used to remove any Leak Detection Liquid that accumulates on an as needed basis. At no time during the year did the Cell 1 Leak Detection System daily inflow exceed 790 litres/hectare/day. Cell 1 has an area of 0.688 hectares and during 2022 only 6725 litres of leak detection liquid was removed.

9.0 Response Action Plan Pursuant to 4.4.10

No Response Action Plans were required in 2022. Response Action Plans if required would be in Appendix J.

10.0 Annual Dugout and Water Well Sampling Program

The Annual Dugout and Water Well Sampling Program pursuant to Section 4.5 of the approval was conducted in October 2022. Water samples were collected from each water well and dugout within an approximate 1.6-kilometre radius of the facility and analyzed for the parameters listed in TABLE 4.5-A. The Annual Dugout and Water Well Sampling Program Report is attached as Appendix K.

11.0 Summary of Revisions to the Landfill Operations Plan

Minor revisions and edits were made to the Landfill Operations Plan in 2022. A copy of the current Landfill Operations Plan is included as Appendix L.

12.0 Groundwater Remedial Action Taken Pursuant to 4.6.34(p)

No groundwater issues requiring remedial action have been detected. No remedial action has been taken at the facility.

13.0 Summary of Records of Landfill Inspections Pursuant to 4.6.53

Section 4.6.52 requires:

> "The approval holder shall inspect the landfill, at a minimum:
>
> (a) weekly; and
> (b) immediately after each storm event to:
>
> i. detect evidence of deterioration of any infrastructure components, including the composite liner,
> ii. detect any malfunction or improper operation of the run-on and runoff control systems, leachate collection system, or leak detection system, and
> iii. take corrective measures to repair any damage to infrastructure components, including the composite liner."

Section 4.6.53 requires:

> "The approval holder shall:
>
> a) keep a record of inspections conducted pursuant to 4.6.52;
> b) have the record of inspections available for review upon written request from the Director; and
> c) immediately report any deficiencies detected by the inspection in 4.6.52 to the Director in writing along with any corrective measures taken or proposed."

Clean Harbors inspects the landfill each operating day. These inspections are entered into the electronic report form and saved on the corporate server. Inspection reports can be retrieved as necessary from the system. Examples of blank and completed Inspection Report forms can be found in Appendix M.

Issues arising from inspections have been identified previously in Sections 7 and 8. No liner deterioration issues were observed during the year. The surface run-on and runoff control systems functioned as per design.

14.0 Summary of Operational Issues, Emergencies and Actions Taken

There were no major operational issues or emergencies in 2022. All operational issues were of a maintenance nature, such as heat trace failures freezing leachate transfer lines, pump replacement, filter issues and maintenance of flow meters and pump lines plugging.

A fire in the engine compartment of landfill dump truck occurred April 4. The vehicle was parked and undergoing re-generation cycle when the fire occurred. The Ryley Fire Department and the RCMP were notified. It was suspected that the fire may have been initiated during the

initiation of the re-generation cycle. The fire resulted in major damage to the engine compartment and cab of the vehicle. There was no impact to the landfill operation or the surrounding environment other than smoke from the fire.

15.0 Summary of Public Complaints and Approval Holder's Responses

The facility received complaints from the public on eight occasions in 2022.

1. May 2, 202 – A complaint was received by the facility manager at 4:10 pm from a Ryley resident. The complaint was about a rotten odour from the landfill. His investigation confirmed that the facility had not received any odourous waste prior to the call. It was suspected that the carbon scrubber on the Cell 4 leachate tank may have become saturated and non-effective. The scrubber drum was replaced within 20 minutes of receiving the complaint. AEP Reference Number 390124.
2. May 4, 2022 – An odour complaint was received from a resident of Ryley to the Facility Manager's cellphone at 6:30 pm about a chemical, burning tire odour coming from the facility. He contacted the facility and confirmed that no odourous waste had been received prior to the call and that there were no fires at the facility. The landfill operator walked the top of the landfill and could not detect any odour as described by the resident. Wind had been from the NNE blowing towards Ryley. AEP Reference #390217.
3. May 17, 2022 – An odour complaint was received from a resident of Ryley at 1:38 pm about a chemical, burning tire odour coming from the facility. This was from the same resident who called in the May 4 complaint. No odourous wastes had been received prior to the call. The facility manager and another Clean Harbors employee drove into Ryley, up and down the streets and avenues, past the resident's home and could not detect any odour. The manager called the resident at 1:49 pm as he was driving by the resident's house and the resident informed him that the odour had gone away. In the morning the facility had shut off all their leachate pumps because the wind was going to be blowing towards town all day. AEP Reference Number 390648.
4. June 1, 2022 – An odour complaint was received from a resident of Ryley at 12:23 pm. She had noticed an odour that she described as an "old petro chemicals" smell. The wind was essentially calm. Investigation found that no odourous wastes had been received. The Facility Manager drove by the complainant's address, but no odour was detected. The complainant and her husband were outside at the time and told the Manager that the odour comes and goes. No leachate was being pumped at the time of the complaint. Carbon scrubbers are going to be installed on leachate tanks nearest the village. AEP Reference Number 391193.

5. June 22, 2022 – An odour complaint was received from a resident of Ryley at 4:08 pm. He described the odour as a chemical smell that comes and goes. Investigation found that no odourous waste had been received prior to the call. A landfill operator was sent to walk the top of the landfill between the working face and the village. No strange or strong odours were detected. AEP Reference Number 400556.
6. August 21, 2022 – An odour complaint was received by the Facility Manager on his cell phone at 11:15 am complaining about odour coming from the landfill. No details or description of the odour was given. Landfill personnel were immediately contacted, and they confirmed that no odourous waste had been received that morning. An operator went to the top of the landfill between the working face and the village but could not detect any strong or strange odours. The wind was light and variable blowing mainly from the NNE. The village sewage lagoon may have been the cause of the odour since it is east of the landfill and also NE of the village. AEP Reference Number 402971.
7. October 2, 2022 - An odour complaint was received by the Facility Manager on his cell phone at 5:58 pm complaining about odour coming from the landfill. The resident did not give a lot of details but said he had noticed the odour for about half an hour. The Landfill Foreman was contacted to drive through Ryley near the complainant's residence and between the landfill and the village to see if he could detect any odours. He reported that he could not. He did report that a road maintenance crew was tarring the village roads a block from the complainant's home. The facility manager spoke with another Clean Harbors' employee who lives two blocks south of the complainant and she reported that she could smell the crew working on the roads. The facility was unable to confirm the source of the odour that complainant called about. AEP Reference Number 405070.
8. On December 22, 2022 - An odour complaint was received by the Facility Manager on his cell phone at 12:19 pm complaining about odour the resident described as a strong but different smell. While on the phone the Facility Manager checked the direction and velocity of the wind. The wind was coming from the south as it had been all morning. The Manager informed the resident of this, but the resident was insistent that odour was coming from Clean Harbors. Since the wind was blowing from the south and the village is south of the Clean Harbors landfill, no further action was taken by the facility. AEP Reference Number 407961.

The Contravention Reports for these complaints are provided in Appendix Q.

16.0 Up-to-Date Financial Security Estimate Pursuant to Section 5.1.2

Section 5 of the Approval requires that the financial security estimate for the facility be reviewed annually and submitted as part of the Annual Landfill Operations Report.

The current Security Estimate calculation and a copy of the 2022 Security bond are provided in Appendix N.

17.0 Site Development Plan

The site development plan is in Appendix O. This plan shows the progression of the landfill operation. The active area includes portions of Cells 3C, 3D, 3E and all of Cell 4. Other areas are inactive or have final cover placed on them.

18.0 Annual Landfill Closure Report

No landfill cells were closed in 2022.

19.0 Summary of Landfill Contraventions Reported

The 2022 landfill contraventions can be grouped into six categories as shown in the following table.

Summary of Landfill Contraventions

Category	Date	Reference Number
Engine compartment fire in landfill dump truck	April 4, 2022	389285
Odour Complaint	May 2, 2022	390124
	May 4, 2022	390217
	May 17 2022	390648
	June 1, 2022	391193
	June 22, 2022	400556
	August 21, 2022	402971
	October 2, 2022	405070
	December 22, 2022	407961
Air Monitoring Equipment Problems	January 10, 2022	386952
Missing Analytical Data	January 21, 2022	387295
Spill within Containment	July 28, 2022	401968
Potential inability to measure leachate levels	August 11, 2022	402552
	August 31, 2022	402552-Update

Copies of the 7-Day Letters to the Director are provided in Appendix Q.

20.0 Any Other Information as Required in Writing by the Director

No additional information was required by the Director.

Appendix A

Quantity and Type of Waste Received

2022 Annual Waste Management Summary - TABLE 4.6-D
Hazardous Waste Landfilled

Hazardous Recycle or Waste Name	PIN	Class	Waste Code	Management Code	Hazardous (kg)	Non-hazardous (kg)	Disposed Onsite
Alk. Soln sludge/residue - metals, non-metals, no cyanide	NONE	N/A	H122	D5	74590		Clean Harbors, Ryley
Alk. Soln sludge/residue - metals, non-metals, no cyanide	UN1759	8	H122	D5	1450		Clean Harbors, Ryley
Alk. Soln sludge/residue - metals, non-metals, no cyanide	UN1760	8	H122	D5	20		Clean Harbors, Ryley
Alk. Soln sludge/residue - metals, non-metals, no cyanide	UN1823	8	H122	D5	205		Clean Harbors, Ryley
Alk. Soln sludge/residue - metals, non-metals, no cyanide	UN1824	8	H122	D5	75		Clean Harbors, Ryley
Alk. Soln sludge/residue - metals, non-metals, no cyanide	UN3253	8	H122	D5	205		Clean Harbors, Ryley
Alk. Soln sludge/residue - metals, non-metals, no cyanide	UN3262	8	H122	D5	8812		Clean Harbors, Ryley
Alk. Soln sludge/residue - metals, non-metals, no cyanide	UN3266	8	H122	D5	350		Clean Harbors, Ryley
Alk. phosphates	NONE	N/A	H123	D5	2390		Clean Harbors, Ryley
Neautralized solutions, sludges, residues with heavy metals	NONE	N/A	H131	D5	165540		Clean Harbors, Ryley
Wastes containing sulphides	UN3190	4.2	H134	D5	1220		Clean Harbors, Ryley
Contaminated debris & soil from spills, accidents & leaks	NONE	N/A	H138	D5	3077550		Clean Harbors, Ryley
Contaminated debris & soil from spills, accidents & leaks	UN1823	8	H138	D5	162290		Clean Harbors, Ryley
Contaminated debris & soil from spills, accidents & leaks	UN3175	4.1	H138	D5	74520		Clean Harbors, Ryley
Contaminated debris & soil from spills, accidents & leaks	UN3262	8	H138	D5	600		Clean Harbors, Ryley
Residues from steel making	NONE	N/A	H143	D5	4726487		Clean Harbors, Ryley
Residues from steel making	UN3262	8	H143	D5	4909933		Clean Harbors, Ryley
Waste from the use of paints, pigments & coatings	NONE	N/A	H145	D5	3508000		Clean Harbors, Ryley
Waste from the use of paints, pigments & coatings	UN1210	3	H145	D5	200		Clean Harbors, Ryley
Waste from the use of paints, pigments & coatings	UN1263	3	H145	D5	3303		Clean Harbors, Ryley
Waste from the use of paints, pigments & coatings	UN1294	3	H145	D5	820		Clean Harbors, Ryley
Waste from the use of paints, pigments & coatings	UN3082	9	H145	D5	205		Clean Harbors, Ryley
Waste from the use of paints, pigments & coatings	UN3175	4.1	H145	D5	406244		Clean Harbors, Ryley
Other specified inorganic sludges, slurries or solids	NONE	N/A	H146	D5	2457366		Clean Harbors, Ryley
Other specified inorganic sludges, slurries or solids	UN2811	6.1	H146	D5	3560		Clean Harbors, Ryley
Other specified inorganic sludges, slurries or solids	UN3077	9	H146	D5	18540		Clean Harbors, Ryley
Other specified inorganic sludges, slurries or solids	UN3190	4.2	H146	D5	1000		Clean Harbors, Ryley
Other specified inorganic sludges, slurries or solids	UN3260	8	H146	D5	87010		Clean Harbors, Ryley
Other specified inorganic sludges, slurries or solids	UN3509	9	H146	D5	2900		Clean Harbors, Ryley
Miscellaneous waste inorganic chemicals	NONE	N/A	H148	D5	65205		Clean Harbors, Ryley
Miscellaneous waste inorganic chemicals	UN1350	4.1	H148	D5	45540		Clean Harbors, Ryley
Miscellaneous waste inorganic chemicals	UN1760	8	H148	D5	715		Clean Harbors, Ryley
Miscellaneous waste inorganic chemicals	UN1823	8	H148	D5	205		Clean Harbors, Ryley
Miscellaneous waste inorganic chemicals	UN3260	8	H148	D5	25		Clean Harbors, Ryley
Miscellaneous waste inorganic chemicals	UN3264	8	H148	D5	580		Clean Harbors, Ryley
Inert inorganic waste	NONE	N/A	H150	D5	84880		Clean Harbors, Ryley

2022 Annual Waste Management Summary - TABLE 4.6-D
Hazardous Waste Landfilled

Hazardous Recycle or Waste Name	PIN	Class	Waste Code	Management Code	Hazardous (kg)	Non-hazardous (kg)	Disposed Onsite
Inert inorganic waste	UN1350	4.1	H150	D5	2000		Clean Harbors, Ryley
Inert inorganic waste	UN2212	9	H150	D5	3941		Clean Harbors, Ryley
Inert inorganic waste	UN2590	9	H150	D5	2199		Clean Harbors, Ryley
Inert inorganic waste	UN3077	9	H150	D5	8980		Clean Harbors, Ryley
Batteries	NONE	N/A	H151	D5	185		Clean Harbors, Ryley
Empty packages, bags, containers	NONE	N/A	H152	D5	2500		Clean Harbors, Ryley
Empty packages, bags, containers	UN1993	3	H152	D5	80		Clean Harbors, Ryley
Empty packages, bags, containers	UN3082	9	H152	D5	10		Clean Harbors, Ryley
Empty packages, bags, containers	UN3509	9	H152	D5	3760		Clean Harbors, Ryley
Spent catalysts	NONE	N/A	H153	D5	2544677		Clean Harbors, Ryley
Spent catalysts	UN1759	8	H153	D5	12340		Clean Harbors, Ryley
Spent catalysts	UN2881	4.2	H153	D5	4920		Clean Harbors, Ryley
Spent catalysts	UN3077	9	H153	D5	127810		Clean Harbors, Ryley
Spent catalysts	UN3175	4.1	H153	D5	26235		Clean Harbors, Ryley
Spent catalysts	UN3190	4.2	H153	D5	394292		Clean Harbors, Ryley
Spent catalysts	UN3262	8	H153	D5	14660		Clean Harbors, Ryley
Spent catalysts	UN3285	6.1	H153	D5	50630		Clean Harbors, Ryley
Desicants - Silica gel, activated alumina & molecular	NONE	N/A	H154	D5	3591564		Clean Harbors, Ryley
Desicants - Silica gel, activated alumina & molecular	UN3175	4.1	H154	D5	49170		Clean Harbors, Ryley
Fluorescent lamps (mercury, sodium)	NONE	N/A	H155	D5	12215		Clean Harbors, Ryley
Aromatic solvents and residues	NONE	N/A	H211	D5	4800		Clean Harbors, Ryley
Aliphatic solvents & residues	NONE	N/A	H212	D5	1200		Clean Harbors, Ryley
Aliphatic solvents & residues	UN1268	3	H212	D5	650		Clean Harbors, Ryley
Petroleum distillates	NONE	N/A	H213	D5	555		Clean Harbors, Ryley
Petroleum distillates	UN1139	3	H213	D5	300		Clean Harbors, Ryley
Petroleum distillates	UN1993	3	H213	D5	3225		Clean Harbors, Ryley
Light fuels	NONE	N/A	H221	D5	615		Clean Harbors, Ryley
Polymeric resins	UN2925	4.1	H232	D5	130150		Clean Harbors, Ryley
Polymeric resins	UN3261	8	H232	D5	20026		Clean Harbors, Ryley
Polymeric resins	UN3265	8	H232	D5	2710		Clean Harbors, Ryley
Other polymeric waste	NONE	N/A	H233	D5	410		Clean Harbors, Ryley
Halogenated solvents and residues	NONE	N/A	H241	D5	252550		Clean Harbors, Ryley
Halognenated pesticides & herbicides	NONE	N/A	H242	D5	14180		Clean Harbors, Ryley
Waste oils/sludges (petroleum based)	NONE	N/A	H251	D5	4276785		Clean Harbors, Ryley
Waste oils/sludges (petroleum based)	UN3175	4.1	H251	D5	3817920		Clean Harbors, Ryley

2022 Annual Waste Management Summary - TABLE 4.6-D

Hazardous Waste Landfilled

Hazardous Recycle or Waste Name	PIN	Class	Waste Code	Management Code	Hazardous (kg)	Non-hazardous (kg)	Disposed Onsite
Waste crankcase oils & lubricants	NONE	N/A	H252	D5	684		Clean Harbors, Ryley
Emulsified oils	NONE	N/A	H253	D5	6560		Clean Harbors, Ryley
Filters from oils & gas processing	NONE	N/A	H256	D5	23510		Clean Harbors, Ryley
Filters from oils & gas processing	UN3088	4.2	H256	D5	10560		Clean Harbors, Ryley
Filters from oils & gas processing	UN3190	4.2	H256	D5	73040		Clean Harbors, Ryley
Miscellaneous waste organic chemicals	NONE	N/A	H263	D5	10400		Clean Harbors, Ryley
Miscellaneous waste organic chemicals	UN1654	6.1	H263	D5	615		Clean Harbors, Ryley
Miscellaneous waste organic chemicals	UN1760	8	H263	D5	935		Clean Harbors, Ryley
Miscellaneous waste organic chemicals	UN1993	3	H263	D5	20100		Clean Harbors, Ryley
Miscellaneous waste organic chemicals	UN2924	3	H263	D5	40		Clean Harbors, Ryley
Miscellaneous waste organic chemicals	UN3175	4.1	H263	D5	8375		Clean Harbors, Ryley
Miscellaneous waste organic chemicals	UN3190	4.2	H263	D5	615		Clean Harbors, Ryley
Amines	UN2735	8	H268	D5	4205		Clean Harbors, Ryley
Amines	UN3082	9	H268	D5	2000		Clean Harbors, Ryley
Amines	UN3088	4.2	H268	D5	1590		Clean Harbors, Ryley
Amines	UN3267	8	H268	D5	500		Clean Harbors, Ryley
Organic non-halogenated pesticides & herbicide waste	UN2810	6.1	H269	D5	700		Clean Harbors, Ryley
Other specified organic sludges, slurries and solids	NONE	N/A	H270	D5	13005374		Clean Harbors, Ryley
Other specified organic sludges, slurries and solids	UN3175	4.1	H270	D5	16796643		Clean Harbors, Ryley
Activated carbon	NONE	N/A	H271	D5	7920		Clean Harbors, Ryley
Activated carbon	UN1325	4.1	H271	D5	38080		Clean Harbors, Ryley
Activated carbon	UN1362	4.2	H271	D5	48575		Clean Harbors, Ryley
Activated carbon	UN3088	4.2	H271	D5	11310		Clean Harbors, Ryley
Activated carbon	UN3190	4.2	H271	D5	14670		Clean Harbors, Ryley
Drilling muds including fresh water gel bentonite, salt	NONE	N/A	H272	D5	67630		Clean Harbors, Ryley
Glycol solutions	NONE	N/A	H273	D5	215		Clean Harbors, Ryley
Sorbent materials	NONE	N/A	H274	D5	151258		Clean Harbors, Ryley
Sorbent materials	UN3175	4.1	H274	D5	410		Clean Harbors, Ryley
Contaminated debris & soil from spills, accidents & leaks	NONE	N/A	H275	D5	28421731		Clean Harbors, Ryley
Contaminated debris & soil from spills, accidents & leaks	UN1759	8	H275	D5	23960		Clean Harbors, Ryley
Contaminated debris & soil from spills, accidents & leaks	UN3175	4.1	H275	D5	297580		Clean Harbors, Ryley
Contaminated debris & soil from spills, accidents & leaks	UN3244	8	H275	D5	55325		Clean Harbors, Ryley
Sludges from oil & gas operations	NONE	N/A	H276	D5	44140		Clean Harbors, Ryley
	Total Hazardous Waste Landfilled (kg)				**94420029**		

2022 Annual Waste Management Summary - TABLE 4.6-D
Non-Hazardous Waste Landfilled

	Uniform Waste Code				Quantity (kg)		
Hazardous Recycle or Waste Name	PIN	Class	Waste Code	Management Code	Hazardous	Non-hazardous	Disposed Onsite
Acid soln, sludge & residues with metals & non-metals	NONE	N/A	N113	D5		17260	Clean Harbors, Ryley
Alk. Soln sludge/residue - metals, non-metals, no cyanide	NONE	N/A	N122	D5		70085	Clean Harbors, Ryley
Neutralized soln, sludges, residues & other metals	NONE	N/A	N132	D5		50800	Clean Harbors, Ryley
Produced water & similar brines	NONE	N/A	N136	D5		630	Clean Harbors, Ryley
Contaminated debris & soil from spills, accidents & leaks	NONE	N/A	N138	D5		1347308	Clean Harbors, Ryley
Residues from steel making	NONE	N/A	N143	D5		1000	Clean Harbors, Ryley
Waste from the use of paints, pigments & coatings	NONE	N/A	N145	D5		201126	Clean Harbors, Ryley
Other specified inorganic sludges, slurries or solids	NONE	N/A	N146	D5		3832317	Clean Harbors, Ryley
Other specified inorganic sludges, slurries or solids	UN2212	9	N146	D5		630	Clean Harbors, Ryley
Other specified inorganic sludges, slurries or solids	UN2590	9	N146	D5		2406	Clean Harbors, Ryley
Chemical fertilizer wastes	NONE	N/A	N147	D5		205	Clean Harbors, Ryley
Miscellaneous waste inorganic chemicals	NONE	N/A	N148	D5		179461	Clean Harbors, Ryley
Inert inorganic waste	NONE	N/A	N150	D5		11570930	Clean Harbors, Ryley
Inert inorganic waste	UN2212	9	N150	D5		406100	Clean Harbors, Ryley
Inert inorganic waste	UN2590	9	N150	D5		236573	Clean Harbors, Ryley
Batteries	NONE	N/A	N151	D5		10395	Clean Harbors, Ryley
Empty packages, bags, containers	NONE	N/A	N152	D5		1234498	Clean Harbors, Ryley
Spent catalysts	NONE	N/A	N153	D5		1189443	Clean Harbors, Ryley
Desiccants - Silica gel, activated alumina & molecular	NONE	N/A	N154	D5		130135	Clean Harbors, Ryley
Aromatic solvents and residues	NONE	N/A	N211	D5		45	Clean Harbors, Ryley
Aliphatic solvents & residues	NONE	N/A	N212	D5		1940	Clean Harbors, Ryley
Petroleum distillates	NONE	N/A	N213	D5		2990	Clean Harbors, Ryley
Solidified, de-watered latex wastes	NONE	N/A	N231	D5		1205	Clean Harbors, Ryley
Polymeric resins	NONE	N/A	N232	D5		23315	Clean Harbors, Ryley
Other polymeric waste	NONE	N/A	N233	D5		29077	Clean Harbors, Ryley
Halogenated pesticides & herbicides	NONE	N/A	N242	D5		93390	Clean Harbors, Ryley
Waste oils/sludges (petroleum based)	NONE	N/A	N251	D5		5995	Clean Harbors, Ryley
Waste crankcase oils & lubricants	NONE	N/A	N252	D5		699482	Clean Harbors, Ryley
Oily water waste oil from waste transfer/processing sites	NONE	N/A	N254	D5		2615	Clean Harbors, Ryley
Water filters	NONE	N/A	N257	D5		33930	Clean Harbors, Ryley
Detergents & soaps	NONE	N/A	N262	D5		2400	Clean Harbors, Ryley
Miscellaneous waste organic chemicals	NONE	N/A	N263	D5		2110403	Clean Harbors, Ryley
Graphic arts wastes	NONE	N/A	N265	D5		5114	Clean Harbors, Ryley
Phenolic waste streams	NONE	N/A	N266	D5		78150	Clean Harbors, Ryley
Organic acids	NONE	N/A	N267	D5		23990	Clean Harbors, Ryley

2022 Annual Waste Management Summary - TABLE 4.6-D
Non-Hazardous Waste Landfilled

	Uniform Waste Code				Quantity (kg)		
Hazardous Recycle or Waste Name	**PIN**	**Class**	**Waste Code**	**Management Code**	**Hazardous**	**Non-hazardous**	**Disposed Onsite**
Amines	NONE	N/A	N268	D5		410	Clean Harbors, Ryley
Other specified organic sludges, slurries and solids	NONE	N/A	N270	D5		759949	Clean Harbors, Ryley
Activated carbon	NONE	N/A	N271	D5		18814001	Clean Harbors, Ryley
Drilling muds including fresh water gel bentonite, salt	NONE	N/A	N272	D5		820	Clean Harbors, Ryley
Glycol solutions	NONE	N/A	N273	D5		2960	Clean Harbors, Ryley
Sorbent materials	NONE	N/A	N274	D5		648311	Clean Harbors, Ryley
Contaminated debris & soil from spills, accidents & leaks	NONE	N/A	N275	D5		19461688	Clean Harbors, Ryley
Sludges from oil & gas operations	NONE	N/A	N276	D5		191500	Clean Harbors, Ryley
		Total Non-Hazardous Waste Landfilled (kg)				**63474982**	

Appendix B

2022 Year-end Survey

Report

TETRA TECH

TECHNICAL MEMO

ISSUED FOR USE

To:	Clean Harbors Inc. Stan Yuha – Facility Manager	**Date:**	January 17, 2023
c:	Michael E. Parker – Vice President Canadian Environmental Compliance	**Memo No.:**	1
From:	Spencer Smith, P.Eng. Sean Buckles, M.Sc., P.Eng.	**File:**	704-SWM.SWOP04490-01
Subject:	Remaining Airspace – January 6, 2023 Clean Harbors Facility, Ryley, Alberta		

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was requested to complete the remaining airspace calculations for the Clean Harbors Facility located near Ryley, Alberta. These calculations are based on the topographic waste survey completed by Clean Harbors Industrial Services – Unmanned Aerial Systems on January 6, 2023. This work was completed as requested by the Clean Harbors Inc. (Clean Harbors) Ryley Landfill Facility Manager on December 8, 2022.

2.0 AIRSPACE MODELLING

Using AutoCAD Civil 3D software, Tetra Tech completed airspace modelling based on the January 6, 2023 survey data provided by Clean Harbors, and design top of waste elevations previously completed by Tetra Tech. The 3D Drawing models are done in Universal Transverse Mercator (UTM) NAD83, Zone 12. As of January 6, 2023, the remaining airspace in Area 1 (Cell 3E) is estimated at 5,650 m^3; the remaining airspace in Area 2 (Cell 4 and the north portion of Cell 3C and Cell 3D) is estimated at 40,134 m^3; and the remaining airspace in the tipping pad area is estimated at 162,030 m^3.

The total estimated remaining airspace at the Clean Harbors Ryley Facility as of December 31, 2021, is 207,814 m^3. The total estimated remaining airspace excluding the tipping pad area is 45,784 m^3. This information is presented in Table 1 below and in the attached Drawing C100 and Drawing C101.

Table 1: Airspace Modelling Summary

Area	Remaining Airspace Volume	Notes
Area 1 (Cell 3E)	5,650 m^3	A reduction of approximately 2,509 m^3 since the December 31, 2021 survey.
Area 2 (Cell 4 and North Portion of Cell 3C and Cell 3D)	40,134 m^3	A reduction of approximately 116,119 m^3 since the December 31, 2021 survey.
Tipping Pad Area	162,030 m^3	A reduction of approximately 21,382 m^3 since the December 31, 2021 survey.
Total	**207,814 m^3**	

The remaining airspace within the proposed 2023 capping area, as shown on Drawing C100, was calculated to be 9,924 m^3. This is included in the total remaining airspace in Area 2, outlined above in Table 1. There was a total of 140,010 m^3 of waste placed since the December 31, 2022 Survey. This includes any snow cover picked up by the Survey.

Tetra Tech Canada Inc.
14940 - 123 Avenue
Edmonton, AB T5V 1B4 CANADA
Tel 780.451.2121 Fax 780.454.5688

3.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Clean Harbors Canada Inc. and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Clean Harbors Canada Inc., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

4.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

704-SWM.SWOP04490-01
704-SWM.SWOP04490-01
704-SWM.SWOP04490-01
704-SWM.SWOP04490-01

Prepared by:
Spencer Smith, P.Eng.
Project Engineer – Team Lead
Solid Waste Management Practice
Direct Line: 403.723.6933
Spencer.Smith@tetratech.com

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704-SWM.SWOP04490-01
704-SWM.SWOP04490-01
704-SWM.SWOP04490-01

Reviewed by:
Sean Buckles, M.Sc., P.Eng.
Senior Project Engineer – Team Lead
Solid Waste Management Practice
Direct Line: 403.723.6876
Sean.Buckles@tetratech.com

/as

PERMIT TO PRACTICE
TETRA TECH CANADA INC.

RM SIGNATURE: _____

RM APEGA ID #: _____

DATE: _____

PERMIT NUMBER: P013774
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Enclosure: Tetra Tech's Limitations on the Use of this Document
2022 Waste Survey Drawing C100 and Drawing C101

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

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If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

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The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

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While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

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The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

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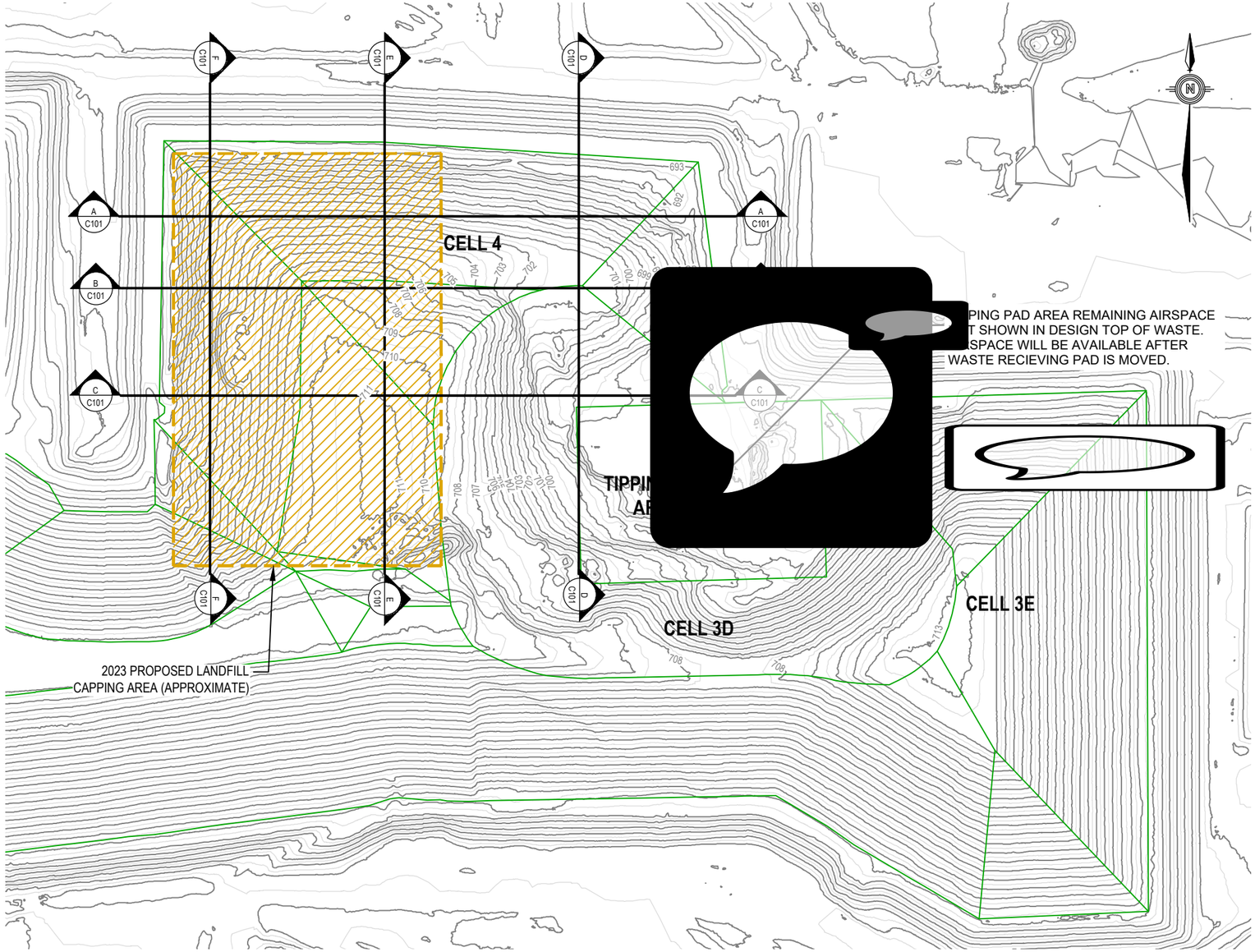
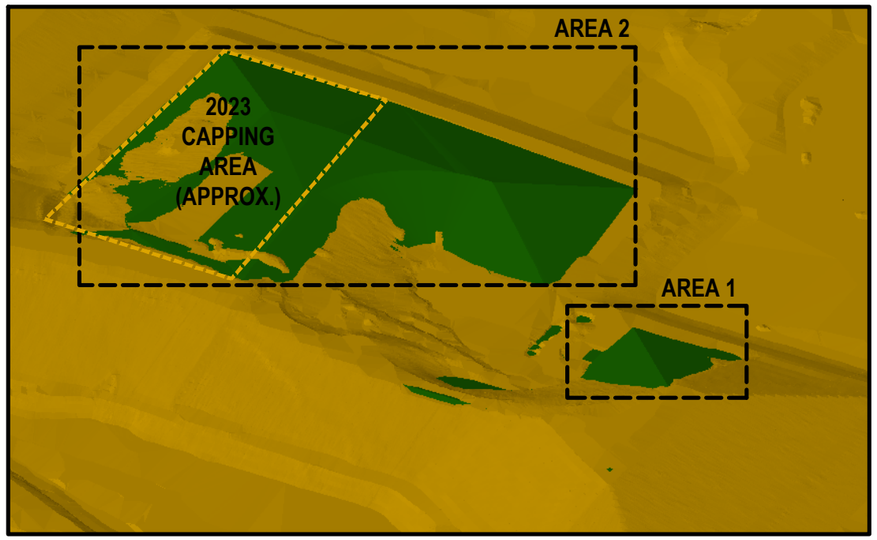
In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.



EXISTING WASTE TOPOGRAPHY - 2022 YEAR END SURVEY
(Flown on January 6, 2023)



DESIGN TOP OF WASTE (green) VS. 2022 YEAR END WASTE SURVEY (orange)

AREA 1 REMAINING AIRSPACE.....5,650 m³

AREA 2 REMAINING AIRSPACE.....40,134 m³

REMAINING AIRSPACE IN TIPPING PAD BOWL.....162,030 m³

REMAINING AIRSPACE TOTAL.....207,814 m³

REMAINING AIRSPACE WITHIN 2023 CAPPING AREA.....NET: 9,924 m³ (CUT=3,022 m³, FILL=12,947 m³)

WASTE PLACED SINCE DECEMBER 2021 SURVEY.....140,010 m³

NOTES:
1. TOPOGRAPHY SHOWN IS THE 2022 YEAR END WASTE SURVEY (Surveyed by Clean Harbors on Jan 6, 2023)
2. UTM with NAD83 datum, Zone 12, Meter; Central Meridian 111d W

STATUS
ISSUED FOR USE

NUM	DATE	APR	DESCRIPTION
			REVISIONS
B	JAN 12/23	SS	ISSUED FOR USE
A	JAN 09/23	SS	ISSUED FOR REVIEW
NUM	DATE	APR	DESCRIPTION
			DRAWING STATUS

PERMIT

PROFESSIONAL SEAL

CLIENT

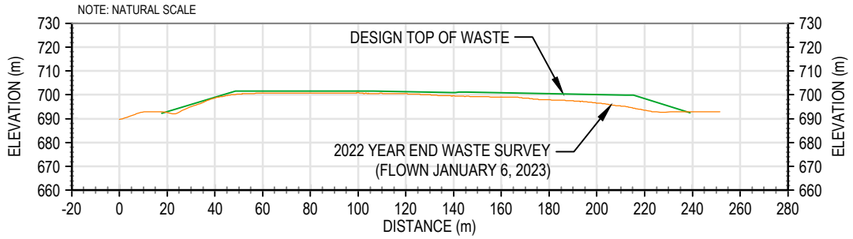
CleanHarbors

TETRA TECH

CLEAN HARBORS
2022 YEAR END WASTE SURVEY

PLAN
2022 YEAR END WASTE SURVEY

PROJECT No.	OFFICE	DES	CKD	REV	DRAWING
SWM.SWOP04490-01	EDM	-	SS	-	C100
DATE: January 12, 2023	SHEET No. 1 of 2	DWN DRG	APP SS	STATUS B	



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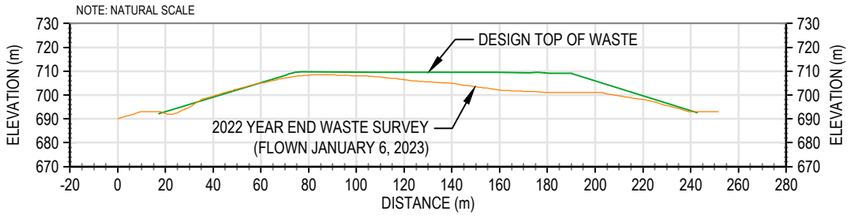

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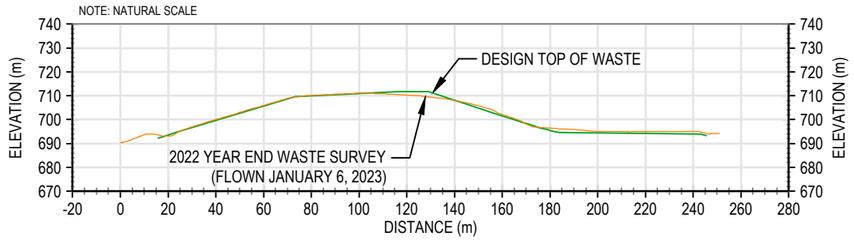

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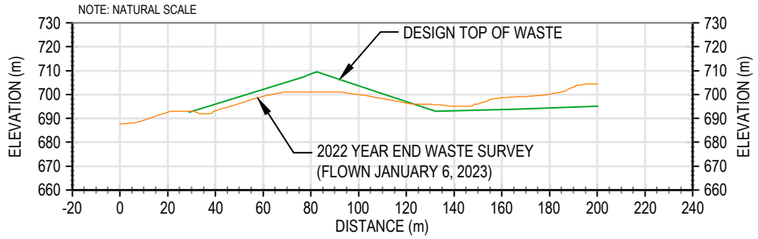

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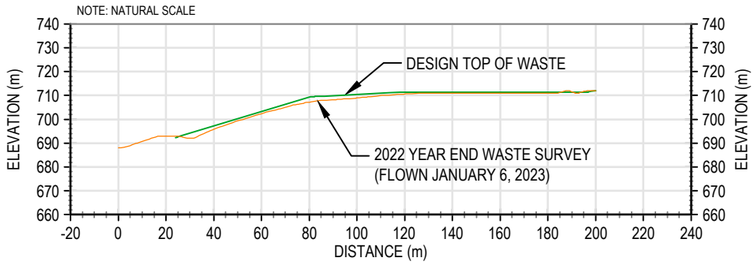

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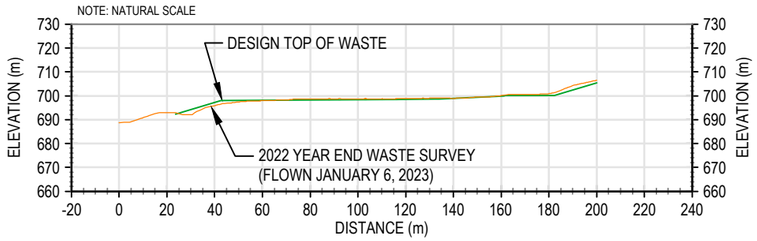

SECTION F

STATUS
ISSUED FOR USE

NUM	DATE	APR	DESCRIPTION
			REVISIONS
B	JAN 12/23	SS	ISSUED FOR USE
A	JAN 09/23	SS	ISSUED FOR REVIEW
NUM	DATE	APR	DESCRIPTION
			DRAWING STATUS

PERMIT

PROFESSIONAL SEAL

CLIENT

CleanHarbors

TETRA TECH

CLEAN HARBORS
2022 YEAR END WASTE SURVEY

CROSS-SECTIONS A - F
2022 YEAR END WASTE SURVEY

PROJECT No.	OFFICE	DES	CKD	REV	DRAWING
SWM.SWOP04490-01	EDM	-	SS	-	C101
DATE: January 12, 2023	SHEET No. 2 of 2	DWN DRG	APP SS	STATUS B	

CHALLENGER GEOMATICS LTD.

Suite 110, 2899 Broadmoor Blvd., Sherwood Park, Alberta
Phone: (780) 424-5511 FAX: (780) 424-3837
Email: AVasynda@chalgeo.com

To: Clean Harbors Canada Attention: Stan Yuha FAX No: 780-663-3539	From: Andriy Vasynda Date: **January 4, 2022** Page 1 of 1 File No: **10265-DEC-21**

Re: Volume Calculation for December 31, 2021 (i.e. What happened on site from: **June 30/ 2021 to December 31/2021).**

Dear Sir:
Following are the volume calculations for the areas that we surveyed on **Dec 31/2021**.

Location	Volume	Total Volume in Cell
Cell 3C(5)	11,824 cu/m (added)	329,940 cu/m
Cell 3D(6)	1,322 cu/m (added)	285,399 cu/m
Cell 4	39,019 cu/m (added)	222,442 cu/m

Volume reported on July 2, 2021

Cell 3C total volume on Jun 30/21 was:	318,116 cu/m
Cell 3D total volume on Jun 30/21 was:	284,077 cu/m
Cell 4 total volume on Jun 30/21 was:	183,423 cu/m

Maximum Elevation of Cell 3C= 713.68m
Maximum Elevation of Cell 3D= 713.48m
Maximum Elevation of Cell 4= 703.60m

Yours truly,
Challenger Geomatics Ltd.
Andriy Vasynda, ALS, CLS
Project Manager

Appendix C

Leachate Head Table

Clean Harbors Canada, Inc. **Leachate Head Level Table** **2022**

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
1-Jan-22			Last precip Dec. 24th					
2-Jan-22								
3-Jan-22	1.26	0.20	0.03	1.14	0.22	0.23	0.59	10
4-Jan-22	1.28	0.20	0.03	1.17	0.27	0.25	0.63	4
5-Jan-22	1.31	0.22	0.04	1.19	0.25	0.27	0.65	24
6-Jan-22	1.25	0.18	0.03	1.33	0.27	0.31	0.64	1
7-Jan-22	1.29	0.20	0.02	0.29	0.29	0.34	0.92	2
8-Jan-22								
9-Jan-22								
10-Jan-22	1.32	0.19	0.01	0.21	0.87	0.00	0.67	
11-Jan-22	1.36	0.20	0.02	0.21	1.23	0.00	1.09	
12-Jan-22	1.41	0.23	0.04	0.21	0.21	0.00	0.28	
13-Jan-22	0.00	0.23	0.04	0.20	0.20	0.00	0.17	2
14-Jan-22	0.00	0.20	0.02	0.19	0.20	0.00	0.04	
15-Jan-22								
16-Jan-22								
17-Jan-22	0.00	0.20	0.02	0.21	0.20	0.00	0.00	2
18-Jan-22	0.00	0.20	0.03	0.21	0.21	0.00	0.00	1
19-Jan-22	0.00	0.20	0.02	0.19	0.20	0.00	0.02	
20-Jan-22	0.00	0.20	0.02	0.20	0.21	0.00	0.01	
21-Jan-22	0.00	0.26	0.08	0.21	0.21	0.01	0.07	1
22-Jan-22								
23-Jan-22								
24-Jan-22	0.00	0.21	0.02	0.20	0.20	0.01	0.03	5
25-Jan-22	0.00	0.18	0.00	0.18	0.19	0.00	0.00	2
26-Jan-22	0.00	0.23	0.03	0.20	0.20	0.00	0.00	
27-Jan-22	0.00	0.19	0.02	0.19	0.20	0.00	0.01	
28-Jan-22	0.00	0.20	0.01	0.19	0.19	0.00	0.01	
29-Jan-22								
30-Jan-22								
31-Jan-22	0.00	0.24	0.05	0.19	0.21	0.00	0.07	2
1-Feb-22	0.00	0.22	0.02	0.21	0.20	0.00	0.03	

Clean Harbors Canada, Inc.

Leachate Head Level Table

2022

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
2-Feb-22	0.00	0.18	0.01	0.19	0.19	0.00	0.00	1
3-Feb-22	0.00	0.22	0.02	0.19	0.20	0.00	0.03	1
4-Feb-22	0.00	0.19	0.01	0.19	0.20	0.00	0.00	2
5-Feb-22								
6-Feb-22								
7-Feb-22	0.00	0.20	0.00	0.19	0.19	0.00	0.01	
8-Feb-22	0.00	0.21	0.02	0.20	0.20	0.00	0.03	
9-Feb-22	0.00	0.21	0.02	0.19	0.20	0.00	0.04	
10-Feb-22	0.02	0.21	0.02	0.19	0.20	0.00	0.05	
11-Feb-22	0.00	0.22	0.02	0.20	0.20	0.00	0.07	
12-Feb-22								
13-Feb-22								
14-Feb-22	0.00	0.21	0.01	0.19	0.20	0.00	1.04	
15-Feb-22	0.00	0.21	0.02	0.20	0.20	0.01	1.29	2
16-Feb-22	0.00	0.21	0.01	0.19	0.20	0.07	1.42	
17-Feb-22	0.00	0.20	0.01	0.19	0.20	0.12	1.56	24
18-Feb-22	0.00	0.21	0.02	0.20	0.21	0.17	1.68	10
19-Feb-22								
20-Feb-22								
21-Feb-22								
22-Feb-22	0.00	0.21	0.01	0.20	0.20	0.30	0.21	10
23-Feb-22	0.00	0.19	0.00	0.19	0.20	0.33	0.87	
24-Feb-22	0.00	0.21	0.01	0.19	0.20	0.37	1.09	10
25-Feb-22	0.00	0.22	0.02	0.20	0.21	0.48	0.62	
26-Feb-22								
27-Feb-22								
28-Feb-22	0.00	0.21	0.00	0.19	0.20	0.00	0.50	
1-Mar-22	0.00	0.21	0.00	0.19	0.20	0.00	0.49	1
2-Mar-22	0.00	0.22	0.01	0.20	0.21	0.11	0.50	1
3-Mar-22	0.00	0.21	0.01	0.20	0.20	0.10	0.49	2
4-Mar-22	0.00	0.21	0.00	0.19	0.19	0.19	0.49	30
5-Mar-22								

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
6-Mar-22								
7-Mar-22	0.00	0.21	0.00	0.19	0.20	0.00	0.49	
8-Mar-22	0.10	0.20	0.21	0.19	0.20	0.19	0.19	1
9-Mar-22	0.09	0.20	0.20	0.19	0.20	0.19	0.18	2
10-Mar-22	0.12	0.22	0.22	0.20	0.20	0.19	0.20	0
11-Mar-22	0.09	0.19	0.20	0.19	0.20	0.19	0.18	
12-Mar-22								
13-Mar-22								
14-Mar-22	0.01	0.21	0.20	0.19	0.20	0.19	0.19	1
15-Mar-22	0.06	0.21	0.21	0.19	0.20	0.20	0.19	
16-Mar-22	0.05	0.22	0.21	0.20	0.20	0.19	0.20	
17-Mar-22	0.05	0.21	0.21	0.20	0.20	0.20	0.20	
18-Mar-22	0.08	0.21	0.21	0.19	0.20	0.19	0.20	
19-Mar-22								
20-Mar-22								
21-Mar-22	0.09	0.21	0.21	0.20	0.20	0.19	0.21	15
22-Mar-22	0.10	0.21	0.21	0.20	0.20	0.19	0.25	
23-Mar-22	0.14	0.20	0.23	0.19	0.20	0.20	0.43	
24-Mar-22	0.79	0.21	0.22	0.20	0.21	0.19	1.02	
25-Mar-22	0.11	0.21	0.21	0.19	0.20	0.19	0.65	
26-Mar-22								
27-Mar-22								
28-Mar-22	0.06	0.18	0.14	0.17	0.15	0.27	0.86	
29-Mar-22	0.11	0.21	0.21	0.23	0.20	0.20	0.23	10
30-Mar-22	0.12	0.20	0.21	0.25	0.20	0.20	0.22	
31-Mar-22	0.14	0.20	0.20	0.28	0.19	0.19	0.22	
1-Apr-22	0.13	0.21	0.20	0.28	0.19	0.19	0.22	
2-Apr-22								
3-Apr-22								
4-Apr-22	0.14	0.19	0.20	0.28	0.20	0.20	0.21	
5-Apr-22	0.18	0.22	0.22	0.30	0.20	0.20	0.25	5

Leachate Head Level Table

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
6-Apr-22	0.14	0.22	0.23	0.27	0.20	0.19	0.27	
7-Apr-22	0.09	0.19	0.20	0.23	0.20	0.19	0.25	
8-Apr-22	0.10	0.18	0.20	0.24	0.20	0.20	0.25	
9-Apr-22								
10-Apr-22								
11-Apr-22	0.15	0.21	0.22	0.22	0.20	0.20	0.27	
12-Apr-22	0.14	0.21	0.22	0.21	0.20	0.20	0.24	
13-Apr-22	0.13	0.21	0.21	0.19	0.20	0.20	0.22	
14-Apr-22	0.13	0.21	0.21	0.18	0.20	0.20	0.32	
15-Apr-22								
16-Apr-22								
17-Apr-22								
18-Apr-22	0.14	0.21	0.21	0.19	0.20	0.20	0.20	
19-Apr-22	0.18	0.21	0.21	0.20	0.20	0.20	0.21	10
20-Apr-22	0.17	0.21	0.21	0.19	0.19	0.19	0.21	10
21-Apr-22	0.17	0.21	0.21	0.20	0.20	0.20	0.21	
22-Apr-22	0.16	0.21	0.21	0.20	0.20	0.20	0.21	
23-Apr-22								
24-Apr-22								
25-Apr-22	0.16	0.21	0.21	0.20	0.21	0.20	0.21	
26-Apr-22	0.17	0.21	0.21	0.19	0.20	0.19	0.20	
27-Apr-22	0.21	0.22	0.22	0.22	0.20	0.20	0.23	10
28-Apr-22	0.18	0.21	0.21	0.13	0.20	0.20	0.21	
29-Apr-22	0.17	0.21	0.21	0.19	0.20	0.19	0.20	
30-Apr-22								
1-May-22								
2-May-22	0.18	0.21	0.22	0.20	0.21	0.20	0.22	1
3-May-22	0.18	0.21	0.21	0.20	0.20	0.20	0.22	
4-May-22	0.19	0.21	0.21	0.19	0.20	0.20	0.21	
5-May-22	0.18	0.20	0.21	0.19	0.20	0.20	0.20	
6-May-22	0.22	0.22	0.22	0.20	0.21	0.20	0.23	

Clean Harbors Canada, Inc.

Leachate Head Level Table

2022

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
7-May-22								
8-May-22								
9-May-22	0.19	0.21	0.22	0.20	0.20	0.00	0.21	
10-May-22	0.18	0.21	0.22	0.19	0.20	0.20	0.21	
11-May-22	0.19	0.30	0.29	0.28	0.28	0.29	0.28	
12-May-22	0.16	0.21	0.21	0.20	0.20	0.20	0.20	
13-May-22	0.19	0.21	0.22	0.20	0.20	0.20	0.20	
14-May-22								
15-May-22								
16-May-22	0.19	0.21	0.21	0.19	0.20	0.20	0.21	
17-May-22	0.19	0.21	0.21	0.19	0.20	0.19	0.21	2
18-May-22	0.37	0.20	0.21	0.19	0.19	0.19	0.25	
19-May-22	0.30	0.27	0.27	0.25	0.24	0.23	0.31	5
20-May-22	0.18	0.21	0.21	0.19	0.20	0.20	0.20	
21-May-22								
22-May-22								
23-May-22								
24-May-22	0.20	0.21	0.21	0.19	0.20	0.20	0.19	
25-May-22	0.21	0.21	0.21	0.19	0.20	0.20	0.20	
26-May-22	0.22	0.21	0.22	0.20	0.20	0.20	0.20	5
27-May-22	0.21	0.21	0.21	0.19	0.20	0.20	0.19	
28-May-22								
29-May-22								
30-May-22	0.21	0.21	0.22	0.20	0.20	0.20	0.20	5
31-May-22	0.18	0.20	0.24	0.19	0.20	0.19	0.20	
1-Jun-22	0.20	0.22	0.22	0.20	0.20	0.20	0.20	
2-Jun-22	0.20	0.21	0.22	0.20	0.20	0.20	0.20	
3-Jun-22	0.22	0.20	0.21	0.19	0.20	0.20	0.19	
4-Jun-22								
5-Jun-22								
6-Jun-22	0.25	0.22	0.22	0.20	0.20	0.20	0.21	
7-Jun-22	0.22	0.21	0.22	0.20	0.21	0.20	0.20	2

Clean Harbors Canada, Inc.

Leachate Head Level Table

2022

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
8-Jun-22	0.40	0.21	0.22	0.19	0.20	0.20	0.20	
9-Jun-22	0.80	0.21	0.22	0.20	0.20	0.20	0.20	
10-Jun-22	1.11	0.22	0.22	0.20	0.20	0.20	0.21	1
11-Jun-22								
12-Jun-22								
13-Jun-22	1.41	0.20	0.21	0.54	0.20	0.23	0.35	
14-Jun-22	1.35	0.23	0.23	0.31	0.20	0.20	0.30	2
15-Jun-22	1.17	0.22	0.22	0.28	0.20	0.20	0.33	3
16-Jun-22	0.10	0.24	0.22	0.26	0.21	0.20	0.44	
17-Jun-22	0.07	0.20	0.21	0.23	0.19	0.20	0.76	1
18-Jun-22								
19-Jun-22								
20-Jun-22	0.05	0.21	0.22	0.20	0.19	0.20	0.22	
21-Jun-22	0.10	0.21	0.22	0.19	0.19	0.19	0.21	
22-Jun-22	0.15	0.21	0.22	0.18	0.19	0.19	0.22	3
23-Jun-22	0.19	0.22	0.22	0.20	0.20	0.20	0.23	20
24-Jun-22	0.21	0.21	0.22	0.20	0.19	0.19	1.29	25
25-Jun-22								
26-Jun-22								
27-Jun-22	0.02	0.21	0.22	0.21	0.20	0.20	2.57	
28-Jun-22	0.21	0.21	0.22	0.26	0.20	0.20	3.24	
29-Jun-22	0.09	0.21	0.22	0.26	0.19	0.19	1.92	12
30-Jun-22	0.07	0.21	0.21	0.25	0.19	0.19	3.27	
1-Jul-22								
2-Jul-22								
3-Jul-22								
4-Jul-22	0.09	0.22	0.22	1.11	0.20	0.20	1.77	
5-Jul-22	0.22	0.22	1.21	1.21	0.20	0.20	3.11	13
6-Jul-22	0.12	0.21	0.22	1.28	0.20	0.20	3.54	
7-Jul-22	0.32	0.21	0.22	1.36	0.19	0.20	3.73	
8-Jul-22	0.73	0.21	0.22	1.46	0.19	0.25	3.42	
9-Jul-22								

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
10-Jul-22								
11-Jul-22	1.42	0.21	0.22	1.63	0.19	0.20	3.04	
12-Jul-22	1.48	0.21	0.30	1.72	0.20	0.20	1.46	
13-Jul-22	1.55	0.21	0.24	1.79	0.19	0.20	1.32	
14-Jul-22	1.58	0.22	0.29	0.34	0.20	0.20	0.56	
15-Jul-22	1.61	0.21	0.34	0.29	0.19	0.19	0.54	
16-Jul-22								
17-Jul-22								
18-Jul-22	0.00	0.24	0.45	0.26	0.20	0.20	2.36	
19-Jul-22	0.00	0.43	0.43	0.72	0.20	0.20	0.54	
20-Jul-22	0.00	0.21	0.22	0.28	0.20	0.20	0.33	1
21-Jul-22	0.00	0.21	0.34	0.24	0.20	0.19	0.25	
22-Jul-22	0.00	0.21	0.26	0.21	0.20	0.19	0.24	
23-Jul-22								
24-Jul-22								
25-Jul-22	0.00	0.21	0.48	0.20	0.19	0.20	0.21	1
26-Jul-22	0.00	0.21	0.49	0.20	0.19	0.20	0.21	
27-Jul-22	0.00	0.22	0.52	0.22	0.20	0.20	0.22	
28-Jul-22	0.00	0.21	0.21	0.27	0.20	0.20	0.20	
29-Jul-22	0.00	0.21	0.21	0.58	0.19	0.19	0.21	
30-Jul-22								
31-Jul-22								
1-Aug-22								
2-Aug-22	0.22	0.22	0.22	0.18	0.19	0.19	1.27	2
3-Aug-22	0.00	0.21	0.22	0.18	0.19	0.20	0.43	
4-Aug-22	0.00	0.21	0.22	0.18	0.19	0.2	0.25	2
5-Aug-22	0.01	0.22	0.21	0.20	0.27	0.27	0.37	2
6-Aug-22								
7-Aug-22								
8-Aug-22	0.00	0.21	0.22	0.22	0.19	0.19	0.23	
9-Aug-22	0.00	0.22	0.22	0.18	0.19	0.19	0.21	

Clean Harbors Canada, Inc.

Leachate Head Level Table

2022

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
10-Aug-22	0.00	0.20	0.21	0.19	0.19	0.19	0.21	
11-Aug-22	0.00	0.20	0.22	0.20	0.19	0.20	0.20	
12-Aug-22	0.00	0.22	0.23	0.20	0.20	0.20	0.22	
13-Aug-22								
14-Aug-22								
15-Aug-22	0.00	0.21	0.22	0.19	0.19	0.20	0.21	
16-Aug-22	0.00	0.20	0.22	0.19	0.18	0.19	0.21	
17-Aug-22	0.00	0.21	0.23	0.20	0.19	0.20	0.22	
18-Aug-22	0.00	0.21	0.23	0.20	0.19	0.20	0.21	
19-Aug-22	0.00	0.20	0.23	0.19	0.19	0.20	0.20	
20-Aug-22								
21-Aug-22								
22-Aug-22	0.00	0.21	0.23	0.19	0.19	0.20	0.20	
23-Aug-22	0.00	0.21	0.23	0.19	0.18	0.19	0.21	
24-Aug-22	0.00	0.21	0.23	0.20	0.17	0.20	0.20	
25-Aug-22	0.00	0.20	0.22	0.20	0.18	0.20	0.20	
26-Aug-22	0.00	0.21	0.23	0.19	0.17	0.20	0.20	
27-Aug-22								
28-Aug-22								
29-Aug-22	0.01	0.21	0.23	0.19	0.17	0.19	0.20	
30-Aug-22	0.00	0.21	0.23	0.19	0.17	0.19	0.21	
31-Aug-22	0.00	0.21	0.23	0.19	0.17	0.20	0.20	
1-Sep-22	0.01	0.22	0.24	0.20	0.18	0.20	0.21	
2-Sep-22	0.01	0.21	0.23	0.20	0.18	0.20	0.21	
3-Sep-22								
4-Sep-22								
5-Sep-22								
6-Sep-22	0.02	0.22	0.24	0.20	0.18	0.20	0.21	11
7-Sep-22	0.07	0.19	0.22	0.19	0.17	0.19	0.20	
8-Sep-22	0.03	0.21	0.23	0.19	0.17	0.19	0.21	3
9-Sep-22	0.02	0.22	0.24	0.20	0.18	0.20	0.21	
10-Sep-22								

Clean Harbors Canada, Inc.

Leachate Head Level Table

2022

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
11-Sep-22								
12-Sep-22	0.01	0.22	0.23	0.20	0.20	0.20	0.21	
13-Sep-22	0.01	0.21	0.23	0.19	0.20	0.20	0.21	
14-Sep-22	0.01	0.21	0.23	0.19	0.20	0.19	0.21	
15-Sep-22	0.01	0.21	0.23	0.19	0.20	0.20	0.21	
16-Sep-22	0.01	0.21	0.23	0.20	0.20	0.20	0.21	
17-Sep-22								
18-Sep-22								
19-Sep-22	0.03	0.21	0.23	0.20	0.20	0.20	0.22	
20-Sep-22	0.02	0.21	0.23	0.20	0.20	0.20	0.21	3
21-Sep-22	0.02	0.21	0.23	0.19	0.20	0.20	0.22	
22-Sep-22	0.01	0.20	0.22	0.19	0.20	0.19	0.21	
23-Sep-22	0.03	0.21	0.23	0.19	0.20	0.19	0.22	
24-Sep-22								
25-Sep-22								
26-Sep-22	0.02	0.21	0.23	0.19	0.20	0.19	0.22	
27-Sep-22	0.02	0.21	0.23	0.19	0.20	0.20	0.21	
28-Sep-22	0.02	0.21	0.23	0.19	0.20	0.19	0.22	
29-Sep-22	0.02	0.21	0.23	0.19	0.20	0.19	0.24	
30-Sep-22								
1-Oct-22								
2-Oct-22								
3-Oct-22	0.02	0.21	0.23	0.19	0.20	0.20	0.21	
4-Oct-22	0.03	0.22	0.25	0.20	0.21	0.20	0.22	
5-Oct-22	0.03	0.22	0.25	0.20	0.20	0.20	0.21	
6-Oct-22	0.01	0.20	0.23	0.19	0.20	0.19	0.19	
7-Oct-22	0.02	0.21	0.23	0.20	0.20	0.20	0.20	
8-Oct-22								
9-Oct-22								
10-Oct-22								
11-Oct-22	0.04	0.20	0.23	0.19	0.20	0.19	0.20	1
12-Oct-22	0.04	0.22	0.24	0.20	0.21	0.20	0.21	

Clean Harbors Canada, Inc.

Leachate Head Level Table

2022

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
13-Oct-22	0.03	0.21	0.23	0.19	0.20	0.20	0.19	
14-Oct-22	0.03	0.21	0.23	0.19	0.20	0.19	0.20	
15-Oct-22								
16-Oct-22								
17-Oct-22	0.03	0.21	0.23	0.19	0.20	0.19	0.20	
18-Oct-22	0.03	0.21	0.23	0.19	0.20	0.19	0.21	
19-Oct-22	0.00	0.18	0.21	0.18	0.20	0.20	0.16	
20-Oct-22	0.03	0.20	0.22	0.20	0.20	0.20	0.19	
21-Oct-22	0.15	0.22	0.23	0.20	0.21	0.20	0.21	
22-Oct-22								
23-Oct-22								
24-Oct-22	0.86	0.20	0.22	0.19	0.19	0.19	0.19	
25-Oct-22	0.03	0.22	0.23	0.20	0.21	0.20	0.21	2
26-Oct-22	0.00	0.21	0.23	0.20	0.21	0.20	0.20	
27-Oct-22	0.00	0.21	0.23	0.19	0.20	0.20	0.20	
28-Oct-22	0.00	0.21	0.22	0.19	0.20	0.19	0.20	
29-Oct-22								
30-Oct-22								
31-Oct-22	0.00	0.21	0.22	0.19	0.20	0.19	0.20	
1-Nov-22	0.01	0.21	0.23	0.19	0.20	0.19	0.20	
2-Nov-22	0.01	0.22	0.23	0.19	0.20	0.19	0.20	20
3-Nov-22	0.01	0.19	0.22	0.19	0.20	0.19	0.19	50
4-Nov-22	0.02	0.21	0.23	0.20	0.21	0.20	0.20	
5-Nov-22								
6-Nov-22								
7-Nov-22	0.00	0.20	0.24	0.19	0.19	0.20	0.19	20
8-Nov-22	0.02	0.22	0.23	0.20	0.21	0.20	0.21	40
9-Nov-22	0.01	0.22	0.23	0.20	0.20	0.20	0.25	60
10-Nov-22	0.01	0.21	0.23	0.21	0.20	0.20	0.31	60
11-Nov-22								
12-Nov-22								
13-Nov-22								

Clean Harbors Canada, Inc.

Leachate Head Level Table

2022

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
14-Nov-22	0.03	0.22	0.23	0.96	0.20	0.20	0.65	
15-Nov-22	0.02	0.21	0.22	1.10	0.20	0.20	0.78	
16-Nov-22	0.03	0.22	0.23	1.11	0.27	0.20	0.89	
17-Nov-22	0.00	0.20	0.22	1.15	0.17	0.20	0.74	
18-Nov-22	0.03	0.22	0.23	0.29	0.21	0.23	0.74	
19-Nov-22								
20-Nov-22								
21-Nov-22	0.04	0.21	0.23	0.22	0.21	0.34	0.39	
22-Nov-22	0.04	0.21	0.23	0.20	0.21	0.37	0.23	
23-Nov-22	0.07	0.24	0.24	0.21	0.21	0.41	0.26	
24-Nov-22	0.36	0.21	0.22	0.19	0.20	0.43	0.31	
25-Nov-22	0.05	0.21	0.22	0.18	0.20	0.45	0.37	
26-Nov-22								
27-Nov-22								
28-Nov-22	0.05	0.22	0.23	0.20	0.22	0.20	0.73	
29-Nov-22	0.04	0.22	0.23	0.20	0.24	0.20	0.85	20
30-Nov-22	0.02	0.20	0.22	0.19	0.25	0.23	0.96	1
1-Dec-22	0.02	0.20	0.27	0.19	0.27	0.27	1.15	20
2-Dec-22	0.05	0.22	0.32	0.20	0.29	0.30	1.27	
3-Dec-22								
4-Dec-22								
5-Dec-22	0.01	0.18	0.22	0.19	0.86	0.40	1.53	
6-Dec-22	0.03	0.20	0.23	0.19	1.20	0.42	1.63	5
7-Dec-22	0.06	0.23	0.21	0.23	1.55	0.44	1.74	
8-Dec-22	0.04	0.21	0.21	0.22	1.83	0.47	1.68	
9-Dec-22	0.06	0.22	0.21	0.20	0.21	0.20	0.93	
10-Dec-22								
11-Dec-22								
12-Dec-22	0.05	0.21	0.21	0.19	0.20	0.22	0.39	5
13-Dec-22	0.04	0.2	0.21	0.19	0.20	0.26	0.52	
14-Dec-22	0.05	0.22	0.22	0.20	0.20	0.29	0.67	
15-Dec-22	0.05	0.23	0.23	0.20	0.21	0.39	0.82	

Date	Cell 2 Head Level (m)	Cell 3A Head Level (m)	Cell 3B Head Level (m)	Cell 3C Head Level (m)	Cell 3D Head Level (m)	Cell 3E Head Level (m)	Cell 4 Head Level (m)	Precipitation (mm)
Maximum Acceptable Leachate Head	**1.0**	**1.0**	**1.0**	**1.0**	**0.30**	**0.3**	**0.30**	
16-Dec-22	0.04	0.21	0.21	0.19	0.21	0.47	0.26	
17-Dec-22								
18-Dec-22								
19-Dec-22	0.05	0.22	0.22	0.2	0.20	0.35	0.20	20
20-Dec-22	0.03	0.21	0.21	0.19	0.20	0.19	0.24	
21-Dec-22	0.05	0.23	0.22	0.20	0.20	0.19	0.21	
22-Dec-22	0.03	0.22	0.21	0.19	0.20	0.15	0.23	10
23-Dec-22	0.03	0.21	0.21	0.2	0.22	0.20	0.22	
24-Dec-22								
25-Dec-22								
26-Dec-22								
27-Dec-22	0.08	0.33	0.2	0.19	0.21	0.2	0.20	
28-Dec-22	0.11	0.28	0.22	0.20	0.23	0.2	0.21	5
29-Dec-22	0.09	0.21	0.22	0.2	0.19	0.2	0.20	
30-Dec-22	0.08	0.25	0.21	0.19	0.19	0.2	0.20	
31-Dec-22								

Appendix D

Primary Leachate Analyses

		Clean Harbors Canada, Inc. - Approval 10348-02					
		2022 Annual Report					
			Section 1.5 Primary Leachate				
		Field pH & Electrical Conductivity Measurements					
	Qtr 1				Qtr 2		
			Conductivity				Conductivity
	Date	pH	(uS/cm)		Date	pH	(uS/cm)
Cell 1	2022-03-24	7.6	19600	Cell 1	2022-06-13	7.5	15820
Cell 2	2022-03-21	8.3	35750	Cell 2	2022-06-13	8.1	42470
Cell 3A	2022-03-21	7.4	32840	Cell 3A	2022-06-13	7.4	31450
Cell 3B	2022-03-21	9.3	37500	Cell 3B	2022-06-13	9.2	46590
Cell 3C	2022-03-21	8.8	13390	Cell 3C	2022-06-13	8.3	15930
Cell 3D	2022-03-21	7.8	20760	Cell 3D	2022-06-13	7.3	21750
Cell 3E	2022-03-21	7.9	14750	Cell 3E	2022-06-13	8.0	16350
Cell 4	2022-03-21	7.7	11630	Cell 4	2022-06-13	7.5	15980
	Qtr 3				Qtr 4		
			Conductivity				Conductivity
	Date	pH	(uS/cm)		Date	pH	(uS/cm)
Cell 1	2022-09-07	7.5	19540	Cell 1	2022-12-05	7.5	22050
Cell 2	2022-09-07	8.4	41920	Cell 2	2022-12-12	8.3	38660
Cell 3A	2022-09-07	7.3	30760	Cell 3A	2022-12-12	7.4	38870
Cell 3B	2022-09-07	9.4	46410	Cell 3B	2022-12-05	9.2	45800
Cell 3C	2022-09-07	8.6	16750	Cell 3C	2022-12-05	8.5	15400
Cell 3D	2022-09-07	7.7	21000	Cell 3D	2022-12-12	7.9	21010
Cell 3E	2022-09-07	7.8	13700	Cell 3E	2022-12-05	8.1	19000

Appendix D

Primary Leachate Analyses

Quarter 1

CERTIFICATE OF ANALYSIS

Work Order	: **EO2201850**	Page	: 1 of 17
Amendment	: **1**		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Stan Yuha	Account Manager	: Pamela Toledo
Address	: 9808 12 Avenue SW Edmonton AB Canada T6X 0J5	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 1 2022	Date Samples Received	: 21-Mar-2022 17:45
PO	: 0000224129	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 20-966636	Issue Date	: 12-Apr-2022 09:43
Sampler	: Murray		
Site	: Table 4.4a		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Austin Wasylyshyn	Lab Analyst	Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Organics, Edmonton, Alberta
Clarin Nobleza	Lab Assistant	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Lisa Watt	Lab Supervisor - Environmental	Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Oscar Ruiz	Lab Assistant	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Samantha Mayor	Lab Assistant	Metals, Edmonton, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.
Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
IB:INT	*Ion Balance Reviewed: Imbalance is due to interference or non-measured component.*

Analytical Results

EO2201850-001

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 2 (PC2)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	10000		10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, carbonate (as CO3)	3812-32-6	515		10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
conductivity	----	33800		1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439336
pH	----	8.43		0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439335
solids, total dissolved [TDS]	----	27100		80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	26600		1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	18.3		3.0	mg/L	E160	-	25-Mar-2022	442313
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	528		125	mg/L	E298	23-Mar-2022	23-Mar-2022	440302
chloride	16887-00-6	7550	DLDS,	10.0	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439383
nitrate (as N)	14797-55-8	<0.400	DLDS,	0.400	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439381
nitrate + nitrite (as N)	----	<0.447		0.447	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS,	0.200	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439382
phosphorus, total	7723-14-0	4.82		0.100	mg/L	E372	23-Mar-2022	23-Mar-2022	439850
phosphorus, total dissolved	7723-14-0	4.97		0.100	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	844	DLDS,	6.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439384
Kjeldahl nitrogen, total [TKN]	----	783		200	mg/L	E318	24-Mar-2022	24-Mar-2022	439874
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	2000		10.0	mg/L	E358-L	24-Mar-2022	25-Mar-2022	441547
Ion Balance									
ion balance (cations/anions)	----	114	IB:INT,	0.010	%	EC101	-	23-Mar-2022	-
Total Metals									
chromium, total	7440-47-3	0.326		0.0500	mg/L	E420	23-Mar-2022	23-Mar-2022	439906
mercury, total	7439-97-6	<0.000500	DLM,	0.000500	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.130		0.100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
antimony, dissolved	7440-36-0	0.639		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
arsenic, dissolved	7440-38-2	0.575		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
barium, dissolved	7440-39-3	1.23		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
beryllium, dissolved	7440-41-7	<0.00200	DLDS,	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
bismuth, dissolved	7440-69-9	<0.00500	DLDS,	0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
boron, dissolved	7440-42-8	51.0		1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cadmium, dissolved	7440-43-9	0.0106		0.000500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
calcium, dissolved	7440-70-2	44.4		5.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
chromium, dissolved	7440-47-3	0.320		0.0500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cobalt, dissolved	7440-48-4	<0.0100	DLDS,	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
copper, dissolved	7440-50-8	0.0663		0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
iron, dissolved	7439-89-6	<1.00	DLDS,	1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
lead, dissolved	7439-92-1	<0.00500	DLDS,	0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
magnesium, dissolved	7439-95-4	359		0.500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
manganese, dissolved	7439-96-5	1.01		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
molybdenum, dissolved	7439-98-7	28.6		0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
nickel, dissolved	7440-02-0	0.424		0.0500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
potassium, dissolved	7440-09-7	1050		5.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
selenium, dissolved	7782-49-2	0.0109		0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
silver, dissolved	7440-22-4	<0.00100	DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
sodium, dissolved	7440-23-5	8550		5.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375

Analytical Results

EO2201850-001

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 2 (PC2)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
strontium, dissolved	7440-24-6	3.29	0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
thallium, dissolved	7440-28-0	<0.00100 DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
tin, dissolved	7440-31-5	0.0145	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
uranium, dissolved	7440-61-1	0.00161	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
vanadium, dissolved	7440-62-2	0.548	0.0500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zinc, dissolved	7440-66-6	<0.100 DLDS,	0.100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zirconium, dissolved	7440-67-7	0.306	0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
dissolved metals filtration location	----	Laboratory	-	-	EP421	-	22-Mar-2022	439375
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	6770 DLHC,	200	mg/L	E559-L	-	23-Mar-2022	440237
phenols, total (4AAP)	----	4.26	0.100	mg/L	E562	22-Mar-2022	22-Mar-2022	439379
Volatile Organic Compounds								
benzene	71-43-2	33.6	0.50	µg/L	E611A	24-Mar-2022	28-Mar-2022	441370
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	24-Mar-2022	28-Mar-2022	441370
toluene	108-88-3	5.86	0.50	µg/L	E611A	24-Mar-2022	28-Mar-2022	441370
xylene, m+p-	179601-23-1	1.35	0.40	µg/L	E611A	24-Mar-2022	28-Mar-2022	441370
xylene, o-	95-47-6	1.73	0.30	µg/L	E611A	24-Mar-2022	28-Mar-2022	441370
xylenes, total	1330-20-7	3.08	0.50	µg/L	E611A	24-Mar-2022	28-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	97.5	1.0	%	E611A	24-Mar-2022	28-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	78.4	1.0	%	E611A	24-Mar-2022	28-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	440	100	µg/L	E581.F1	24-Mar-2022	28-Mar-2022	441371
F1-BTEX	----	400	120	µg/L	EC580	-	28-Mar-2022	-
F2 (C10-C16)	----	1180	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	97.5	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	110	1.0	%	E581.F1	24-Mar-2022	28-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201850-002

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3A (PC3A)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	8900	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
conductivity	----	31100	1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439336
pH	----	7.62	0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439335
solids, total dissolved [TDS]	----	20400	80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	23800	1.0	mg/L	EC103	-	23-Mar-2022	-

Analytical Results

EO2201850-002

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3A (PC3A)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
solids, total suspended [TSS]	----	82.3		3.0	mg/L	E160	-	25-Mar-2022	442313
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	840		25.0	mg/L	E298	23-Mar-2022	28-Mar-2022	440302
chloride	16887-00-6	8990	DLDS,	10.0	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439383
nitrate (as N)	14797-55-8	<0.400	DLDS,	0.400	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439381
nitrate + nitrite (as N)	----	<0.447		0.447	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS,	0.200	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439382
phosphorus, total	7723-14-0	4.58		0.100	mg/L	E372	23-Mar-2022	23-Mar-2022	439850
phosphorus, total dissolved	7723-14-0	4.52		0.050	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	318	DLDS,	6.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439384
Kjeldahl nitrogen, total [TKN]	----	980		200	mg/L	E318	24-Mar-2022	24-Mar-2022	439874
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	1060		10.0	mg/L	E358-L	24-Mar-2022	25-Mar-2022	441547
Ion Balance									
ion balance (cations/anions)	----	99.8		0.010	%	EC101	-	23-Mar-2022	-
Total Metals									
chromium, total	7440-47-3	0.230		0.0500	mg/L	E420	23-Mar-2022	23-Mar-2022	439906
mercury, total	7439-97-6	<0.000500	DLM,	0.000500	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.166		0.100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
antimony, dissolved	7440-36-0	<0.0100	DLDS,	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
arsenic, dissolved	7440-38-2	0.353		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
barium, dissolved	7440-39-3	1.48		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
beryllium, dissolved	7440-41-7	<0.00200	DLDS,	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
bismuth, dissolved	7440-69-9	<0.00500	DLDS,	0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
boron, dissolved	7440-42-8	43.4		1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cadmium, dissolved	7440-43-9	<0.000500	DLDS,	0.000500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
calcium, dissolved	7440-70-2	202		5.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
chromium, dissolved	7440-47-3	0.214		0.0500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cobalt, dissolved	7440-48-4	<0.0100	DLDS,	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
copper, dissolved	7440-50-8	<0.0200	DLDS,	0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
iron, dissolved	7439-89-6	<1.00	DLDS,	1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
lead, dissolved	7439-92-1	<0.00500	DLDS,	0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
magnesium, dissolved	7439-95-4	482		0.500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
manganese, dissolved	7439-96-5	1.13		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
molybdenum, dissolved	7439-98-7	0.269		0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
nickel, dissolved	7440-02-0	0.472		0.0500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
potassium, dissolved	7440-09-7	1210		5.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
selenium, dissolved	7782-49-2	0.0149		0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
silver, dissolved	7440-22-4	<0.00100	DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
sodium, dissolved	7440-23-5	6070		5.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
strontium, dissolved	7440-24-6	4.83		0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
thallium, dissolved	7440-28-0	<0.00100	DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
tin, dissolved	7440-31-5	<0.0100	DLDS,	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
uranium, dissolved	7440-61-1	0.00181		0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
vanadium, dissolved	7440-62-2	0.158		0.0500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zinc, dissolved	7440-66-6	<0.100	DLDS,	0.100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zirconium, dissolved	7440-67-7	0.179		0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375

Analytical Results

EO2201850-002

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3A (PC3A)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
dissolved metals filtration location	----	Laboratory	-	-	EP421	-	22-Mar-2022	439375
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	3650 DLHC,	200	mg/L	E559-L	-	23-Mar-2022	440237
phenols, total (4AAP)	----	12.7	0.200	mg/L	E562	22-Mar-2022	22-Mar-2022	439379
Volatile Organic Compounds								
benzene	71-43-2	122	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	7.75	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	67.6	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	45.6	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	17.1	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	62.7	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	71.5	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	70.3	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	940	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	680	260	µg/L	EC580	-	29-Mar-2022	-
F2 (C10-C16)	----	14800	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	104	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	110	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201850-003

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3B (PC3B)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	6200	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, carbonate (as CO3)	3812-32-6	3750	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
conductivity	----	35800	1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439336
pH	----	9.37	0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439335
solids, total dissolved [TDS]	----	29700	80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	31000	1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	39.3	3.0	mg/L	E160	-	25-Mar-2022	442313
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	1110	125	mg/L	E298	23-Mar-2022	23-Mar-2022	440302
chloride	16887-00-6	8660 DLDS,	10.0	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439383
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439381
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439382

Analytical Results

EO2201850-003

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3B (PC3B)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients									
phosphorus, total	7723-14-0	5.04		0.100	mg/L	E372	23-Mar-2022	23-Mar-2022	439850
phosphorus, total dissolved	7723-14-0	4.86		0.050	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	1400	DLDS,	6.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439384
Kjeldahl nitrogen, total [TKN]	----	1790		200	mg/L	E318	24-Mar-2022	24-Mar-2022	439874
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	2630		25.0	mg/L	E358-L	24-Mar-2022	25-Mar-2022	441547
Ion Balance									
ion balance (cations/anions)	----	94.6		0.010	%	EC101	-	23-Mar-2022	-
Total Metals									
chromium, total	7440-47-3	0.592		0.0500	mg/L	E420	23-Mar-2022	23-Mar-2022	439906
mercury, total	7439-97-6	<0.000500	DLM,	0.000500	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals									
aluminum, dissolved	7429-90-5	<0.100	DLDS,	0.100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
antimony, dissolved	7440-36-0	<0.0100	DLDS,	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
arsenic, dissolved	7440-38-2	0.106		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
barium, dissolved	7440-39-3	0.483		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
beryllium, dissolved	7440-41-7	<0.00200	DLDS,	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
bismuth, dissolved	7440-69-9	<0.00500	DLDS,	0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
boron, dissolved	7440-42-8	115		1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cadmium, dissolved	7440-43-9	0.0115		0.000500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
calcium, dissolved	7440-70-2	14.6		5.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
chromium, dissolved	7440-47-3	0.529		0.0500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cobalt, dissolved	7440-48-4	0.0189		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
copper, dissolved	7440-50-8	0.114		0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
iron, dissolved	7439-89-6	1.23		1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
lead, dissolved	7439-92-1	0.00596		0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
magnesium, dissolved	7439-95-4	45.5		0.500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
manganese, dissolved	7439-96-5	0.696		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
molybdenum, dissolved	7439-98-7	25.9		0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
nickel, dissolved	7440-02-0	1.11		0.0500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
potassium, dissolved	7440-09-7	2460		5.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
selenium, dissolved	7782-49-2	0.0606		0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
silver, dissolved	7440-22-4	<0.00100	DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
sodium, dissolved	7440-23-5	7500		5.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
strontium, dissolved	7440-24-6	0.719		0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
thallium, dissolved	7440-28-0	<0.00100	DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
tin, dissolved	7440-31-5	0.0132		0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
uranium, dissolved	7440-61-1	0.00137		0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
vanadium, dissolved	7440-62-2	0.339		0.0500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zinc, dissolved	7440-66-6	<0.100	DLDS,	0.100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zirconium, dissolved	7440-67-7	0.100		0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
dissolved metals filtration location	----	Laboratory		-	-	EP421	-	22-Mar-2022	439375
Speciated Metals									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050		0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics									
chemical oxygen demand [COD]	----	11900	DLHC,	200	mg/L	E559-L	-	23-Mar-2022	440237
phenols, total (4AAP)	----	18.6		0.500	mg/L	E562	22-Mar-2022	22-Mar-2022	439379
Volatile Organic Compounds									

Analytical Results

EO2201850-003

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3B (PC3B)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Volatile Organic Compounds								
benzene	71-43-2	8.23	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	1.15	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	7.41	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	2.82	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	2.94	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	5.76	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	72.8	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	82.6	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	1730	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	1710	460	µg/L	EC580	-	29-Mar-2022	-
F2 (C10-C16)	----	1700	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	101	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	108	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201850-004

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3C (PC3C)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	3720	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, carbonate (as CO3)	3812-32-6	450	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
conductivity	----	12800	1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439336
pH	----	8.73	0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439335
solids, total dissolved [TDS]	----	7360	80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	9090	1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	9.5	3.0	mg/L	E160	-	25-Mar-2022	442313
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	438	125	mg/L	E298	23-Mar-2022	23-Mar-2022	440302
chloride	16887-00-6	2410 DLDS,	10.0	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439383
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439381
nitrate + nitrite (as N)	----	1.08	0.447	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	1.08 DLDS,	0.200	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439382
phosphorus, total	7723-14-0	1.85	0.020	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	1.89	0.020	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	506 DLDS,	6.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439384
Kjeldahl nitrogen, total [TKN]	----	539	200	mg/L	E318	24-Mar-2022	24-Mar-2022	439874
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	520	10.0	mg/L	E358-L	24-Mar-2022	25-Mar-2022	441547
Ion Balance								

Analytical Results

EO2201850-004

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3C (PC3C)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Ion Balance								
ion balance (cations/anions)	----	96.1	0.010	%	EC101	-	23-Mar-2022	-
Total Metals								
chromium, total	7440-47-3	<0.0100 DLDS,	0.0100	mg/L	E420	23-Mar-2022	23-Mar-2022	439906
mercury, total	7439-97-6	<0.000500 DLM,	0.000500	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0387	0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
antimony, dissolved	7440-36-0	<0.00200 DLDS,	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
arsenic, dissolved	7440-38-2	0.0315	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
barium, dissolved	7440-39-3	0.0696	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
beryllium, dissolved	7440-41-7	<0.000400 DLDS,	0.000400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
bismuth, dissolved	7440-69-9	<0.00100 DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
boron, dissolved	7440-42-8	43.6	0.200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cadmium, dissolved	7440-43-9	0.00123	0.000100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
calcium, dissolved	7440-70-2	43.0	1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
chromium, dissolved	7440-47-3	<0.0100 DLDS,	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cobalt, dissolved	7440-48-4	0.00332	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
copper, dissolved	7440-50-8	0.0137	0.00400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
iron, dissolved	7439-89-6	0.668	0.200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
lead, dissolved	7439-92-1	<0.00100 DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
magnesium, dissolved	7439-95-4	102	0.100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
manganese, dissolved	7439-96-5	0.418	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
molybdenum, dissolved	7439-98-7	3.00	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
nickel, dissolved	7440-02-0	0.694	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
potassium, dissolved	7440-09-7	395	1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
selenium, dissolved	7782-49-2	0.0250	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
silver, dissolved	7440-22-4	<0.000200 DLDS,	0.000200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
sodium, dissolved	7440-23-5	2230	1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
strontium, dissolved	7440-24-6	0.276	0.00400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
thallium, dissolved	7440-28-0	<0.000200 DLDS,	0.000200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
tin, dissolved	7440-31-5	0.00394	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
uranium, dissolved	7440-61-1	0.00653	0.000200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
vanadium, dissolved	7440-62-2	18.1	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zinc, dissolved	7440-66-6	<0.0200 DLDS,	0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zirconium, dissolved	7440-67-7	0.0835	0.00400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
dissolved metals filtration location	----	Laboratory	-	-	EP421	-	22-Mar-2022	439375
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	1280 DLM,	200	mg/L	E559-L	-	23-Mar-2022	440237
phenols, total (4AAP)	----	0.889	0.0200	mg/L	E562	22-Mar-2022	22-Mar-2022	439379
Volatile Organic Compounds								
benzene	71-43-2	13.0	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	113	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	241	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	377	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	178	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	555	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								

Analytical Results

EO2201850-004

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3C (PC3C)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	77.1	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	75.2	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	1900	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	980	540	µg/L	EC580	-	29-Mar-2022	-
F2 (C10-C16)	----	1460	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	104	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	107	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201850-005

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3D (PC3D)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	5810	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
conductivity	----	19900	1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439336
pH	----	7.98	0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439335
solids, total dissolved [TDS]	----	11900	80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	13700	1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	18.1	3.0	mg/L	E160	-	25-Mar-2022	442313
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	351	125	mg/L	E298	23-Mar-2022	23-Mar-2022	440302
chloride	16887-00-6	4690 DLDS,	10.0	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439383
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439381
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439382
phosphorus, total	7723-14-0	1.24	0.020	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	1.22	0.020	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	198 DLDS,	6.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439384
Kjeldahl nitrogen, total [TKN]	----	477	200	mg/L	E318	24-Mar-2022	24-Mar-2022	439874
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	754	10.0	mg/L	E358-L	24-Mar-2022	25-Mar-2022	441547
Ion Balance								
ion balance (cations/anions)	----	99.1	0.010	%	EC101	-	23-Mar-2022	-
Total Metals								
chromium, total	7440-47-3	0.0256	0.0100	mg/L	E420	23-Mar-2022	23-Mar-2022	439906
mercury, total	7439-97-6	<0.000500 DLM,	0.000500	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0586	0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
antimony, dissolved	7440-36-0	<0.00200 DLDS,	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375

Analytical Results

EO2201850-005

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3D (PC3D)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
arsenic, dissolved	7440-38-2	0.0241	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
barium, dissolved	7440-39-3	0.387	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
beryllium, dissolved	7440-41-7	<0.000400 DLDS,	0.000400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
bismuth, dissolved	7440-69-9	<0.00100 DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
boron, dissolved	7440-42-8	63.4	0.200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cadmium, dissolved	7440-43-9	0.00169	0.000100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
calcium, dissolved	7440-70-2	180	1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
chromium, dissolved	7440-47-3	0.0231	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cobalt, dissolved	7440-48-4	0.00593	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
copper, dissolved	7440-50-8	0.0457	0.00400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
iron, dissolved	7439-89-6	1.20	0.200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
lead, dissolved	7439-92-1	<0.00100 DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
magnesium, dissolved	7439-95-4	206	0.100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
manganese, dissolved	7439-96-5	1.41	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
molybdenum, dissolved	7439-98-7	3.64	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
nickel, dissolved	7440-02-0	2.47	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
potassium, dissolved	7440-09-7	582	1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
selenium, dissolved	7782-49-2	0.0104	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
silver, dissolved	7440-22-4	<0.000200 DLDS,	0.000200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
sodium, dissolved	7440-23-5	3780	1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
strontium, dissolved	7440-24-6	2.05	0.00400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
thallium, dissolved	7440-28-0	<0.000200 DLDS,	0.000200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
tin, dissolved	7440-31-5	<0.00200 DLDS,	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
uranium, dissolved	7440-61-1	0.00452	0.000200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
vanadium, dissolved	7440-62-2	5.68	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zinc, dissolved	7440-66-6	<0.0200 DLDS,	0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zirconium, dissolved	7440-67-7	0.0724	0.00400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
dissolved metals filtration location	----	Laboratory	-	-	EP421	-	22-Mar-2022	439375
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	2310 DLHC,	200	mg/L	E559-L	-	23-Mar-2022	440237
phenols, total (4AAP)	----	4.59	0.100	mg/L	E562	22-Mar-2022	22-Mar-2022	439379
Volatile Organic Compounds								
benzene	71-43-2	6.98	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	1.54	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	8.14	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	4.55	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	2.77	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	7.32	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	75.8	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	76.0	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	350	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	330	100	µg/L	EC580	-	29-Mar-2022	-
F2 (C10-C16)	----	620	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								

Analytical Results

EO2201850-005

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3D (PC3D)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	99.2	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	108	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201850-006

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3E (PC3E)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	5320	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
conductivity	----	13900	1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439336
pH	----	8.08	0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439335
solids, total dissolved [TDS]	----	8150	80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	10100	1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	24.3	3.0	mg/L	E160	-	25-Mar-2022	442313
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	321	125	mg/L	E298	23-Mar-2022	23-Mar-2022	440302
chloride	16887-00-6	2920 DLDS,	10.0	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439383
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439381
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439382
phosphorus, total	7723-14-0	1.13	0.020	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	1.04	0.020	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	718 DLDS,	6.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439384
Kjeldahl nitrogen, total [TKN]	----	408	200	mg/L	E318	24-Mar-2022	24-Mar-2022	439874
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	164	10.0	mg/L	E358-L	24-Mar-2022	25-Mar-2022	441547
Ion Balance								
ion balance (cations/anions)	----	92.4	0.010	%	EC101	-	23-Mar-2022	-
Total Metals								
chromium, total	7440-47-3	0.00776	0.00500	mg/L	E420	23-Mar-2022	24-Mar-2022	439936
mercury, total	7439-97-6	<0.000500 DLM,	0.000500	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0124	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
antimony, dissolved	7440-36-0	<0.00100 DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
arsenic, dissolved	7440-38-2	0.00870	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
barium, dissolved	7440-39-3	0.329	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
beryllium, dissolved	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
bismuth, dissolved	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
boron, dissolved	7440-42-8	5.80	0.100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cadmium, dissolved	7440-43-9	0.000475	0.0000500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
calcium, dissolved	7440-70-2	109	0.500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375

Analytical Results

EO2201850-006

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3E (PC3E)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
chromium, dissolved	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cobalt, dissolved	7440-48-4	0.00663	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
copper, dissolved	7440-50-8	0.00258	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
iron, dissolved	7439-89-6	0.249	0.100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
magnesium, dissolved	7439-95-4	277	0.0500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
manganese, dissolved	7439-96-5	0.800	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
molybdenum, dissolved	7439-98-7	1.22	0.000500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
nickel, dissolved	7440-02-0	0.745	0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
potassium, dissolved	7440-09-7	266	0.500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
selenium, dissolved	7782-49-2	0.00176	0.000500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
silver, dissolved	7440-22-4	0.000307	0.000100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
sodium, dissolved	7440-23-5	2580	0.500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
strontium, dissolved	7440-24-6	2.81	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
uranium, dissolved	7440-61-1	0.0141	0.000100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
vanadium, dissolved	7440-62-2	5.76	0.00500	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zinc, dissolved	7440-66-6	<0.0100 DLDS,	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zirconium, dissolved	7440-67-7	0.106	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
dissolved metals filtration location	----	Laboratory	-	-	EP421	-	22-Mar-2022	439375
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	659 DLM,	200	mg/L	E559-L	-	23-Mar-2022	440237
phenols, total (4AAP)	----	0.0407 DLM,	0.0030	mg/L	E562	22-Mar-2022	22-Mar-2022	439379
Volatile Organic Compounds								
benzene	71-43-2	13.7	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	2.52	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	2.35	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	2.78	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	1.77	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	4.55	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	72.3	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	72.8	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	110	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	<100	100	µg/L	EC580	-	29-Mar-2022	-
F2 (C10-C16)	----	12200	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	100	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	103	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201850-007

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 4 (PC4)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	4020	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, carbonate (as CO3)	3812-32-6	37.2	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439337
conductivity	----	11100	1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439336
pH	----	8.00	0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439335
solids, total dissolved [TDS]	----	7790	80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	8210	1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	157	5.0	mg/L	E160	-	25-Mar-2022	442313
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	204	125	mg/L	E298	23-Mar-2022	23-Mar-2022	440302
chloride	16887-00-6	2040 DLDS,	10.0	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439383
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439381
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439382
phosphorus, total	7723-14-0	1.81	0.020	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	1.66	0.020	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	292 DLDS,	6.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439384
Kjeldahl nitrogen, total [TKN]	----	293	200	mg/L	E318	24-Mar-2022	24-Mar-2022	439874
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	809	10.0	mg/L	E358-L	24-Mar-2022	25-Mar-2022	441547
Ion Balance								
ion balance (cations/anions)	----	105	0.010	%	EC101	-	23-Mar-2022	-
Total Metals								
chromium, total	7440-47-3	<0.0100 DLDS,	0.0100	mg/L	E420	23-Mar-2022	24-Mar-2022	439936
mercury, total	7439-97-6	<0.000500 DLM,	0.000500	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.132	0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
antimony, dissolved	7440-36-0	<0.00200 DLDS,	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
arsenic, dissolved	7440-38-2	0.0246	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
barium, dissolved	7440-39-3	0.312	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
beryllium, dissolved	7440-41-7	<0.000400 DLDS,	0.000400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
bismuth, dissolved	7440-69-9	<0.00100 DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
boron, dissolved	7440-42-8	17.4	0.200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cadmium, dissolved	7440-43-9	0.00212	0.000100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
calcium, dissolved	7440-70-2	242	1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
chromium, dissolved	7440-47-3	<0.0100 DLDS,	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
cobalt, dissolved	7440-48-4	0.00791	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
copper, dissolved	7440-50-8	0.0183	0.00400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
iron, dissolved	7439-89-6	1.79	0.200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
lead, dissolved	7439-92-1	<0.00100 DLDS,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
magnesium, dissolved	7439-95-4	162	0.100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
manganese, dissolved	7439-96-5	1.63	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
molybdenum, dissolved	7439-98-7	5.94	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
nickel, dissolved	7440-02-0	0.446	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
potassium, dissolved	7440-09-7	256	1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
selenium, dissolved	7782-49-2	0.00805 DTC,	0.00100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
silver, dissolved	7440-22-4	<0.000200 DLDS,	0.000200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
sodium, dissolved	7440-23-5	2090	1.00	mg/L	E421	22-Mar-2022	23-Mar-2022	439375

Analytical Results

EO2201850-007

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 4 (PC4)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
strontium, dissolved	7440-24-6	1.57	0.00400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
thallium, dissolved	7440-28-0	<0.000200 DLDS,	0.000200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
tin, dissolved	7440-31-5	0.00768 DTC,	0.00200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
uranium, dissolved	7440-61-1	0.0119	0.000200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
vanadium, dissolved	7440-62-2	0.884	0.0100	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zinc, dissolved	7440-66-6	0.0878	0.0200	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
zirconium, dissolved	7440-67-7	0.0449	0.00400	mg/L	E421	22-Mar-2022	23-Mar-2022	439375
dissolved metals filtration location	----	Laboratory	-	-	EP421	-	22-Mar-2022	439375
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	3150 DLHC,	200	mg/L	E559-L	-	23-Mar-2022	440237
phenols, total (4AAP)	----	2.43	0.100	mg/L	E562	22-Mar-2022	22-Mar-2022	439379
Volatile Organic Compounds								
benzene	71-43-2	57.0	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	21.1	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	182	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	56.1	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	34.3	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	90.4	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	71.0	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	71.2	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	900	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	550	250	µg/L	EC580	-	29-Mar-2022	-
F2 (C10-C16)	----	2560	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	96.6	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	112	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201850-008

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 1 (PC1)

Client sampling date / time: 24-Mar-2022 14:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	7010	10.0	mg/L	E290	28-Mar-2022	31-Mar-2022	444212
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	28-Mar-2022	31-Mar-2022	444212
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	28-Mar-2022	31-Mar-2022	444212
conductivity	----	18400	1.0	µS/cm	E100	28-Mar-2022	28-Mar-2022	444214
pH	----	8.08	0.10	pH units	E108	28-Mar-2022	28-Mar-2022	444213
solids, total dissolved [TDS]	----	14200	80	mg/L	E162	-	29-Mar-2022	445426
solids, total dissolved [TDS], calculated	----	15300	1.0	mg/L	EC103	-	28-Mar-2022	-

Analytical Results

EO2201850-008

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 1 (PC1)
Client sampling date / time: 24-Mar-2022 14:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
solids, total suspended [TSS]	----	206		3.0	mg/L	E160	-	29-Mar-2022	444985
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	636		25.0	mg/L	E298	28-Mar-2022	28-Mar-2022	444140
chloride	16887-00-6	2820	DLDS,	5.00	mg/L	E235.Cl	27-Mar-2022	27-Mar-2022	443798
nitrate (as N)	14797-55-8	13.0	DLDS,	0.200	mg/L	E235.NO3	27-Mar-2022	27-Mar-2022	443795
nitrate + nitrite (as N)	----	13.9		0.224	mg/L	EC235.N+N	-	29-Mar-2022	-
nitrite (as N)	14797-65-0	0.878	DLDS,	0.100	mg/L	E235.NO2	27-Mar-2022	27-Mar-2022	443796
phosphorus, total	7723-14-0	10.9		0.200	mg/L	E372	28-Mar-2022	28-Mar-2022	443956
phosphorus, total dissolved	7723-14-0	10.2		0.200	mg/L	E375-H	28-Mar-2022	28-Mar-2022	443957
sulfate (as SO4)	14808-79-8	2540	DLDS,	3.00	mg/L	E235.SO4	27-Mar-2022	27-Mar-2022	443794
Kjeldahl nitrogen, total [TKN]	----	810		100	mg/L	E318	29-Mar-2022	31-Mar-2022	444239
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	872		10.0	mg/L	E358-L	28-Mar-2022	28-Mar-2022	444097
Ion Balance									
ion balance (cations/anions)	----	104		0.010	%	EC101	-	28-Mar-2022	-
Total Metals									
chromium, total	7440-47-3	0.496		0.0100	mg/L	E420	27-Mar-2022	27-Mar-2022	443537
mercury, total	7439-97-6	0.000673		0.0000500	mg/L	E508	29-Mar-2022	29-Mar-2022	445042
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.310		0.0200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
antimony, dissolved	7440-36-0	0.0114		0.00200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
arsenic, dissolved	7440-38-2	0.0517		0.00200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
barium, dissolved	7440-39-3	0.330		0.00200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
beryllium, dissolved	7440-41-7	<0.000400	DLDS,	0.000400	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
bismuth, dissolved	7440-69-9	<0.00100	DLDS,	0.00100	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
boron, dissolved	7440-42-8	19.7		0.200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
cadmium, dissolved	7440-43-9	0.00630		0.000100	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
calcium, dissolved	7440-70-2	299		1.00	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
chromium, dissolved	7440-47-3	0.454		0.0100	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
cobalt, dissolved	7440-48-4	0.128		0.00200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
copper, dissolved	7440-50-8	0.107		0.00400	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
iron, dissolved	7439-89-6	111		0.200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
lead, dissolved	7439-92-1	0.183		0.00100	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
magnesium, dissolved	7439-95-4	367		0.100	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
manganese, dissolved	7439-96-5	20.8		0.00200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
molybdenum, dissolved	7439-98-7	5.38		0.00100	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
nickel, dissolved	7440-02-0	10.4		0.0100	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
potassium, dissolved	7440-09-7	464		1.00	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
selenium, dissolved	7782-49-2	0.00264		0.00100	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
silver, dissolved	7440-22-4	0.000561		0.000200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
sodium, dissolved	7440-23-5	3490		1.00	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
strontium, dissolved	7440-24-6	2.52		0.00400	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
thallium, dissolved	7440-28-0	<0.000200	DLDS,	0.000200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
tin, dissolved	7440-31-5	<0.00200	DLDS,	0.00200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
uranium, dissolved	7440-61-1	0.0116		0.000200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
vanadium, dissolved	7440-62-2	16.9		0.0100	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
zinc, dissolved	7440-66-6	1.76		0.0200	mg/L	E421	27-Mar-2022	27-Mar-2022	443615
zirconium, dissolved	7440-67-7	0.260		0.00400	mg/L	E421	27-Mar-2022	27-Mar-2022	443615

Analytical Results

EO2201850-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 1 (PC1)
Client sampling date / time: 24-Mar-2022 14:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
dissolved metals filtration location	----	Field	-	-	EP421	-	27-Mar-2022	443615
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	28-Mar-2022	444525
Aggregate Organics								
chemical oxygen demand [COD]	----	2150 DLHC,	100	mg/L	E559-L	-	29-Mar-2022	444994
phenols, total (4AAP)	----	0.0286	0.0010	mg/L	E562	29-Mar-2022	29-Mar-2022	445264
Volatile Organic Compounds								
benzene	71-43-2	9.07	0.50	µg/L	E611A	29-Mar-2022	29-Mar-2022	443829
ethylbenzene	100-41-4	0.52	0.50	µg/L	E611A	29-Mar-2022	29-Mar-2022	443829
toluene	108-88-3	0.67	0.50	µg/L	E611A	29-Mar-2022	29-Mar-2022	443829
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	29-Mar-2022	29-Mar-2022	443829
xylene, o-	95-47-6	0.60	0.30	µg/L	E611A	29-Mar-2022	29-Mar-2022	443829
xylenes, total	1330-20-7	0.60	0.50	µg/L	E611A	29-Mar-2022	29-Mar-2022	443829
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	100	1.0	%	E611A	29-Mar-2022	29-Mar-2022	443829
difluorobenzene, 1,4-	540-36-3	70.6	1.0	%	E611A	29-Mar-2022	29-Mar-2022	443829
Hydrocarbons								
F1 (C6-C10)	----	370	100	µg/L	E581.F1	29-Mar-2022	29-Mar-2022	443828
F1-BTEX	----	360	100	µg/L	EC580	-	29-Mar-2022	-
F2 (C10-C16)	----	830	100	µg/L	E601	29-Mar-2022	29-Mar-2022	444978
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	83.6	1.0	%	E601	29-Mar-2022	29-Mar-2022	444978
dichlorotoluene, 3,4-	97-75-0	111	1.0	%	E581.F1	29-Mar-2022	29-Mar-2022	443828

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2201850**	Page	: 1 of 31
Amendment	: 1		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Stan Yuha	Account Manager	: Pamela Toledo
Address	: 9808 12 Avenue SW Edmonton AB Canada T6X 0J5	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 1 2022	Date Samples Received	: 21-Mar-2022 17:45
PO	: 0000224129	Issue Date	: 12-Apr-2022 09:43
C-O-C number	: 20-966636		
Sampler	: Murray		
Site	: Table 4.4a		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- Matrix Spike outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Dissolved Metals	EO2201850-002	Primary Leachate Cell 3A (PC3A)	selenium, dissolved	7782-49-2	E421	67.9 %	70.0-130%	Recovery less than lower data quality objective

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 2 (PC2)	E559-L	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 3A (PC3A)	E559-L	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 3B (PC3B)	E559-L	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 3C (PC3C)	E559-L	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 3D (PC3D)	E559-L	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 3E (PC3E)	E559-L	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 4 (PC4)	E559-L	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 1 (PC1)	E559-L	24-Mar-2022	----	----	----		29-Mar-2022	28 days	5 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 2 (PC2)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3A (PC3A)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3B (PC3B)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3C (PC3C)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3D (PC3D)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3E (PC3E)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 4 (PC4)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 1 (PC1)	E562	24-Mar-2022	----	----	----		29-Mar-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 2 (PC2)	E298	21-Mar-2022	23-Mar-2022	----	----		23-Mar-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3A (PC3A)	E298	21-Mar-2022	23-Mar-2022	----	----		23-Mar-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3B (PC3B)	E298	21-Mar-2022	23-Mar-2022	----	----		23-Mar-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3C (PC3C)	E298	21-Mar-2022	23-Mar-2022	----	----		23-Mar-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3D (PC3D)	E298	21-Mar-2022	23-Mar-2022	----	----		23-Mar-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3E (PC3E)	E298	21-Mar-2022	23-Mar-2022	----	----		23-Mar-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 4 (PC4)	E298	21-Mar-2022	23-Mar-2022	----	----		23-Mar-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 1 (PC1)	E298	24-Mar-2022	28-Mar-2022	----	----		28-Mar-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Primary Leachate Cell 2 (PC2)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 3A (PC3A)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 3B (PC3B)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 3C (PC3C)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 3D (PC3D)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 3E (PC3E)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 4 (PC4)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 1 (PC1)	E235.Cl	24-Mar-2022	----	----	----		27-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE Primary Leachate Cell 2 (PC2)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE Primary Leachate Cell 3A (PC3A)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 3B (PC3B)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 3C (PC3C)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 3D (PC3D)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 3E (PC3E)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 4 (PC4)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 1 (PC1)	E235.NO3	24-Mar-2022	----	----	----		27-Mar-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Primary Leachate Cell 2 (PC2)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Primary Leachate Cell 3A (PC3A)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Primary Leachate Cell 3B (PC3B)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE Primary Leachate Cell 3C (PC3C)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE Primary Leachate Cell 3D (PC3D)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE Primary Leachate Cell 3E (PC3E)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE Primary Leachate Cell 4 (PC4)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE Primary Leachate Cell 1 (PC1)	E235.NO2	24-Mar-2022	----	----	----		27-Mar-2022	3 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Primary Leachate Cell 2 (PC2)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Primary Leachate Cell 3A (PC3A)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Primary Leachate Cell 3B (PC3B)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Primary Leachate Cell 3C (PC3C)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 3D (PC3D)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 3E (PC3E)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 4 (PC4)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 1 (PC1)	E235.SO4	24-Mar-2022	----	----	----		27-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 2 (PC2)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 3A (PC3A)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 3B (PC3B)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 3C (PC3C)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 3D (PC3D)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 3E (PC3E)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 4 (PC4)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 1 (PC1)	E375-H	24-Mar-2022	28-Mar-2022	----	----		28-Mar-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 2 (PC2)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 3A (PC3A)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 3B (PC3B)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 3C (PC3C)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 3D (PC3D)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Primary Leachate Cell 3E (PC3E)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 4 (PC4)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 1 (PC1)	E318	24-Mar-2022	29-Mar-2022	----	----		29-Mar-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 2 (PC2)	E372	21-Mar-2022	23-Mar-2022	----	----		23-Mar-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3A (PC3A)	E372	21-Mar-2022	23-Mar-2022	----	----		23-Mar-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3B (PC3B)	E372	21-Mar-2022	23-Mar-2022	----	----		23-Mar-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3C (PC3C)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3D (PC3D)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3E (PC3E)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 4 (PC4)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 1 (PC1)	E372	24-Mar-2022	28-Mar-2022	----	----		28-Mar-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 2 (PC2)	E421	21-Mar-2022	22-Mar-2022	----	----		23-Mar-2022	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 3A (PC3A)	E421	21-Mar-2022	22-Mar-2022	----	----		23-Mar-2022	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 3B (PC3B)	E421	21-Mar-2022	22-Mar-2022	----	----		23-Mar-2022	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 3C (PC3C)	E421	21-Mar-2022	22-Mar-2022	----	----		23-Mar-2022	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 3D (PC3D)	E421	21-Mar-2022	22-Mar-2022	----	----		23-Mar-2022	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 3E (PC3E)	E421	21-Mar-2022	22-Mar-2022	----	----		23-Mar-2022	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 4 (PC4)	E421	21-Mar-2022	22-Mar-2022	----	----		23-Mar-2022	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 1 (PC1)	E421	24-Mar-2022	27-Mar-2022	----	----		27-Mar-2022	180 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 2 (PC2)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		28-Mar-2022	14 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 1 (PC1)	E581.F1	24-Mar-2022	29-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 3A (PC3A)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 3B (PC3B)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 3C (PC3C)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 3D (PC3D)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 3E (PC3E)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 4 (PC4)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Primary Leachate Cell 2 (PC2)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Primary Leachate Cell 3A (PC3A)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Primary Leachate Cell 3B (PC3B)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Primary Leachate Cell 3C (PC3C)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Primary Leachate Cell 3D (PC3D)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Primary Leachate Cell 3E (PC3E)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Primary Leachate Cell 4 (PC4)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Primary Leachate Cell 1 (PC1)	E601	24-Mar-2022	29-Mar-2022	17 days	8 days	✓	29-Mar-2022	40 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 2 (PC2)	E358-L	21-Mar-2022	24-Mar-2022	----	----		25-Mar-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 3A (PC3A)	E358-L	21-Mar-2022	24-Mar-2022	----	----		25-Mar-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 3B (PC3B)	E358-L	21-Mar-2022	24-Mar-2022	----	----		25-Mar-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 3C (PC3C)	E358-L	21-Mar-2022	24-Mar-2022	----	----		25-Mar-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 3D (PC3D)	E358-L	21-Mar-2022	24-Mar-2022	----	----		25-Mar-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 3E (PC3E)	E358-L	21-Mar-2022	24-Mar-2022	----	----		25-Mar-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 4 (PC4)	E358-L	21-Mar-2022	24-Mar-2022	----	----		25-Mar-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 1 (PC1)	E358-L	24-Mar-2022	28-Mar-2022	----	----		28-Mar-2022	28 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 2 (PC2)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 3A (PC3A)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 3B (PC3B)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 3C (PC3C)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 3D (PC3D)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 3E (PC3E)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 4 (PC4)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 1 (PC1)	E290	24-Mar-2022	----	----	----		28-Mar-2022	14 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 2 (PC2)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 3A (PC3A)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 3B (PC3B)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 3C (PC3C)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 3D (PC3D)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 3E (PC3E)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 4 (PC4)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 1 (PC1)	E100	24-Mar-2022	----	----	----		28-Mar-2022	28 days	4 days	✓
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 2 (PC2)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 3A (PC3A)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 3B (PC3B)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 3C (PC3C)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 3D (PC3D)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 3E (PC3E)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 4 (PC4)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 1 (PC1)	E108	24-Mar-2022	----	----	----		28-Mar-2022	0.25 hrs	98 hrs	× EHT
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 2 (PC2)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 3A (PC3A)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 3B (PC3B)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 3C (PC3C)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 3D (PC3D)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 3E (PC3E)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 4 (PC4)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 1 (PC1)	E162	24-Mar-2022	----	----	----		29-Mar-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 2 (PC2)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 3A (PC3A)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 3B (PC3B)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 3C (PC3C)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 3D (PC3D)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 3E (PC3E)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 4 (PC4)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE										
Primary Leachate Cell 1 (PC1)	E160	24-Mar-2022	----	----	----		29-Mar-2022	7 days	5 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 2 (PC2)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 3A (PC3A)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 3B (PC3B)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 3C (PC3C)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 3D (PC3D)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 3E (PC3E)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 4 (PC4)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 1 (PC1)	E532A	24-Mar-2022	----	----	----		28-Mar-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 2 (PC2)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 3A (PC3A)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 3B (PC3B)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 3C (PC3C)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 3D (PC3D)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 3E (PC3E)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 4 (PC4)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 1 (PC1)	E508	24-Mar-2022	----	----	----		29-Mar-2022	28 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Primary Leachate Cell 2 (PC2)	E420	21-Mar-2022	----	----	----		23-Mar-2022	180 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Primary Leachate Cell 3A (PC3A)	E420	21-Mar-2022	----	----	----		23-Mar-2022	180 days	2 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Primary Leachate Cell 3B (PC3B)	E420	21-Mar-2022	----	----	----		23-Mar-2022	180 days	2 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Primary Leachate Cell 3C (PC3C)	E420	21-Mar-2022	----	----	----		23-Mar-2022	180 days	2 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Primary Leachate Cell 3D (PC3D)	E420	21-Mar-2022	----	----	----		23-Mar-2022	180 days	2 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Primary Leachate Cell 1 (PC1)	E420	24-Mar-2022	----	----	----		27-Mar-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Primary Leachate Cell 3E (PC3E)	E420	21-Mar-2022	----	----	----		24-Mar-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Primary Leachate Cell 4 (PC4)	E420	21-Mar-2022	----	----	----		24-Mar-2022	180 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 2 (PC2)	E611A	21-Mar-2022	24-Mar-2022	----	----		28-Mar-2022	14 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 1 (PC1)	E611A	24-Mar-2022	29-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 3A (PC3A)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 3B (PC3B)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 3C (PC3C)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 3D (PC3D)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 3E (PC3E)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 4 (PC4)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	440302	2	21	9.5	5.0	✓
BTEX by Headspace GC-MS	E611A	441370	2	37	5.4	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	441371	2	32	6.2	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	440237	2	39	5.1	5.0	✓
Chloride in Water by IC	E235.Cl	439383	2	39	5.1	5.0	✓
Conductivity in Water	E100	439336	2	35	5.7	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	440496	2	17	11.7	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	439375	2	40	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	441547	2	40	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	439381	2	31	6.4	5.0	✓
Nitrite in Water by IC	E235.NO2	439382	2	30	6.6	5.0	✓
pH by Meter	E108	439335	2	40	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	439379	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	439384	2	30	6.6	5.0	✓
TDS by Gravimetry	E162	441192	2	32	6.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (High Level)	E375-H	443327	2	17	11.7	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	439874	2	40	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	440977	2	25	8.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	439906	3	46	6.5	5.0	✓
Total Phosphorus by Colourimetry	E372	439850	3	52	5.7	5.0	✓
TSS by Gravimetry	E160	442313	2	24	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	440302	2	21	9.5	5.0	✓
BTEX by Headspace GC-MS	E611A	441370	2	37	5.4	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	441371	2	32	6.2	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	439439	2	26	7.6	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	440237	2	39	5.1	5.0	✓
Chloride in Water by IC	E235.Cl	439383	2	39	5.1	5.0	✓
Conductivity in Water	E100	439336	2	35	5.7	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	440496	2	17	11.7	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	439375	2	40	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	441547	2	40	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	439381	2	31	6.4	5.0	✓
Nitrite in Water by IC	E235.NO2	439382	2	30	6.6	5.0	✓
pH by Meter	E108	439335	2	40	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	439379	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	439384	2	30	6.6	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
TDS by Gravimetry	E162	441192	2	32	6.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (High Level)	E375-H	443327	2	17	11.7	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	439874	2	40	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	440977	2	25	8.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	439906	3	46	6.5	5.0	✓
Total Phosphorus by Colourimetry	E372	439850	3	52	5.7	5.0	✓
TSS by Gravimetry	E160	442313	2	24	8.3	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	440302	2	21	9.5	5.0	✓
BTEX by Headspace GC-MS	E611A	441370	2	37	5.4	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	441371	2	32	6.2	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	439439	2	26	7.6	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	440237	2	39	5.1	5.0	✓
Chloride in Water by IC	E235.Cl	439383	2	39	5.1	5.0	✓
Conductivity in Water	E100	439336	2	35	5.7	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	440496	2	17	11.7	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	439375	2	40	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	441547	2	40	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	439381	2	31	6.4	5.0	✓
Nitrite in Water by IC	E235.NO2	439382	2	30	6.6	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	439379	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	439384	2	30	6.6	5.0	✓
TDS by Gravimetry	E162	441192	2	32	6.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (High Level)	E375-H	443327	2	17	11.7	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	439874	2	40	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	440977	2	25	8.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	439906	3	46	6.5	5.0	✓
Total Phosphorus by Colourimetry	E372	439850	3	52	5.7	5.0	✓
TSS by Gravimetry	E160	442313	2	24	8.3	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	440302	1	21	4.7	5.0	×
BTEX by Headspace GC-MS	E611A	441370	2	37	5.4	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	440237	2	39	5.1	5.0	✓
Chloride in Water by IC	E235.Cl	439383	2	39	5.1	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	440496	2	17	11.7	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	439375	2	40	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	441547	2	40	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	439381	2	31	6.4	5.0	✓
Nitrite in Water by IC	E235.NO2	439382	2	30	6.6	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	439379	2	40	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Sulfate in Water by IC	E235.SO4	439384	2	30	6.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (High Level)	E375-H	443327	1	17	5.8	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	439874	2	40	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	440977	2	25	8.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	439906	3	46	6.5	5.0	✓
Total Phosphorus by Colourimetry	E372	439850	3	52	5.7	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Edmonton - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry	E372 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (High Level)	E375-H Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total Metals in Water by CRC ICPMS	E420 Edmonton - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Edmonton - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A Edmonton - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. sample pretreatment involved field or lab filtration following by sample preservation.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
CCME PHC - F1 by Headspace GC-FID	E581.F1 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BTEX by Headspace GC-MS	E611A Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Dissolved Phosphorus in water	EP375 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581 Edmonton - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Edmonton - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EO2201850**	Page	: 1 of 23
Amendment	: **1**		

Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Stan Yuha	Account Manager	: Pamela Toledo
Address	: 9808 12 Avenue SW Edmonton AB Canada T6X 0J5	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 1 2022	Date Samples Received	: 21-Mar-2022 17:45
PO	: 0000224129	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 20-966636	Issue Date	: 12-Apr-2022 09:43
Sampler	: Murray		
Site	: Table 4.4a		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Austin Wasylyshyn	Lab Analyst	Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Organics, Edmonton, Alberta
Clarin Nobleza	Lab Assistant	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Lisa Watt	Lab Supervisor - Environmental	Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta

Oscar Ruiz	Lab Assistant	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Samantha Mayor	Lab Assistant	Metals, Edmonton, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 439335)											
EO2201827-001	Anonymous	pH	----	E108	0.10	pH units	8.94	8.94	0.00%	3%	----
Physical Tests (QC Lot: 439336)											
EO2201827-001	Anonymous	conductivity	----	E100	2.0	µS/cm	1190	1180	0.929%	10%	----
Physical Tests (QC Lot: 441192)											
EO2201732-002	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	1730	1720	0.725%	20%	----
Physical Tests (QC Lot: 442313)											
EO2201811-004	Anonymous	solids, total suspended [TSS]	----	E160	7.5	mg/L	110	102	8.02%	20%	----
Physical Tests (QC Lot: 444213)											
FC2200538-001	Anonymous	pH	----	E108	0.10	pH units	8.03	8.02	0.125%	3%	----
Physical Tests (QC Lot: 444214)											
FC2200538-001	Anonymous	conductivity	----	E100	1.0	µS/cm	936	933	0.321%	10%	----
Physical Tests (QC Lot: 444985)											
EO2200555-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 445426)											
EO2201850-008	Primary Leachate Cell 1 (PC1)	solids, total dissolved [TDS]	----	E162	80	mg/L	14200	13900	2.41%	20%	----
Anions and Nutrients (QC Lot: 439381)											
EO2201851-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.649	0.663	2.07%	20%	----
Anions and Nutrients (QC Lot: 439382)											
EO2201851-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 439383)											
EO2201851-002	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	15.1	14.5	4.29%	20%	----
Anions and Nutrients (QC Lot: 439384)											
EO2201851-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	8.27	7.89	4.65%	20%	----
Anions and Nutrients (QC Lot: 439850)											
EO2201825-001	Anonymous	phosphorus, total	7723-14-0	E372	0.100	mg/L	7.81	7.83	0.238%	20%	----
Anions and Nutrients (QC Lot: 439874)											
CG2203241-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.856	0.718	17.5%	20%	----
Anions and Nutrients (QC Lot: 440302)											
CG2203267-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.125	mg/L	3.97	3.91	1.54%	20%	----
Anions and Nutrients (QC Lot: 443325)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 443325) - continued											
EO2201850-004	Primary Leachate Cell 3C (PC3C)	phosphorus, total	7723-14-0	E372	0.020	mg/L	1.85	1.85	0.368%	20%	----
Anions and Nutrients (QC Lot: 443327)											
EO2201850-001	Primary Leachate Cell 2 (PC2)	phosphorus, total dissolved	7723-14-0	E375-H	0.100	mg/L	4.97	5.17	3.81%	20%	----
Anions and Nutrients (QC Lot: 443794)											
EO2201991-006	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	195	194	0.650%	20%	----
Anions and Nutrients (QC Lot: 443795)											
EO2201991-006	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	1.55	1.56	0.424%	20%	----
Anions and Nutrients (QC Lot: 443796)											
EO2201991-006	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	0.064	0.062	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 443798)											
EO2201991-006	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	108	107	1.20%	20%	----
Anions and Nutrients (QC Lot: 443956)											
EO2201850-008	Primary Leachate Cell 1 (PC1)	phosphorus, total	7723-14-0	E372	0.200	mg/L	10.9	10.9	0.174%	20%	----
Anions and Nutrients (QC Lot: 443957)											
EO2201850-008	Primary Leachate Cell 1 (PC1)	phosphorus, total dissolved	7723-14-0	E375-H	0.200	mg/L	10.2	10.2	0.462%	20%	----
Anions and Nutrients (QC Lot: 444140)											
EO2201850-008	Primary Leachate Cell 1 (PC1)	ammonia, total (as N)	7664-41-7	E298	25.0	mg/L	636	663	4.09%	20%	----
Anions and Nutrients (QC Lot: 444239)											
CG2203430-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 441547)											
CG2203236-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.04	2.02	0.03	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 444097)											
CG2203350-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Total Metals (QC Lot: 439906)											
EO2201827-001	Anonymous	chromium, total	7440-47-3	E420	0.00050	mg/L	0.00621	0.00597	3.98%	20%	----
Total Metals (QC Lot: 439936)											
EO2201850-006	Primary Leachate Cell 3E (PC3E)	chromium, total	7440-47-3	E420	0.00500	mg/L	0.00776	0.00683	0.00093	Diff <2x LOR	----
Total Metals (QC Lot: 440977)											
EO2201855-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000500	0.0000457	0.0000043	Diff <2x LOR	----
Total Metals (QC Lot: 443537)											
EO2201850-008	Primary Leachate Cell 1 (PC1)	chromium, total	7440-47-3	E420	0.0100	mg/L	0.496	0.491	1.08%	20%	----
Total Metals (QC Lot: 445042)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 445042) - continued											
EO2201850-008	Primary Leachate Cell 1 (PC1)	mercury, total	7439-97-6	E508	0.0000500	mg/L	0.000673	0.000709	5.21%	20%	----
Dissolved Metals (QC Lot: 439375)											
EO2201850-001	Primary Leachate Cell 2 (PC2)	aluminum, dissolved	7429-90-5	E421	0.100	mg/L	0.130	0.156	0.0262	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.0100	mg/L	0.639	0.660	3.30%	20%	----
		arsenic, dissolved	7440-38-2	E421	0.0100	mg/L	0.575	0.574	0.182%	20%	----
		barium, dissolved	7440-39-3	E421	0.0100	mg/L	1.23	1.24	1.15%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	1.00	mg/L	51.0	51.2	0.347%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.000500	mg/L	0.0106	0.0106	0.237%	20%	----
		calcium, dissolved	7440-70-2	E421	5.00	mg/L	44.4	45.0	0.606	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.0500	mg/L	0.320	0.302	0.0178	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.0100	mg/L	<0.0100	0.0101	0.00014	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.0200	mg/L	0.0663	0.0695	0.00318	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	1.00	mg/L	<1.00	<1.00	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.500	mg/L	359	365	1.64%	20%	----
		manganese, dissolved	7439-96-5	E421	0.0100	mg/L	1.01	0.968	4.62%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.00500	mg/L	28.6	28.9	0.971%	20%	----
		nickel, dissolved	7440-02-0	E421	0.0500	mg/L	0.424	0.429	0.00486	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	5.00	mg/L	1050	1040	0.973%	20%	----
		selenium, dissolved	7782-49-2	E421	0.00500	mg/L	0.0109	0.0148	0.00397	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	5.00	mg/L	8550	8670	1.43%	20%	----
		strontium, dissolved	7440-24-6	E421	0.0200	mg/L	3.29	3.37	2.38%	20%	----
		thallium, dissolved	7440-28-0	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.0100	mg/L	0.0145	0.0156	0.00107	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.00100	mg/L	0.00161	0.00173	0.000117	Diff <2x LOR	----
		vanadium, dissolved	7440-62-2	E421	0.0500	mg/L	0.548	0.553	0.936%	20%	----
		zinc, dissolved	7440-66-6	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.0200	mg/L	0.306	0.311	1.49%	20%	----
Dissolved Metals (QC Lot: 443615)											
EO2201850-008	Primary Leachate Cell 1 (PC1)	aluminum, dissolved	7429-90-5	E421	0.0200	mg/L	0.310	0.326	5.09%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00200	mg/L	0.0114	0.0117	0.00027	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 443615) - continued											
EO2201850-008	Primary Leachate Cell 1 (PC1)	arsenic, dissolved	7440-38-2	E421	0.00200	mg/L	0.0517	0.0558	7.52%	20%	----
		barium, dissolved	7440-39-3	E421	0.00200	mg/L	0.330	0.372	12.2%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000400	mg/L	<0.000400	<0.000400	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.200	mg/L	19.7	20.9	5.59%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.000100	mg/L	0.00630	0.00660	4.62%	20%	----
		calcium, dissolved	7440-70-2	E421	1.00	mg/L	299	316	5.58%	20%	----
		chromium, dissolved	7440-47-3	E421	0.0100	mg/L	0.454	0.484	6.61%	20%	----
		cobalt, dissolved	7440-48-4	E421	0.00200	mg/L	0.128	0.138	7.43%	20%	----
		copper, dissolved	7440-50-8	E421	0.00400	mg/L	0.107	0.114	6.38%	20%	----
		iron, dissolved	7439-89-6	E421	0.200	mg/L	111	113	1.75%	20%	----
		lead, dissolved	7439-92-1	E421	0.00100	mg/L	0.183	0.200	8.81%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.100	mg/L	367	391	6.29%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00200	mg/L	20.8	21.8	4.61%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.00100	mg/L	5.38	5.65	4.86%	20%	----
		nickel, dissolved	7440-02-0	E421	0.0100	mg/L	10.4	11.0	5.30%	20%	----
		potassium, dissolved	7440-09-7	E421	1.00	mg/L	464	480	3.44%	20%	----
		selenium, dissolved	7782-49-2	E421	0.00100	mg/L	0.00264	0.00221	0.000427	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000200	mg/L	0.000561	0.000692	0.000131	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	1.00	mg/L	3490	3640	4.35%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00400	mg/L	2.52	2.72	7.88%	20%	----
		thallium, dissolved	7440-28-0	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000200	mg/L	0.0116	0.0127	9.66%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.0100	mg/L	16.9	17.8	5.13%	20%	----
		zinc, dissolved	7440-66-6	E421	0.0200	mg/L	1.76	1.85	5.24%	20%	----
		zirconium, dissolved	7440-67-7	E421	0.00400	mg/L	0.260	0.272	4.57%	20%	----
Speciated Metals (QC Lot: 440496)											
EO2201855-008	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 444525)											
FC2200518-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 439379)											
VA22A5558-007	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 440237)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Aggregate Organics (QC Lot: 440237) - continued											
EO2201825-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	1100	1120	1.62%	20%	----
Aggregate Organics (QC Lot: 444994)											
EO2201850-008	Primary Leachate Cell 1 (PC1)	chemical oxygen demand [COD]	----	E559-L	100	mg/L	2150	2340	8.44%	20%	----
Aggregate Organics (QC Lot: 445264)											
EO2201989-004	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 441370)											
EO2201850-001	Primary Leachate Cell 2 (PC2)	benzene	71-43-2	E611A	0.50	µg/L	33.6	31.6	6.10%	30%	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	5.86	5.63	3.86%	30%	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	1.35	1.31	0.04	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	1.73	1.67	0.06	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 443829)											
EO2201850-008	Primary Leachate Cell 1 (PC1)	benzene	71-43-2	E611A	0.50	µg/L	9.07	9.36	3.20%	30%	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	0.52	0.55	0.04	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	0.67	0.66	0.002	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	0.60	0.64	0.04	Diff <2x LOR	----
Hydrocarbons (QC Lot: 441371)											
EO2201850-001	Primary Leachate Cell 2 (PC2)	F1 (C6-C10)	----	E581.F1	100	µg/L	440	490	50	Diff <2x LOR	----
Hydrocarbons (QC Lot: 443828)											
EO2201850-008	Primary Leachate Cell 1 (PC1)	F1 (C6-C10)	----	E581.F1	100	µg/L	370	340	20	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 439336)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 441192)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 442313)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 444214)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 444985)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 445426)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 439381)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 439382)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 439383)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 439384)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 439850)						
phosphorus, total	7723-14-0	E372	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 439874)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 440302)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 443325)						
phosphorus, total	7723-14-0	E372	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 443327)						
phosphorus, total dissolved	7723-14-0	E375-H	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 443794)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 443795)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 443796)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 443798)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 443956)						
phosphorus, total	7723-14-0	E372	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 443957)						
phosphorus, total dissolved	7723-14-0	E375-H	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 444140)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 444239)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Organic / Inorganic Carbon (QCLot: 441547)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 444097)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 439906)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 439936)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 440977)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 443537)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 445042)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 439375)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 439375) - continued						
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 443615)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 443615) - continued						
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Speciated Metals (QCLot: 440496)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Speciated Metals (QCLot: 444525)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 439379)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 440237)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 444994)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 445264)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 441370)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 443829)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 439439)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Hydrocarbons (QCLot: 439439) - continued						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 441371)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 443828)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 444978)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 439335)									
pH	----	E108	----	pH units	6 pH units	101	97.0	103	----
Physical Tests (QCLot: 439336)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	99.9	90.0	110	----
Physical Tests (QCLot: 441192)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	98.8	85.0	115	----
Physical Tests (QCLot: 442313)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	107	85.0	115	----
Physical Tests (QCLot: 444213)									
pH	----	E108	----	pH units	6 pH units	101	97.0	103	----
Physical Tests (QCLot: 444214)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	106	90.0	110	----
Physical Tests (QCLot: 444985)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	91.9	85.0	115	----
Physical Tests (QCLot: 445426)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	98.4	85.0	115	----
Anions and Nutrients (QCLot: 439381)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	93.1	90.0	110	----
Anions and Nutrients (QCLot: 439382)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	92.7	90.0	110	----
Anions and Nutrients (QCLot: 439383)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 439384)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 439850)									
phosphorus, total	7723-14-0	E372	0.02	mg/L	0.5 mg/L	101	80.0	120	----
Anions and Nutrients (QCLot: 439874)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 440302)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	93.8	85.0	115	----
Anions and Nutrients (QCLot: 443325)									
phosphorus, total	7723-14-0	E372	0.02	mg/L	0.5 mg/L	100	80.0	120	----
Anions and Nutrients (QCLot: 443327)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 443327) - continued									
phosphorus, total dissolved	7723-14-0	E375-H	0.02	mg/L	0.5 mg/L	100	80.0	120	----
Anions and Nutrients (QCLot: 443794)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	97.6	90.0	110	----
Anions and Nutrients (QCLot: 443795)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 443796)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 443798)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 443956)									
phosphorus, total	7723-14-0	E372	0.02	mg/L	0.5 mg/L	104	80.0	120	----
Anions and Nutrients (QCLot: 443957)									
phosphorus, total dissolved	7723-14-0	E375-H	0.02	mg/L	0.5 mg/L	104	80.0	120	----
Anions and Nutrients (QCLot: 444140)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 444239)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	103	75.0	125	----
Organic / Inorganic Carbon (QCLot: 441547)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.0	80.0	120	----
Organic / Inorganic Carbon (QCLot: 444097)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	97.2	80.0	120	----
Total Metals (QCLot: 439906)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	108	80.0	120	----
Total Metals (QCLot: 439936)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	107	80.0	120	----
Total Metals (QCLot: 440977)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	105	80.0	120	----
Total Metals (QCLot: 443537)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	107	80.0	120	----
Total Metals (QCLot: 445042)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	113	80.0	120	----
Dissolved Metals (QCLot: 439375)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	110	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	106	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 439375) - continued									
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	108	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	112	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	101	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	105	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	90.8	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	105	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	108	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	106	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	107	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	103	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	105	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	97.7	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	113	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	99.1	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	100	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	103	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	109	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	103	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
Dissolved Metals (QCLot: 443615)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	108	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	105	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	104	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	106	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	118	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	106	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 443615) - continued									
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	106	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	108	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	105	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	105	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	91.1	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	113	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	110	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	97.2	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	97.2	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	107	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	111	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	96.8	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	109	80.0	120	----
Speciated Metals (QCLot: 440496)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
Speciated Metals (QCLot: 444525)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	99.3	80.0	120	----
Aggregate Organics (QCLot: 439379)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	92.0	85.0	115	----
Aggregate Organics (QCLot: 440237)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	92.9	85.0	115	----
Aggregate Organics (QCLot: 444994)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	98.2	85.0	115	----
Aggregate Organics (QCLot: 445264)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	101	85.0	115	----
Volatile Organic Compounds (QCLot: 441370)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	106	70.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 441370) - continued									
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	95.7	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	103	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	100.0	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	105	70.0	130	----
Volatile Organic Compounds (QCLot: 443829)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	84.4	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	99.4	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	94.3	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	97.9	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	101	70.0	130	----
Hydrocarbons (QCLot: 439439)									
F2 (C10-C16)	----	E601	100	µg/L	3260 µg/L	104	70.0	130	----
Hydrocarbons (QCLot: 441371)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	113	70.0	130	----
Hydrocarbons (QCLot: 443828)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	112	70.0	130	----
Hydrocarbons (QCLot: 444978)									
F2 (C10-C16)	----	E601	100	µg/L	3260 µg/L	114	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 439381)										
EO2201851-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.47 mg/L	2.5 mg/L	98.7	75.0	125	----
Anions and Nutrients (QCLot: 439382)										
EO2201851-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.502 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 439383)										
EO2201851-002	Anonymous	chloride	16887-00-6	E235.Cl	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 439384)										
EO2201851-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	97.0 mg/L	100 mg/L	97.0	75.0	125	----
Anions and Nutrients (QCLot: 439850)										
EO2201827-001	Anonymous	phosphorus, total	7723-14-0	E372	ND mg/L	0.37 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 439874)										
CG2203241-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.59 mg/L	2.5 mg/L	104	70.0	130	----
Anions and Nutrients (QCLot: 440302)										
EO2201837-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.100 mg/L	0.1 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 443325)										
EO2201850-005	Primary Leachate Cell 3D (PC3D)	phosphorus, total	7723-14-0	E372	ND mg/L	0.37 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 443327)										
EO2201850-002	Primary Leachate Cell 3A (PC3A)	phosphorus, total dissolved	7723-14-0	E375-H	ND mg/L	0.37 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 443794)										
EO2201990-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	103 mg/L	100 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 443795)										
EO2201990-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.52 mg/L	2.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 443796)										
EO2201990-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.529 mg/L	0.5 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 443798)										
EO2201990-004	Anonymous	chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 443956)										
EO2201987-001	Anonymous	phosphorus, total	7723-14-0	E372	ND mg/L	0.37 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 444239)										
CG2203438-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 441547)										
CG2203236-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.00 mg/L	5 mg/L	100.0	70.0	130	----
Organic / Inorganic Carbon (QCLot: 444097)										
CG2203350-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.47 mg/L	5 mg/L	109	70.0	130	----
Total Metals (QCLot: 439906)										
EO2201828-001	Anonymous	chromium, total	7440-47-3	E420	0.0448 mg/L	0.04 mg/L	112	70.0	130	----
Total Metals (QCLot: 439936)										
EO2201850-007	Primary Leachate Cell 4 (PC4)	chromium, total	7440-47-3	E420	0.0432 mg/L	0.04 mg/L	108	70.0	130	----
Total Metals (QCLot: 440977)										
EO2201855-005	Anonymous	mercury, total	7439-97-6	E508	0.0000981 mg/L	0.0001 mg/L	98.1	70.0	130	----
Total Metals (QCLot: 443537)										
EO2201940-001	Anonymous	chromium, total	7440-47-3	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
Total Metals (QCLot: 445042)										
EO2202016-001	Anonymous	mercury, total	7439-97-6	E508	0.000105 mg/L	0.0001 mg/L	105	70.0	130	----
Dissolved Metals (QCLot: 439375)										
EO2201850-002	Primary Leachate Cell 3A (PC3A)	aluminum, dissolved	7429-90-5	E421	0.216 mg/L	0.2 mg/L	108	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0199 mg/L	0.02 mg/L	99.5	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0422 mg/L	0.04 mg/L	105	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00721 mg/L	0.01 mg/L	72.1	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00418 mg/L	0.004 mg/L	104	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, dissolved	7440-47-3	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0211 mg/L	0.02 mg/L	106	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0168 mg/L	0.02 mg/L	84.2	70.0	130	----
		iron, dissolved	7439-89-6	E421	2.08 mg/L	2 mg/L	104	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0199 mg/L	0.02 mg/L	99.7	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 439375) - continued										
EO2201850-002	Primary Leachate Cell 3A (PC3A)	potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0272 mg/L	0.04 mg/L	67.9	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00344 mg/L	0.004 mg/L	86.0	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00417 mg/L	0.004 mg/L	104	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0209 mg/L	0.02 mg/L	104	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00381 mg/L	0.004 mg/L	95.4	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.423 mg/L	0.4 mg/L	106	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 443615)										
VA22A6028-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.218 mg/L	0.2 mg/L	109	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0216 mg/L	0.02 mg/L	108	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0203 mg/L	0.02 mg/L	101	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0444 mg/L	0.04 mg/L	111	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0104 mg/L	0.01 mg/L	104	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00397 mg/L	0.004 mg/L	99.3	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0414 mg/L	0.04 mg/L	104	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0198 mg/L	0.02 mg/L	99.1	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.97 mg/L	2 mg/L	98.6	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0189 mg/L	0.02 mg/L	94.4	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0402 mg/L	0.04 mg/L	100	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0443 mg/L	0.04 mg/L	111	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00334 mg/L	0.004 mg/L	83.6	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	0.0231 mg/L	0.02 mg/L	115	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00380 mg/L	0.004 mg/L	95.0	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 443615) - continued										
VA22A6028-001	Anonymous	tin, dissolved	7440-31-5	E421	0.0194 mg/L	0.02 mg/L	96.9	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00403 mg/L	0.004 mg/L	101	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.111 mg/L	0.1 mg/L	111	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.381 mg/L	0.4 mg/L	95.2	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0437 mg/L	0.04 mg/L	109	70.0	130	----
Speciated Metals (QCLot: 440496)										
EO2201855-008	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0463 mg/L	0.05 mg/L	92.6	70.0	130	----
Speciated Metals (QCLot: 444525)										
FC2200518-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0496 mg/L	0.05 mg/L	99.2	70.0	130	----
Aggregate Organics (QCLot: 439379)										
VA22A5558-007	Anonymous	phenols, total (4AAP)	----	E562	0.0192 mg/L	0.02 mg/L	95.9	75.0	125	----
Aggregate Organics (QCLot: 440237)										
EO2201828-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	92 mg/L	100 mg/L	92.4	75.0	125	----
Aggregate Organics (QCLot: 444994)										
EO2201878-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Aggregate Organics (QCLot: 445264)										
EO2201989-004	Anonymous	phenols, total (4AAP)	----	E562	0.0193 mg/L	0.02 mg/L	96.7	75.0	125	----
Volatile Organic Compounds (QCLot: 441370)										
EO2201850-002	Primary Leachate Cell 3A (PC3A)	benzene	71-43-2	E611A	ND µg/L	100 µg/L	ND	50.0	140	MS-B
		ethylbenzene	100-41-4	E611A	102 µg/L	100 µg/L	102	50.0	140	----
		toluene	108-88-3	E611A	77.7 µg/L	100 µg/L	77.7	50.0	140	----
		xylene, m+p-	179601-23-1	E611A	206 µg/L	200 µg/L	103	50.0	140	----
		xylene, o-	95-47-6	E611A	104 µg/L	100 µg/L	104	50.0	140	----
Volatile Organic Compounds (QCLot: 443829)										
EO2201878-001	Anonymous	benzene	71-43-2	E611A	73.4 µg/L	100 µg/L	73.4	50.0	140	----
		ethylbenzene	100-41-4	E611A	84.4 µg/L	100 µg/L	84.4	50.0	140	----
		toluene	108-88-3	E611A	82.1 µg/L	100 µg/L	82.1	50.0	140	----
		xylene, m+p-	179601-23-1	E611A	177 µg/L	200 µg/L	88.6	50.0	140	----
		xylene, o-	95-47-6	E611A	88.4 µg/L	100 µg/L	88.4	50.0	140	----

Qualifiers

Qualifier	Description
MS-B	*Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.*

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 966636

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Clean Harbors Canada
Contact:	Todd Webb, Stan Yuha
Phone:	(780) 663-2513
Company address below will appear on the final report	
Street:	PO Box 390, Soil4 Range Road 173
City/Province:	Ryley, AB
Postal Code:	T0B 4A0
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors Canada
Contact:	Robbi Gooding

Reports / Recipients

Select Report Format: ☐ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: webb.todd@cleanharbors.com

Email 2: yuha.stan@cleanharbors.com

Email 3:

Invoice Recipients

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: gooding.robbi@cleanharbors.com

Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] If received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] If received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] If received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm (24hr)

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:

Job #: Primary Leachate Qtr 1 2022

PO / AFE:

LSD: Table 4.4A

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (ALS use only): EO2201850

ALS Contact: Kieran **Sampler:** Murray

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS: Table 4.4A Leachate + Leak Detection Monitoring	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	Primary Leachate Cell 2 (PC2)	21-Mar-22	11:00		✓			
	Primary Leachate Cell 3A (PC3A)	21-Mar-22	11:00		✓			
	Primary Leachate Cell 3B (PC3B)	21-Mar-22	11:00		✓			
	Primary Leachate Cell 3C (PC3C)	21-Mar-22	11:00		✓			
	Primary Leachate Cell 3D (PC3D)	21-Mar-22	11:00		✓			
	Primary Leachate Cell 3E (PC3E)	21-Mar-22	11:00		✓			
	Primary Leachate Cell 4 (PC4)	21-Mar-22	11:00		✓			

Environmental Division
Edmonton
Work Order Reference
EO2201850

Telephone : +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Analyze as per Quote Q82438
Table 4.4A package (attached)
Cyanide bottle for Cr(III) is filtered and preserved
Separate report than COC 966635

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☑ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
13.4							

SHIPMENT RELEASE (client use)

Released by: Todd Webb Date: March 21, 2022 Time: 16:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: VA Date: MAR 21 2022 Time: 5:45pm

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 966638

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Clean Harbors Canada
Contact:	Todd Webb, Stan Yuha
Phone:	780-663-2513
	Company address below will appear on the final report
Street:	PO Box 398, 501M Range Road 173
City/Province:	Rycy, AB
Postal Code:	T0B 4A0
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors Canada
Contact:	Robbi Gooding

Reports / Recipients

Select Report Format: ☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: webb.todd@cleanharbors.com

Email 2: yuha.stan@cleanharbors.com

Email 3:

Invoice Recipients

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: gooding.robbi@cleanharbors.com

Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [EZ] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:	
Job #:	Primary Leachate Qtr 1 2022
PO / AFE:	0000224129
LSD:	Table 4.4A
ALS Lab Work Order # (ALS use only):	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	
ALS Contact: Pamela Toledo	Sampler: Murray

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS: Table 4.4A Leachate	Heat Detection Monitoring	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	Primary Leachate Cell 1 (PC1)	24-Mar-22	14:00		✓				

Environmental Division
Edmonton
Work Order Reference
EO2201850

Telephone : +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Add to same report as COC 966636 (EO2201850)
Table 4.4A package (attached), quote QB2438
Cyanide bottle for [Cr^{+6}] is filtered and preserved

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification. ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Todd Webb	March 25, 2022	10:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

Appendix D

Primary Leachate Analyses

Quarter 2

CERTIFICATE OF ANALYSIS

Work Order	: **EO2204438**	Page	: 1 of 24
Amendment	: **2**		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Rame Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 2 2022	Date Samples Received	: 14-Jun-2022 13:30
PO	: 225924	Date Analysis Commenced	: 14-Jun-2022
C-O-C number	: ----	Issue Date	: 10-Aug-2022 13:41
Sampler	: Murray		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Austin Wasylyshyn	Lab Analyst	Metals, Edmonton, Alberta
Cynthia Bauer	Organic Supervisor	Organics, Calgary, Alberta
Dan Nguyen	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Jeanie Mark	Laboratory Analyst	Organics, Calgary, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Kira Sampley	Lab Analyst	Inorganics, Edmonton, Alberta
Lisa Watt	Lab Supervisor - Environmental	Inorganics, Edmonton, Alberta
Maqsood UlHassan	Laboratory Analyst	Organics, Calgary, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Sobhithan Pillay		Inorganics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.
Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
IB:INT	*Ion Balance Reviewed: Imbalance is due to interference or non-measured component.*
RRV	*Reported result verified by repeat analysis.*
SFP	*Sample was filtered and preserved at the laboratory.*

Analytical Results

EO2204438-001

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 1 (PC1)
Client sampling date / time: 13-Jun-2022 15:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	7470 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	13800 RRV,	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	1730	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	8.03 RRV,	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	11400	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	12200	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	45.2	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	254	5.00	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	2370 DLDS, RRV,	5.00	mg/L	E235.Cl	15-Jun-2022	14-Jun-2022	524655
fluoride	16984-48-8	7.16 DLDS,	0.200	mg/L	E235.F	15-Jun-2022	14-Jun-2022	524652
nitrate (as N)	14797-55-8	<0.200 DLDS,	0.200	mg/L	E235.NO3	15-Jun-2022	14-Jun-2022	524653
nitrate + nitrite (as N)	----	<0.224	0.224	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.100 DLDS,	0.100	mg/L	E235.NO2	15-Jun-2022	14-Jun-2022	524654
phosphorus, total	7723-14-0	16.8	0.200	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	16.0	0.500	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546878
sulfate (as SO4)	14808-79-8	1330 DLDS, RRV,	3.00	mg/L	E235.SO4	15-Jun-2022	14-Jun-2022	524656
Kjeldahl nitrogen, total [TKN]	----	474	10.0	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	916	5.00	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538849
Ion Balance								
ion balance (cations/anions)	----	82.0 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	1.57	0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	0.00167	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.0456	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.680	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	16.1	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.000616	0.0000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	333	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	0.000347	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.512	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.0853	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	0.0138	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	106	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	0.00690	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	0.310	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	282	0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	21.6	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000500 DLM,	0.0000500	mg/L	E508	15-Jun-2022	15-Jun-2022	524171
molybdenum, total	7439-98-7	1.44	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	9.17	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	18.5	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	329	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204438-001

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 1 (PC1)
Client sampling date / time: 13-Jun-2022 15:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals									
rubidium, total	7440-17-7	0.0292		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.00230		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	18.7		1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	0.000651		0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	3030		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	2.64		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	479		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00200	DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	0.00140		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.146		0.00300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	0.0269		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.00263		0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	21.6		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	0.189		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zirconium, total	7440-67-7	0.155		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.570		0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
antimony, dissolved	7440-36-0	0.00132		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
arsenic, dissolved	7440-38-2	0.0393		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
barium, dissolved	7440-39-3	0.681		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
beryllium, dissolved	7440-41-7	<0.000100	DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
bismuth, dissolved	7440-69-9	<0.000250	DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
boron, dissolved	7440-42-8	12.2		0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cadmium, dissolved	7440-43-9	0.000465		0.0000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
calcium, dissolved	7440-70-2	285		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
chromium, dissolved	7440-47-3	0.456		0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cobalt, dissolved	7440-48-4	0.0744		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
copper, dissolved	7440-50-8	0.00108		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
iron, dissolved	7439-89-6	98.2		0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
lead, dissolved	7439-92-1	0.000860		0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
magnesium, dissolved	7439-95-4	248		0.0250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
manganese, dissolved	7439-96-5	18.9		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
molybdenum, dissolved	7439-98-7	1.12		0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
nickel, dissolved	7440-02-0	8.10		0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
potassium, dissolved	7440-09-7	293		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
selenium, dissolved	7782-49-2	0.00154		0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
silver, dissolved	7440-22-4	0.000400		0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
sodium, dissolved	7440-23-5	2600		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
strontium, dissolved	7440-24-6	2.39		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
thallium, dissolved	7440-28-0	<0.000050	DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
tin, dissolved	7440-31-5	0.00130		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
uranium, dissolved	7440-61-1	0.00315		0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
vanadium, dissolved	7440-62-2	19.5		0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zinc, dissolved	7440-66-6	0.142		0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zirconium, dissolved	7440-67-7	0.152		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
dissolved metals filtration location	----	Field		-	-	EP421	-	18-Jun-2022	529228

Analytical Results

EO2204438-001

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 1 (PC1)
Client sampling date / time: 13-Jun-2022 15:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	2250 DLHC,	100	mg/L	E559-L	-	21-Jun-2022	532048
phenols, total (4AAP)	----	0.111	0.0100	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	30.6	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
ethylbenzene	100-41-4	1.08	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
toluene	108-88-3	8.75	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, m+p-	179601-23-1	3.55	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, o-	95-47-6	1.38	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylenes, total	1330-20-7	4.93	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	87.1	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
difluorobenzene, 1,4-	540-36-3	98.3	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
Hydrocarbons								
F1 (C6-C10)	----	400	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	524509
F1-BTEX	----	355	143	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	490	100	µg/L	E601	16-Jun-2022	16-Jun-2022	525803
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	86.3	1.0	%	E601	16-Jun-2022	16-Jun-2022	525803
dichlorotoluene, 3,4-	97-75-0	91.0	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	524509

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204438-002

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 2 (PC2)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	18800 RRV,	10.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	475 RRV,	10.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	36400 RRV,	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	1660	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	8.82 RRV,	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	31000	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	33000	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	6.6	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	580	10.0	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	8200 DLDS, RRV,	50.0	mg/L	E235.Cl	15-Jun-2022	14-Jun-2022	524655
fluoride	16984-48-8	3.12 DLDS,	2.00	mg/L	E235.F	15-Jun-2022	14-Jun-2022	524652
nitrate (as N)	14797-55-8	<2.00 DLDS,	2.00	mg/L	E235.NO3	15-Jun-2022	14-Jun-2022	524653
nitrate + nitrite (as N)	----	<2.24	2.24	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<1.00 DLDS,	1.00	mg/L	E235.NO2	15-Jun-2022	14-Jun-2022	524654

Analytical Results

EO2204438-002

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 2 (PC2)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients									
phosphorus, total	7723-14-0	7.90	RRV,	0.100	mg/L	E372-S	06-Jul-2022	13-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	8.07	RRV, SFP,	0.100	mg/L	E375-U	04-Jul-2022	17-Jul-2022	546878
sulfate (as SO4)	14808-79-8	673	DLDS, RRV,	30.0	mg/L	E235.SO4	15-Jun-2022	14-Jun-2022	524656
Kjeldahl nitrogen, total [TKN]	----	853	DLM,	50.0	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	3010		50.0	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538849
Ion Balance									
ion balance (cations/anions)	----	87.3	IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals									
aluminum, total	7429-90-5	<0.300	DLDS,	0.300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	<0.0100	DLDS, RRV,	0.0100	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
arsenic, total	7440-38-2	0.0481	RRV,	0.0100	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
barium, total	7440-39-3	1.34		0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	<0.00200	DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.00500	DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	66.8		1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.000595	RRV,	0.000500	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
calcium, total	7440-70-2	40.0		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	0.00163		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.365		0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	<0.0100	DLDS,	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	<0.0500	DLDS,	0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	<1.00	DLDS,	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	<0.00500	DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	9.99		0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	413		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	1.10		0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000500	DLM,	0.0000500	mg/L	E508	15-Jun-2022	15-Jun-2022	524171
molybdenum, total	7439-98-7	1.06	RRV,	0.00500	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
nickel, total	7440-02-0	0.287		0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	6.64		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	1220		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
rubidium, total	7440-17-7	0.180		0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	<0.00500	DLDS, RRV,	0.00500	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
silicon, total	7440-21-3	<10.0	DLDS,	10.0	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	9810		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	4.22		0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	273		50.0	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.0200	DLDS,	0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.0100	DLDS,	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.0100	DLDS,	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.152		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	13.9		0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	0.640		0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	<0.300	DLDS,	0.300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204438-002

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 2 (PC2)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals								
zirconium, total	7440-67-7	0.353	0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0771	0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
antimony, dissolved	7440-36-0	0.772 DTC,	0.0100	mg/L	E421	18-Jun-2022	21-Jun-2022	529228
arsenic, dissolved	7440-38-2	0.656 DTC,	0.0100	mg/L	E421	18-Jun-2022	21-Jun-2022	529228
barium, dissolved	7440-39-3	1.38	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
beryllium, dissolved	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
bismuth, dissolved	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
boron, dissolved	7440-42-8	44.5	0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cadmium, dissolved	7440-43-9	0.0161 DTC,	0.000500	mg/L	E421	18-Jun-2022	21-Jun-2022	529228
calcium, dissolved	7440-70-2	33.1	0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
chromium, dissolved	7440-47-3	0.329	0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cobalt, dissolved	7440-48-4	0.00419	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
copper, dissolved	7440-50-8	0.00324	0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
iron, dissolved	7439-89-6	<0.100 DLDS,	0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
magnesium, dissolved	7439-95-4	384	0.0500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
manganese, dissolved	7439-96-5	0.968	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
molybdenum, dissolved	7439-98-7	40.0 DTC,	0.00500	mg/L	E421	18-Jun-2022	21-Jun-2022	529228
nickel, dissolved	7440-02-0	0.278	0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
potassium, dissolved	7440-09-7	1140	0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
selenium, dissolved	7782-49-2	0.0217 DTC,	0.00500	mg/L	E421	18-Jun-2022	21-Jun-2022	529228
silver, dissolved	7440-22-4	0.000779	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
sodium, dissolved	7440-23-5	9040	0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
strontium, dissolved	7440-24-6	3.34	0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
tin, dissolved	7440-31-5	0.00316	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
uranium, dissolved	7440-61-1	0.00115	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
vanadium, dissolved	7440-62-2	0.592	0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zinc, dissolved	7440-66-6	0.0106	0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zirconium, dissolved	7440-67-7	0.330	0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
dissolved metals filtration location	----	Field	-	-	EP421	-	18-Jun-2022	529228
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	9040 DLHC,	100	mg/L	E559-L	-	21-Jun-2022	532048
phenols, total (4AAP)	----	5.25	0.100	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	57.6	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
toluene	108-88-3	7.44	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, m+p-	179601-23-1	1.92	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, o-	95-47-6	1.68	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylenes, total	1330-20-7	3.60	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	84.2	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
difluorobenzene, 1,4-	540-36-3	98.3	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
Hydrocarbons								

Analytical Results

EO2204438-002

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 2 (PC2)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Hydrocarbons								
F1 (C6-C10)	----	550	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	524509
F1-BTEX	----	481	189	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	1340	100	µg/L	E601	16-Jun-2022	16-Jun-2022	525803
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	94.1	1.0	%	E601	16-Jun-2022	16-Jun-2022	525803
dichlorotoluene, 3,4-	97-75-0	96.0	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	524509

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204438-003

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3A (PC3A)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	8960 RRV,	10.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	27200 RRV,	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	2380	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	8.10 RRV,	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	17600	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	21100	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	163	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	585	10.0	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	8040 DLDS, RRV,	10.0	mg/L	E235.Cl	15-Jun-2022	14-Jun-2022	524655
fluoride	16984-48-8	<0.400 DLDS,	0.400	mg/L	E235.F	15-Jun-2022	14-Jun-2022	524652
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	15-Jun-2022	14-Jun-2022	524653
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	15-Jun-2022	14-Jun-2022	524654
phosphorus, total	7723-14-0	4.20	0.100	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	4.72 SFP,	0.100	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546878
sulfate (as SO4)	14808-79-8	264 DLDS,	6.00	mg/L	E235.SO4	15-Jun-2022	14-Jun-2022	524656
Kjeldahl nitrogen, total [TKN]	----	654	10.0	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	831	5.00	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538849
Ion Balance								
ion balance (cations/anions)	----	89.2 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	<0.300 DLDS,	0.300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	<0.0100 DLDS,	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.356	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	1.60	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	<0.00200 DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.00500 DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204438-003

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3A (PC3A)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals									
boron, total	7440-42-8	35.9		1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	<0.000500	DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	280		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	0.00166		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.220		0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	<0.0100	DLDS,	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	<0.0500	DLDS,	0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	<1.00	DLDS,	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	<0.00500	DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	2.60		0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	458		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	1.58		0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000500	DLM,	0.0000500	mg/L	E508	15-Jun-2022	15-Jun-2022	524171
molybdenum, total	7439-98-7	0.150	RRV,	0.00500	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
nickel, total	7440-02-0	0.465		0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	6.07		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	1010		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
rubidium, total	7440-17-7	0.729		0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.00921		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	17.8		10.0	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	5290		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	5.56		0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	151		50.0	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.0200	DLDS,	0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.0100	DLDS,	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.0100	DLDS,	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.0698		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	1.45		0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	0.180		0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	<0.300	DLDS,	0.300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zirconium, total	7440-67-7	0.172		0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0646		0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
antimony, dissolved	7440-36-0	0.0108		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
arsenic, dissolved	7440-38-2	0.379		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
barium, dissolved	7440-39-3	1.71		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
boron, dissolved	7440-42-8	31.0		0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cadmium, dissolved	7440-43-9	0.000299		0.0000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
calcium, dissolved	7440-70-2	272		0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
chromium, dissolved	7440-47-3	0.213		0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cobalt, dissolved	7440-48-4	0.00852		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
copper, dissolved	7440-50-8	0.00479		0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
iron, dissolved	7439-89-6	0.103		0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228

Analytical Results

EO2204438-003

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3A (PC3A)

Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
magnesium, dissolved	7439-95-4	414	0.0500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
manganese, dissolved	7439-96-5	1.46	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
molybdenum, dissolved	7439-98-7	0.632 DTC,	0.00500	mg/L	E421	18-Jun-2022	21-Jun-2022	529228
nickel, dissolved	7440-02-0	0.433	0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
potassium, dissolved	7440-09-7	892	0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
selenium, dissolved	7782-49-2	0.00779	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
silver, dissolved	7440-22-4	0.000498	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
sodium, dissolved	7440-23-5	5200	0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
strontium, dissolved	7440-24-6	5.23	0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
tin, dissolved	7440-31-5	0.00148	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
uranium, dissolved	7440-61-1	0.000503	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
vanadium, dissolved	7440-62-2	0.175	0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zinc, dissolved	7440-66-6	0.0128	0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zirconium, dissolved	7440-67-7	0.184	0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
dissolved metals filtration location	----	Field	-	-	EP421	-	18-Jun-2022	529228
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	3710 DLHC,	100	mg/L	E559-L	-	21-Jun-2022	532048
phenols, total (4AAP)	----	8.57	0.100	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	184	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
ethylbenzene	100-41-4	7.26	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
toluene	108-88-3	105	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, m+p-	179601-23-1	63.9	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, o-	95-47-6	18.5	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylenes, total	1330-20-7	82.4	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	96.9	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
difluorobenzene, 1,4-	540-36-3	98.6	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
Hydrocarbons								
F1 (C6-C10)	----	560	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	524509
F1-BTEX	----	<214	214	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	20800	100	µg/L	E601	16-Jun-2022	16-Jun-2022	525803
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	103	1.0	%	E601	16-Jun-2022	16-Jun-2022	525803
dichlorotoluene, 3,4-	97-75-0	91.0	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	524509

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204438-004

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3B (PC3B)

Client sampling date / time: 13-Jun-2022 11:00

Analytical Results

EO2204438-004

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3B (PC3B)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	8800 RRV,	10.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	4950 RRV,	10.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	40900.00 RRV,	1	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	261	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	9.11 RRV,	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	34800	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	41100	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	8.6	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	1880	25.0	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	10400 DLDS, RRV,	50.0	mg/L	E235.Cl	15-Jun-2022	14-Jun-2022	524655
fluoride	16984-48-8	<2.00 DLDS,	2.00	mg/L	E235.F	15-Jun-2022	14-Jun-2022	524652
nitrate (as N)	14797-55-8	<2.00 DLDS,	2.00	mg/L	E235.NO3	15-Jun-2022	14-Jun-2022	524653
nitrate + nitrite (as N)	----	<2.24	2.24	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<1.00 DLDS,	1.00	mg/L	E235.NO2	15-Jun-2022	14-Jun-2022	524654
phosphorus, total	7723-14-0	5.08	0.100	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	5.36 SFP,	0.100	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546878
sulfate (as SO4)	14808-79-8	1400 DLDS, RRV,	30.0	mg/L	E235.SO4	15-Jun-2022	14-Jun-2022	524656
Kjeldahl nitrogen, total [TKN]	----	1980 DLM,	50.0	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	5850	50.0	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538849
Ion Balance								
ion balance (cations/anions)	----	93.5 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	0.404	0.300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	<0.0100 DLDS,	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.132	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.567	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	<0.00200 DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.00500 DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	152	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.0108	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	13.3	5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	0.143	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.638	0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.0215	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	0.0695	0.0500	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
iron, total	7439-89-6	1.24	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	0.00718	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	10.0	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	52.7	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	0.893	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000500 DLM,	0.0000500	mg/L	E508	15-Jun-2022	15-Jun-2022	524172
molybdenum, total	7439-98-7	28.3	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	1.28	0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	6.27	5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	3090	5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204438-004

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3B (PC3B)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals									
rubidium, total	7440-17-7	5.04		0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.0579		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	36.6		10.0	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	9340		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	0.856		0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	625		50.0	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.0200	DLDS,	0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.0100	DLDS,	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.0100	DLDS,	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.0730		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	11.0		0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.00112		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	0.368		0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	<0.300	DLDS,	0.300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zirconium, total	7440-67-7	0.130		0.0200	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0384		0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
antimony, dissolved	7440-36-0	0.00853		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
arsenic, dissolved	7440-38-2	0.148		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
barium, dissolved	7440-39-3	0.597		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
boron, dissolved	7440-42-8	119		0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cadmium, dissolved	7440-43-9	0.0142		0.0000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
calcium, dissolved	7440-70-2	17.6		0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
chromium, dissolved	7440-47-3	0.582		0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cobalt, dissolved	7440-48-4	0.0204		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
copper, dissolved	7440-50-8	<0.0200	DLDS,	0.0200	mg/L	E421	18-Jun-2022	21-Jun-2022	529228
iron, dissolved	7439-89-6	1.48		0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
lead, dissolved	7439-92-1	0.00695		0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
magnesium, dissolved	7439-95-4	52.8		0.0500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
manganese, dissolved	7439-96-5	0.821		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
molybdenum, dissolved	7439-98-7	31.3		0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
nickel, dissolved	7440-02-0	1.14		0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
potassium, dissolved	7440-09-7	2850		0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
selenium, dissolved	7782-49-2	0.0716		0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
silver, dissolved	7440-22-4	0.000655		0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
sodium, dissolved	7440-23-5	8710		0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
strontium, dissolved	7440-24-6	0.835		0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
thallium, dissolved	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
tin, dissolved	7440-31-5	0.00974		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
uranium, dissolved	7440-61-1	0.00122		0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
vanadium, dissolved	7440-62-2	0.348		0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zinc, dissolved	7440-66-6	0.0338		0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zirconium, dissolved	7440-67-7	0.0895		0.0200	mg/L	E421	18-Jun-2022	21-Jun-2022	529228
dissolved metals filtration location	----	Field		-	-	EP421	-	18-Jun-2022	529228

Analytical Results

EO2204438-004

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3B (PC3B)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	15800 DLHC,	100	mg/L	E559-L	-	21-Jun-2022	532048
phenols, total (4AAP)	----	21.2	0.500	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	13.9	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
ethylbenzene	100-41-4	0.73	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
toluene	108-88-3	8.70	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylene, m+p-	179601-23-1	2.40	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylene, o-	95-47-6	2.11	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylenes, total	1330-20-7	4.51	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	104	1.0	%	E611A	15-Jun-2022	15-Jun-2022	525011
difluorobenzene, 1,4-	540-36-3	97.0	1.0	%	E611A	15-Jun-2022	15-Jun-2022	525011
Hydrocarbons								
F1 (C6-C10)	----	1570	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	525010
F1-BTEX	----	1540	508	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	2230	100	µg/L	E601	16-Jun-2022	16-Jun-2022	525803
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	104	1.0	%	E601	16-Jun-2022	16-Jun-2022	525803
dichlorotoluene, 3,4-	97-75-0	97.8	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	525010

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204438-005

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3C (PC3C)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	5880 RRV,	10.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	108 RRV,	10.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	13800 RRV,	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	648	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	8.65 RRV,	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	7800	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	10500	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	41.0	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	638	10.0	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	2630 DLDS, RRV,	10.0	mg/L	E235.Cl	15-Jun-2022	14-Jun-2022	524655
fluoride	16984-48-8	0.567 DLDS,	0.400	mg/L	E235.F	15-Jun-2022	14-Jun-2022	524652
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	15-Jun-2022	14-Jun-2022	524653
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	15-Jun-2022	14-Jun-2022	524654

Analytical Results

EO2204438-005

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3C (PC3C)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients								
phosphorus, total	7723-14-0	3.77	0.100	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	3.04 SFP,	0.0500	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546878
sulfate (as SO4)	14808-79-8	558 DLDS, RRV,	6.00	mg/L	E235.SO4	15-Jun-2022	14-Jun-2022	524656
Kjeldahl nitrogen, total [TKN]	----	769 DLM,	25.0	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	556	5.00	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538849
Ion Balance								
ion balance (cations/anions)	----	90.9 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	0.0407	0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	<0.00100 DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.0373	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.0896	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	42.2	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.000529	0.0000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	42.7	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	0.000594	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
cobalt, total	7440-48-4	0.00264	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	<0.00500 DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	0.794	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	0.00174	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	1.85	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	147	0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	0.293	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000500 DLM,	0.0000500	mg/L	E508	15-Jun-2022	15-Jun-2022	524172
molybdenum, total	7439-98-7	1.41	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	0.514	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	4.33	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	398	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
rubidium, total	7440-17-7	0.241	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.00560	0.000500	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
silicon, total	7440-21-3	9.61	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	0.000223	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	2360	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	0.399	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	255	5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00200 DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00100 DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	0.00104	0.00100	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
titanium, total	7440-32-6	0.00457	0.00300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	0.0472	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.00469	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	5.31	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	<0.0300 DLDS,	0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204438-005

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3C (PC3C)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals								
zirconium, total	7440-67-7	0.0484	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0173	0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
antimony, dissolved	7440-36-0	0.00065	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
arsenic, dissolved	7440-38-2	0.0306	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
barium, dissolved	7440-39-3	0.113	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
beryllium, dissolved	7440-41-7	<0.000100 DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
bismuth, dissolved	7440-69-9	<0.000250 DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
boron, dissolved	7440-42-8	35.3	0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cadmium, dissolved	7440-43-9	0.000532	0.0000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
calcium, dissolved	7440-70-2	40.1	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
chromium, dissolved	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E421	18-Jun-2022	21-Jun-2022	529228
cobalt, dissolved	7440-48-4	0.00235	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
copper, dissolved	7440-50-8	0.00205	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
iron, dissolved	7439-89-6	0.389	0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
lead, dissolved	7439-92-1	<0.000250 DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
magnesium, dissolved	7439-95-4	133	0.0250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
manganese, dissolved	7439-96-5	0.255	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
molybdenum, dissolved	7439-98-7	1.16	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
nickel, dissolved	7440-02-0	0.486	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
potassium, dissolved	7440-09-7	390	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
selenium, dissolved	7782-49-2	0.00599	0.000500	mg/L	E421	18-Jun-2022	21-Jun-2022	529228
silver, dissolved	7440-22-4	0.000201	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
sodium, dissolved	7440-23-5	2320	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
strontium, dissolved	7440-24-6	0.348	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
thallium, dissolved	7440-28-0	<0.000050 DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	18-Jun-2022	21-Jun-2022	529228
uranium, dissolved	7440-61-1	0.00454	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
vanadium, dissolved	7440-62-2	4.68	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zinc, dissolved	7440-66-6	0.0089	0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zirconium, dissolved	7440-67-7	0.0626	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
dissolved metals filtration location	----	Field	-	-	EP421	-	18-Jun-2022	529228
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	2210 DLHC,	100	mg/L	E559-L	-	21-Jun-2022	532048
phenols, total (4AAP)	----	0.737	0.0200	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	17.3	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
ethylbenzene	100-41-4	66.4	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
toluene	108-88-3	222	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylene, m+p-	179601-23-1	318	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylene, o-	95-47-6	132	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylenes, total	1330-20-7	450	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	104	1.0	%	E611A	15-Jun-2022	15-Jun-2022	525011
difluorobenzene, 1,4-	540-36-3	99.9	1.0	%	E611A	15-Jun-2022	15-Jun-2022	525011
Hydrocarbons								

Analytical Results

EO2204438-005

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3C (PC3C)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Hydrocarbons								
F1 (C6-C10)	----	1420	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	525010
F1-BTEX	----	664	502	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	3790	100	µg/L	E601	16-Jun-2022	16-Jun-2022	526034
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	95.4	1.0	%	E601	16-Jun-2022	16-Jun-2022	526034
dichlorotoluene, 3,4-	97-75-0	95.3	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	525010

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204438-006

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3D (PC3D
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	6200 RRV,	10.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	19100 RRV,	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	1420	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	8.18 RRV,	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	12800	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	14500	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	85.0	3.0	mg/L	E160	-	15-Jun-2022	524770
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	337	5.00	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	5100 DLDS, RRV,	10.0	mg/L	E235.Cl	15-Jun-2022	14-Jun-2022	524655
fluoride	16984-48-8	<0.400 DLDS,	0.400	mg/L	E235.F	15-Jun-2022	14-Jun-2022	524652
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	15-Jun-2022	14-Jun-2022	524653
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	15-Jun-2022	14-Jun-2022	524654
phosphorus, total	7723-14-0	3.63	0.100	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	2.55 SFP,	0.100	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546879
sulfate (as SO4)	14808-79-8	243 DLDS, RRV,	6.00	mg/L	E235.SO4	15-Jun-2022	14-Jun-2022	524656
Kjeldahl nitrogen, total [TKN]	----	534 DLM,	25.0	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	1040	25.0	mg/L	E358-L	28-Jun-2022	28-Jun-2022	541673
Ion Balance								
ion balance (cations/anions)	----	88.4 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	0.0694	0.0600	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	<0.00200 DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.0389	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.615	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	<0.000400 DLDS,	0.000400	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.00100 DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204438-006

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3D (PC3D

Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals								
boron, total	7440-42-8	35.6	0.200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.00250	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	239	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	0.00156	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.0251	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.00862	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	<0.0100 DLDS,	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	2.42	0.200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	0.00142	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	1.63	0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	225	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	1.88	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000500 DLM,	0.0000500	mg/L	E508	15-Jun-2022	15-Jun-2022	524172
molybdenum, total	7439-98-7	6.30	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	4.27	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	5.69	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	637	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
rubidium, total	7440-17-7	0.400	0.00400	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.00969	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	15.7	2.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	0.000215	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	3610	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	2.71	0.00400	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	157	10.0	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00400 DLDS,	0.00400	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000200 DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00200 DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.00200 DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.0109	0.00600	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	0.0680	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.00151	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	5.68	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	0.107	0.0600	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zirconium, total	7440-67-7	0.0648	0.00400	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0267	0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
antimony, dissolved	7440-36-0	0.00108	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
arsenic, dissolved	7440-38-2	0.0298	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
barium, dissolved	7440-39-3	0.684	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
beryllium, dissolved	7440-41-7	<0.000100 DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
bismuth, dissolved	7440-69-9	<0.000250 DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
boron, dissolved	7440-42-8	27.2	0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cadmium, dissolved	7440-43-9	0.00156	0.0000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
calcium, dissolved	7440-70-2	219	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
chromium, dissolved	7440-47-3	0.0183	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cobalt, dissolved	7440-48-4	0.00429	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
copper, dissolved	7440-50-8	0.00296	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
iron, dissolved	7439-89-6	1.16	0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228

Analytical Results

EO2204438-006

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3D (PC3D

Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
lead, dissolved	7439-92-1	0.000398	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
magnesium, dissolved	7439-95-4	213	0.0250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
manganese, dissolved	7439-96-5	1.74	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
molybdenum, dissolved	7439-98-7	3.01	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
nickel, dissolved	7440-02-0	4.01	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
potassium, dissolved	7440-09-7	600	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
selenium, dissolved	7782-49-2	0.0100	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
silver, dissolved	7440-22-4	0.000194	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
sodium, dissolved	7440-23-5	3530	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
strontium, dissolved	7440-24-6	2.41	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
thallium, dissolved	7440-28-0	<0.000050 DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
tin, dissolved	7440-31-5	0.00130	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
uranium, dissolved	7440-61-1	0.00128	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
vanadium, dissolved	7440-62-2	5.02	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zinc, dissolved	7440-66-6	0.0349	0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zirconium, dissolved	7440-67-7	0.0683	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
dissolved metals filtration location	----	Field	-	-	EP421	-	18-Jun-2022	529228
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	3720 DLHC,	100	mg/L	E559-L	-	21-Jun-2022	532048
phenols, total (4AAP)	----	7.08	0.100	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	40.4	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
ethylbenzene	100-41-4	2.84	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
toluene	108-88-3	28.5	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylene, m+p-	179601-23-1	7.06	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylene, o-	95-47-6	5.05	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylenes, total	1330-20-7	12.1	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	119	1.0	%	E611A	15-Jun-2022	15-Jun-2022	525011
difluorobenzene, 1,4-	540-36-3	102	1.0	%	E611A	15-Jun-2022	15-Jun-2022	525011
Hydrocarbons								
F1 (C6-C10)	----	540	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	525010
F1-BTEX	----	456	186	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	1430	100	µg/L	E601	16-Jun-2022	16-Jun-2022	526034
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	85.8	1.0	%	E601	16-Jun-2022	16-Jun-2022	526034
dichlorotoluene, 3,4-	97-75-0	99.9	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	525010

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204438-007

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3E (PC3E)

Client sampling date / time: 13-Jun-2022 11:00

Analytical Results

EO2204438-007

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3E (PC3E)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	6620 RRV,	10.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	14400 RRV,	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	1060	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	8.30 RRV,	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	8060	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	10500	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	22.6	3.0	mg/L	E160	-	15-Jun-2022	524770
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	515	10.0	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	2900 DLDS, RRV,	10.0	mg/L	E235.Cl	15-Jun-2022	14-Jun-2022	524655
fluoride	16984-48-8	<0.400 DLDS,	0.400	mg/L	E235.F	15-Jun-2022	14-Jun-2022	524652
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	15-Jun-2022	14-Jun-2022	524653
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	15-Jun-2022	14-Jun-2022	524654
phosphorus, total	7723-14-0	1.17	0.0200	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	1.06 SFP,	0.0200	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546879
sulfate (as SO4)	14808-79-8	486 DLDS, RRV,	6.00	mg/L	E235.SO4	15-Jun-2022	14-Jun-2022	524656
Kjeldahl nitrogen, total [TKN]	----	645 DLM,	25.0	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	195	5.00	mg/L	E358-L	28-Jun-2022	28-Jun-2022	541673
Ion Balance								
ion balance (cations/anions)	----	84.5 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	0.0981	0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	<0.00100 DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.00980	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.234	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	4.84	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.000140	0.0000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	86.0	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	0.00528	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.00670	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.00714	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	0.0125	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	0.309	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	0.729	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	231	0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	0.523	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000500 DLM,	0.0000500	mg/L	E508	15-Jun-2022	15-Jun-2022	524172
molybdenum, total	7439-98-7	0.267	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	0.727	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	1.23	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	267	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204438-007

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3E (PC3E)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals									
rubidium, total	7440-17-7	0.386		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.00253		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	13.1		1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	0.000247		0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	2440		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	2.58		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	262		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00200	DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.00565		0.00300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	0.0289		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.00859		0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	4.07		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	<0.0300	DLDS,	0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zirconium, total	7440-67-7	0.0908		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0417		0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
antimony, dissolved	7440-36-0	<0.00050	DLDS,	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
arsenic, dissolved	7440-38-2	0.00873		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
barium, dissolved	7440-39-3	0.248		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
beryllium, dissolved	7440-41-7	<0.000100	DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
bismuth, dissolved	7440-69-9	<0.000250	DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
boron, dissolved	7440-42-8	4.58		0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cadmium, dissolved	7440-43-9	0.000136		0.0000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
calcium, dissolved	7440-70-2	82.0		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
chromium, dissolved	7440-47-3	0.00319		0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cobalt, dissolved	7440-48-4	0.00554		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
copper, dissolved	7440-50-8	0.00403		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
iron, dissolved	7439-89-6	0.172		0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
lead, dissolved	7439-92-1	<0.000250	DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
magnesium, dissolved	7439-95-4	209		0.0250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
manganese, dissolved	7439-96-5	0.472		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
molybdenum, dissolved	7439-98-7	0.228		0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
nickel, dissolved	7440-02-0	0.675		0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
potassium, dissolved	7440-09-7	235		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
selenium, dissolved	7782-49-2	0.00265		0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
silver, dissolved	7440-22-4	0.000266		0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
sodium, dissolved	7440-23-5	2420		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
strontium, dissolved	7440-24-6	2.28		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
thallium, dissolved	7440-28-0	<0.000050	DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
tin, dissolved	7440-31-5	<0.00050	DLDS,	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
uranium, dissolved	7440-61-1	0.00844		0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
vanadium, dissolved	7440-62-2	3.73		0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zinc, dissolved	7440-66-6	0.0107		0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zirconium, dissolved	7440-67-7	0.0909		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
dissolved metals filtration location	----	Field		-	-	EP421	-	18-Jun-2022	529228

Analytical Results

EO2204438-007

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3E (PC3E)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	1510 DLHC,	100	mg/L	E559-L	-	21-Jun-2022	532048
phenols, total (4AAP)	----	0.0249	0.0100	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	29.7	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
ethylbenzene	100-41-4	1.86	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
toluene	108-88-3	2.64	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylene, m+p-	179601-23-1	1.18	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylene, o-	95-47-6	0.96	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylenes, total	1330-20-7	2.14	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	89.9	1.0	%	E611A	15-Jun-2022	15-Jun-2022	525011
difluorobenzene, 1,4-	540-36-3	100	1.0	%	E611A	15-Jun-2022	15-Jun-2022	525011
Hydrocarbons								
F1 (C6-C10)	----	250	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	525010
F1-BTEX	----	214	100	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	12200	100	µg/L	E601	16-Jun-2022	16-Jun-2022	526034
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	90.2	1.0	%	E601	16-Jun-2022	16-Jun-2022	526034
dichlorotoluene, 3,4-	97-75-0	88.0	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	525010

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204438-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 4)PC4)
Client sampling date / time: 14-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	5400 RRV,	10.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529807
alkalinity, carbonate (as CO3)	3812-32-6	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529807
alkalinity, hydroxide (as OH)	14280-30-9	<1.0 RRV,	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529807
conductivity	----	14200 RRV,	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529809
hardness (as CaCO3), dissolved	----	1430	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	8.34 RRV,	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529808
solids, total dissolved [TDS]	----	9880	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	11400	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	38.8	3.0	mg/L	E160	-	15-Jun-2022	524770
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	370	5.00	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	3030 DLDS, RRV,	10.0	mg/L	E235.Cl	15-Jun-2022	14-Jun-2022	524655
fluoride	16984-48-8	<0.400 DLDS,	0.400	mg/L	E235.F	15-Jun-2022	14-Jun-2022	524652
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	15-Jun-2022	14-Jun-2022	524653
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	15-Jun-2022	14-Jun-2022	524654

Analytical Results

EO2204438-008

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 4)PC4)
Client sampling date / time: 14-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients								
phosphorus, total	7723-14-0	2.30	0.0500	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	2.08	0.0500	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546879
sulfate (as SO4)	14808-79-8	259 DLDS, RRV,	6.00	mg/L	E235.SO4	15-Jun-2022	14-Jun-2022	524656
Kjeldahl nitrogen, total [TKN]	----	25500 DLM,	25.0	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	1830	25.0	mg/L	E358-L	28-Jun-2022	28-Jun-2022	541673
Ion Balance								
ion balance (cations/anions)	----	91.1 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	0.323	0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	0.00164	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.0229	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.424	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	0.000225	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	20.7	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.00136	0.0000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	318	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	0.0171	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.0122	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.0115	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	0.0436	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	4.39	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	0.00105	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	0.124	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	193	0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	2.72	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000500 DLM,	0.0000500	mg/L	E508	15-Jun-2022	15-Jun-2022	524172
molybdenum, total	7439-98-7	3.01	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	0.306	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	4.13	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	338	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
rubidium, total	7440-17-7	0.270	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.00491	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	14.1	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	0.000122	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	2550	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	2.07	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	154	5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00200 DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00100 DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.0304	0.00300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	0.0864	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.00356	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	0.527	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	0.0950	0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204438-008

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 4)PC4)
Client sampling date / time: 14-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals								
zirconium, total	7440-67-7	0.0289	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.117	0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
antimony, dissolved	7440-36-0	0.00134	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
arsenic, dissolved	7440-38-2	0.0207	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
barium, dissolved	7440-39-3	0.443	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
beryllium, dissolved	7440-41-7	0.000140	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
bismuth, dissolved	7440-69-9	<0.000250 DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
boron, dissolved	7440-42-8	15.6	0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cadmium, dissolved	7440-43-9	0.000950	0.0000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
calcium, dissolved	7440-70-2	292	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
chromium, dissolved	7440-47-3	0.00867	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cobalt, dissolved	7440-48-4	0.00685	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
copper, dissolved	7440-50-8	0.00268	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
iron, dissolved	7439-89-6	1.42	0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
lead, dissolved	7439-92-1	0.000256	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
magnesium, dissolved	7439-95-4	171	0.0250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
manganese, dissolved	7439-96-5	2.43	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
molybdenum, dissolved	7439-98-7	2.08	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
nickel, dissolved	7440-02-0	0.271	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
potassium, dissolved	7440-09-7	309	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
selenium, dissolved	7782-49-2	0.00630	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
silver, dissolved	7440-22-4	0.000096	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
sodium, dissolved	7440-23-5	2290	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
strontium, dissolved	7440-24-6	1.84	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
thallium, dissolved	7440-28-0	<0.000050 DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
tin, dissolved	7440-31-5	<0.00050 DLDS,	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
uranium, dissolved	7440-61-1	0.00372	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
vanadium, dissolved	7440-62-2	0.470	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zinc, dissolved	7440-66-6	0.0275	0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zirconium, dissolved	7440-67-7	0.0297	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
dissolved metals filtration location	----	Field	-	-	EP421	-	18-Jun-2022	529228
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	5540 DLHC,	100	mg/L	E559-L	-	21-Jun-2022	532048
phenols, total (4AAP)	----	4.00	0.100	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	139	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
ethylbenzene	100-41-4	40.5	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
toluene	108-88-3	378	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylene, m+p-	179601-23-1	138	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylene, o-	95-47-6	50.3	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
xylenes, total	1330-20-7	188	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	525011
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	101	1.0	%	E611A	15-Jun-2022	15-Jun-2022	525011
difluorobenzene, 1,4-	540-36-3	99.4	1.0	%	E611A	15-Jun-2022	15-Jun-2022	525011
Hydrocarbons								

Analytical Results

EO2204438-008

Sub-Matrix:**Water**
(Matrix: **Water)**

Client sample ID: PRIMARY LEACHATE CELL 4)PC4)
Client sampling date / time: 14-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Hydrocarbons								
F1 (C6-C10)	----	1250	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	525010
F1-BTEX	----	504	450	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	5340	100	µg/L	E601	16-Jun-2022	16-Jun-2022	526034
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	88.4	1.0	%	E601	16-Jun-2022	16-Jun-2022	526034
dichlorotoluene, 3,4-	97-75-0	100	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	525010

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2204438**	Page	: 1 of 31
Amendment	: **2**		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Rame Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 2 2022	Date Samples Received	: 14-Jun-2022 13:30
PO	: 225924	Issue Date	: 10-Aug-2022 13:42
C-O-C number	: ----		
Sampler	: Murray		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 4)PC4)	E559-L	14-Jun-2022	----	----	----		21-Jun-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 4)PC4)	E562	14-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	10 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PRIMARY LEACHATE CELL 4)PC4)	E298	14-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	17 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PRIMARY LEACHATE CELL 1 (PC1)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PRIMARY LEACHATE CELL 2 (PC2)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PRIMARY LEACHATE CELL 3A (PC3A)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PRIMARY LEACHATE CELL 3B (PC3B)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PRIMARY LEACHATE CELL 3C (PC3C)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PRIMARY LEACHATE CELL 3D (PC3D	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PRIMARY LEACHATE CELL 3E (PC3E)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
PRIMARY LEACHATE CELL 4)PC4)	E235.Cl	14-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E235.Cl	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E235.Cl	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E235.Cl	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E235.Cl	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E235.Cl	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3D (PC3D	E235.Cl	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E235.Cl	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 4)PC4)	E235.F	14-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	0 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E235.F	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E235.F	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E235.F	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E235.F	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E235.F	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3D (PC3D	E235.F	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E235.F	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 4)PC4)	E235.NO3	14-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E235.NO3	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E235.NO3	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E235.NO3	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E235.NO3	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E235.NO3	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3D (PC3D	E235.NO3	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E235.NO3	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 4)PC4)	E235.NO2	14-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E235.NO2	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E235.NO2	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E235.NO2	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E235.NO2	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E235.NO2	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 3D (PC3D	E235.NO2	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E235.NO2	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 4)PC4)	E235.SO4	14-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	0 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E235.SO4	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E235.SO4	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E235.SO4	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E235.SO4	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
PRIMARY LEACHATE CELL 3C (PC3C)	E235.SO4	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
PRIMARY LEACHATE CELL 3D (PC3D	E235.SO4	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
PRIMARY LEACHATE CELL 3E (PC3E)	E235.SO4	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
PRIMARY LEACHATE CELL 4)PC4)	E375-U	14-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	21 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
PRIMARY LEACHATE CELL 1 (PC1)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
PRIMARY LEACHATE CELL 2 (PC2)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
PRIMARY LEACHATE CELL 3A (PC3A)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
PRIMARY LEACHATE CELL 3B (PC3B)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
PRIMARY LEACHATE CELL 3C (PC3C)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 4)PC4)	E318	14-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 4)PC4)	E372-S	14-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	25 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	30 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 4)PC4)	E421	14-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 1 (PC1)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 2 (PC2)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 3D (PC3D	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 4)PC4)	E581.F1	14-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 1 (PC1)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 2 (PC2)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3A (PC3A)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3B (PC3B)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3C (PC3C)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3D (PC3D	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3E (PC3E)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 4)PC4)	E601	14-Jun-2022	16-Jun-2022	14 days	2 days	✓	16-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 1 (PC1)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 2 (PC2)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 3A (PC3A)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 3B (PC3B)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 3C (PC3C)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 3D (PC3D	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 3E (PC3E)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 4)PC4)	E358-L	14-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	28 days	14 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D	E358-L	13-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	28 days	15 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E358-L	13-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	28 days	15 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 4)PC4)	E290	14-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 3D (PC3D	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 4)PC4)	E100	14-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 3D (PC3D	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 3D (PC3D	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 4)PC4)	E108	14-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	✖ EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 4)PC4)	E162	14-Jun-2022	----	----	----		19-Jun-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3D (PC3D	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 4)PC4)	E160	14-Jun-2022	----	----	----		15-Jun-2022	7 days	1 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3D (PC3D	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) PRIMARY LEACHATE CELL 4)PC4)	E532A	14-Jun-2022	----	----	----		15-Jun-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) PRIMARY LEACHATE CELL 1 (PC1)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) PRIMARY LEACHATE CELL 2 (PC2)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) PRIMARY LEACHATE CELL 3A (PC3A)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) PRIMARY LEACHATE CELL 3B (PC3B)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) PRIMARY LEACHATE CELL 3C (PC3C)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) PRIMARY LEACHATE CELL 3D (PC3D	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) PRIMARY LEACHATE CELL 3E (PC3E)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 4)PC4)	E508	14-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	1 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 1 (PC1)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 2 (PC2)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 3D (PC3D	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 4)PC4)	E420	14-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 1 (PC1)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 2 (PC2)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 3D (PC3D	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 4)PC4)	E611A	14-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 1 (PC1)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 2 (PC2)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3A (PC3A)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3B (PC3B)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3C (PC3C)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3D (PC3D	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3E (PC3E)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	546260	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	524508	2	25	8.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	524509	2	16	12.5	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	532048	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	524655	1	20	5.0	5.0	✓
Conductivity in Water	E100	529809	2	31	6.4	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	524600	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	529228	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	538849	2	40	5.0	5.0	✓
Fluoride in Water by IC	E235.F	524652	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	524653	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	524654	1	19	5.2	5.0	✓
pH by Meter	E108	529808	2	32	6.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	537934	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	524656	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	529775	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	546878	3	55	5.4	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	549006	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	524171	2	38	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	530405	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	549816	2	33	6.0	5.0	✓
TSS by Gravimetry	E160	524518	2	40	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	546260	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	524508	2	25	8.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	524509	2	16	12.5	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	525803	2	37	5.4	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	532048	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	524655	1	20	5.0	5.0	✓
Conductivity in Water	E100	529809	2	31	6.4	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	524600	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	529228	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	538849	2	40	5.0	5.0	✓
Fluoride in Water by IC	E235.F	524652	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	524653	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	524654	1	19	5.2	5.0	✓
pH by Meter	E108	529808	2	32	6.2	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Phenols (4AAP) in Water by Colorimetry	E562	537934	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	524656	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	529775	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	546878	3	55	5.4	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	549006	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	524171	2	38	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	530405	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	549816	2	33	6.0	5.0	✓
TSS by Gravimetry	E160	524518	2	40	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	546260	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	524508	2	25	8.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	524509	2	16	12.5	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	525803	2	37	5.4	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	532048	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	524655	1	20	5.0	5.0	✓
Conductivity in Water	E100	529809	2	31	6.4	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	524600	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	529228	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	538849	2	40	5.0	5.0	✓
Fluoride in Water by IC	E235.F	524652	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	524653	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	524654	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	537934	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	524656	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	529775	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	546878	3	55	5.4	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	549006	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	524171	2	38	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	530405	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	549816	2	33	6.0	5.0	✓
TSS by Gravimetry	E160	524518	2	40	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	546260	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	524508	2	25	8.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	532048	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	524655	1	20	5.0	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	524600	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	529228	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	538849	2	40	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Fluoride in Water by IC	E235.F	524652	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	524653	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	524654	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	537934	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	524656	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	546878	3	55	5.4	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	549006	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	524171	2	38	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	530405	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	549816	2	33	6.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Edmonton - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Edmonton - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Edmonton - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Edmonton - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourmetrically after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total Metals in Water by CRC ICPMS	E420 Edmonton - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Edmonton - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A Edmonton - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. sample pretreatment involved field or lab filtration following by sample preservation.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
CCME PHC - F1 by Headspace GC-FID	E581.F1 Calgary - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Calgary - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BTEX by Headspace GC-MS	E611A Calgary - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Edmonton - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Calgary - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318 Edmonton - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Edmonton - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581 Calgary - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Calgary - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: **EO2204438**	Page	: 1 of 20
Amendment	: **2**		
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Rame Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 2 2022	Date Samples Received	: 14-Jun-2022 13:30
PO	: 225924	Date Analysis Commenced	: 14-Jun-2022
C-O-C number	: ----	Issue Date	: 10-Aug-2022 13:41
Sampler	: Murray		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Austin Wasylyshyn	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Cynthia Bauer	Organic Supervisor	Calgary Organics, Calgary, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Jeanie Mark	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Jing Liu	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Kira Sampley	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Lisa Watt	Lab Supervisor - Environmental	Edmonton Inorganics, Edmonton, Alberta
Maqsood UlHassan	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Muzammil Ali	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Sobhithan Pillay		Edmonton Inorganics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 524518)											
EO2204422-008	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	126	150	17.5%	20%	----
Physical Tests (QC Lot: 524770)											
EO2204438-006	PRIMARY LEACHATE CELL 3D (PC3D	solids, total suspended [TSS]	----	E160	3.0	mg/L	85.0	88.8	4.37%	20%	----
Physical Tests (QC Lot: 529775)											
EO2204184-004	Anonymous	solids, total dissolved [TDS]	----	E162	40	mg/L	302	295	7	Diff <2x LOR	----
Physical Tests (QC Lot: 529808)											
EO2204438-008	PRIMARY LEACHATE CELL 4)PC4)	pH	----	E108	0.10	pH units	8.34	8.31	0.360%	3%	----
Physical Tests (QC Lot: 529809)											
EO2204438-008	PRIMARY LEACHATE CELL 4)PC4)	conductivity	----	E100	1.0	µS/cm	14200	14200	0.352%	10%	----
Physical Tests (QC Lot: 529817)											
FC2201268-004	Anonymous	pH	----	E108	0.10	pH units	7.56	7.57	0.132%	3%	----
Physical Tests (QC Lot: 529818)											
FC2201268-004	Anonymous	conductivity	----	E100	1.0	µS/cm	4550	4580	0.657%	10%	----
Anions and Nutrients (QC Lot: 524652)											
EO2204461-004	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.555	0.569	2.49%	20%	----
Anions and Nutrients (QC Lot: 524653)											
EO2204461-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.031	0.032	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 524654)											
EO2204461-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	0.015	0.014	0.0008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 524655)											
EO2204461-004	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	13.9	13.8	0.404%	20%	----
Anions and Nutrients (QC Lot: 524656)											
EO2204461-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1.08	1.07	0.007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 546260)											
FC2201255-004	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0500	mg/L	2.27	2.30	1.23%	20%	----
Anions and Nutrients (QC Lot: 546878)											
EO2203771-003	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	0.0050	mg/L	0.107	0.108	1.30%	20%	----
Anions and Nutrients (QC Lot: 546879)											
EO2204438-006	PRIMARY LEACHATE CELL 3D (PC3D	phosphorus, total dissolved	7723-14-0	E375-U	0.100	mg/L	2.55	2.62	2.50%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 549006)											
EO2204435-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.50	mg/L	90.8	88.6	2.55%	20%	----
Anions and Nutrients (QC Lot: 549816)											
EO2204435-003	Anonymous	phosphorus, total	7723-14-0	E372-S	0.0100	mg/L	0.375	0.350	6.93%	20%	----
Anions and Nutrients (QC Lot: 558478)											
EO2204236-001	Anonymous	phosphorus, total	7723-14-0	E372-S	0.0200	mg/L	1.75	1.73	0.747%	20%	----
Anions and Nutrients (QC Lot: 560990)											
EO2204435-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	0.0100	mg/L	0.508	0.451	11.9%	20%	----
Organic / Inorganic Carbon (QC Lot: 538849)											
GP2201046-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	11.2	11.7	4.48%	20%	----
Organic / Inorganic Carbon (QC Lot: 541673)											
FC2201292-003	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	13.6	15.1	10.3%	20%	----
Total Metals (QC Lot: 524171)											
EO2204422-018	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 524172)											
EO2204441-002	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 530405)											
EO2204435-001	Anonymous	aluminum, total	7429-90-5	E420	0.0300	mg/L	0.0500	0.0455	0.0044	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00100	mg/L	0.00892	0.00898	0.00005	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00100	mg/L	0.0938	0.0921	1.92%	20%	----
		beryllium, total	7440-41-7	E420	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.100	mg/L	7.14	7.28	1.87%	20%	----
		cadmium, total	7440-43-9	E420	0.0000500	mg/L	0.00432	0.00434	0.342%	20%	----
		calcium, total	7440-70-2	E420	0.500	mg/L	574	558	2.76%	20%	----
		cesium, total	7440-46-2	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00500	mg/L	0.0969	0.0974	0.509%	20%	----
		cobalt, total	7440-48-4	E420	0.00100	mg/L	2.28	2.38	4.57%	20%	----
		copper, total	7440-50-8	E420	0.00500	mg/L	0.0507	0.0490	0.00174	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.100	mg/L	16.3	16.4	0.833%	20%	----
		lead, total	7439-92-1	E420	0.000500	mg/L	0.115	0.116	0.456%	20%	----
		lithium, total	7439-93-2	E420	0.0100	mg/L	0.474	0.491	3.56%	20%	----
		magnesium, total	7439-95-4	E420	0.0500	mg/L	205	216	5.09%	20%	----
		manganese, total	7439-96-5	E420	0.00100	mg/L	37.8	36.4	3.72%	20%	----
		molybdenum, total	7439-98-7	E420	0.000500	mg/L	0.0132	0.0129	2.50%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 530405) - continued											
EO2204435-001	Anonymous	nickel, total	7440-02-0	E420	0.00500	mg/L	10.9	11.5	5.71%	20%	----
		phosphorus, total	7723-14-0	E420	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.500	mg/L	25.4	25.8	1.44%	20%	----
		rubidium, total	7440-17-7	E420	0.00200	mg/L	0.00692	0.00747	0.00055	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000500	mg/L	0.00136	0.00137	0.000010	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	1.00	mg/L	8.39	8.60	0.21	Diff <2x LOR	----
		silver, total	7440-22-4	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.500	mg/L	2000	2060	2.84%	20%	----
		strontium, total	7440-24-6	E420	0.00200	mg/L	3.11	3.10	0.296%	20%	----
		sulfur, total	7704-34-9	E420	5.00	mg/L	1160	1160	0.399%	20%	----
		tellurium, total	13494-80-9	E420	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00300	mg/L	0.00418	0.00377	0.00041	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000100	mg/L	0.0536	0.0528	1.45%	20%	----
		vanadium, total	7440-62-2	E420	0.00500	mg/L	0.0414	0.0418	0.00037	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0300	mg/L	3.48	3.52	0.921%	20%	----
		zirconium, total	7440-67-7	E420	0.00200	mg/L	0.00915	0.00939	0.00024	Diff <2x LOR	----
Dissolved Metals (QC Lot: 529228)											
EO2204435-007	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0050	mg/L	0.0098	0.0096	0.0002	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00050	mg/L	0.00113	0.00113	0.0000009	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00050	mg/L	0.00593	0.00624	5.04%	20%	----
		barium, dissolved	7440-39-3	E421	0.00050	mg/L	0.0545	0.0580	6.31%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000250	mg/L	0.000393	<0.000250	0.000143	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.050	mg/L	5.88	6.92	16.2%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000250	mg/L	0.000273	0.000280	2.58%	20%	----
		calcium, dissolved	7440-70-2	E421	0.250	mg/L	267	319	18.0%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00050	mg/L	0.00380	0.00369	0.00010	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.050	mg/L	0.363	0.374	0.011	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 529228) - continued											
EO2204435-007	Anonymous	magnesium, dissolved	7439-95-4	E421	0.0250	mg/L	275	283	2.96%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00050	mg/L	1.38	1.41	1.99%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000250	mg/L	0.548	0.642	15.8%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00250	mg/L	0.117	0.120	2.49%	20%	----
		potassium, dissolved	7440-09-7	E421	0.250	mg/L	36.1	35.3	2.09%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000250	mg/L	0.00121	0.00124	0.000036	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000050	mg/L	0.000063	0.000053	0.000010	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.250	mg/L	2690	2780	3.17%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00100	mg/L	3.65	4.30	16.4%	20%	----
		thallium, dissolved	7440-28-0	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000050	mg/L	0.0353	0.0425	18.5%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00250	mg/L	0.386	0.393	1.79%	20%	----
		zinc, dissolved	7440-66-6	E421	0.0050	mg/L	0.0271	0.0254	0.0017	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00100	mg/L	0.0109	0.0130	17.6%	20%	----
Speciated Metals (QC Lot: 524600)											
EO2204438-008	PRIMARY LEACHATE CELL 4)PC4)	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 532048)											
EO2204435-008	Anonymous	chemical oxygen demand [COD]	----	E559-L	100	mg/L	340	326	14	Diff <2x LOR	----
Aggregate Organics (QC Lot: 537934)											
EO2204447-003	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 524508)											
CG2207481-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 525011)											
EO2204438-004	PRIMARY LEACHATE CELL 3B (PC3B)	benzene	71-43-2	E611A	0.50	µg/L	13.9	13.3	4.38%	30%	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	0.73	0.79	0.06	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	8.70	7.98	8.52%	30%	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	2.40	2.36	0.04	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	2.11	1.63	0.47	Diff <2x LOR	----
Hydrocarbons (QC Lot: 524509)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Hydrocarbons (QC Lot: 524509) - continued											
CG2207481-001	Anonymous	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 525010)											
EO2204438-004	PRIMARY LEACHATE CELL 3B (PC3B)	F1 (C6-C10)	----	E581.F1	100	µg/L	1570	1540	2.14%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 524518)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 524770)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 529775)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 529809)						
conductivity	----	E100	1	µS/cm	1.3	----
Physical Tests (QCLot: 529818)						
conductivity	----	E100	1	µS/cm	1.5	----
Anions and Nutrients (QCLot: 524652)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 524653)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 524654)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 524655)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 524656)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 546260)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 546878)						
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 546879)						
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 549006)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 549816)						
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 558478)						
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 560990)						
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	<0.0010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 538849)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 541673)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 524171)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 524172)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 530405)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 530405) - continued						
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 529228)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 529228) - continued						
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Speciated Metals (QCLot: 524600)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 532048)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 537934)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 524508)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 525011)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 524509)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 525010)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 525803)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 526034)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 524518)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	112	85.0	115	----
Physical Tests (QCLot: 524770)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	112	85.0	115	----
Physical Tests (QCLot: 529775)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	97.4	85.0	115	----
Physical Tests (QCLot: 529808)									
pH	----	E108	----	pH units	6 pH units	101	97.0	103	----
Physical Tests (QCLot: 529809)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	96.6	90.0	110	----
Physical Tests (QCLot: 529817)									
pH	----	E108	----	pH units	6 pH units	101	97.0	103	----
Physical Tests (QCLot: 529818)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	94.5	90.0	110	----
Anions and Nutrients (QCLot: 524652)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 524653)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 524654)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 524655)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 524656)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 546260)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	98.4	85.0	115	----
Anions and Nutrients (QCLot: 546878)									
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	0.05 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 546879)									
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	0.05 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 549006)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	98.7	75.0	125	----
Anions and Nutrients (QCLot: 549816)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 549816) - continued									
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	0.05 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 558478)									
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	0.05 mg/L	97.0	80.0	120	----
Anions and Nutrients (QCLot: 560990)									
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	0.05 mg/L	105	80.0	120	----
Organic / Inorganic Carbon (QCLot: 538849)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Organic / Inorganic Carbon (QCLot: 541673)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	114	80.0	120	----
Total Metals (QCLot: 524171)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	92.7	80.0	120	----
Total Metals (QCLot: 524172)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	102	80.0	120	----
Total Metals (QCLot: 530405)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	104	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	104	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	101	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	91.2	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	96.8	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	96.5	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	94.4	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	99.0	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	101	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	99.6	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	97.6	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	96.4	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	98.9	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	94.2	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	95.4	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	98.8	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	97.9	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	97.0	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	98.3	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	99.5	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Total Metals (QCLot: 530405) - continued									
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	98.6	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	95.3	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	93.7	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	98.7	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	95.7	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	98.8	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	92.5	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	88.3	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	97.2	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	93.6	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	91.4	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	95.5	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	99.2	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	92.8	80.0	120	----
Dissolved Metals (QCLot: 529228)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	95.8	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	88.1	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	96.2	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	96.3	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	96.6	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	97.4	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	92.2	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	98.0	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	97.5	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.6	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	97.8	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	99.6	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	96.3	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	102	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	95.1	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	87.4	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	93.5	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 529228) - continued									
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	92.8	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	89.9	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	90.2	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.8	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	87.4	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	99.4	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	94.7	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	95.5	80.0	120	----
Speciated Metals (QCLot: 524600)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
Aggregate Organics (QCLot: 532048)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	102	85.0	115	----
Aggregate Organics (QCLot: 537934)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	101	85.0	115	----
Volatile Organic Compounds (QCLot: 524508)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	90.5	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	87.3	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	82.9	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	97.4	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	92.0	70.0	130	----
Volatile Organic Compounds (QCLot: 525011)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	100	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	93.1	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	95.2	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	102	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	92.4	70.0	130	----
Hydrocarbons (QCLot: 524509)									
F1 (C6-C10)	----	E581.F1	100	µg/L	100 µg/L	104	70.0	130	----
Hydrocarbons (QCLot: 525010)									
F1 (C6-C10)	----	E581.F1	100	µg/L	100 µg/L	103	70.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Hydrocarbons (QCLot: 525803)									
F2 (C10-C16)	----	E601	100	µg/L	3669.135 µg/L	108	70.0	130	----
Hydrocarbons (QCLot: 526034)									
F2 (C10-C16)	----	E601	100	µg/L	3669.135 µg/L	102	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 524652)										
EO2204461-004	Anonymous	fluoride	16984-48-8	E235.F	0.972 mg/L	1 mg/L	97.2	75.0	125	----
Anions and Nutrients (QCLot: 524653)										
EO2204461-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.89 mg/L	2.5 mg/L	116	75.0	125	----
Anions and Nutrients (QCLot: 524654)										
EO2204461-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.519 mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 524655)										
EO2204461-004	Anonymous	chloride	16887-00-6	E235.Cl	108 mg/L	100 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 524656)										
EO2204461-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	110 mg/L	100 mg/L	110	75.0	125	----
Anions and Nutrients (QCLot: 546260)										
FC2201255-004	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 546878)										
EO2204406-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	0.0640 mg/L	0.067 mg/L	95.5	70.0	130	----
Anions and Nutrients (QCLot: 546879)										
EO2204438-007	PRIMARY LEACHATE CELL 3E (PC3E)	phosphorus, total dissolved	7723-14-0	E375-U	ND mg/L	0.067 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 549006)										
EO2204435-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 549816)										
EO2204435-004	Anonymous	phosphorus, total	7723-14-0	E372-S	ND mg/L	0.067 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 558478)										
EO2204236-002	Anonymous	phosphorus, total	7723-14-0	E372-S	ND mg/L	0.067 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 560990)										
EO2204438-002	PRIMARY LEACHATE CELL 2 (PC2)	phosphorus, total dissolved	7723-14-0	E375-U	ND mg/L	0.067 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 538849)										
GP2201046-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 541673)										
FC2201292-003	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 524171)										
EO2204422-019	Anonymous	mercury, total	7439-97-6	E508	0.0000889 mg/L	0.0001 mg/L	88.9	70.0	130	----
Total Metals (QCLot: 524172)										
EO2204442-002	Anonymous	mercury, total	7439-97-6	E508	0.000103 mg/L	0.0001 mg/L	103	70.0	130	----
Total Metals (QCLot: 530405)										
EO2204435-002	Anonymous	aluminum, total	7429-90-5	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, total	7440-36-0	E420	0.0209 mg/L	0.02 mg/L	105	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0213 mg/L	0.02 mg/L	106	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0387 mg/L	0.04 mg/L	96.7	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00953 mg/L	0.01 mg/L	95.3	70.0	130	----
		boron, total	7440-42-8	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00390 mg/L	0.004 mg/L	97.5	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0107 mg/L	0.01 mg/L	107	70.0	130	----
		chromium, total	7440-47-3	E420	0.0434 mg/L	0.04 mg/L	108	70.0	130	----
		cobalt, total	7440-48-4	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		copper, total	7440-50-8	E420	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		iron, total	7439-89-6	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, total	7439-92-1	E420	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		lithium, total	7439-93-2	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, total	7440-02-0	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		phosphorus, total	7723-14-0	E420	11.2 mg/L	10 mg/L	112	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		selenium, total	7782-49-2	E420	0.0461 mg/L	0.04 mg/L	115	70.0	130	----
		silicon, total	7440-21-3	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, total	7440-22-4	E420	0.00400 mg/L	0.004 mg/L	100.0	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0427 mg/L	0.04 mg/L	107	70.0	130	----
		thallium, total	7440-28-0	E420	0.00389 mg/L	0.004 mg/L	97.3	70.0	130	----
		thorium, total	7440-29-1	E420	0.0171 mg/L	0.02 mg/L	85.4	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 530405) - continued										
EO2204435-002	Anonymous	tin, total	7440-31-5	E420	0.0205 mg/L	0.02 mg/L	103	70.0	130	----
		titanium, total	7440-32-6	E420	0.0421 mg/L	0.04 mg/L	105	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		uranium, total	7440-61-1	E420	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, total	7440-62-2	E420	0.114 mg/L	0.1 mg/L	114	70.0	130	----
		zinc, total	7440-66-6	E420	0.345 mg/L	0.4 mg/L	86.2	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0429 mg/L	0.04 mg/L	107	70.0	130	----
Dissolved Metals (QCLot: 529228)										
EO2204438-001	PRIMARY LEACHATE CELL 1 (PC1)	aluminum, dissolved	7429-90-5	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0176 mg/L	0.02 mg/L	88.1	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0380 mg/L	0.04 mg/L	95.0	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00851 mg/L	0.01 mg/L	85.1	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00381 mg/L	0.004 mg/L	95.3	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, dissolved	7440-47-3	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0181 mg/L	0.02 mg/L	90.6	70.0	130	----
		iron, dissolved	7439-89-6	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0170 mg/L	0.02 mg/L	85.1	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0335 mg/L	0.04 mg/L	83.7	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00328 mg/L	0.004 mg/L	81.9	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00341 mg/L	0.004 mg/L	85.3	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0170 mg/L	0.02 mg/L	85.0	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00303 mg/L	0.004 mg/L	75.6	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.352 mg/L	0.4 mg/L	88.1	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 529228) - continued										
EO2204438-001	PRIMARY LEACHATE CELL 1 (PC1)	zirconium, dissolved	7440-67-7	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
Speciated Metals (QCLot: 524600)										
EO2204438-008	PRIMARY LEACHATE CELL 4)PC4)	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0458 mg/L	0.05 mg/L	91.6	70.0	130	----
Aggregate Organics (QCLot: 532048)										
EO2204438-001	PRIMARY LEACHATE CELL 1 (PC1)	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Aggregate Organics (QCLot: 537934)										
EO2204447-003	Anonymous	phenols, total (4AAP)	----	E562	0.0210 mg/L	0.02 mg/L	105	75.0	125	----
Volatile Organic Compounds (QCLot: 524508)										
CG2207481-001	Anonymous	benzene	71-43-2	E611A	108 µg/L	100 µg/L	108	70.0	130	----
		ethylbenzene	100-41-4	E611A	91.2 µg/L	100 µg/L	91.2	70.0	130	----
		toluene	108-88-3	E611A	99.6 µg/L	100 µg/L	99.6	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	193 µg/L	200 µg/L	96.6	70.0	130	----
		xylene, o-	95-47-6	E611A	94.4 µg/L	100 µg/L	94.4	70.0	130	----
Volatile Organic Compounds (QCLot: 525011)										
EO2204438-004	PRIMARY LEACHATE CELL 3B (PC3B)	benzene	71-43-2	E611A	96.2 µg/L	100 µg/L	96.2	70.0	130	----
		ethylbenzene	100-41-4	E611A	89.1 µg/L	100 µg/L	89.1	70.0	130	----
		toluene	108-88-3	E611A	104 µg/L	100 µg/L	104	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	175 µg/L	200 µg/L	87.4	70.0	130	----
		xylene, o-	95-47-6	E611A	84.9 µg/L	100 µg/L	84.9	70.0	130	----

ALS Canada Ltd.
8081 Lougheed Hwy
Burnaby, BC, Canada V5A 1W9
T +1 604 253 4188

right solutions.
right partner.

August 8, 2022

Email Address(es): webb.todd@cleanharbors.com

Dear Todd,

Re: CAR22560 – Discrepancy in pdf report results when dilutions required.

We have discovered that during a brief period between May-July,2022, there was a discrepancy in reporting that has affected some of your results. Where a sample needed a dilution, and the sample result was less than the raised limit of reporting (<LOR) and a report setting was set to report non-detected results as <LOR, the displayed result was incorrectly appearing as less than the undiluted limit of reporting. This issue affected only the PDF format reports for results that had dilutions and the report settings applied. Electronic data deliverables (EDD) and Excel format reports are not affected by this issue and displayed the correct results during this period.

The cause of this discrepancy has been addressed and reported results after July 28,2022 are not affected.

Attached is a summary file outlining the original results reported in PDF format (Old LOR), and their corrected values (New LOR). Please inform us if you will require an amended PDF report and we will supply that for you as soon as possible.

We understand that this issue may have affected your operations and we apologize for this. ALS appreciates that clients rely on analytical test results to make important, confident, and cost-effective decisions. ALS takes these types of issues very seriously and is committed to working with clients to provide the best service and the most reliable test results possible.

Regards,

Maureen Olinek
Edmonton Client Services Manager
Maureeen.olinek@alsglobal.com

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page of

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Report To	Contact and company name below will appear on the final report
Company:	Clean Harbors Canada
Contact:	Todd Webb, Stan Yuha
Phone:	(780) 663-2513
	Company address below will appear on the final report
Street:	PO Box 390, 50114 Range Road 173
City/Province:	Ryley, AB
Postal Code:	T0B 4A0
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors Canada
Contact:	Robbi Gooding

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: webb.todd@cleanharbors.com

Email 2: yuha.stan@cleanharbors.com

Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: gooding.robbi@cleanharbors.com

Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q82438	AFE/Cost Center:	PO#
Job #:	Primary Leachate Qtr 2 2022	Major/Minor Code:	Routing Code:
PO / AFE:	225924	Requisitioner:	
LSD:	Table 4.4A	Location:	

ALS Lab Work Order # (ALS use only): EO2204438 **ALS Contact:** Pamela Toledo **Sampler:** Murray

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Table 4.4A Leachate	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	Primary Leachate Cell 1 (PC1)	13-Jun-22	11:00		12	R			
	Primary Leachate Cell 2 (PC2)	13-Jun-22	11:00		12	R			
	Primary Leachate Cell 3A (PC3A)	13-Jun-22	11:00		12	R			
	Primary Leachate Cell 3B (PC3B)	13-Jun-22	11:00		12	R			
	Primary Leachate Cell 3C (PC3C)	13-Jun-22	11:00		12	R			
	Primary Leachate Cell 3D (PC3D)	13-Jun-22	11:00		12	R			
	Primary Leachate Cell 3E (PC3E)	13-Jun-22	11:00		12	R			
	Primary Leachate Cell 4 (PC4)	13-Jun-22	11:00		12	R			

Environmental Division
Edmonton
Work Order Reference
EO2204438

Telephone : +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Analyze as per Qutoe Q82438, Table 4.4A package (Attached). Same as last time COC 966636

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
11.1							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Todd Webb	Date: 14-Jun-22	Time:	Received by:	Date: 6/14/22	Time: 1:30	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

TABLE 4.4-A: LEACHATE AND LEAK DETECTION LIQUID MONITORING

PARAMETERS		
pH (field and laboratory)	TDS	Nutrients
Electrical conductivity (field and laboratory)	TSS	BTEX
COD	Metals	Phenols
DOC	Major Ions	Petroleum Hydrocarbons Fractions F1 and F2

"metals" means the following:

Aluminum, dissolved	Chromium, dissolved (hexavalent)	Nickel, dissolved
Antimony, dissolved	Cobalt, dissolved	Selenium, dissolved
Arsenic, dissolved	Copper, dissolved	Silver, dissolved
Barium, dissolved	Lead, dissolved	Thallium, dissolved
Boron, dissolved	Manganese, dissolved	Tin, dissolved
Cadmium, dissolved	Mercury, total	Uranium, dissolved
Chromium, total	Molybdenum, dissolved	Zinc, dissolved

"major ions" means the following:

Calcium	Carbonate
Magnesium	Bicarbonate
Sodium	Chloride
Potassium	Sulfate

"nutrients" means the following:

Ammonia nitrogen	Nitrite nitrogen
Total Kjeldahl nitrogen	Total phosphorus
Nitrate nitrogen	Dissolved phosphorus

Appendix D

Primary Leachate Analyses

Quarter 3

CERTIFICATE OF ANALYSIS

Work Order	: **EO2207403**	Page	: 1 of 17
Amendment	: **1**		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 3 2022	Date Samples Received	: 08-Sep-2022 12:00
PO	: 0000227865	Date Analysis Commenced	: 08-Sep-2022
C-O-C number	: ----	Issue Date	: 04-Oct-2022 11:47
Sampler	: Murry		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Austin Wasylyshyn	Lab Analyst	Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Jessica Maitland	Lab Assistant	Inorganics, Edmonton, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Ryan Huynh	Lab Assistant	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Sobhithan Pillay		Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.
Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
IB:INT	*Ion Balance Reviewed: Imbalance is due to interference or non-measured component.*
SFP	*Sample was filtered and preserved at the laboratory.*

Analytical Results

EO2207403-001

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 1 (PC1)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	5660	10.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	17200	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	8.03	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	11800	20	mg/L	E162	-	08-Sep-2022	638379
solids, total dissolved [TDS], calculated	----	14400	1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	12.8	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	765	10.0	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	2710 DLDS,	5.00	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638318
nitrate (as N)	14797-55-8	117 DLDS,	0.200	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638315
nitrate + nitrite (as N)	----	117	0.224	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	0.414 DLDS,	0.100	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638316
phosphorus, total	7723-14-0	11.3 DLHC,	0.400	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639337
phosphorus, total dissolved	7723-14-0	10.7 DLHC,	0.400	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	2550 DLDS,	3.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638314
Kjeldahl nitrogen, total [TKN]	----	887	10.0	mg/L	E318	12-Sep-2022	15-Sep-2022	641762
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	862 SFP,	5.00	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640170
Ion Balance								
ion balance (cations/anions)	----	101	0.010	%	EC101	-	09-Sep-2022	-
Total Metals								
chromium, total	7440-47-3	0.385	0.0100	mg/L	E420	11-Sep-2022	11-Sep-2022	641899
mercury, total	7439-97-6	0.0000540	0.0000500	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.411	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	0.00907	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.0427	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.330	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	13.6	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.00338	0.0000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	247	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	0.399	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.0889	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	0.00913	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	87.7	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	0.0469	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	291	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	16.1	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	6.91	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
nickel, dissolved	7440-02-0	8.36	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	438	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.00196	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	0.000584	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	2920	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849

Analytical Results

EO2207403-001

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 1 (PC1)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
strontium, dissolved	7440-24-6	2.09	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.00878	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	15.0	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	0.929	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	0.220	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641849
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	1850 DLHC,	100	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	0.0310	0.0010	mg/L	E562	10-Sep-2022	10-Sep-2022	641206
Volatile Organic Compounds								
benzene	71-43-2	29.9	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	1.68	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	7.18	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	4.60	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	2.20	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	6.80	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	320	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	274	100	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	450	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	101	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	94.1	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	93.9	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	81.1	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207403-002

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 2 (PC2)
Client sampling date / time: 07-Sep-2022 12:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	14800	10.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	958	10.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	37000	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	8.74	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	30300	20	mg/L	E162	-	09-Sep-2022	640357
solids, total dissolved [TDS], calculated	----	32500	1.0	mg/L	EC103	-	09-Sep-2022	-

Analytical Results

EO2207403-002

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 2 (PC2)
Client sampling date / time: 07-Sep-2022 12:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
solids, total suspended [TSS]	----	11.0		3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	807		10.0	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	8480	DLDS,	10.0	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638318
nitrate (as N)	14797-55-8	1.43	DLDS,	0.400	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638315
nitrate + nitrite (as N)	----	1.43		0.447	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS,	0.200	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638316
phosphorus, total	7723-14-0	7.36	DLHC,	0.200	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639337
phosphorus, total dissolved	7723-14-0	4.52	DLHC,	0.200	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	1100	DLDS,	6.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638314
Kjeldahl nitrogen, total [TKN]	----	941		25.0	mg/L	E318	12-Sep-2022	12-Sep-2022	641762
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	3140	SFP,	50.0	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640170
Ion Balance									
ion balance (cations/anions)	----	93.7		0.010	%	EC101	-	09-Sep-2022	-
Total Metals									
chromium, total	7440-47-3	0.364		0.0250	mg/L	E420	13-Sep-2022	13-Sep-2022	642171
mercury, total	7439-97-6	<0.0000500	DLM,	0.0000500	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals									
aluminum, dissolved	7429-90-5	<0.0500	DLDS,	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	0.655	DTC,	0.00500	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.516	DTC,	0.00500	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
barium, dissolved	7440-39-3	1.16		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.00100	DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.00250	DLDS,	0.00250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	59.0		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.0159	DTC,	0.000250	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
calcium, dissolved	7440-70-2	42.8		2.50	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	0.348		0.0250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.0107	DTC,	0.00500	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
copper, dissolved	7440-50-8	0.0500	DTC,	0.0100	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
iron, dissolved	7439-89-6	<0.500	DLDS,	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	<0.00250	DLDS,	0.00250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	366		0.250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	0.866		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	45.5	DTC,	0.00250	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
nickel, dissolved	7440-02-0	0.395	DTC,	0.0250	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
potassium, dissolved	7440-09-7	1190		2.50	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.00628	DTC,	0.00250	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
silver, dissolved	7440-22-4	0.000921		0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	8820		2.50	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
strontium, dissolved	7440-24-6	3.32		0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000500	DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	0.0109	DTC,	0.00500	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
uranium, dissolved	7440-61-1	0.00174		0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	0.619		0.0250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	<0.0500	DLDS,	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	0.349		0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849

Analytical Results

EO2207403-002

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 2 (PC2)

Client sampling date / time: 07-Sep-2022 12:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641849
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	9390 DLHC,	100	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	4.92	0.100	mg/L	E562	10-Sep-2022	10-Sep-2022	641206
Volatile Organic Compounds								
benzene	71-43-2	55.4	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	8.45	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	1.47	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	1.73	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	3.20	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	540	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	473	143	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	1490	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	103	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	90.4	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	103	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	99.3	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207403-003

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3A (PC3A) -

Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	7820	10.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	27400	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	7.92	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	17800	20	mg/L	E162	-	09-Sep-2022	640357
solids, total dissolved [TDS], calculated	----	20600	1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	12.0	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	576	10.0	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	8290 DLDS,	10.0	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638318
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638315
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638316

Analytical Results

EO2207403-003

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3A (PC3A) -
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients									
phosphorus, total	7723-14-0	3.98	DLHC,	0.100	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639338
phosphorus, total dissolved	7723-14-0	4.05	DLHC,	0.200	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	330	DLDS,	6.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638314
Kjeldahl nitrogen, total [TKN]	----	778		10.0	mg/L	E318	15-Sep-2022	15-Sep-2022	645378
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	825	SFP,	25.0	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640493
Ion Balance									
ion balance (cations/anions)	----	88.9		0.010	%	EC101	-	09-Sep-2022	-
Total Metals									
chromium, total	7440-47-3	0.229		0.0250	mg/L	E420	13-Sep-2022	13-Sep-2022	642171
mercury, total	7439-97-6	<0.0000500	DLM,	0.0000500	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals									
aluminum, dissolved	7429-90-5	<0.0500	DLDS,	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	0.00958		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.437		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	1.70		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.00100	DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.00250	DLDS,	0.00250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	33.5		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.000318		0.000250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	251		2.50	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	0.208		0.0250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.00773		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	0.0224		0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	<0.500	DLDS,	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	<0.00250	DLDS,	0.00250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	426		0.250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	1.38		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	0.393	DTC,	0.00250	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
nickel, dissolved	7440-02-0	0.450		0.0250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	854		2.50	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.00864		0.00250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	<0.000500	DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	5010		2.50	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
strontium, dissolved	7440-24-6	4.96		0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000500	DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	<0.00500	DLDS,	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	<0.000500	DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	0.179		0.0250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	<0.0500	DLDS,	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	0.136		0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
dissolved metals filtration location	----	Field		-	-	EP421	-	11-Sep-2022	641849
Speciated Metals									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050		0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics									
chemical oxygen demand [COD]	----	2980	DLHC,	100	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	8.08		0.500	mg/L	E562	10-Sep-2022	10-Sep-2022	641206
Volatile Organic Compounds									

Analytical Results

EO2207403-003

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3A (PC3A) -

Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Volatile Organic Compounds								
benzene	71-43-2	297	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	10.9	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	165	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	82.6	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	28.8	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	111	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	460	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	<181	181	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	2790	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	103	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	83.7	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	102	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	103	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207403-004

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3B (PC3B)

Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	7420	10.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	4020	10.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	42700	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	9.30	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	35400	20	mg/L	E162	-	09-Sep-2022	640357
solids, total dissolved [TDS], calculated	----	40000	1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	6.6	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	738	20.0	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	11900 DLDS,	50.0	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638318
nitrate (as N)	14797-55-8	<2.00 DLDS,	2.00	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638315
nitrate + nitrite (as N)	----	<2.24	2.24	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<1.00 DLDS,	1.00	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638316
phosphorus, total	7723-14-0	4.30 DLHC,	0.100	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639338
phosphorus, total dissolved	7723-14-0	4.35 DLHC,	0.200	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	1500 DLDS,	30.0	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638314
Kjeldahl nitrogen, total [TKN]	----	2270	25.0	mg/L	E318	15-Sep-2022	18-Sep-2022	645378
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	5850 SFP,	50.0	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640493
Ion Balance								

Analytical Results

EO2207403-004

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3B (PC3B)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Ion Balance								
ion balance (cations/anions)	----	84.4 IB:INT,	0.010	%	EC101	-	09-Sep-2022	-
Total Metals								
chromium, total	7440-47-3	0.566	0.0250	mg/L	E420	13-Sep-2022	13-Sep-2022	642171
mercury, total	7439-97-6	<0.0000500 DLM,	0.0000500	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals								
aluminum, dissolved	7429-90-5	<0.100 DLDS,	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	<0.0100 DLDS,	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.154	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.593	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.00500 DLDS,	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	138	1.00	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.0137	0.000250	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
calcium, dissolved	7440-70-2	13.9	5.00	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	0.592	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.0257	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	0.0595	0.0200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	1.42	1.00	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	0.00856	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	46.0	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	0.782	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	33.9	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
nickel, dissolved	7440-02-0	1.28	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	2950	5.00	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.0694	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	0.00166	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	9040	5.00	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
strontium, dissolved	7440-24-6	0.790	0.0200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	0.0272	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.00112	0.000500	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
vanadium, dissolved	7440-62-2	0.444	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	0.106	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	0.104	0.0200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641849
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	16500 DLHC,	100	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	224	5.00	mg/L	E562	10-Sep-2022	10-Sep-2022	641206
Volatile Organic Compounds								
benzene	71-43-2	12.4	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	0.78	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	8.51	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	2.09	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	2.00	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	4.09	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								

Analytical Results

EO2207403-004

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3B (PC3B)

Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Hydrocarbons								
F1 (C6-C10)	----	1410	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	1380	372	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	2630	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	106	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	81.5	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	99.2	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	113	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207403-005

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3C (PC3C)

Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	4430	10.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	352	10.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	15200	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	8.74	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	8750	20	mg/L	E162	-	09-Sep-2022	640357
solids, total dissolved [TDS], calculated	----	10800	1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	4.4	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	599	10.0	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	3030 DLDS,	10.0	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638318
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638315
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638316
phosphorus, total	7723-14-0	1.84 DLHC,	0.0400	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639338
phosphorus, total dissolved	7723-14-0	1.76 DLHC,	0.0400	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	695 DLDS,	6.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638314
Kjeldahl nitrogen, total [TKN]	----	636	10.0	mg/L	E318	15-Sep-2022	15-Sep-2022	645378
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	456 SFP,	5.00	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640493
Ion Balance								
ion balance (cations/anions)	----	99.4	0.010	%	EC101	-	09-Sep-2022	-
Total Metals								
chromium, total	7440-47-3	<0.0100 DLDS,	0.0100	mg/L	E420	13-Sep-2022	13-Sep-2022	642171
mercury, total	7439-97-6	<0.0000500 DLM,	0.0000500	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0160	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849

Analytical Results

EO2207403-005

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3C (PC3C)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
arsenic, dissolved	7440-38-2	0.0235	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.108	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	50.5	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.000400	0.0000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	42.5	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.00298	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	0.00667	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	0.452	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	147	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	0.464	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	1.13	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
nickel, dissolved	7440-02-0	0.784	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	438	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.00574 DTC,	0.00100	mg/L	E421	11-Sep-2022	14-Sep-2022	641849
silver, dissolved	7440-22-4	0.000246	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	2650	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
strontium, dissolved	7440-24-6	0.370	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.00699	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	7.03	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	<0.0100 DLDS,	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	0.0844	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641849
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	1710 DLHC,	100	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	0.874	0.0100	mg/L	E562	10-Sep-2022	10-Sep-2022	641206
Volatile Organic Compounds								
benzene	71-43-2	18.5	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	69.7	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	247	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	257	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	127	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	384	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	780	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	<263	263	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	1940	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	107	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	93.9	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								

Analytical Results

EO2207403-005

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3C (PC3C)

Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	114	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	102	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207403-006

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3D (PC3D)

Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	4880	10.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	18600	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	8.36	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	12600	20	mg/L	E162	-	09-Sep-2022	640357
solids, total dissolved [TDS], calculated	----	14700	1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	4.6	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	408	5.00	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	5930 DLDS,	10.0	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638318
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638315
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638316
phosphorus, total	7723-14-0	1.26 DLHC,	0.0400	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639338
phosphorus, total dissolved	7723-14-0	1.14 DLHC,	0.0400	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	194 DLDS,	6.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638314
Kjeldahl nitrogen, total [TKN]	----	457	5.00	mg/L	E318	15-Sep-2022	15-Sep-2022	645378
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	867 SFP,	5.00	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640493
Ion Balance								
ion balance (cations/anions)	----	92.4	0.010	%	EC101	-	09-Sep-2022	-
Total Metals								
chromium, total	7440-47-3	0.0239	0.0100	mg/L	E420	13-Sep-2022	13-Sep-2022	642171
mercury, total	7439-97-6	<0.0000500 DLM,	0.0000500	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0202	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.0286	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.464	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	49.8	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.00140	0.0000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	162	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849

Analytical Results

EO2207403-006

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3D (PC3D)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
chromium, dissolved	7440-47-3	0.0206	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.00506	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	0.0382	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	1.12	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	183	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	1.36	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	3.63	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
nickel, dissolved	7440-02-0	2.91	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	606	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.0115	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	0.000192	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	3770	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
strontium, dissolved	7440-24-6	2.03	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.00220	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	4.95	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	0.0342	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	0.0618	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641849
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	2980 DLHC,	100	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	5.11	0.100	mg/L	E562	10-Sep-2022	10-Sep-2022	641206
Volatile Organic Compounds								
benzene	71-43-2	14.3	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	1.95	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	17.0	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	6.18	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	3.06	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	9.24	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	350	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	308	100	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	1270	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	104	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	98.8	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	101	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	114	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207403-007

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3E (PC3E)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	4190	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	22.3	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	12200	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	8.32	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	7380	20	mg/L	E162	-	09-Sep-2022	640357
solids, total dissolved [TDS], calculated	----	9230	1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	5.0	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	321	5.00	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	3030 DLDS,	5.00	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638318
nitrate (as N)	14797-55-8	0.324 DLDS,	0.200	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638315
nitrate + nitrite (as N)	----	0.439	0.224	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	0.115 DLDS,	0.100	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638316
phosphorus, total	7723-14-0	0.864 DLHC,	0.0200	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639338
phosphorus, total dissolved	7723-14-0	0.809 DLHC,	0.0200	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639344
sulfate (as SO4)	14808-79-8	616 DLDS,	3.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638314
Kjeldahl nitrogen, total [TKN]	----	374	5.00	mg/L	E318	15-Sep-2022	18-Sep-2022	645378
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	137 SFP,	1.00	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640493
Ion Balance								
ion balance (cations/anions)	----	92.3	0.010	%	EC101	-	09-Sep-2022	-
Total Metals								
chromium, total	7440-47-3	0.00607	0.00500	mg/L	E420	13-Sep-2022	13-Sep-2022	642171
mercury, total	7439-97-6	<0.0000050	0.0000050	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0161	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
antimony, dissolved	7440-36-0	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
arsenic, dissolved	7440-38-2	0.00692	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
barium, dissolved	7440-39-3	0.288	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
beryllium, dissolved	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
bismuth, dissolved	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
boron, dissolved	7440-42-8	7.07	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
cadmium, dissolved	7440-43-9	0.000417	0.0000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
calcium, dissolved	7440-70-2	98.9	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
chromium, dissolved	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
cobalt, dissolved	7440-48-4	0.00614	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
copper, dissolved	7440-50-8	0.00961	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
iron, dissolved	7439-89-6	0.167	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
magnesium, dissolved	7439-95-4	234	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
manganese, dissolved	7439-96-5	0.783	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
molybdenum, dissolved	7439-98-7	1.05	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
nickel, dissolved	7440-02-0	0.734	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
potassium, dissolved	7440-09-7	238	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
selenium, dissolved	7782-49-2	0.00188	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
silver, dissolved	7440-22-4	0.000406	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
sodium, dissolved	7440-23-5	2340	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851

Analytical Results

EO2207403-007

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 3E (PC3E)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
strontium, dissolved	7440-24-6	2.60	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	12-Sep-2022	641851
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
uranium, dissolved	7440-61-1	0.00950	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
vanadium, dissolved	7440-62-2	5.81	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
zinc, dissolved	7440-66-6	0.0112	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
zirconium, dissolved	7440-67-7	0.0791	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641851
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	515 DLM,	100	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	0.0185	0.0010	mg/L	E562	10-Sep-2022	10-Sep-2022	641206
Volatile Organic Compounds								
benzene	71-43-2	20.0	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	2.56	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	2.05	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	2.34	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	1.87	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	4.21	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	100	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	<100	100	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	17700	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	104	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	77.4	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	114	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	100	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207403-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 4 (PC4)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	4480	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	43.4	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	13200	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	8.35	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	9220	20	mg/L	E162	-	09-Sep-2022	640357
solids, total dissolved [TDS], calculated	----	10500	1.0	mg/L	EC103	-	09-Sep-2022	-

Analytical Results

EO2207403-008

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 4 (PC4)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
solids, total suspended [TSS]	----	35.0		3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	332		5.00	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	2760	DLDS,	5.00	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638318
nitrate (as N)	14797-55-8	<0.200	DLDS,	0.200	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638315
nitrate + nitrite (as N)	----	<0.224		0.224	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<0.100	DLDS,	0.100	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638316
phosphorus, total	7723-14-0	1.73	DLHC,	0.0400	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639338
phosphorus, total dissolved	7723-14-0	1.61	DLHC,	0.0400	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639344
sulfate (as SO4)	14808-79-8	250	DLDS,	3.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638314
Kjeldahl nitrogen, total [TKN]	----	412		5.00	mg/L	E318	15-Sep-2022	15-Sep-2022	645378
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	1580	SFP,	50.0	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640493
Ion Balance									
ion balance (cations/anions)	----	106		0.010	%	EC101	-	09-Sep-2022	-
Total Metals									
chromium, total	7440-47-3	0.00995		0.00500	mg/L	E420	13-Sep-2022	13-Sep-2022	642171
mercury, total	7439-97-6	<0.0000500	DLM,	0.0000500	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.287		0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
antimony, dissolved	7440-36-0	0.00180		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
arsenic, dissolved	7440-38-2	0.0436		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
barium, dissolved	7440-39-3	0.422		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
boron, dissolved	7440-42-8	26.3		0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
cadmium, dissolved	7440-43-9	0.00142		0.0000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
calcium, dissolved	7440-70-2	206		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
chromium, dissolved	7440-47-3	0.0119		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
cobalt, dissolved	7440-48-4	0.00669		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
copper, dissolved	7440-50-8	0.0494		0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
iron, dissolved	7439-89-6	1.01		0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
lead, dissolved	7439-92-1	0.000579		0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
magnesium, dissolved	7439-95-4	205		0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
manganese, dissolved	7439-96-5	1.32		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
molybdenum, dissolved	7439-98-7	3.52		0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
nickel, dissolved	7440-02-0	0.522		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
potassium, dissolved	7440-09-7	331		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
selenium, dissolved	7782-49-2	0.00774		0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
silver, dissolved	7440-22-4	0.000294		0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
sodium, dissolved	7440-23-5	2470		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
strontium, dissolved	7440-24-6	1.75		0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
thallium, dissolved	7440-28-0	0.000163	DTC,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
tin, dissolved	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
uranium, dissolved	7440-61-1	0.00468	DTC,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
vanadium, dissolved	7440-62-2	1.36		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
zinc, dissolved	7440-66-6	0.0974		0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641851
zirconium, dissolved	7440-67-7	0.0508		0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641851

Analytical Results

EO2207403-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Primary Leachate Cell 4 (PC4)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641851
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	4460 DLHC,	100	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	2.84	0.100	mg/L	E562	10-Sep-2022	10-Sep-2022	641206
Volatile Organic Compounds								
benzene	71-43-2	89.4	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	33.6	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	244	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	116	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	51.3	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	167	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	810	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	276	246	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	3620	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	105	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	79.2	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	105	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	101	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2207403**	Page	: 1 of 31
Amendment	: 1		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 3 2022	Date Samples Received	: 08-Sep-2022 12:00
PO	: 0000227865	Issue Date	: 04-Oct-2022 11:46
C-O-C number	: ----		
Sampler	: Murry		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- Matrix Spike outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Dissolved Metals	EO2207403-008	Primary Leachate Cell 4 (PC4)	selenium, dissolved	7782-49-2	E421	61.0 % MES	70.0-130%	Recovery less than lower data quality objective

Result Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 1 (PC1)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 2 (PC2)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3A (PC3A)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3B (PC3B)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3C (PC3C)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3D (PC3D)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3E (PC3E)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 4 (PC4)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 1 (PC1)	E562	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 2 (PC2)	E562	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3A (PC3A)	E562	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3B (PC3B)	E562	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3C (PC3C)	E562	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3D (PC3D)	E562	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3E (PC3E)	E562	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 4 (PC4)	E562	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Primary Leachate Cell 1 (PC1)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Primary Leachate Cell 2 (PC2)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Primary Leachate Cell 3A (PC3A)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Primary Leachate Cell 3B (PC3B)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Primary Leachate Cell 3C (PC3C)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Primary Leachate Cell 3D (PC3D)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Primary Leachate Cell 3E (PC3E)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Primary Leachate Cell 4 (PC4)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 1 (PC1)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 2 (PC2)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 3A (PC3A)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 3B (PC3B)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 3C (PC3C)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 3D (PC3D)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 3E (PC3E)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Primary Leachate Cell 4 (PC4)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE Primary Leachate Cell 1 (PC1)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE Primary Leachate Cell 2 (PC2)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 3A (PC3A)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 3B (PC3B)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 3C (PC3C)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 3D (PC3D)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 3E (PC3E)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Primary Leachate Cell 4 (PC4)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Primary Leachate Cell 1 (PC1)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Primary Leachate Cell 2 (PC2)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Primary Leachate Cell 3A (PC3A)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Primary Leachate Cell 3B (PC3B)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Primary Leachate Cell 3C (PC3C)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Primary Leachate Cell 3D (PC3D)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Primary Leachate Cell 3E (PC3E)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Primary Leachate Cell 4 (PC4)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 1 (PC1)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 2 (PC2)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 3A (PC3A)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 3B (PC3B)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 3C (PC3C)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 3D (PC3D)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 3E (PC3E)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Primary Leachate Cell 4 (PC4)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 1 (PC1)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 2 (PC2)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 3A (PC3A)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 3B (PC3B)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 3C (PC3C)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 3D (PC3D)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 3E (PC3E)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 4 (PC4)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 1 (PC1)	E318	07-Sep-2022	12-Sep-2022	----	----		12-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 2 (PC2)	E318	07-Sep-2022	12-Sep-2022	----	----		12-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3A (PC3A)	E318	07-Sep-2022	15-Sep-2022	----	----		15-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3B (PC3B)	E318	07-Sep-2022	15-Sep-2022	----	----		15-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3C (PC3C)	E318	07-Sep-2022	15-Sep-2022	----	----		15-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3D (PC3D)	E318	07-Sep-2022	15-Sep-2022	----	----		15-Sep-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3E (PC3E)	E318	07-Sep-2022	15-Sep-2022	----	----		15-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 4 (PC4)	E318	07-Sep-2022	15-Sep-2022	----	----		15-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 1 (PC1)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 2 (PC2)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3A (PC3A)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3B (PC3B)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3C (PC3C)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3D (PC3D)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 3E (PC3E)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Primary Leachate Cell 4 (PC4)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 1 (PC1)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 2 (PC2)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 3A (PC3A)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 3B (PC3B)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 3C (PC3C)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 3D (PC3D)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 3E (PC3E)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Primary Leachate Cell 4 (PC4)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 1 (PC1)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 2 (PC2)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 3A (PC3A)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 3B (PC3B)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 3C (PC3C)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 3D (PC3D)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 3E (PC3E)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Primary Leachate Cell 4 (PC4)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Primary Leachate Cell 1 (PC1)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Primary Leachate Cell 2 (PC2)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Primary Leachate Cell 3A (PC3A)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Primary Leachate Cell 3B (PC3B)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Primary Leachate Cell 3C (PC3C)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Primary Leachate Cell 3D (PC3D)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Primary Leachate Cell 3E (PC3E)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Primary Leachate Cell 4 (PC4)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 1 (PC1)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
Primary Leachate Cell 2 (PC2)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 3A (PC3A)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 3B (PC3B)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 3C (PC3C)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 3D (PC3D)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 3E (PC3E)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Primary Leachate Cell 4 (PC4)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 1 (PC1)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 2 (PC2)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 3A (PC3A)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 3B (PC3B)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 3C (PC3C)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 3D (PC3D)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 3E (PC3E)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Primary Leachate Cell 4 (PC4)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 1 (PC1)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 2 (PC2)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 3A (PC3A)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 3B (PC3B)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 3C (PC3C)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 3D (PC3D)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 3E (PC3E)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Primary Leachate Cell 4 (PC4)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 1 (PC1)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 2 (PC2)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 3A (PC3A)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 3B (PC3B)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 3C (PC3C)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 3D (PC3D)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 3E (PC3E)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Primary Leachate Cell 4 (PC4)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 1 (PC1)	E162	07-Sep-2022	----	----	----		08-Sep-2022	7 days	1 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 2 (PC2)	E162	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 3A (PC3A)	E162	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 3B (PC3B)	E162	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 3C (PC3C)	E162	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 3D (PC3D)	E162	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 3E (PC3E)	E162	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Primary Leachate Cell 4 (PC4)	E162	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 1 (PC1)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 2 (PC2)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 3A (PC3A)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 3B (PC3B)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 3C (PC3C)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 3D (PC3D)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Primary Leachate Cell 3E (PC3E)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE										
Primary Leachate Cell 4 (PC4)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 1 (PC1)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 2 (PC2)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 3A (PC3A)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 3B (PC3B)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 3C (PC3C)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 3D (PC3D)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 3E (PC3E)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Primary Leachate Cell 4 (PC4)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 1 (PC1)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 2 (PC2)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 3A (PC3A)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 3B (PC3B)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 3C (PC3C)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 3D (PC3D)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 3E (PC3E)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Primary Leachate Cell 4 (PC4)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) Primary Leachate Cell 1 (PC1)	E420	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Primary Leachate Cell 2 (PC2)	E420	07-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	6 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Primary Leachate Cell 3A (PC3A)	E420	07-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	6 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Primary Leachate Cell 3B (PC3B)	E420	07-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	6 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Primary Leachate Cell 3C (PC3C)	E420	07-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	6 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Primary Leachate Cell 3D (PC3D)	E420	07-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	6 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Primary Leachate Cell 3E (PC3E)	E420	07-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	6 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Primary Leachate Cell 4 (PC4)	E420	07-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
Primary Leachate Cell 1 (PC1)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
Primary Leachate Cell 2 (PC2)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 3A (PC3A)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 3B (PC3B)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 3C (PC3C)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 3D (PC3D)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 3E (PC3E)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Primary Leachate Cell 4 (PC4)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	643078	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	641049	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	641050	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	646277	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	638318	1	20	5.0	5.0	✓
Conductivity in Water	E100	639115	1	17	5.8	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	638298	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	641849	2	39	5.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	640170	2	34	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	638315	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	638316	1	20	5.0	5.0	✓
pH by Meter	E108	639114	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	641206	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	638314	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	638379	2	38	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	639343	2	40	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	641762	3	56	5.3	5.0	✓
Total Mercury in Water by CVAAS	E508	639000	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	641899	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	639337	2	36	5.5	5.0	✓
TSS by Gravimetry	E160	639389	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	643078	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	641049	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	641050	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	644239	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	646277	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	638318	1	20	5.0	5.0	✓
Conductivity in Water	E100	639115	1	17	5.8	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	638298	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	641849	2	39	5.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	640170	2	34	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	638315	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	638316	1	20	5.0	5.0	✓
pH by Meter	E108	639114	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	641206	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	638314	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
TDS by Gravimetry	E162	638379	2	38	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	639343	2	40	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	641762	3	56	5.3	5.0	✓
Total Mercury in Water by CVAAS	E508	639000	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	641899	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	639337	2	36	5.5	5.0	✓
TSS by Gravimetry	E160	639389	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	643078	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	641049	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	641050	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	644239	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	646277	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	638318	1	20	5.0	5.0	✓
Conductivity in Water	E100	639115	1	17	5.8	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	638298	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	641849	2	39	5.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	640170	2	34	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	638315	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	638316	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	641206	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	638314	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	638379	2	38	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	639343	2	40	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	641762	3	56	5.3	5.0	✓
Total Mercury in Water by CVAAS	E508	639000	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	641899	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	639337	2	36	5.5	5.0	✓
TSS by Gravimetry	E160	639389	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	643078	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	641049	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	646277	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	638318	1	20	5.0	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	638298	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	641849	2	39	5.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	640170	2	34	5.8	5.0	✓
Nitrate in Water by IC	E235.NO3	638315	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	638316	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	641206	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Sulfate in Water by IC	E235.SO4	638314	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	639343	2	40	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	641762	3	56	5.3	5.0	✓
Total Mercury in Water by CVAAS	E508	639000	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	641899	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	639337	2	36	5.5	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Edmonton - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Edmonton - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Edmonton - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Edmonton - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total metals in Water by CRC ICPMS	E420 Edmonton - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Edmonton - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A Edmonton - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. sample pretreatment involved field or lab filtration following by sample preservation.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
CCME PHC - F1 by Headspace GC-FID	E581.F1 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BTEX by Headspace GC-MS	E611A Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Edmonton - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Edmonton - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581 Edmonton - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Edmonton - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: **EO2207403**	Page	: 1 of 18
Amendment	: **1**		
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 3 2022	Date Samples Received	: 08-Sep-2022 12:00
PO	: 0000227865	Date Analysis Commenced	: 08-Sep-2022
C-O-C number	: ----	Issue Date	: 04-Oct-2022 11:46
Sampler	: Murry		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Austin Wasylyshyn	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Edmonton Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Jessica Maitland	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Jing Liu	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Edmonton Organics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Edmonton Inorganics, Edmonton, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Ryan Huynh	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Sobhithan Pillay		Edmonton Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Edmonton Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 638379)											
EO2207362-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	406	412	1.47%	20%	----
Physical Tests (QC Lot: 639114)											
EO2207403-008	Primary Leachate Cell 4 (PC4)	pH	----	E108	0.10	pH units	8.35	8.37	0.239%	3%	----
Physical Tests (QC Lot: 639115)											
EO2207403-008	Primary Leachate Cell 4 (PC4)	conductivity	----	E100	1.0	µS/cm	13200	13300	0.151%	10%	----
Physical Tests (QC Lot: 639389)											
EO2207398-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	36.4	36.0	1.10%	20%	----
Physical Tests (QC Lot: 640357)											
EO2207403-002	Primary Leachate Cell 2 (PC2)	solids, total dissolved [TDS]	----	E162	20	mg/L	30300	30600	0.934%	20%	----
Anions and Nutrients (QC Lot: 638314)											
EO2207411-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	88.7	91.6	3.22%	20%	----
Anions and Nutrients (QC Lot: 638315)											
EO2207411-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.410	0.438	6.60%	20%	----
Anions and Nutrients (QC Lot: 638316)											
EO2207411-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 638318)											
EO2207411-004	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	8.10	8.70	7.08%	20%	----
Anions and Nutrients (QC Lot: 639337)											
EO2207398-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.477	0.479	0.377%	20%	----
Anions and Nutrients (QC Lot: 639338)											
EO2207403-003	Primary Leachate Cell 3A (PC3A)	phosphorus, total	7723-14-0	E372-U	0.100	mg/L	3.98	4.08	2.47%	20%	----
Anions and Nutrients (QC Lot: 639343)											
CG2212153-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0089	0.0086	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 639344)											
EO2207403-007	Primary Leachate Cell 3E (PC3E)	phosphorus, total dissolved	7723-14-0	E375-T	0.0200	mg/L	0.809	0.824	1.78%	20%	----
Anions and Nutrients (QC Lot: 641762)											
EO2207365-003	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 643078)											
EO2207398-008	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.250	mg/L	14.1	14.0	0.606%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 645378)											
EO2207403-001	Primary Leachate Cell 1 (PC1)	Kjeldahl nitrogen, total [TKN]	----	E318	10.0	mg/L	887	852	4.05%	20%	----
Anions and Nutrients (QC Lot: 651962)											
EO2207403-004	Primary Leachate Cell 3B (PC3B)	Kjeldahl nitrogen, total [TKN]	----	E318	25.0	mg/L	2270	2290	0.639%	20%	----
Organic / Inorganic Carbon (QC Lot: 640170)											
FC2202123-010	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	13.3	13.3	0.488%	20%	----
Organic / Inorganic Carbon (QC Lot: 640493)											
EO2207403-003	Primary Leachate Cell 3A (PC3A)	carbon, dissolved organic [DOC]	----	E358-L	25.0	mg/L	825	809	1.99%	20%	----
Total Metals (QC Lot: 639000)											
EO2207398-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000077	0.0000159	0.0000082	Diff <2x LOR	----
Total Metals (QC Lot: 641899)											
EO2207398-001	Anonymous	chromium, total	7440-47-3	E420	0.00500	mg/L	0.118	0.115	2.25%	20%	----
Total Metals (QC Lot: 642171)											
EO2207403-003	Primary Leachate Cell 3A (PC3A)	chromium, total	7440-47-3	E420	0.0250	mg/L	0.229	0.223	0.00580	Diff <2x LOR	----
Dissolved Metals (QC Lot: 641849)											
EO2207373-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	0.0012	0.0002	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00021	0.00018	0.00003	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.229	0.225	1.84%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0355 µg/L	0.0000320	0.0000035	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	34.7	33.6	3.03%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00025	0.00021	0.00004	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	16.0	15.8	1.24%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00050	0.00049	0.00001	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000487	0.000437	0.000050	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.455	0.452	0.003	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 641849) - continued											
EO2207373-001	Anonymous	selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.809 µg/L	0.000802	0.888%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	1.86	1.86	0.0210%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0879	0.0854	2.87%	20%	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000297	0.000309	4.06%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0063	0.0075	0.0012	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 641851)											
EO2207403-007	Primary Leachate Cell 3E (PC3E)	aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	0.0161	0.0161	0.000007	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	0.00692	0.00685	0.00007	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.288	0.278	3.62%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.100	mg/L	7.07	6.80	3.93%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	0.000417	0.000442	0.0000251	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.500	mg/L	98.9	98.2	0.725%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	0.00614	0.00605	0.00009	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00200	mg/L	0.00961	0.00915	0.00046	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.100	mg/L	0.167	0.165	0.002	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	234	233	0.231%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00100	mg/L	0.783	0.790	0.948%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	1.05	1.04	1.19%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00500	mg/L	0.734	0.727	0.914%	20%	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	238	228	4.24%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000500	mg/L	0.00188	0.00188	0.0000009	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000100	mg/L	0.000406	0.000324	0.000082	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.500	mg/L	2340	2300	1.91%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00200	mg/L	2.60	2.55	1.96%	20%	----
		thallium, dissolved	7440-28-0	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 641851) - continued											
EO2207403-007	Primary Leachate Cell 3E (PC3E)	tin, dissolved	7440-31-5	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000100	mg/L	0.00950	0.00954	0.440%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	5.81	5.81	0.0295%	20%	----
		zinc, dissolved	7440-66-6	E421	0.0100	mg/L	0.0112	0.0101	0.0011	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00200	mg/L	0.0791	0.0783	1.02%	20%	----
Speciated Metals (QC Lot: 638298)											
FC2202096-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 641206)											
CG2212181-002	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0029	0.0023	0.0006	Diff <2x LOR	----
Aggregate Organics (QC Lot: 646277)											
EO2207385-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 641049)											
EO2207398-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	1.64	1.63	0.009	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 641050)											
EO2207398-001	Anonymous	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 638379)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 639115)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 639389)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 640357)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 638314)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 638315)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 638316)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 638318)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 639337)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 639338)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 639343)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 639344)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 641762)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 643078)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 645378)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 651962)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Organic / Inorganic Carbon (QCLot: 640170)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 640493)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 639000)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 641899)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 642171)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Dissolved Metals (QCLot: 641849)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 641851)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Speciated Metals (QCLot: 638298)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 641206)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 646277)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 641049)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 641049) - continued						
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 641050)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 644239)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 638379)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	98.5	85.0	115	----
Physical Tests (QCLot: 639114)									
pH	----	E108	----	pH units	6 pH units	102	97.0	103	----
Physical Tests (QCLot: 639115)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	97.2	90.0	110	----
Physical Tests (QCLot: 639389)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	96.9	85.0	115	----
Physical Tests (QCLot: 640357)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 638314)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	106	90.0	110	----
Anions and Nutrients (QCLot: 638315)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	106	90.0	110	----
Anions and Nutrients (QCLot: 638316)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 638318)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 639337)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	97.7	80.0	120	----
Anions and Nutrients (QCLot: 639338)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	105	80.0	120	----
Anions and Nutrients (QCLot: 639343)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.03 mg/L	94.4	80.0	120	----
Anions and Nutrients (QCLot: 639344)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.03 mg/L	99.2	80.0	120	----
Anions and Nutrients (QCLot: 641762)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 643078)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.4	85.0	115	----
Anions and Nutrients (QCLot: 645378)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	99.7	75.0	125	----
Anions and Nutrients (QCLot: 651962)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Anions and Nutrients (QCLot: 651962) - continued									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	98.6	75.0	125	----
Organic / Inorganic Carbon (QCLot: 640170)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----
Organic / Inorganic Carbon (QCLot: 640493)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----
Total Metals (QCLot: 639000)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	89.0	80.0	120	----
Total Metals (QCLot: 641899)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	112	80.0	120	----
Total Metals (QCLot: 642171)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	98.0	80.0	120	----
Dissolved Metals (QCLot: 641849)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.0	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	99.3	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	97.7	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	98.4	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	95.2	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.4	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.7	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	99.5	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	98.0	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	97.8	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	96.6	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	97.8	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	97.4	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	99.1	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	97.6	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	97.5	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	92.4	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	101	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 641849) - continued									
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	98.1	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	95.2	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	92.6	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	99.8	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	97.2	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	101	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	93.6	80.0	120	----
Dissolved Metals (QCLot: 641851)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	105	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	99.5	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	91.6	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	99.9	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	94.4	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	100	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	96.1	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	96.6	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.0	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	104	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	90.6	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	98.6	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	92.2	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	111	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	98.2	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	94.8	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	95.7	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	101	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	104	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	92.7	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Speciated Metals (QCLot: 638298)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	99.9	80.0	120	----
Aggregate Organics (QCLot: 641206)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	94.1	85.0	115	----
Aggregate Organics (QCLot: 646277)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	94.0	85.0	115	----
Volatile Organic Compounds (QCLot: 641049)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	108	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	108	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	91.1	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	117	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	107	70.0	130	----
Hydrocarbons (QCLot: 641050)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	97.3	70.0	130	----
Hydrocarbons (QCLot: 644239)									
F2 (C10-C16)	----	E601	100	µg/L	3260 µg/L	111	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 638314)										
EO2207411-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 638315)										
EO2207411-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.69 mg/L	2.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 638316)										
EO2207411-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.499 mg/L	0.5 mg/L	99.9	75.0	125	----
Anions and Nutrients (QCLot: 638318)										
EO2207411-004	Anonymous	chloride	16887-00-6	E235.Cl	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 639337)										
EO2207398-001	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 639338)										
EO2207403-004	Primary Leachate Cell 3B (PC3B)	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 639343)										
CG2212162-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 639344)										
EO2207403-008	Primary Leachate Cell 4 (PC4)	phosphorus, total dissolved	7723-14-0	E375-T	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 641762)										
EO2207365-004	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.62 mg/L	2.5 mg/L	105	70.0	130	----
Anions and Nutrients (QCLot: 643078)										
EO2207398-008	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 645378)										
EO2207403-003	Primary Leachate Cell 3A (PC3A)	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 651962)										
EO2207403-007	Primary Leachate Cell 3E (PC3E)	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 640170)										
FC2202123-011	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 640493)										

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 640493) - continued										
EO2207403-004	Primary Leachate Cell 3B (PC3B)	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 639000)										
EO2207398-002	Anonymous	mercury, total	7439-97-6	E508	0.0000864 mg/L	0.0001 mg/L	86.4	70.0	130	----
Total Metals (QCLot: 641899)										
EO2207398-002	Anonymous	chromium, total	7440-47-3	E420	0.0392 mg/L	0.04 mg/L	98.0	70.0	130	----
Total Metals (QCLot: 642171)										
EO2207403-002	Primary Leachate Cell 2 (PC2)	chromium, total	7440-47-3	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 641849)										
EO2207373-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.211 mg/L	0.2 mg/L	106	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0240 mg/L	0.02 mg/L	120	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00798 mg/L	0.01 mg/L	79.8	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.092 mg/L	0.1 mg/L	92.5	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00397 mg/L	0.004 mg/L	99.3	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0198 mg/L	0.02 mg/L	98.9	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0186 mg/L	0.02 mg/L	93.0	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.98 mg/L	2 mg/L	99.1	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0182 mg/L	0.02 mg/L	90.8	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0198 mg/L	0.02 mg/L	99.3	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0372 mg/L	0.04 mg/L	93.0	70.0	130	----
		potassium, dissolved	7440-09-7	E421	4.14 mg/L	4 mg/L	104	70.0	130	----
		selenium, dissolved	7782-49-2	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00373 mg/L	0.004 mg/L	93.2	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00368 mg/L	0.004 mg/L	91.9	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0186 mg/L	0.02 mg/L	93.3	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 641849) - continued										
EO2207373-002	Anonymous	vanadium, dissolved	7440-62-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.382 mg/L	0.4 mg/L	95.6	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0414 mg/L	0.04 mg/L	104	70.0	130	----
Dissolved Metals (QCLot: 641851)										
EO2207403-008	Primary Leachate Cell 4 (PC4)	aluminum, dissolved	7429-90-5	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00746 mg/L	0.01 mg/L	74.6	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00405 mg/L	0.004 mg/L	101	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0426 mg/L	0.04 mg/L	106	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		copper, dissolved	7440-50-8	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		iron, dissolved	7439-89-6	E421	2.06 mg/L	2 mg/L	103	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0142 mg/L	0.02 mg/L	71.1	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0244 mg/L	0.04 mg/L	61.0	70.0	130	MES
		silver, dissolved	7440-22-4	E421	0.00347 mg/L	0.004 mg/L	86.7	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00330 mg/L	0.004 mg/L	82.4	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0168 mg/L	0.02 mg/L	84.2	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.397 mg/L	0.4 mg/L	99.2	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
Speciated Metals (QCLot: 638298)										
FC2202140-002	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0506 mg/L	0.05 mg/L	101	70.0	130	----
Aggregate Organics (QCLot: 641206)										

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Aggregate Organics (QCLot: 641206) - continued										
CG2212181-002	Anonymous	phenols, total (4AAP)	----	E562	0.0161 mg/L	0.02 mg/L	80.4	75.0	125	----
Aggregate Organics (QCLot: 646277)										
EO2207398-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Volatile Organic Compounds (QCLot: 641049)										
EO2207398-002	Anonymous	benzene	71-43-2	E611A	102 µg/L	100 µg/L	102	50.0	140	----
		ethylbenzene	100-41-4	E611A	101 µg/L	100 µg/L	101	50.0	140	----
		toluene	108-88-3	E611A	74.9 µg/L	100 µg/L	74.9	50.0	140	----
		xylene, m+p-	179601-23-1	E611A	228 µg/L	200 µg/L	114	50.0	140	----
		xylene, o-	95-47-6	E611A	108 µg/L	100 µg/L	108	50.0	140	----

Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 22 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	Clean Harbors Canada
Contact:	Todd Webb, Stan Yuha
Phone:	(780) 663-2513
	Company address below will appear on the final report
Street:	PO Box 390, 50114 Range Road 173
City/Province:	Ryley, AB
Postal Code:	T0B 4A0
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors Canada
Contact:	Robbi Gooding

Project Information

ALS Account # / Quote #:	Q82438
Job #:	Primary Leachate Qtr 3 2022
PO / AFE:	0000227865
LSD:	Table 4.4A

ALS Lab Work Order # (ALS use only): EO2207403

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: webb.todd@cleanharbors.com

Email 2: yuha.stan@cleanharbors.com

Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: gooding.robbi@cleanharbors.com

Email 2: yuha.stan@cleanharbors.com

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Pamela Toledo **Sampler:** Murray

Turnaround Time (TAT) Requested

- ☑ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- ☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Table 4.4A Leachate
	Primary Leachate Cell 1 (PC1)	7-Sep-22	11:00		11	R
	Primary Leachate Cell 2 (PC2)	7-Sep-22	12:00		11	R
	Primary Leachate Cell 3A (PC3A)	7-Sep-22	11:00		11	R
	Primary Leachate Cell 3B (PC3B)	7-Sep-22	11:00		11	R
	Primary Leachate Cell 3C (PC3C)	7-Sep-22	11:00		11	R
	Primary Leachate Cell 3D (PC3D)	7-Sep-22	11:00		11	R
	Primary Leachate Cell 3E (PC3E)	7-Sep-22	11:00		11	R
	Primary Leachate Cell 4 (PC4)	7-Sep-22	11:00		11	R

SAMPLES ON HOLD | EXTENDED STORAGE REQUIRED | SUSPECTED HAZARD (see notes)

Environmental Division
Edmonton
Work Order Reference
EO2207403

Telephone : +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Analyze as per Qutoe Q82438, Table 4.4A package (Attached). Same as COC 966636

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C			
7.5°c	7.3c				

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Todd Webb	7-Sep-22	14:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
MK	8/9/22	9

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

TABLE 4.4-A: LEACHATE AND LEAK DETECTION LIQUID MONITORING

PARAMETERS		
pH (field and laboratory)	TDS	Nutrients
Electrical conductivity (field and laboratory)	TSS	BTEX
COD	Metals	Phenols
DOC	Major Ions	Petroleum Hydrocarbons Fractions F1 and F2

"metals" means the following:

Aluminum, dissolved	Chromium, dissolved (hexavalent)	Nickel, dissolved
Antimony, dissolved	Cobalt, dissolved	Selenium, dissolved
Arsenic, dissolved	Copper, dissolved	Silver, dissolved
Barium, dissolved	Lead, dissolved	Thallium, dissolved
Boron, dissolved	Manganese, dissolved	Tin, dissolved
Cadmium, dissolved	Mercury, total	Uranium, dissolved
Chromium, total	Molybdenum, dissolved	Zinc, dissolved

"major ions" means the following:

Calcium	Carbonate
Magnesium	Bicarbonate
Sodium	Chloride
Potassium	Sulfate

"nutrients" means the following:

Ammonia nitrogen	Nitrite nitrogen
Total Kjeldahl nitrogen	Total phosphorus
Nitrate nitrogen	Dissolved phosphorus

Appendix D

Primary Leachate Analyses

Quarter 4

CERTIFICATE OF ANALYSIS

Work Order	: **EO2210705**	Page	: 1 of 19
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 4 2022	Date Samples Received	: 06-Dec-2022 14:53
PO	: 0000230062	Date Analysis Commenced	: 07-Dec-2022
C-O-C number	: ----	Issue Date	: 20-Dec-2022 16:08
Sampler	: JA		
Site	: TABLE 4.4A		
Quote number	: EO22-CHES100-008		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Alex Drake	Lab Analyst	Metals, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Metals, Edmonton, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Jon Fisher	Department Manager - Inorganics	Metals, Waterloo, Ontario
Leah Yee	Lab Assistant	Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Metals, Edmonton, Alberta
Rebecca McCaig	Lab Assistant	Metals, Edmonton, Alberta
Remy Gatabazi	Lab Analyst	Organics, Edmonton, Alberta
Ryan Huynh	Lab Assistant	Inorganics, Edmonton, Alberta
Samantha Mayor	Lab Assistant	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Sobhithan Pillay		Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.
Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
IB:INT	*Ion Balance Reviewed: Imbalance is due to interference or non-measured component.*
RRV	*Reported result verified by repeat analysis.*
SFP	*Sample was filtered and preserved at the laboratory.*
SHMI	*Surrogate recovery was outside ALS DQO (High) due to Matrix Interference*
SP	*Sample was preserved at the laboratory.*

Analytical Results

EO2210705-001

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 1 (PC1)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	5390		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, carbonate (as CO3)	3812-32-6	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, total (as CaCO3)	----	4420		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
conductivity	----	20400		1.0	µS/cm	E100	07-Dec-2022	07-Dec-2022	770132
hardness (as CaCO3), dissolved	----	2150		2.5	mg/L	EC100	-	10-Dec-2022	-
pH	----	7.70		0.10	pH units	E108	07-Dec-2022	07-Dec-2022	770131
solids, total dissolved [TDS], calculated	----	16200		1.0	mg/L	EC103	-	07-Dec-2022	-
solids, total suspended [TSS]	----	14.8		3.0	mg/L	E160	-	10-Dec-2022	772267
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	833		10.0	mg/L	E298	07-Dec-2022	07-Dec-2022	770815
chloride	16887-00-6	3300	DLDS,	10.0	mg/L	E235.Cl	07-Dec-2022	07-Dec-2022	770083
fluoride	16984-48-8	9.45	DLDS,	0.400	mg/L	E235.F	07-Dec-2022	07-Dec-2022	770080
nitrate (as N)	14797-55-8	68.8	DLDS,	0.400	mg/L	E235.NO3	07-Dec-2022	07-Dec-2022	770081
nitrate + nitrite (as N)	----	73.0		0.447	mg/L	EC235.N+N	-	07-Dec-2022	-
nitrite (as N)	14797-65-0	4.24	DLDS,	0.200	mg/L	E235.NO2	07-Dec-2022	07-Dec-2022	770084
phosphorus, total	7723-14-0	9.99	SP,	0.100	mg/L	E372-S	07-Dec-2022	07-Dec-2022	769887
phosphorus, total dissolved	7723-14-0	9.91	SFP,	0.100	mg/L	E375-U	07-Dec-2022	07-Dec-2022	769892
sulfate (as SO4)	14808-79-8	3340	DLDS,	6.00	mg/L	E235.SO4	07-Dec-2022	07-Dec-2022	770082
Kjeldahl nitrogen, total [TKN]	----	1320		25.0	mg/L	E318	07-Dec-2022	08-Dec-2022	770138
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	868		5.00	mg/L	E358-L	08-Dec-2022	08-Dec-2022	772604
Ion Balance									
ion balance (cations/anions)	----	104		0.010	%	EC101	-	07-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.462		0.0250	mg/L	E420	08-Dec-2022	09-Dec-2022	771618
mercury, total	7439-97-6	0.0000405		0.0000050	mg/L	E508	07-Dec-2022	07-Dec-2022	769906
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.357		0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
antimony, dissolved	7440-36-0	0.0154		0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
arsenic, dissolved	7440-38-2	0.0551		0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
barium, dissolved	7440-39-3	0.292		0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
beryllium, dissolved	7440-41-7	<0.00100	DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
bismuth, dissolved	7440-69-9	<0.00250	DLDS,	0.00250	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
boron, dissolved	7440-42-8	18.6		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cadmium, dissolved	7440-43-9	0.00634		0.000250	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
calcium, dissolved	7440-70-2	278		2.50	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cesium, dissolved	7440-46-2	0.00119		0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
chromium, dissolved	7440-47-3	0.472		0.0250	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cobalt, dissolved	7440-48-4	0.127		0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
copper, dissolved	7440-50-8	0.0866		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
iron, dissolved	7439-89-6	104		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lead, dissolved	7439-92-1	0.219		0.00250	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lithium, dissolved	7439-93-2	0.436		0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
magnesium, dissolved	7439-95-4	354		0.250	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
manganese, dissolved	7439-96-5	19.2		0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744

Analytical Results

EO2210705-001

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 1 (PC1)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	7.65	0.00250	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
nickel, dissolved	7440-02-0	9.69	0.0250	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
phosphorus, dissolved	7723-14-0	11.7	2.50	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
potassium, dissolved	7440-09-7	479	2.50	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
rubidium, dissolved	7440-17-7	0.0546	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
selenium, dissolved	7782-49-2	<0.00250 DLDS	0.00250	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silicon, dissolved	7440-21-3	12.1	2.50	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silver, dissolved	7440-22-4	0.000658	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sodium, dissolved	7440-23-5	3390	2.50	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
strontium, dissolved	7440-24-6	2.40	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sulfur, dissolved	7704-34-9	1030	25.0	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tellurium, dissolved	13494-80-9	<0.0100 DLDS	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thallium, dissolved	7440-28-0	<0.000500 DLDS	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thorium, dissolved	7440-29-1	<0.00500 DLDS	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tin, dissolved	7440-31-5	<0.00500 DLDS	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
titanium, dissolved	7440-32-6	0.117	0.0150	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tungsten, dissolved	7440-33-7	0.0845	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
uranium, dissolved	7440-61-1	0.0133	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
vanadium, dissolved	7440-62-2	16.6	0.0250	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zinc, dissolved	7440-66-6	2.01	0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zirconium, dissolved	7440-67-7	0.278	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
dissolved metals filtration location	----	Field	-	-	EP421	-	07-Dec-2022	770744
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.0100 DLM	0.0100	mg/L	E532A	-	12-Dec-2022	773067
Aggregate Organics								
chemical oxygen demand [COD]	----	3740 DLHC	100	mg/L	E559-L	-	08-Dec-2022	771715
phenols, total (4AAP)	----	0.0274	0.0010	mg/L	E562	07-Dec-2022	07-Dec-2022	770924
Volatile Organic Compounds								
benzene	71-43-2	28.0	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
ethylbenzene	100-41-4	1.97	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
toluene	108-88-3	2.21	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, m+p-	179601-23-1	1.86	0.40	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, o-	95-47-6	2.63	0.30	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylenes, total	1330-20-7	4.49	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
Hydrocarbons								
F1 (C6-C10)	----	320	100	µg/L	E581.F1	07-Dec-2022	07-Dec-2022	770179
F1-BTEX	----	283	100	µg/L	EC580	-	09-Dec-2022	-
F2 (C10-C16)	----	380	100	µg/L	E601	07-Dec-2022	07-Dec-2022	769882
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	102	1.0	%	E601	07-Dec-2022	07-Dec-2022	769882
dichlorotoluene, 3,4-	97-75-0	118	1.0	%	E581.F1	07-Dec-2022	07-Dec-2022	770179
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	91.3	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178
difluorobenzene, 1,4-	540-36-3	101	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210705-002

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3B (PC3B)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	6970		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, carbonate (as CO3)	3812-32-6	3800		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, total (as CaCO3)	----	12000		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
conductivity	----	42200		1.0	µS/cm	E100	07-Dec-2022	07-Dec-2022	770132
hardness (as CaCO3), dissolved	----	216		5	mg/L	EC100	-	10-Dec-2022	-
pH	----	9.37		0.10	pH units	E108	07-Dec-2022	07-Dec-2022	770131
solids, total dissolved [TDS], calculated	----	35700		1.0	mg/L	EC103	-	07-Dec-2022	-
solids, total suspended [TSS]	----	43.4		3.0	mg/L	E160	-	10-Dec-2022	772267
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	1820		20.0	mg/L	E298	07-Dec-2022	07-Dec-2022	770815
chloride	16887-00-6	9550	DLDS,	10.0	mg/L	E235.Cl	07-Dec-2022	07-Dec-2022	770083
fluoride	16984-48-8	6.11	DLDS,	0.400	mg/L	E235.F	07-Dec-2022	07-Dec-2022	770080
nitrate (as N)	14797-55-8	<0.400	DLDS,	0.400	mg/L	E235.NO3	07-Dec-2022	07-Dec-2022	770081
nitrate + nitrite (as N)	----	<0.447		0.447	mg/L	EC235.N+N	-	07-Dec-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS,	0.200	mg/L	E235.NO2	07-Dec-2022	07-Dec-2022	770084
phosphorus, total	7723-14-0	7.63	SP,	0.100	mg/L	E372-S	07-Dec-2022	07-Dec-2022	769887
phosphorus, total dissolved	7723-14-0	7.22	SFP,	0.100	mg/L	E375-U	07-Dec-2022	07-Dec-2022	769892
sulfate (as SO4)	14808-79-8	1590	DLDS,	6.00	mg/L	E235.SO4	07-Dec-2022	07-Dec-2022	770082
Kjeldahl nitrogen, total [TKN]	----	2320		25.0	mg/L	E318	07-Dec-2022	08-Dec-2022	770138
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	1860		25.0	mg/L	E358-L	08-Dec-2022	08-Dec-2022	772604
Ion Balance									
ion balance (cations/anions)	----	116	IB:INT,	0.010	%	EC101	-	07-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.513		0.0500	mg/L	E420	08-Dec-2022	09-Dec-2022	771618
mercury, total	7439-97-6	<0.0000500	DLM,	0.0000500	mg/L	E508	07-Dec-2022	07-Dec-2022	769906
Dissolved Metals									
aluminum, dissolved	7429-90-5	<0.100	DLDS,	0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
antimony, dissolved	7440-36-0	<0.0100	DLDS,	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
arsenic, dissolved	7440-38-2	0.0966		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
barium, dissolved	7440-39-3	0.566		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
beryllium, dissolved	7440-41-7	<0.00200	DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
bismuth, dissolved	7440-69-9	<0.00500	DLDS,	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
boron, dissolved	7440-42-8	140		1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cadmium, dissolved	7440-43-9	0.00645		0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
calcium, dissolved	7440-70-2	16.4		5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cesium, dissolved	7440-46-2	0.122		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
chromium, dissolved	7440-47-3	0.410		0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cobalt, dissolved	7440-48-4	0.0221		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
copper, dissolved	7440-50-8	<0.0200	DLDS,	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
iron, dissolved	7439-89-6	1.07		1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lead, dissolved	7439-92-1	<0.00500	DLDS,	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lithium, dissolved	7439-93-2	11.2		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
magnesium, dissolved	7439-95-4	42.5		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
manganese, dissolved	7439-96-5	0.654		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744

Analytical Results

EO2210705-002

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3B (PC3B)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	15.4	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
nickel, dissolved	7440-02-0	1.16	0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
phosphorus, dissolved	7723-14-0	11.9	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
potassium, dissolved	7440-09-7	3670	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
rubidium, dissolved	7440-17-7	5.52	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
selenium, dissolved	7782-49-2	0.0843	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silicon, dissolved	7440-21-3	41.5	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silver, dissolved	7440-22-4	<0.00100 DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sodium, dissolved	7440-23-5	9280	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
strontium, dissolved	7440-24-6	0.908	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sulfur, dissolved	7704-34-9	824	50.0	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tellurium, dissolved	13494-80-9	<0.0200 DLDS,	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thallium, dissolved	7440-28-0	<0.00100 DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thorium, dissolved	7440-29-1	<0.0100 DLDS,	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tin, dissolved	7440-31-5	0.0114	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
titanium, dissolved	7440-32-6	0.0526	0.0300	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tungsten, dissolved	7440-33-7	5.81	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
uranium, dissolved	7440-61-1	0.00141	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
vanadium, dissolved	7440-62-2	0.460	0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zinc, dissolved	7440-66-6	<0.100 DLDS,	0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zirconium, dissolved	7440-67-7	0.0530	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
dissolved metals filtration location	----	Field	-	-	EP421	-	07-Dec-2022	770744
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.0500 DLM,	0.0500	mg/L	E532A	-	13-Dec-2022	773067
Aggregate Organics								
chemical oxygen demand [COD]	----	19400 DLHC,	100	mg/L	E559-L	-	08-Dec-2022	771715
phenols, total (4AAP)	----	22.3	0.500	mg/L	E562	07-Dec-2022	07-Dec-2022	770924
Volatile Organic Compounds								
benzene	71-43-2	13.6	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
ethylbenzene	100-41-4	1.42	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
toluene	108-88-3	15.3	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, m+p-	179601-23-1	3.83	0.40	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, o-	95-47-6	4.12	0.30	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylenes, total	1330-20-7	7.95	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
Hydrocarbons								
F1 (C6-C10)	----	2110	100	µg/L	E581.F1	07-Dec-2022	07-Dec-2022	770179
F1-BTEX	----	2070	558	µg/L	EC580	-	09-Dec-2022	-
F2 (C10-C16)	----	3240	100	µg/L	E601	07-Dec-2022	07-Dec-2022	769882
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	102	1.0	%	E601	07-Dec-2022	07-Dec-2022	769882
dichlorotoluene, 3,4-	97-75-0	109	1.0	%	E581.F1	07-Dec-2022	07-Dec-2022	770179
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	99.8	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178
difluorobenzene, 1,4-	540-36-3	109	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210705-003

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3C (PC3C)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	3650		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, carbonate (as CO3)	3812-32-6	448		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, total (as CaCO3)	----	3740		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
conductivity	----	14200		1.0	µS/cm	E100	07-Dec-2022	07-Dec-2022	770132
hardness (as CaCO3), dissolved	----	842		0.50	mg/L	EC100	-	10-Dec-2022	-
pH	----	8.68		0.10	pH units	E108	07-Dec-2022	07-Dec-2022	770131
solids, total dissolved [TDS], calculated	----	10200		1.0	mg/L	EC103	-	08-Dec-2022	-
solids, total suspended [TSS]	----	4.4		3.0	mg/L	E160	-	10-Dec-2022	772267
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	681		10.0	mg/L	E298	07-Dec-2022	07-Dec-2022	770815
chloride	16887-00-6	2660	DLDS,	10.0	mg/L	E235.Cl	07-Dec-2022	07-Dec-2022	770172
fluoride	16984-48-8	1.45	DLDS,	0.400	mg/L	E235.F	07-Dec-2022	07-Dec-2022	770171
nitrate (as N)	14797-55-8	<0.400	DLDS,	0.400	mg/L	E235.NO3	07-Dec-2022	07-Dec-2022	770169
nitrate + nitrite (as N)	----	<0.447		0.447	mg/L	EC235.N+N	-	08-Dec-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS,	0.200	mg/L	E235.NO2	07-Dec-2022	07-Dec-2022	770170
phosphorus, total	7723-14-0	3.32	SP,	0.100	mg/L	E372-S	07-Dec-2022	07-Dec-2022	769887
phosphorus, total dissolved	7723-14-0	3.17	SFP,	0.100	mg/L	E375-U	07-Dec-2022	07-Dec-2022	769892
sulfate (as SO4)	14808-79-8	988	DLDS,	6.00	mg/L	E235.SO4	07-Dec-2022	07-Dec-2022	770168
Kjeldahl nitrogen, total [TKN]	----	756		10.0	mg/L	E318	07-Dec-2022	08-Dec-2022	770138
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	458		5.00	mg/L	E358-L	08-Dec-2022	08-Dec-2022	772604
Ion Balance									
ion balance (cations/anions)	----	104		0.010	%	EC101	-	08-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	<0.00500	RRV,	0.00500	mg/L	E420	08-Dec-2022	10-Dec-2022	771618
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	07-Dec-2022	07-Dec-2022	769906
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0225		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
antimony, dissolved	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
arsenic, dissolved	7440-38-2	0.0136		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
barium, dissolved	7440-39-3	0.0755		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
boron, dissolved	7440-42-8	40.6		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cadmium, dissolved	7440-43-9	0.0000936		0.0000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
calcium, dissolved	7440-70-2	51.7		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cesium, dissolved	7440-46-2	0.00182		0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
chromium, dissolved	7440-47-3	0.00757	DTC, RRV,	0.00500	mg/L	E421	07-Dec-2022	10-Dec-2022	770744
cobalt, dissolved	7440-48-4	0.00154		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
copper, dissolved	7440-50-8	<0.00200	DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
iron, dissolved	7439-89-6	0.289		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lead, dissolved	7439-92-1	<0.000500	DLDS,	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lithium, dissolved	7439-93-2	1.96		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
magnesium, dissolved	7439-95-4	173		0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
manganese, dissolved	7439-96-5	0.410		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744

Analytical Results

EO2210705-003

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3C (PC3C)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	0.211	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
nickel, dissolved	7440-02-0	0.451	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
phosphorus, dissolved	7723-14-0	2.96	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
potassium, dissolved	7440-09-7	398	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
rubidium, dissolved	7440-17-7	0.256	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
selenium, dissolved	7782-49-2	0.00643	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silicon, dissolved	7440-21-3	10.0	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silver, dissolved	7440-22-4	0.000110	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sodium, dissolved	7440-23-5	2340	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
strontium, dissolved	7440-24-6	0.386	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sulfur, dissolved	7704-34-9	388	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tellurium, dissolved	13494-80-9	<0.00200 DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thorium, dissolved	7440-29-1	<0.00100 DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
titanium, dissolved	7440-32-6	<0.00300 DLDS,	0.00300	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tungsten, dissolved	7440-33-7	0.0934	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
uranium, dissolved	7440-61-1	0.00684	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
vanadium, dissolved	7440-62-2	4.68	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zinc, dissolved	7440-66-6	<0.0100 DLDS,	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zirconium, dissolved	7440-67-7	0.0522	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
dissolved metals filtration location	----	Field	-	-	EP421	-	07-Dec-2022	770744
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.0500 DLM,	0.0500	mg/L	E532A	-	13-Dec-2022	773067
Aggregate Organics								
chemical oxygen demand [COD]	----	3350 DLHC,	100	mg/L	E559-L	-	08-Dec-2022	771715
phenols, total (4AAP)	----	0.977	0.0500	mg/L	E562	07-Dec-2022	07-Dec-2022	770924
Volatile Organic Compounds								
benzene	71-43-2	20.8	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
ethylbenzene	100-41-4	112	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
toluene	108-88-3	372	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, m+p-	179601-23-1	414	0.40	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, o-	95-47-6	211	0.30	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylenes, total	1330-20-7	625	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
Hydrocarbons								
F1 (C6-C10)	----	2180	100	µg/L	E581.F1	07-Dec-2022	07-Dec-2022	770179
F1-BTEX	----	1050	632	µg/L	EC580	-	09-Dec-2022	-
F2 (C10-C16)	----	1380	100	µg/L	E601	07-Dec-2022	07-Dec-2022	769882
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	104	1.0	%	E601	07-Dec-2022	07-Dec-2022	769882
dichlorotoluene, 3,4-	97-75-0	122	1.0	%	E581.F1	07-Dec-2022	07-Dec-2022	770179
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	157 SHMI,	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178
difluorobenzene, 1,4-	540-36-3	104	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210705-004

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3E (PC3E)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	7340		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, carbonate (as CO3)	3812-32-6	266		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, total (as CaCO3)	----	6460		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
conductivity	----	17400		1.0	µS/cm	E100	07-Dec-2022	07-Dec-2022	770132
hardness (as CaCO3), dissolved	----	1030		1	mg/L	EC100	-	10-Dec-2022	-
pH	----	8.35		0.10	pH units	E108	07-Dec-2022	07-Dec-2022	770131
solids, total dissolved [TDS], calculated	----	11400		1.0	mg/L	EC103	-	08-Dec-2022	-
solids, total suspended [TSS]	----	16.8		3.0	mg/L	E160	-	10-Dec-2022	772267
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	907		20.0	mg/L	E298	07-Dec-2022	08-Dec-2022	770815
chloride	16887-00-6	2720	DLDS,	10.0	mg/L	E235.Cl	07-Dec-2022	07-Dec-2022	770172
fluoride	16984-48-8	2.58	DLDS,	0.400	mg/L	E235.F	07-Dec-2022	07-Dec-2022	770171
nitrate (as N)	14797-55-8	<0.400	DLDS,	0.400	mg/L	E235.NO3	07-Dec-2022	07-Dec-2022	770169
nitrate + nitrite (as N)	----	<0.447		0.447	mg/L	EC235.N+N	-	08-Dec-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS,	0.200	mg/L	E235.NO2	07-Dec-2022	07-Dec-2022	770170
phosphorus, total	7723-14-0	2.65	SP,	0.0500	mg/L	E372-S	07-Dec-2022	07-Dec-2022	769887
phosphorus, total dissolved	7723-14-0	2.52	SFP,	0.0500	mg/L	E375-U	07-Dec-2022	07-Dec-2022	769892
sulfate (as SO4)	14808-79-8	190	DLDS,	6.00	mg/L	E235.SO4	07-Dec-2022	07-Dec-2022	770168
Kjeldahl nitrogen, total [TKN]	----	1240		25.0	mg/L	E318	07-Dec-2022	08-Dec-2022	770138
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	277		5.00	mg/L	E358-L	08-Dec-2022	08-Dec-2022	772604
Ion Balance									
ion balance (cations/anions)	----	96.7		0.010	%	EC101	-	08-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	<0.0100	DLDS,	0.0100	mg/L	E420	08-Dec-2022	09-Dec-2022	771618
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	07-Dec-2022	07-Dec-2022	769906
Dissolved Metals									
aluminum, dissolved	7429-90-5	<0.0200	DLDS,	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
antimony, dissolved	7440-36-0	<0.00200	DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
arsenic, dissolved	7440-38-2	0.00665		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
barium, dissolved	7440-39-3	0.292		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
beryllium, dissolved	7440-41-7	<0.000400	DLDS,	0.000400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
bismuth, dissolved	7440-69-9	<0.00100	DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
boron, dissolved	7440-42-8	5.93		0.200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cadmium, dissolved	7440-43-9	<0.000100	DLDS,	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
calcium, dissolved	7440-70-2	43.8		1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cesium, dissolved	7440-46-2	0.00671		0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
chromium, dissolved	7440-47-3	<0.0100	DLDS,	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cobalt, dissolved	7440-48-4	0.00378		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
copper, dissolved	7440-50-8	<0.00400	DLDS,	0.00400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
iron, dissolved	7439-89-6	<0.200	DLDS,	0.200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lead, dissolved	7439-92-1	<0.00100	DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lithium, dissolved	7439-93-2	0.766		0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
magnesium, dissolved	7439-95-4	223		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
manganese, dissolved	7439-96-5	0.360		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744

Analytical Results

EO2210705-004

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3E (PC3E)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	0.0717	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
nickel, dissolved	7440-02-0	0.744	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
phosphorus, dissolved	7723-14-0	2.38	1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
potassium, dissolved	7440-09-7	272	1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
rubidium, dissolved	7440-17-7	0.418	0.00400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
selenium, dissolved	7782-49-2	0.00184	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silicon, dissolved	7440-21-3	11.4	1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silver, dissolved	7440-22-4	0.000283	0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sodium, dissolved	7440-23-5	2550	1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
strontium, dissolved	7440-24-6	1.71	0.00400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sulfur, dissolved	7704-34-9	131	10.0	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tellurium, dissolved	13494-80-9	<0.00400 DLDS,	0.00400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thallium, dissolved	7440-28-0	<0.000200 DLDS,	0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thorium, dissolved	7440-29-1	<0.00200 DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tin, dissolved	7440-31-5	<0.00200 DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
titanium, dissolved	7440-32-6	<0.00600 DLDS,	0.00600	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tungsten, dissolved	7440-33-7	0.0348	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
uranium, dissolved	7440-61-1	0.00484	0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
vanadium, dissolved	7440-62-2	3.52	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zinc, dissolved	7440-66-6	<0.0200 DLDS,	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zirconium, dissolved	7440-67-7	0.153	0.00400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
dissolved metals filtration location	----	Field	-	-	EP421	-	07-Dec-2022	770744
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.0500 DLM,	0.0500	mg/L	E532A	-	13-Dec-2022	773067
Aggregate Organics								
chemical oxygen demand [COD]	----	4320 DLHC,	100	mg/L	E559-L	-	08-Dec-2022	771715
phenols, total (4AAP)	----	0.0969	0.0010	mg/L	E562	07-Dec-2022	07-Dec-2022	770924
Volatile Organic Compounds								
benzene	71-43-2	45.1	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
ethylbenzene	100-41-4	4.51	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
toluene	108-88-3	4.80	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, m+p-	179601-23-1	3.08	0.40	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, o-	95-47-6	1.94	0.30	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylenes, total	1330-20-7	5.02	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	07-Dec-2022	07-Dec-2022	770179
F1-BTEX	----	<100	100	µg/L	EC580	-	09-Dec-2022	-
F2 (C10-C16)	----	14700	100	µg/L	E601	07-Dec-2022	07-Dec-2022	769882
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	99.9	1.0	%	E601	07-Dec-2022	07-Dec-2022	769882
dichlorotoluene, 3,4-	97-75-0	126	1.0	%	E581.F1	07-Dec-2022	07-Dec-2022	770179
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	92.8	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178
difluorobenzene, 1,4-	540-36-3	100	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210705-005

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 4 (PC4)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	5160		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, carbonate (as CO3)	3812-32-6	208		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, total (as CaCO3)	----	4570		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
conductivity	----	16400		1.0	µS/cm	E100	07-Dec-2022	07-Dec-2022	770132
hardness (as CaCO3), dissolved	----	1700		1	mg/L	EC100	-	10-Dec-2022	-
pH	----	8.21		0.10	pH units	E108	07-Dec-2022	07-Dec-2022	770131
solids, total dissolved [TDS], calculated	----	12800		1.0	mg/L	EC103	-	08-Dec-2022	-
solids, total suspended [TSS]	----	34.6		3.0	mg/L	E160	-	10-Dec-2022	772267
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	345		5.00	mg/L	E298	07-Dec-2022	07-Dec-2022	770815
chloride	16887-00-6	2680	DLDS,	10.0	mg/L	E235.Cl	07-Dec-2022	07-Dec-2022	770172
fluoride	16984-48-8	1.43	DLDS,	0.400	mg/L	E235.F	07-Dec-2022	07-Dec-2022	770171
nitrate (as N)	14797-55-8	<0.400	DLDS,	0.400	mg/L	E235.NO3	07-Dec-2022	07-Dec-2022	770169
nitrate + nitrite (as N)	----	<0.447		0.447	mg/L	EC235.N+N	-	08-Dec-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS,	0.200	mg/L	E235.NO2	07-Dec-2022	07-Dec-2022	770170
phosphorus, total	7723-14-0	3.38	SP,	0.100	mg/L	E372-S	07-Dec-2022	07-Dec-2022	769887
phosphorus, total dissolved	7723-14-0	3.18	SFP,	0.100	mg/L	E375-U	07-Dec-2022	07-Dec-2022	769892
sulfate (as SO4)	14808-79-8	1590	DLDS,	6.00	mg/L	E235.SO4	07-Dec-2022	07-Dec-2022	770168
Kjeldahl nitrogen, total [TKN]	----	400		5.00	mg/L	E318	07-Dec-2022	08-Dec-2022	770138
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	1010		25.0	mg/L	E358-L	08-Dec-2022	08-Dec-2022	772604
Ion Balance									
ion balance (cations/anions)	----	109		0.010	%	EC101	-	08-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.0112		0.0100	mg/L	E420	08-Dec-2022	09-Dec-2022	771618
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	07-Dec-2022	07-Dec-2022	769906
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.142		0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
antimony, dissolved	7440-36-0	<0.00200	DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
arsenic, dissolved	7440-38-2	0.0119		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
barium, dissolved	7440-39-3	0.268		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
beryllium, dissolved	7440-41-7	<0.000400	DLDS,	0.000400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
bismuth, dissolved	7440-69-9	<0.00100	DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
boron, dissolved	7440-42-8	17.9		0.200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cadmium, dissolved	7440-43-9	<0.000100	DLDS,	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
calcium, dissolved	7440-70-2	234		1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cesium, dissolved	7440-46-2	0.00440		0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
chromium, dissolved	7440-47-3	0.0134		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cobalt, dissolved	7440-48-4	0.00356		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
copper, dissolved	7440-50-8	<0.00400	DLDS,	0.00400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
iron, dissolved	7439-89-6	0.774		0.200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lead, dissolved	7439-92-1	<0.00100	DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lithium, dissolved	7439-93-2	0.364		0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
magnesium, dissolved	7439-95-4	271		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
manganese, dissolved	7439-96-5	1.25		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744

Analytical Results

EO2210705-005

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 4 (PC4)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	0.0899	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
nickel, dissolved	7440-02-0	0.311	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
phosphorus, dissolved	7723-14-0	4.26	1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
potassium, dissolved	7440-09-7	308	1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
rubidium, dissolved	7440-17-7	0.230	0.00400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
selenium, dissolved	7782-49-2	0.00616	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silicon, dissolved	7440-21-3	11.8	1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silver, dissolved	7440-22-4	<0.000200 DLDS,	0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sodium, dissolved	7440-23-5	3480	1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
strontium, dissolved	7440-24-6	2.87	0.00400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sulfur, dissolved	7704-34-9	1030	10.0	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tellurium, dissolved	13494-80-9	<0.00400 DLDS,	0.00400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thallium, dissolved	7440-28-0	<0.000200 DLDS,	0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thorium, dissolved	7440-29-1	<0.00200 DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tin, dissolved	7440-31-5	<0.00200 DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
titanium, dissolved	7440-32-6	0.0275	0.00600	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tungsten, dissolved	7440-33-7	0.148	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
uranium, dissolved	7440-61-1	0.0203	0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
vanadium, dissolved	7440-62-2	0.670	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zinc, dissolved	7440-66-6	0.0705	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zirconium, dissolved	7440-67-7	0.0618	0.00400	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
dissolved metals filtration location	----	Field	-	-	EP421	-	07-Dec-2022	770744
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.0500 DLM,	0.0500	mg/L	E532A	-	13-Dec-2022	773067
Aggregate Organics								
chemical oxygen demand [COD]	----	4860 DLHC,	100	mg/L	E559-L	-	08-Dec-2022	771715
phenols, total (4AAP)	----	3.13	0.100	mg/L	E562	07-Dec-2022	07-Dec-2022	770924
Volatile Organic Compounds								
benzene	71-43-2	82.7	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
ethylbenzene	100-41-4	54.0	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
toluene	108-88-3	295	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, m+p-	179601-23-1	170	0.40	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, o-	95-47-6	75.5	0.30	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylenes, total	1330-20-7	246	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
Hydrocarbons								
F1 (C6-C10)	----	1000	100	µg/L	E581.F1	07-Dec-2022	07-Dec-2022	770179
F1-BTEX	----	323	308	µg/L	EC580	-	09-Dec-2022	-
F2 (C10-C16)	----	2000	100	µg/L	E601	07-Dec-2022	07-Dec-2022	769882
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	101	1.0	%	E601	07-Dec-2022	07-Dec-2022	769882
dichlorotoluene, 3,4-	97-75-0	124	1.0	%	E581.F1	07-Dec-2022	07-Dec-2022	770179
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	100.0	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178
difluorobenzene, 1,4-	540-36-3	113	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210705-006

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 2 (PC2)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	12200		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, carbonate (as CO3)	3812-32-6	1930		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, total (as CaCO3)	----	13200		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
conductivity	----	39500		1.0	µS/cm	E100	13-Dec-2022	13-Dec-2022	777291
hardness (as CaCO3), dissolved	----	1770		1	mg/L	EC100	-	17-Dec-2022	-
pH	----	8.49		0.10	pH units	E108	13-Dec-2022	13-Dec-2022	777290
solids, total dissolved [TDS], calculated	----	31200		1.0	mg/L	EC103	-	14-Dec-2022	-
solids, total suspended [TSS]	----	260		3.0	mg/L	E160	-	14-Dec-2022	777244
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	810		10.0	mg/L	E298	13-Dec-2022	13-Dec-2022	777233
chloride	16887-00-6	8370	DLDS.	10.0	mg/L	E235.Cl	13-Dec-2022	13-Dec-2022	777253
fluoride	16984-48-8	2.61	DLDS.	0.400	mg/L	E235.F	13-Dec-2022	13-Dec-2022	777250
nitrate (as N)	14797-55-8	<0.400	DLDS.	0.400	mg/L	E235.NO3	13-Dec-2022	13-Dec-2022	777251
nitrate + nitrite (as N)	----	<0.447		0.447	mg/L	EC235.N+N	-	14-Dec-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS.	0.200	mg/L	E235.NO2	13-Dec-2022	13-Dec-2022	777252
phosphorus, total	7723-14-0	8.21		0.100	mg/L	E372-S	15-Dec-2022	15-Dec-2022	778090
phosphorus, total dissolved	7723-14-0	7.22		0.100	mg/L	E375-U	15-Dec-2022	15-Dec-2022	778089
sulfate (as SO4)	14808-79-8	900	DLDS.	6.00	mg/L	E235.SO4	13-Dec-2022	13-Dec-2022	777249
Kjeldahl nitrogen, total [TKN]	----	757		15.0	mg/L	E318	13-Dec-2022	14-Dec-2022	777161
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	2420	SFP.	25.0	mg/L	E358-L	13-Dec-2022	16-Dec-2022	777478
Ion Balance									
ion balance (cations/anions)	----	98.6		0.010	%	EC101	-	14-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.354		0.0100	mg/L	E420	14-Dec-2022	15-Dec-2022	777880
mercury, total	7439-97-6	<0.000500	DLM.	0.000500	mg/L	E508	15-Dec-2022	15-Dec-2022	779354
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.114	RRV.	0.0200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
antimony, dissolved	7440-36-0	0.280	RRV.	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
arsenic, dissolved	7440-38-2	0.290	RRV.	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
barium, dissolved	7440-39-3	1.20	RRV.	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
beryllium, dissolved	7440-41-7	<0.000400	DLDS.	0.000400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
bismuth, dissolved	7440-69-9	0.00146	RRV.	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
boron, dissolved	7440-42-8	66.1	RRV.	0.200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cadmium, dissolved	7440-43-9	0.0127	RRV.	0.000100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
calcium, dissolved	7440-70-2	60.9	RRV.	1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cesium, dissolved	7440-46-2	0.00162	RRV.	0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
chromium, dissolved	7440-47-3	0.321	RRV.	0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cobalt, dissolved	7440-48-4	0.00768	RRV.	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
copper, dissolved	7440-50-8	0.0475	RRV.	0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
iron, dissolved	7439-89-6	<0.200	DLDS.	0.200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
lead, dissolved	7439-92-1	<0.00100	DLDS.	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
lithium, dissolved	7439-93-2	9.45	RRV.	0.0200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
magnesium, dissolved	7439-95-4	394	RRV.	0.100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
manganese, dissolved	7439-96-5	1.10	RRV.	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882

Analytical Results

EO2210705-006

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 2 (PC2)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	36.6 RRV.	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
nickel, dissolved	7440-02-0	0.322 RRV.	0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
phosphorus, dissolved	7723-14-0	7.56 RRV.	1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
potassium, dissolved	7440-09-7	1180 RRV.	1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
rubidium, dissolved	7440-17-7	0.168 RRV.	0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
selenium, dissolved	7782-49-2	0.00564 RRV.	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
silicon, dissolved	7440-21-3	9.39 RRV.	1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
silver, dissolved	7440-22-4	0.000720 RRV.	0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
sodium, dissolved	7440-23-5	8930 RRV.	1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
strontium, dissolved	7440-24-6	3.76 RRV.	0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
sulfur, dissolved	7704-34-9	539 RRV.	10.0	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tellurium, dissolved	13494-80-9	<0.00400 DLDS.	0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
thallium, dissolved	7440-28-0	<0.000200 DLDS.	0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
thorium, dissolved	7440-29-1	0.00358 RRV.	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tin, dissolved	7440-31-5	0.00615 RRV.	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
titanium, dissolved	7440-32-6	0.224 RRV.	0.00600	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tungsten, dissolved	7440-33-7	16.9 RRV.	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
uranium, dissolved	7440-61-1	0.00224 RRV.	0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
vanadium, dissolved	7440-62-2	0.626 RRV.	0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
zinc, dissolved	7440-66-6	0.0445 RRV.	0.0200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
zirconium, dissolved	7440-67-7	0.348 RRV.	0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
dissolved metals filtration location	----	Field SP.	-	-	EP421	-	14-Dec-2022	777882
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Dec-2022	780035
Aggregate Organics								
chemical oxygen demand [COD]	----	10200 DLHC.	200	mg/L	E559-L	-	15-Dec-2022	779429
phenols, total (4AAP)	----	5.30 SP.	0.100	mg/L	E562	13-Dec-2022	13-Dec-2022	777248
Volatile Organic Compounds								
benzene	71-43-2	68.1	0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
ethylbenzene	100-41-4	0.64	0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
toluene	108-88-3	10.4	0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylene, m+p-	179601-23-1	1.98	0.40	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylene, o-	95-47-6	2.36	0.30	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylenes, total	1330-20-7	4.34	0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
Hydrocarbons								
F1 (C6-C10)	----	560	100	µg/L	E581.F1	17-Dec-2022	17-Dec-2022	782188
F1-BTEX	----	476	149	µg/L	EC580	-	17-Dec-2022	-
F2 (C10-C16)	----	1560	100	µg/L	E601	14-Dec-2022	14-Dec-2022	778042
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	103	1.0	%	E601	14-Dec-2022	14-Dec-2022	778042
dichlorotoluene, 3,4-	97-75-0	105	1.0	%	E581.F1	17-Dec-2022	17-Dec-2022	782188
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	110	1.0	%	E611A	17-Dec-2022	17-Dec-2022	782189
difluorobenzene, 1,4-	540-36-3	102	1.0	%	E611A	17-Dec-2022	17-Dec-2022	782189

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210705-007

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3A (PC3A)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	8820		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, carbonate (as CO3)	3812-32-6	588		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, total (as CaCO3)	----	8210		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
conductivity	----	37900		1.0	µS/cm	E100	13-Dec-2022	13-Dec-2022	777291
hardness (as CaCO3), dissolved	----	2450		1	mg/L	EC100	-	17-Dec-2022	-
pH	----	7.79		0.10	pH units	E108	13-Dec-2022	13-Dec-2022	777290
solids, total dissolved [TDS], calculated	----	27600		1.0	mg/L	EC103	-	14-Dec-2022	-
solids, total suspended [TSS]	----	702		15.0	mg/L	E160	-	14-Dec-2022	777244
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	940		25.0	mg/L	E298	13-Dec-2022	13-Dec-2022	777233
chloride	16887-00-6	11000	DLDS	10.0	mg/L	E235.Cl	13-Dec-2022	13-Dec-2022	777253
fluoride	16984-48-8	3.90	DLDS	0.400	mg/L	E235.F	13-Dec-2022	13-Dec-2022	777250
nitrate (as N)	14797-55-8	<0.400	DLDS	0.400	mg/L	E235.NO3	13-Dec-2022	13-Dec-2022	777251
nitrate + nitrite (as N)	----	<0.447		0.447	mg/L	EC235.N+N	-	14-Dec-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS	0.200	mg/L	E235.NO2	13-Dec-2022	13-Dec-2022	777252
phosphorus, total	7723-14-0	6.03		0.100	mg/L	E372-S	15-Dec-2022	15-Dec-2022	778090
phosphorus, total dissolved	7723-14-0	5.46		0.100	mg/L	E375-U	15-Dec-2022	15-Dec-2022	778089
sulfate (as SO4)	14808-79-8	322	DLDS	6.00	mg/L	E235.SO4	13-Dec-2022	13-Dec-2022	777249
Kjeldahl nitrogen, total [TKN]	----	1390		25.0	mg/L	E318	13-Dec-2022	14-Dec-2022	777161
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	1140		10.0	mg/L	E358-L	13-Dec-2022	13-Dec-2022	777478
Ion Balance									
ion balance (cations/anions)	----	93.6		0.010	%	EC101	-	14-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.353		0.0100	mg/L	E420	14-Dec-2022	15-Dec-2022	777880
mercury, total	7439-97-6	<0.0000500	DLM	0.0000500	mg/L	E508	15-Dec-2022	15-Dec-2022	779354
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.197		0.0200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
antimony, dissolved	7440-36-0	0.00951		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
arsenic, dissolved	7440-38-2	0.376		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
barium, dissolved	7440-39-3	1.78		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
beryllium, dissolved	7440-41-7	<0.000400	DLDS	0.000400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
bismuth, dissolved	7440-69-9	<0.00100	DLDS	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
boron, dissolved	7440-42-8	64.9		0.200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cadmium, dissolved	7440-43-9	0.000203		0.000100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
calcium, dissolved	7440-70-2	259		1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cesium, dissolved	7440-46-2	0.00329		0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
chromium, dissolved	7440-47-3	0.318		0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cobalt, dissolved	7440-48-4	0.0104		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
copper, dissolved	7440-50-8	<0.00400	DLDS	0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
iron, dissolved	7439-89-6	0.289		0.200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
lead, dissolved	7439-92-1	<0.00100	DLDS	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
lithium, dissolved	7439-93-2	4.24		0.0200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
magnesium, dissolved	7439-95-4	438		0.100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
manganese, dissolved	7439-96-5	1.56		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882

Analytical Results

EO2210705-007

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3A (PC3A)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals									
molybdenum, dissolved	7439-98-7	0.391		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
nickel, dissolved	7440-02-0	0.529		0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
phosphorus, dissolved	7723-14-0	9.46		1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
potassium, dissolved	7440-09-7	1430		1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
rubidium, dissolved	7440-17-7	1.38		0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
selenium, dissolved	7782-49-2	0.0113		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
silicon, dissolved	7440-21-3	19.1		1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
silver, dissolved	7440-22-4	0.000469		0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
sodium, dissolved	7440-23-5	6840		1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
strontium, dissolved	7440-24-6	5.45		0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
sulfur, dissolved	7704-34-9	268		10.0	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tellurium, dissolved	13494-80-9	<0.00400	DLDS,	0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
thallium, dissolved	7440-28-0	<0.000200	DLDS,	0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
thorium, dissolved	7440-29-1	<0.00200	DLDS,	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tin, dissolved	7440-31-5	<0.00200	DLDS,	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
titanium, dissolved	7440-32-6	0.0754		0.00600	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tungsten, dissolved	7440-33-7	1.25		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
uranium, dissolved	7440-61-1	0.00163		0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
vanadium, dissolved	7440-62-2	0.256		0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
zinc, dissolved	7440-66-6	0.0670		0.0200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
zirconium, dissolved	7440-67-7	0.235		0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
dissolved metals filtration location	----	Field	SP,	-	-	EP421	-	14-Dec-2022	777882
Speciated Metals									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050		0.00050	mg/L	E532A	-	15-Dec-2022	780035
Aggregate Organics									
chemical oxygen demand [COD]	----	9320	DLHC,	200	mg/L	E559-L	-	15-Dec-2022	779429
phenols, total (4AAP)	----	20.7	SP,	0.500	mg/L	E562	13-Dec-2022	13-Dec-2022	777248
Volatile Organic Compounds									
benzene	71-43-2	254		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
ethylbenzene	100-41-4	14.4		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
toluene	108-88-3	182		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylene, m+p-	179601-23-1	113		0.40	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylene, o-	95-47-6	37.2		0.30	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylenes, total	1330-20-7	150		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
Hydrocarbons									
F1 (C6-C10)	----	1170		100	µg/L	E581.F1	17-Dec-2022	17-Dec-2022	782188
F1-BTEX	----	569		338	µg/L	EC580	-	17-Dec-2022	-
F2 (C10-C16)	----	42400		420	µg/L	E601	14-Dec-2022	14-Dec-2022	778042
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	107		4.2	%	E601	14-Dec-2022	14-Dec-2022	778042
dichlorotoluene, 3,4-	97-75-0	89.1		1.0	%	E581.F1	17-Dec-2022	17-Dec-2022	782188
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	121		1.0	%	E611A	17-Dec-2022	17-Dec-2022	782189
difluorobenzene, 1,4-	540-36-3	95.2		1.0	%	E611A	17-Dec-2022	17-Dec-2022	782189

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210705-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3D (PC3D)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	4740		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, carbonate (as CO3)	3812-32-6	386		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, total (as CaCO3)	----	4530		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
conductivity	----	22900		1.0	µS/cm	E100	13-Dec-2022	13-Dec-2022	777291
hardness (as CaCO3), dissolved	----	1350		1	mg/L	EC100	-	17-Dec-2022	-
pH	----	8.19		0.10	pH units	E108	13-Dec-2022	13-Dec-2022	777290
solids, total dissolved [TDS], calculated	----	15500		1.0	mg/L	EC103	-	14-Dec-2022	-
solids, total suspended [TSS]	----	153		3.0	mg/L	E160	-	14-Dec-2022	777919
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	471		10.0	mg/L	E298	13-Dec-2022	13-Dec-2022	777233
chloride	16887-00-6	5640	DLDS,	10.0	mg/L	E235.Cl	13-Dec-2022	13-Dec-2022	777253
fluoride	16984-48-8	3.11	DLDS,	0.400	mg/L	E235.F	13-Dec-2022	13-Dec-2022	777250
nitrate (as N)	14797-55-8	<0.400	DLDS,	0.400	mg/L	E235.NO3	13-Dec-2022	13-Dec-2022	777251
nitrate + nitrite (as N)	----	<0.447		0.447	mg/L	EC235.N+N	-	14-Dec-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS,	0.200	mg/L	E235.NO2	13-Dec-2022	13-Dec-2022	777252
phosphorus, total	7723-14-0	1.50		0.0500	mg/L	E372-S	15-Dec-2022	15-Dec-2022	778090
phosphorus, total dissolved	7723-14-0	1.40		0.0500	mg/L	E375-U	15-Dec-2022	15-Dec-2022	778089
sulfate (as SO4)	14808-79-8	268	DLDS,	6.00	mg/L	E235.SO4	13-Dec-2022	13-Dec-2022	777249
Kjeldahl nitrogen, total [TKN]	----	809		15.0	mg/L	E318	13-Dec-2022	14-Dec-2022	777161
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	1070		10.0	mg/L	E358-L	13-Dec-2022	13-Dec-2022	777478
Ion Balance									
ion balance (cations/anions)	----	100		0.010	%	EC101	-	14-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.0293		0.0100	mg/L	E420	14-Dec-2022	15-Dec-2022	777880
mercury, total	7439-97-6	<0.000500	DLM,	0.000500	mg/L	E508	15-Dec-2022	15-Dec-2022	779354
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0497		0.0200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
antimony, dissolved	7440-36-0	<0.00200	DLDS,	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
arsenic, dissolved	7440-38-2	0.0241		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
barium, dissolved	7440-39-3	0.522		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
beryllium, dissolved	7440-41-7	<0.000400	DLDS,	0.000400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
bismuth, dissolved	7440-69-9	<0.00100	DLDS,	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
boron, dissolved	7440-42-8	52.3		0.200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cadmium, dissolved	7440-43-9	0.000440		0.000100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
calcium, dissolved	7440-70-2	215		1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cesium, dissolved	7440-46-2	0.00286		0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
chromium, dissolved	7440-47-3	0.0247		0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cobalt, dissolved	7440-48-4	0.00396		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
copper, dissolved	7440-50-8	<0.00400	DLDS,	0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
iron, dissolved	7439-89-6	1.03		0.200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
lead, dissolved	7439-92-1	<0.00100	DLDS,	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
lithium, dissolved	7439-93-2	1.77		0.0200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
magnesium, dissolved	7439-95-4	198		0.100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
manganese, dissolved	7439-96-5	1.64		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882

Analytical Results

EO2210705-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: PRIMARY LEACHATE CELL 3D (PC3D)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals									
molybdenum, dissolved	7439-98-7	1.06		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
nickel, dissolved	7440-02-0	3.20		0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
phosphorus, dissolved	7723-14-0	1.86		1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
potassium, dissolved	7440-09-7	719		1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
rubidium, dissolved	7440-17-7	0.493		0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
selenium, dissolved	7782-49-2	0.0113		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
silicon, dissolved	7440-21-3	20.6		1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
silver, dissolved	7440-22-4	<0.000200	DLDS,	0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
sodium, dissolved	7440-23-5	4050		1.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
strontium, dissolved	7440-24-6	2.11		0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
sulfur, dissolved	7704-34-9	181		10.0	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tellurium, dissolved	13494-80-9	<0.00400	DLDS,	0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
thallium, dissolved	7440-28-0	<0.000200	DLDS,	0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
thorium, dissolved	7440-29-1	<0.00200	DLDS,	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tin, dissolved	7440-31-5	<0.00200	DLDS,	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
titanium, dissolved	7440-32-6	0.0121		0.00600	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tungsten, dissolved	7440-33-7	0.244		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
uranium, dissolved	7440-61-1	0.00259		0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
vanadium, dissolved	7440-62-2	4.58		0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
zinc, dissolved	7440-66-6	0.0273		0.0200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
zirconium, dissolved	7440-67-7	0.0740		0.00400	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
dissolved metals filtration location	----	Field	SP,	-	-	EP421	-	14-Dec-2022	777882
Speciated Metals									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050		0.00050	mg/L	E532A	-	15-Dec-2022	780035
Aggregate Organics									
chemical oxygen demand [COD]	----	3690	DLHC,	200	mg/L	E559-L	-	15-Dec-2022	779429
phenols, total (4AAP)	----	7.59	SP,	0.100	mg/L	E562	13-Dec-2022	13-Dec-2022	777248
Volatile Organic Compounds									
benzene	71-43-2	22.5		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
ethylbenzene	100-41-4	4.14		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
toluene	108-88-3	35.7		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylene, m+p-	179601-23-1	17.0		0.40	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylene, o-	95-47-6	11.2		0.30	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylenes, total	1330-20-7	28.2		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
Hydrocarbons									
F1 (C6-C10)	----	820		100	µg/L	E581.F1	17-Dec-2022	17-Dec-2022	782188
F1-BTEX	----	730		218	µg/L	EC580	-	17-Dec-2022	-
F2 (C10-C16)	----	1230		100	µg/L	E601	14-Dec-2022	14-Dec-2022	778042
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	104		1.0	%	E601	14-Dec-2022	14-Dec-2022	778042
dichlorotoluene, 3,4-	97-75-0	124		1.0	%	E581.F1	17-Dec-2022	17-Dec-2022	782188
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	128		1.0	%	E611A	17-Dec-2022	17-Dec-2022	782189
difluorobenzene, 1,4-	540-36-3	103		1.0	%	E611A	17-Dec-2022	17-Dec-2022	782189

Please refer to the General Comments section for an explanation of any qualifiers detected.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2210705**	Page	: 1 of 31
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 4 2022	Date Samples Received	: 06-Dec-2022 14:53
PO	: 0000230062	Issue Date	: 20-Dec-2022 16:08
C-O-C number	: ----		
Sampler	: JA		
Site	: TABLE 4.4A		
Quote number	: EO22-CHES100-008		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- Matrix Spike outliers occur - please see following pages for full details.
- Test sample Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Dissolved Metals	Anonymous	Anonymous	tungsten, dissolved	7440-33-7	E421	131 % MES	70.0-130%	Recovery greater than upper data quality objective

Result Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Regular Sample Surrogates

Sub-Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Result	Limits	Comment
Samples Submitted							
Volatile Organic Compounds Surrogates	EO2210705-003	PRIMARY LEACHATE CELL 3C (PC3C)	bromofluorobenzene, 4-	460-00-4	157 %	70.0-130 %	Recovery greater than upper data quality objective

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E559-L	05-Dec-2022	----	----	----		15-Dec-2022	28 days	10 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E559-L	05-Dec-2022	----	----	----		15-Dec-2022	28 days	10 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D)	E559-L	05-Dec-2022	----	----	----		15-Dec-2022	28 days	10 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E559-L	05-Dec-2022	----	----	----		08-Dec-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E559-L	05-Dec-2022	----	----	----		08-Dec-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E559-L	05-Dec-2022	----	----	----		08-Dec-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E559-L	05-Dec-2022	----	----	----		08-Dec-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 4 (PC4)	E559-L	05-Dec-2022	----	----	----		08-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E562	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E562	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E562	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E562	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 4 (PC4)	E562	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E562	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E562	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D)	E562	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E298	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E298	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E298	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E298	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 4 (PC4)	E298	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E298	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E298	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D)	E298	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E235.Cl	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E235.Cl	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E235.Cl	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E235.Cl	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 4 (PC4)	E235.Cl	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E235.Cl	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E235.Cl	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3D (PC3D)	E235.Cl	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E235.F	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E235.F	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E235.F	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E235.F	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 4 (PC4)	E235.F	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E235.F	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E235.F	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PRIMARY LEACHATE CELL 3D (PC3D)	E235.F	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E235.NO3	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E235.NO3	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E235.NO3	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E235.NO3	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 4 (PC4)	E235.NO3	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E235.NO3	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	3 days	9 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E235.NO3	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	3 days	9 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3D (PC3D)	E235.NO3	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	3 days	9 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E235.NO2	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E235.NO2	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E235.NO2	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E235.NO2	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 4 (PC4)	E235.NO2	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E235.NO2	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	3 days	9 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E235.NO2	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	3 days	9 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE PRIMARY LEACHATE CELL 3D (PC3D)	E235.NO2	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	3 days	9 days	× EHT
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E235.SO4	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E235.SO4	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E235.SO4	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E235.SO4	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 4 (PC4)	E235.SO4	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E235.SO4	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E235.SO4	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PRIMARY LEACHATE CELL 3D (PC3D)	E235.SO4	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E375-U	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E375-U	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D)	E375-U	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E375-U	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E375-U	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E375-U	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E375-U	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 4 (PC4)	E375-U	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E318	05-Dec-2022	13-Dec-2022	----	----		14-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E318	05-Dec-2022	13-Dec-2022	----	----		14-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D)	E318	05-Dec-2022	13-Dec-2022	----	----		14-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E318	05-Dec-2022	07-Dec-2022	----	----		08-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E318	05-Dec-2022	07-Dec-2022	----	----		08-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E318	05-Dec-2022	07-Dec-2022	----	----		08-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E318	05-Dec-2022	07-Dec-2022	----	----		08-Dec-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 4 (PC4)	E318	05-Dec-2022	07-Dec-2022	----	----		08-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E372-S	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E372-S	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D)	E372-S	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E372-S	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E372-S	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E372-S	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E372-S	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) PRIMARY LEACHATE CELL 4 (PC4)	E372-S	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 2 (PC2)	E421	05-Dec-2022	14-Dec-2022	----	----		15-Dec-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E421	05-Dec-2022	14-Dec-2022	----	----		15-Dec-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 3D (PC3D)	E421	05-Dec-2022	14-Dec-2022	----	----		15-Dec-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 1 (PC1)	E421	05-Dec-2022	07-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E421	05-Dec-2022	07-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E421	05-Dec-2022	07-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E421	05-Dec-2022	07-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PRIMARY LEACHATE CELL 4 (PC4)	E421	05-Dec-2022	07-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 2 (PC2)	E581.F1	05-Dec-2022	17-Dec-2022	----	----		17-Dec-2022	14 days	12 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3A (PC3A)	E581.F1	05-Dec-2022	17-Dec-2022	----	----		17-Dec-2022	14 days	12 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3D (PC3D)	E581.F1	05-Dec-2022	17-Dec-2022	----	----		17-Dec-2022	14 days	12 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 1 (PC1)	E581.F1	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3B (PC3B)	E581.F1	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3C (PC3C)	E581.F1	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3E (PC3E)	E581.F1	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 4 (PC4)	E581.F1	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 1 (PC1)	E601	05-Dec-2022	07-Dec-2022	14 days	2 days	✓	07-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 3B (PC3B)	E601	05-Dec-2022	07-Dec-2022	14 days	2 days	✓	07-Dec-2022	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 3C (PC3C)	E601	05-Dec-2022	07-Dec-2022	14 days	2 days	✓	07-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 3E (PC3E)	E601	05-Dec-2022	07-Dec-2022	14 days	2 days	✓	07-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 4 (PC4)	E601	05-Dec-2022	07-Dec-2022	14 days	2 days	✓	07-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 2 (PC2)	E601	05-Dec-2022	14-Dec-2022	14 days	9 days	✓	14-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 3A (PC3A)	E601	05-Dec-2022	14-Dec-2022	14 days	9 days	✓	14-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) PRIMARY LEACHATE CELL 3D (PC3D)	E601	05-Dec-2022	14-Dec-2022	14 days	9 days	✓	14-Dec-2022	40 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 1 (PC1)	E358-L	05-Dec-2022	08-Dec-2022	----	----		08-Dec-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E358-L	05-Dec-2022	08-Dec-2022	----	----		08-Dec-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E358-L	05-Dec-2022	08-Dec-2022	----	----		08-Dec-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E358-L	05-Dec-2022	08-Dec-2022	----	----		08-Dec-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 4 (PC4)	E358-L	05-Dec-2022	08-Dec-2022	----	----		08-Dec-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 2 (PC2)	E358-L	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E358-L	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PRIMARY LEACHATE CELL 3D (PC3D)	E358-L	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E290	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E290	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E290	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E290	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 4 (PC4)	E290	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E290	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	14 days	9 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E290	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	14 days	9 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PRIMARY LEACHATE CELL 3D (PC3D)	E290	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	14 days	9 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E100	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E100	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E100	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E100	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 4 (PC4)	E100	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E100	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E100	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Physical Tests : Conductivity in Water										
HDPE PRIMARY LEACHATE CELL 3D (PC3D)	E100	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E108	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E108	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 3D (PC3D)	E108	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E108	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	0.25 hrs	3.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E108	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	0.25 hrs	3.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E108	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	0.25 hrs	3.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E108	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	0.25 hrs	3.25 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PRIMARY LEACHATE CELL 4 (PC4)	E108	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	0.25 hrs	3.25 hrs	✖ EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 2 (PC2)	E160	05-Dec-2022	----	----	----		14-Dec-2022	7 days	10 days	✖ EHT
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3A (PC3A)	E160	05-Dec-2022	----	----	----		14-Dec-2022	7 days	10 days	✖ EHT
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3D (PC3D)	E160	05-Dec-2022	----	----	----		14-Dec-2022	7 days	10 days	✖ EHT
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 1 (PC1)	E160	05-Dec-2022	----	----	----		10-Dec-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3B (PC3B)	E160	05-Dec-2022	----	----	----		10-Dec-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3C (PC3C)	E160	05-Dec-2022	----	----	----		10-Dec-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PRIMARY LEACHATE CELL 3E (PC3E)	E160	05-Dec-2022	----	----	----		10-Dec-2022	7 days	5 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE										
PRIMARY LEACHATE CELL 4 (PC4)	E160	05-Dec-2022	----	----	----		10-Dec-2022	7 days	5 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
PRIMARY LEACHATE CELL 2 (PC2)	E532A	05-Dec-2022	----	----	----		15-Dec-2022	28 days	11 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
PRIMARY LEACHATE CELL 3A (PC3A)	E532A	05-Dec-2022	----	----	----		15-Dec-2022	28 days	11 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
PRIMARY LEACHATE CELL 3D (PC3D)	E532A	05-Dec-2022	----	----	----		15-Dec-2022	28 days	11 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
PRIMARY LEACHATE CELL 1 (PC1)	E532A	05-Dec-2022	----	----	----		09-Dec-2022	28 days	4 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
PRIMARY LEACHATE CELL 3B (PC3B)	E532A	05-Dec-2022	----	----	----		09-Dec-2022	28 days	4 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
PRIMARY LEACHATE CELL 3C (PC3C)	E532A	05-Dec-2022	----	----	----		09-Dec-2022	28 days	4 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
PRIMARY LEACHATE CELL 3E (PC3E)	E532A	05-Dec-2022	----	----	----		09-Dec-2022	28 days	4 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
PRIMARY LEACHATE CELL 4 (PC4)	E532A	05-Dec-2022	----	----	----		09-Dec-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 2 (PC2)	E508	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E508	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 3D (PC3D)	E508	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 1 (PC1)	E508	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E508	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E508	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E508	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) PRIMARY LEACHATE CELL 4 (PC4)	E508	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 2 (PC2)	E420	05-Dec-2022	14-Dec-2022	----	----		15-Dec-2022	180 days	11 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 3A (PC3A)	E420	05-Dec-2022	14-Dec-2022	----	----		15-Dec-2022	180 days	11 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 3D (PC3D)	E420	05-Dec-2022	14-Dec-2022	----	----		15-Dec-2022	180 days	11 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 1 (PC1)	E420	05-Dec-2022	08-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 3B (PC3B)	E420	05-Dec-2022	08-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 3C (PC3C)	E420	05-Dec-2022	08-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 3E (PC3E)	E420	05-Dec-2022	08-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PRIMARY LEACHATE CELL 4 (PC4)	E420	05-Dec-2022	08-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 2 (PC2)	E611A	05-Dec-2022	17-Dec-2022	----	----		17-Dec-2022	14 days	12 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3A (PC3A)	E611A	05-Dec-2022	17-Dec-2022	----	----		17-Dec-2022	14 days	12 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3D (PC3D)	E611A	05-Dec-2022	17-Dec-2022	----	----		17-Dec-2022	14 days	12 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 1 (PC1)	E611A	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3B (PC3B)	E611A	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3C (PC3C)	E611A	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 3E (PC3E)	E611A	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) PRIMARY LEACHATE CELL 4 (PC4)	E611A	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	770133	2	24	8.3	5.0	✓
Ammonia by Fluorescence	E298	770815	2	32	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	770178	2	20	10.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	770179	2	20	10.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	771715	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	770083	3	55	5.4	5.0	✓
Conductivity in Water	E100	770132	2	24	8.3	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	773067	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	770744	2	35	5.7	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	772604	3	49	6.1	5.0	✓
Fluoride in Water by IC	E235.F	770080	3	52	5.7	5.0	✓
Nitrate in Water by IC	E235.NO3	770081	3	56	5.3	5.0	✓
Nitrite in Water by IC	E235.NO2	770084	3	54	5.5	5.0	✓
pH by Meter	E108	770131	2	25	8.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	770924	2	29	6.9	5.0	✓
Sulfate in Water by IC	E235.SO4	770082	3	49	6.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	769892	2	18	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	770138	2	27	7.4	5.0	✓
Total Mercury in Water by CVAAS	E508	769906	2	28	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	771618	2	29	6.9	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	769887	2	37	5.4	5.0	✓
TSS by Gravimetry	E160	772267	3	60	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	770133	2	24	8.3	5.0	✓
Ammonia by Fluorescence	E298	770815	2	32	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	770178	2	20	10.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	770179	2	20	10.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	769882	2	27	7.4	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	771715	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	770083	3	55	5.4	5.0	✓
Conductivity in Water	E100	770132	2	24	8.3	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	773067	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	770744	2	35	5.7	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	772604	3	49	6.1	5.0	✓
Fluoride in Water by IC	E235.F	770080	3	52	5.7	5.0	✓
Nitrate in Water by IC	E235.NO3	770081	3	56	5.3	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Nitrite in Water by IC	E235.NO2	770084	3	54	5.5	5.0	✓
pH by Meter	E108	770131	2	25	8.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	770924	2	29	6.9	5.0	✓
Sulfate in Water by IC	E235.SO4	770082	3	49	6.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	769892	2	18	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	770138	2	27	7.4	5.0	✓
Total Mercury in Water by CVAAS	E508	769906	2	28	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	771618	2	29	6.9	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	769887	2	37	5.4	5.0	✓
TSS by Gravimetry	E160	772267	3	60	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	770133	2	24	8.3	5.0	✓
Ammonia by Fluorescence	E298	770815	2	32	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	770178	2	20	10.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	770179	2	20	10.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	769882	2	27	7.4	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	771715	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	770083	3	55	5.4	5.0	✓
Conductivity in Water	E100	770132	2	24	8.3	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	773067	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	770744	2	35	5.7	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	772604	3	49	6.1	5.0	✓
Fluoride in Water by IC	E235.F	770080	3	52	5.7	5.0	✓
Nitrate in Water by IC	E235.NO3	770081	3	56	5.3	5.0	✓
Nitrite in Water by IC	E235.NO2	770084	3	54	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	770924	2	29	6.9	5.0	✓
Sulfate in Water by IC	E235.SO4	770082	3	49	6.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	769892	2	18	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	770138	2	27	7.4	5.0	✓
Total Mercury in Water by CVAAS	E508	769906	2	28	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	771618	2	29	6.9	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	769887	2	37	5.4	5.0	✓
TSS by Gravimetry	E160	772267	3	60	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	770815	2	32	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	770178	2	20	10.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	771715	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	770083	3	55	5.4	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	773067	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Dissolved Metals in Water by CRC ICPMS	E421	770744	2	35	5.7	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	772604	3	49	6.1	5.0	✓
Fluoride in Water by IC	E235.F	770080	3	52	5.7	5.0	✓
Nitrate in Water by IC	E235.NO3	770081	3	56	5.3	5.0	✓
Nitrite in Water by IC	E235.NO2	770084	3	54	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	770924	2	29	6.9	5.0	✓
Sulfate in Water by IC	E235.SO4	770082	3	49	6.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	769892	2	18	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	770138	2	27	7.4	5.0	✓
Total Mercury in Water by CVAAS	E508	769906	2	28	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	771618	2	29	6.9	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	769887	2	37	5.4	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Edmonton - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Edmonton - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Edmonton - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourmetrically after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total metals in Water by CRC ICPMS	E420 Edmonton - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Edmonton - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A Waterloo - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. sample pretreatment involved field or lab filtration following by sample preservation.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
CCME PHC - F1 by Headspace GC-FID	E581.F1 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BTEX by Headspace GC-MS	E611A Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Edmonton - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Edmonton - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Edmonton - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581 Edmonton - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Edmonton - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

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QUALITY CONTROL REPORT

Work Order	: **EO2210705**	Page	: 1 of 27
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	:	Telephone	: +1 780 413 5227
Project	: Primary Leachate Qtr 4 2022	Date Samples Received	: 06-Dec-2022 14:53
PO	: 0000230062	Date Analysis Commenced	: 07-Dec-2022
C-O-C number	: ----	Issue Date	: 20-Dec-2022 16:08
Sampler	: JA 780 663 2513		
Site	: TABLE 4.4A		
Quote number	: EO22-CHES100-008		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Alex Drake	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Edmonton Metals, Edmonton, Alberta
Jing Liu	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Jon Fisher	Department Manager - Inorganics	Waterloo Metals, Waterloo, Ontario
Leah Yee	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Edmonton Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Rebecca McCaig	Lab Assistant	Edmonton Metals, Edmonton, Alberta
Remy Gatabazi	Lab Analyst	Edmonton Organics, Edmonton, Alberta
Ryan Huynh	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Samantha Mayor	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta

Shruti Mudliar	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Sobhithan Pillay		Edmonton Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Edmonton Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 770131)											
EO2210704-001	Anonymous	pH	----	E108	0.10	pH units	7.42	7.44	0.269%	3%	----
Physical Tests (QC Lot: 770132)											
EO2210704-001	Anonymous	conductivity	----	E100	1.0	µS/cm	11100	11000	0.724%	10%	----
Physical Tests (QC Lot: 770133)											
EO2210704-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	1290	1300	0.882%	20%	----
Physical Tests (QC Lot: 772267)											
EO2210656-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	17.6	19.6	2.0	Diff <2x LOR	----
Physical Tests (QC Lot: 777244)											
EO2210686-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	34.6	33.8	2.34%	20%	----
Physical Tests (QC Lot: 777289)											
EO2210704-007	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	531	530	0.0754%	20%	----
Physical Tests (QC Lot: 777290)											
EO2210704-007	Anonymous	pH	----	E108	0.10	pH units	8.13	8.13	0.00%	3%	----
Physical Tests (QC Lot: 777291)											
EO2210704-007	Anonymous	conductivity	----	E100	1.0	µS/cm	5690	5730	0.700%	10%	----
Physical Tests (QC Lot: 777919)											
EO2210705-008	PRIMARY LEACHATE CELL 3D (PC3D)	solids, total suspended [TSS]	----	E160	3.0	mg/L	153	171	11.1%	20%	----
Anions and Nutrients (QC Lot: 769887)											
EO2210704-001	Anonymous	phosphorus, total	7723-14-0	E372-S	0.0100	mg/L	0.533	0.525	1.43%	20%	----
Anions and Nutrients (QC Lot: 769892)											
EO2210704-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	0.0100	mg/L	0.489	0.428	13.3%	20%	----
Anions and Nutrients (QC Lot: 770080)											
EO2210683-008	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	0.173	0.172	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 770081)											
EO2210683-008	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 770082)											
EO2210683-008	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	1160	1160	0.235%	20%	----
Anions and Nutrients (QC Lot: 770083)											
EO2210683-008	Anonymous	chloride	16887-00-6	E235.Cl	2.50	mg/L	138	139	0.617%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 770084)											
EO2210683-008	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 770138)											
EO2210704-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.50	mg/L	122	108	12.2%	20%	----
Anions and Nutrients (QC Lot: 770168)											
EO2210707-013	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	6.00	mg/L	896	890	0.601%	20%	----
Anions and Nutrients (QC Lot: 770169)											
EO2210707-013	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.400	mg/L	<0.400	<0.400	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 770170)											
EO2210707-013	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.200	mg/L	<0.200	<0.200	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 770171)											
EO2210707-013	Anonymous	fluoride	16984-48-8	E235.F	0.400	mg/L	53.5	51.1	4.51%	20%	----
Anions and Nutrients (QC Lot: 770172)											
EO2210707-013	Anonymous	chloride	16887-00-6	E235.Cl	10.0	mg/L	1060	985	7.02%	20%	----
Anions and Nutrients (QC Lot: 770815)											
FC2202939-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.100	mg/L	6.69	6.76	1.01%	20%	----
Anions and Nutrients (QC Lot: 777161)											
EO2210704-007	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	2.47	2.45	0.971%	20%	----
Anions and Nutrients (QC Lot: 777233)											
EO2210882-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.100	mg/L	6.96	7.15	2.65%	20%	----
Anions and Nutrients (QC Lot: 777249)											
EO2210889-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	422	424	0.344%	20%	----
Anions and Nutrients (QC Lot: 777250)											
EO2210889-002	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.159	0.167	0.008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 777251)											
EO2210889-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.578	0.582	0.725%	20%	----
Anions and Nutrients (QC Lot: 777252)											
EO2210889-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 777253)											
EO2210889-002	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	5.25	5.27	0.456%	20%	----
Anions and Nutrients (QC Lot: 778089)											
EO2210704-007	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	0.0050	mg/L	0.240	0.242	0.647%	20%	----
Anions and Nutrients (QC Lot: 778090)											
EO2210704-007	Anonymous	phosphorus, total	7723-14-0	E372-S	0.0050	mg/L	0.154	0.143	7.79%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Organic / Inorganic Carbon (QC Lot: 772604)											
FC2202942-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	10.9	11.2	3.16%	20%	----
Organic / Inorganic Carbon (QC Lot: 777478)											
FC2202952-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	17.2	18.2	5.66%	20%	----
Organic / Inorganic Carbon (QC Lot: 781846)											
EO2210975-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	6.89	6.47	6.26%	20%	----
Total Metals (QC Lot: 769906)											
EO2210683-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	0.000112	0.000110	1.80%	20%	----
Total Metals (QC Lot: 771618)											
EO2210705-001	PRIMARY LEACHATE CELL 1 (PC1)	chromium, total	7440-47-3	E420	0.0250	mg/L	0.462	0.471	1.96%	20%	----
Total Metals (QC Lot: 777880)											
EO2210704-007	Anonymous	chromium, total	7440-47-3	E420	0.00500	mg/L	0.0103	0.0124	0.00214	Diff <2x LOR	----
Total Metals (QC Lot: 779354)											
EO2210704-007	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000099	0.0000137	0.0000038	Diff <2x LOR	----
Dissolved Metals (QC Lot: 770744)											
EO2210704-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	0.0526	0.0540	0.0014	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00100	mg/L	0.00106	<0.00100	0.00006	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	0.00633	0.00628	0.00005	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.112	0.121	7.22%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.100	mg/L	9.81	9.53	2.90%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	0.0000803	0.0000822	0.0000019	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.500	mg/L	520	544	4.61%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00500	mg/L	0.126	0.123	2.54%	20%	----
		cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	2.19	2.10	4.26%	20%	----
		copper, dissolved	7440-50-8	E421	0.00200	mg/L	0.00566	0.00567	0.000010	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.100	mg/L	33.6	32.0	5.01%	20%	----
		lead, dissolved	7439-92-1	E421	0.000500	mg/L	0.00731	0.00721	1.38%	20%	----
		lithium, dissolved	7439-93-2	E421	0.0100	mg/L	0.576	0.548	5.05%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	228	220	3.82%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00100	mg/L	36.6	35.8	2.05%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	0.0133	0.0127	4.42%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 770744) - continued											
EO2210704-001	Anonymous	nickel, dissolved	7440-02-0	E421	0.00500	mg/L	11.5	11.0	3.64%	20%	----
		phosphorus, dissolved	7723-14-0	E421	0.500	mg/L	0.672	0.701	0.029	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	25.8	25.6	0.460%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00200	mg/L	0.00536	0.00502	0.00034	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000500	mg/L	0.00125	0.00133	0.000079	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.500	mg/L	9.06	8.46	6.84%	20%	----
		silver, dissolved	7440-22-4	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.500	mg/L	2250	2310	2.63%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00200	mg/L	3.20	3.12	2.39%	20%	----
		sulfur, dissolved	7704-34-9	E421	5.00	mg/L	1230	1170	4.74%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00300	mg/L	0.00498	0.00524	0.00025	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000100	mg/L	0.0421	0.0412	2.18%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	0.0571	0.0566	0.878%	20%	----
		zinc, dissolved	7440-66-6	E421	0.0100	mg/L	0.338	0.334	1.40%	20%	----
		zirconium, dissolved	7440-67-7	E421	0.00200	mg/L	0.0120	0.0116	0.00041	Diff <2x LOR	----
Dissolved Metals (QC Lot: 777882)											
EO2210704-007	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	0.0367	0.0284	0.0083	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00100	mg/L	0.00200	0.00176	0.00024	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	0.00136	0.00114	0.00022	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.108	0.109	0.618%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.100	mg/L	0.857	0.913	0.056	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	0.000154	0.000144	0.0000098	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.500	mg/L	106	108	2.30%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00500	mg/L	0.0127	<0.00500	0.00773	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	<0.00100	0.00103	0.00003	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00200	mg/L	0.0310	0.0307	0.746%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 777882) - continued											
EO2210704-007	Anonymous	iron, dissolved	7439-89-6	E421	0.100	mg/L	0.150	<0.100	0.050	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0100	mg/L	0.253	0.265	4.50%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	107	106	1.27%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00100	mg/L	0.103	0.104	1.04%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	0.461	0.471	2.18%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00500	mg/L	0.0870	0.0849	2.39%	20%	----
		phosphorus, dissolved	7723-14-0	E421	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	21.8	22.2	1.81%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00200	mg/L	0.00426	0.00432	0.00005	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000500	mg/L	0.00132	0.00117	0.000154	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.500	mg/L	5.62	5.64	0.372%	20%	----
		silver, dissolved	7440-22-4	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.500	mg/L	1100	1130	2.94%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00200	mg/L	1.48	1.55	4.31%	20%	----
		sulfur, dissolved	7704-34-9	E421	5.00	mg/L	854	875	2.46%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00100	mg/L	0.00129	0.00141	0.00012	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000100	mg/L	0.0527	0.0547	3.81%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	0.00988	0.00971	0.00016	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0100	mg/L	0.0342	0.0339	0.0002	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 773067)											
EO2210704-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 780035)											
FC2202997-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 770924)											
VA22C9491-001	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0022	0.0022	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 771715)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Aggregate Organics (QC Lot: 771715) - continued											
EO2210652-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	28	30	2	Diff <2x LOR	----
Aggregate Organics (QC Lot: 777248)											
CG2217108-001	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 779429)											
EO2210704-007	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	87	90	3	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 770178)											
EO2210704-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	2.18	2.23	0.05	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	0.98	1.01	0.03	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	0.41	<0.40	0.007	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 782189)											
EO2210704-007	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 770179)											
EO2210704-001	Anonymous	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 782188)											
EO2210704-007	Anonymous	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 770132)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 770133)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 772267)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 777244)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 777289)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 777291)						
conductivity	----	E100	1	µS/cm	1.9	----
Physical Tests (QCLot: 777919)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 769887)						
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 769892)						
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 770080)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 770081)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 770082)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 770083)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 770084)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 770138)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 770168)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 770169)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 770169) - continued						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 770170)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 770171)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 770172)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 770815)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 777161)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 777233)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 777249)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 777250)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 777251)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 777252)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 777253)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 778089)						
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 778090)						
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	<0.0010	----
Organic / Inorganic Carbon (QCLot: 772604)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 777478)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 781846)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 769906)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 771618)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 777880)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 779354)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 770744)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 770744) - continued						
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 777882)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 777882) - continued						
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Speciated Metals (QCLot: 773067)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Speciated Metals (QCLot: 780035)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 770924)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 771715)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 777248)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 779429)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 770178)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 782189)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 782189) - continued						
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 769882)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 770179)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 778042)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 782188)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 770131)									
pH	----	E108	----	pH units	6 pH units	99.7	97.0	103	----
Physical Tests (QCLot: 770132)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	102	90.0	110	----
Physical Tests (QCLot: 770133)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	107	85.0	115	----
Physical Tests (QCLot: 772267)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	98.5	85.0	115	----
Physical Tests (QCLot: 777244)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	94.9	85.0	115	----
Physical Tests (QCLot: 777289)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	108	85.0	115	----
Physical Tests (QCLot: 777290)									
pH	----	E108	----	pH units	6 pH units	100	97.0	103	----
Physical Tests (QCLot: 777291)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	96.7	90.0	110	----
Physical Tests (QCLot: 777919)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	96.3	85.0	115	----
Anions and Nutrients (QCLot: 769887)									
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	0.05 mg/L	106	80.0	120	----
Anions and Nutrients (QCLot: 769892)									
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	0.05 mg/L	101	80.0	120	----
Anions and Nutrients (QCLot: 770080)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 770081)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 770082)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 770083)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 770084)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	100	90.0	110	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 770138)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	92.2	75.0	125	----
Anions and Nutrients (QCLot: 770168)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 770169)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 770170)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	98.5	90.0	110	----
Anions and Nutrients (QCLot: 770171)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 770172)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 770815)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 777161)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 777233)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	113	85.0	115	----
Anions and Nutrients (QCLot: 777249)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 777250)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 777251)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 777252)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	94.5	90.0	110	----
Anions and Nutrients (QCLot: 777253)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 778089)									
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	0.05 mg/L	97.6	80.0	120	----
Anions and Nutrients (QCLot: 778090)									
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	0.05 mg/L	97.6	80.0	120	----
Organic / Inorganic Carbon (QCLot: 772604)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	94.5	80.0	120	----
Organic / Inorganic Carbon (QCLot: 777478)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Organic / Inorganic Carbon (QCLot: 777478) - continued									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	98.2	80.0	120	----
Organic / Inorganic Carbon (QCLot: 781846)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	89.7	80.0	120	----
Total Metals (QCLot: 769906)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	90.1	80.0	120	----
Total Metals (QCLot: 771618)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
Total Metals (QCLot: 777880)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	97.5	80.0	120	----
Total Metals (QCLot: 779354)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	94.2	80.0	120	----
Dissolved Metals (QCLot: 770744)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	106	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	104	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	110	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	108	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	112	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	98.6	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	110	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	107	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	113	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	110	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	110	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	107	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	93.5	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	115	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	109	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	117	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	108	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 770744) - continued									
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	102	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	97.4	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	113	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	107	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	96.4	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	105	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	104	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	111	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	106	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	111	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	112	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	109	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	95.6	80.0	120	----
Dissolved Metals (QCLot: 777882)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	109	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	91.0	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	87.6	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	97.6	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	88.1	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	114	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	81.5	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	89.2	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.7	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	91.7	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	106	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	107	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	106	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	97.8	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	83.7	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	103	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 777882) - continued									
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	114	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	99.9	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	106	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	102	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	86.8	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	90.6	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	111	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	97.4	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	95.6	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	91.1	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	103	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	118	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	94.2	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	80.5	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
Speciated Metals (QCLot: 773067)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.025 mg/L	98.5	80.0	120	----
Speciated Metals (QCLot: 780035)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
Aggregate Organics (QCLot: 770924)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	101	85.0	115	----
Aggregate Organics (QCLot: 771715)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	106	85.0	115	----
Aggregate Organics (QCLot: 777248)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	100	85.0	115	----
Aggregate Organics (QCLot: 779429)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	105	85.0	115	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 770178)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	92.1	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	94.2	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	93.2	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	92.6	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	100	70.0	130	----
Volatile Organic Compounds (QCLot: 782189)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	89.2	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	88.1	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	84.9	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	95.0	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	102	70.0	130	----
Hydrocarbons (QCLot: 769882)									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	125	70.0	130	----
Hydrocarbons (QCLot: 770179)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	82.9	70.0	130	----
Hydrocarbons (QCLot: 778042)									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	117	70.0	130	----
Hydrocarbons (QCLot: 782188)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	112	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 769887)										
EO2210704-002	Anonymous	phosphorus, total	7723-14-0	E372-S	ND mg/L	0.067 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 769892)										
EO2210704-002	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	0.0505 mg/L	0.067 mg/L	75.3	70.0	130	----
Anions and Nutrients (QCLot: 770080)										
FC2202942-004	Anonymous	fluoride	16984-48-8	E235.F	1.08 mg/L	1 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 770081)										
FC2202942-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.55 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 770082)										
FC2202942-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	98.7 mg/L	100 mg/L	98.7	75.0	125	----
Anions and Nutrients (QCLot: 770083)										
FC2202942-004	Anonymous	chloride	16887-00-6	E235.Cl	99.8 mg/L	100 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 770084)										
FC2202942-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.478 mg/L	0.5 mg/L	95.7	75.0	125	----
Anions and Nutrients (QCLot: 770138)										
EO2210704-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 770168)										
EO2210707-013	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 770169)										
EO2210707-013	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.55 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 770170)										
EO2210707-013	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.468 mg/L	0.5 mg/L	93.6	75.0	125	----
Anions and Nutrients (QCLot: 770171)										
EO2210707-013	Anonymous	fluoride	16984-48-8	E235.F	ND mg/L	1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 770172)										
EO2210707-013	Anonymous	chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 770815)										
FC2202939-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 777161)										
EO2210704-008	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 777233)										
EO2210882-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 777249)										
EO2210889-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 777250)										
EO2210889-002	Anonymous	fluoride	16984-48-8	E235.F	0.960 mg/L	1 mg/L	96.0	75.0	125	----
Anions and Nutrients (QCLot: 777251)										
EO2210889-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.64 mg/L	2.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 777252)										
EO2210889-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.510 mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 777253)										
EO2210889-002	Anonymous	chloride	16887-00-6	E235.Cl	106 mg/L	100 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 778089)										
EO2210704-008	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	ND mg/L	0.067 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 778090)										
EO2210704-008	Anonymous	phosphorus, total	7723-14-0	E372-S	ND mg/L	0.067 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 772604)										
FC2202942-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 777478)										
FC2202952-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 781846)										
EO2210975-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 769906)										
EO2210683-002	Anonymous	mercury, total	7439-97-6	E508	0.000115 mg/L	0.0001 mg/L	115	70.0	130	----
Total Metals (QCLot: 771618)										
EO2210705-002	PRIMARY LEACHATE CELL 3B (PC3B)	chromium, total	7440-47-3	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
Total Metals (QCLot: 777880)										
EO2210704-008	Anonymous	chromium, total	7440-47-3	E420	0.0402 mg/L	0.04 mg/L	100	70.0	130	----
Total Metals (QCLot: 779354)										

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 779354) - continued										
EO2210704-008	Anonymous	mercury, total	7439-97-6	E508	0.0000801 mg/L	0.0001 mg/L	80.1	70.0	130	----
Dissolved Metals (QCLot: 770744)										
EO2210704-002	Anonymous	aluminum, dissolved	7429-90-5	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0402 mg/L	0.04 mg/L	101	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00870 mg/L	0.01 mg/L	87.0	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00418 mg/L	0.004 mg/L	104	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0103 mg/L	0.01 mg/L	103	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0414 mg/L	0.04 mg/L	103	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0187 mg/L	0.02 mg/L	93.6	70.0	130	----
		iron, dissolved	7439-89-6	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0182 mg/L	0.02 mg/L	91.1	70.0	130	----
		lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.2 mg/L	10 mg/L	112	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0398 mg/L	0.04 mg/L	99.5	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00369 mg/L	0.004 mg/L	92.3	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0414 mg/L	0.04 mg/L	103	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00371 mg/L	0.004 mg/L	92.8	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0195 mg/L	0.02 mg/L	97.3	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 770744) - continued										
EO2210704-002	Anonymous	titanium, dissolved	7440-32-6	E421	0.0434 mg/L	0.04 mg/L	108	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.381 mg/L	0.4 mg/L	95.3	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0424 mg/L	0.04 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 777882)										
EO2210704-008	Anonymous	aluminum, dissolved	7429-90-5	E421	0.222 mg/L	0.2 mg/L	111	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0198 mg/L	0.02 mg/L	99.1	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0187 mg/L	0.02 mg/L	93.7	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0428 mg/L	0.04 mg/L	107	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0121 mg/L	0.01 mg/L	121	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00344 mg/L	0.004 mg/L	86.0	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00961 mg/L	0.01 mg/L	96.1	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0433 mg/L	0.04 mg/L	108	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0211 mg/L	0.02 mg/L	105	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		iron, dissolved	7439-89-6	E421	2.06 mg/L	2 mg/L	103	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.4 mg/L	10 mg/L	114	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0423 mg/L	0.04 mg/L	106	70.0	130	----
		silicon, dissolved	7440-21-3	E421	11.8 mg/L	10 mg/L	118	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00368 mg/L	0.004 mg/L	92.0	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 777882) - continued										
EO2210704-008	Anonymous	sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0455 mg/L	0.04 mg/L	114	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00408 mg/L	0.004 mg/L	102	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0446 mg/L	0.04 mg/L	112	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0262 mg/L	0.02 mg/L	131	70.0	130	MES
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.109 mg/L	0.1 mg/L	109	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.304 mg/L	0.4 mg/L	76.1	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0515 mg/L	0.04 mg/L	129	70.0	130	----
Speciated Metals (QCLot: 773067)										
EO2210704-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0386 mg/L	0.04 mg/L	96.4	70.0	130	----
Speciated Metals (QCLot: 780035)										
FC2202997-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0463 mg/L	0.05 mg/L	92.6	70.0	130	----
Aggregate Organics (QCLot: 770924)										
VA22C9491-001	Anonymous	phenols, total (4AAP)	----	E562	0.0194 mg/L	0.02 mg/L	96.8	75.0	125	----
Aggregate Organics (QCLot: 771715)										
EO2210653-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	98 mg/L	100 mg/L	98.2	75.0	125	----
Aggregate Organics (QCLot: 777248)										
CG2217108-001	Anonymous	phenols, total (4AAP)	----	E562	0.0191 mg/L	0.02 mg/L	95.6	75.0	125	----
Aggregate Organics (QCLot: 779429)										
EO2210704-008	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Volatile Organic Compounds (QCLot: 770178)										
EO2210704-002	Anonymous	benzene	71-43-2	E611A	86.9 µg/L	100 µg/L	86.9	50.0	140	----
		ethylbenzene	100-41-4	E611A	95.7 µg/L	100 µg/L	95.7	50.0	140	----
		toluene	108-88-3	E611A	95.4 µg/L	100 µg/L	95.4	50.0	140	----
		xylene, m+p-	179601-23-1	E611A	187 µg/L	200 µg/L	93.6	50.0	140	----
		xylene, o-	95-47-6	E611A	102 µg/L	100 µg/L	102	50.0	140	----
Volatile Organic Compounds (QCLot: 782189)										
EO2210704-008	Anonymous	benzene	71-43-2	E611A	91.4 µg/L	100 µg/L	91.4	50.0	140	----
		ethylbenzene	100-41-4	E611A	87.1 µg/L	100 µg/L	87.1	50.0	140	----
		toluene	108-88-3	E611A	83.6 µg/L	100 µg/L	83.6	50.0	140	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 782189) - continued										
EO2210704-008	Anonymous	xylene, m+p-	179601-23-1	E611A	182 µg/L	200 µg/L	90.8	50.0	140	----
		xylene, o-	95-47-6	E611A	100 µg/L	100 µg/L	100	50.0	140	----

Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 22 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Clean Harbors Canada
Contact:	Todd Webb, Stan Yuha
Phone:	(780) 663-2513
	Company address below will appear on the final report
Street:	PO Box 390, 50114 Range Road 173
City/Province:	Ryley, AB
Postal Code:	T0B 4A0
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors Canada
Contact:	Robbi Gooding, Stephanie Dennis

Project Information

ALS Account # / Quote #:	EO22-CHES100-008
Job #:	Primary Leachate Qtr 4 2022
PO / AFE:	0000230062
LSD:	Table 4.4A

ALS Lab Work Order # (ALS use only): EO2210705

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: webb.todd@cleanharbors.com

Email 2: yuha.stan@cleanharbors.com

Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: gooding.robbi@cleanharbors.com

Email 2: dennis.stephanie@cleanharbors.com

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Contact: Pamela Toledo **Sampler:** James

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Table 4.4A Leachate	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	Primary Leachate Cell 1 (PC1)	5-Dec-22	12:00		11	R			
	Primary Leachate Cell 3B (PC3B)	5-Dec-22	12:00		11	R			
	Primary Leachate Cell 3C (PC3C)	5-Dec-22	12:00		11	R			
	Primary Leachate Cell 3E (PC3E)	5-Dec-22	12:00		11	R			
	Primary Leachate Cell 4 (PC4)	5-Dec-22	12:00		11	R			

Environmental Division
Edmonton
Work Order Reference
EO2210705

Telephone : +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Analyze as per Quote EO22-CHES100-008, Table 4.4A package (Attached). Same as COC 966636

SAMPLE RECE

Cooling Method: ☐ NONE ☐ ICE ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
6.8							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Todd Webb	6-Dec-22	11:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	DEC 6,22	2:53

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page of

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Report To	Contact and company name below will appear on the final report
Company:	Clean Harbors Canada
Contact:	Todd Webb, Stan Yuha
Phone:	(780) 663-2513
	Company address below will appear on the final report
Street:	PO Box 390, 50114 Range Road 173
City/Province:	Ryley, AB
Postal Code:	T0B 4A0
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors Canada
Contact:	Robbi Gooding, Stephanie Dennis

Project Information

ALS Account # / Quote #:	EO22-CHES100-008
Job #:	Primary Leachate Qtr 4 2022
PO / AFE:	0000230062
LSD:	Table 4.4A

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: webb.todd@cleanharbors.com

Email 2: yuha.stan@cleanharbors.com

Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: gooding.robbi@cleanharbors.com

Email 2: dennis.stephanie@cleanharbors.com

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

ALS Lab Work Order # (ALS use only):

ALS Contact: Pamela Toledo **Sampler:** James

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Table 4.4A Leachate	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
					11	R			
	Primary Leachate Cell 2 (PC2)	12-Dec-22	12:00						
	Primary Leachate Cell 3A (PC3A)	12-Dec-22	12:00						
					11	R			
					11	R			
	Primary Leachate Cell 3D (PC3D)	12-Dec-22	12:00						
					11	R			
					11	R			

Environmental Division
Edmonton
Work Order Reference
EO2210705

Telephone : +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Add to report for EO2210705

Analyze as per Quote EO22-CHES100-008, Table 4.4A package (Attached). Same as COC 966636

SAMP

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
4.8	

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Todd Webb	13-Dec-22	11:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	DEC 13, 22	10:35

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

APPENDIX E

Volume of Leachate Removed

Date	Cell 1	Cell 2		Cell 3A		Cell 3B		Cell 3C		Cell 3D		Cell 3E		Cell 4	
2022-01-01															
2022-01-02															
2022-01-03		0	F	0	F	0	F	0	F	0	F	0	F	0	F
2022-01-04		0	F	0	F	0	F	0	F	0	F	0	F	0	F
2022-01-05		0	F	0	F	0	F	0	F	0	F	0	F	0	F
2022-01-06		0	F	0	F	0	F	0	F	0	F	0	F	0	F
2022-01-07		0	F	0	F	0	F	10572		0	F	0	F	0	F
2022-01-08															
2022-01-09															
2022-01-10		0	F	0	F	0	F	18916		0	F	49561		0	**
2022-01-11		0	F	0	F	0	F	5372		0	F	5582		0	**
2022-01-12		0	F	0	F	7979		5299		17033		4462		45374	
2022-01-13		1153		7679		2943		5737		11977		2619		33867	
2022-01-14		323		173		1906		3562		7499		4792		6203	
2022-01-15															
2022-01-16															
2022-01-17		9421		21396		4825		13965		5311		8149		24366	
2022-01-18		337		3068		1457		4276		1743		2936		3476	
2022-01-19		324		431		1197		4082		1249		1932		5050	
2022-01-20		258		182		1020		3823		1255		1584		6259	
2022-01-21		324		417		1711		4117		1692		2749		6522	
2022-01-22															
2022-01-23															
2022-01-24		959		12595		1264		11131		4644		6914		19362	
2022-01-25		326		370		1264		3489		1436		2773		7358	
2022-01-26		340		1931		1406		3718		1527		2841		7320	
2022-01-27		296		1245		1136		3243		715		2667		5278	
2022-01-28		275		783		1151		3359		2262		2282		5778	
2022-01-29															
2022-01-30															
2022-01-31		907		2441		3933		10319		5075		7684		19208	
2022-02-01		318		838		1191		2938		1628		2494		5495	
2022-02-02		281		560		938		2725		1282		1527		5701	
2022-02-03		250		86		1050		3169		1415		1630		5624	
2022-02-04		279		417		1029		3082		1504		2176		6032	

Date	Cell 1	Cell 2		Cell 3A		Cell 3B		Cell 3C		Cell 3D		Cell 3E		Cell 4	
2022-02-05															
2022-02-06															
2022-02-07		885		1221		353		9674		5100		8398		18083	
2022-02-08		343		499		1		3143		1802		3766		10160	
2022-02-09		355		446		2719		3132		1655		2936		11434	
2022-02-10		751		450		1494		3614		1950		2900		17022	
2022-02-11		873		382		1491		4085		2081		4065		22954	
2022-02-12															
2022-02-13															
2022-02-14		944		1233		3204		13955		4413		12838		0	*
2022-02-15		271		259		978		4716		1626		0	**	0	*
2022-02-16		298		387		1178		4195		1652		9	**	0	*
2022-02-17		301		384		1004		4107		1441		0	**	0	*
2022-02-18		248		419		1149		4057		1795		0	**	0	*
2022-02-19															
2022-02-20															
2022-02-21															
2022-02-22		1174		1360		4237		14573		6108		0	**	98465	
2022-02-23		276		313		987		3574		1576		0	**	0	*
2022-02-24		314		0	*	1115		4776		2861		0	**	0	*
2022-02-25		230		0	*	0	**	2525		802		0	***	36195	
2022-02-26															
2022-02-27															
2022-02-28		881		0	*	0	**	10570		4968		56109		15962	
2022-03-01		282		0	*	0	**	3016		1629		6323		9959	
2022-03-02		284		0	*	0	**	3328		1552		2437		7298	
2022-03-03		240		0	*	0	**	3192		1440		1923		7091	
2022-03-04		263		0	*	0	***	3322		1479		1870		7895	
2022-03-05															
2022-03-06															
2022-03-07		813		0	*	11717		9790		4473		5765		22729	
2022-03-08		288		3039		1623		3158		1645		2259		7252	
2022-03-09		203		630		1252		3016		1426		1741		6917	
2022-03-10		239		650		1467		3351		1573		1928		7854	

Date	Cell 1	Cell 2		Cell 3A		Cell 3B		Cell 3C		Cell 3D		Cell 3E		Cell 4	
2022-03-11		275		0	*	1282		3066		1646		2216		6818	
2022-03-12															
2022-03-13															
2022-03-14		1416		0	*	4432		9635		5437		7421		22234	
2022-03-15		330		0	*	1279		3195		1649		2123		7695	
2022-03-16		1200		0	*	1719		3934		1772		2491		8612	
2022-03-17		685		0	*	3817		2597		3339		2048		8964	
2022-03-18		458		0	*	4027		3727		1574		1825		11723	
2022-03-19															
2022-03-20															
2022-03-21		844		0	*	7156		12227		4801		6541		54373	
2022-03-22		0	*	0	*	1086		4338		1476		8446		8426	
2022-03-23		0	*	0	*	2999		4233		1432		1844		0	F
2022-03-24	300	199		0	*	3677		2847		0	F	2473		0	**
2022-03-25		469		0	*	1316		2972		3238		2087		42104	
2022-03-26															
2022-03-27															
2022-03-28		934		0	*	3845		17273		4562		6481		118216	
2022-03-29		324		0	*	1335		6405		1611		2783		25386	
2022-03-30		302		0	*	1082		5191		1689		2552		25076	
2022-03-31		306		0	*	1391		4519		1709		3500		25655	
2022-04-01		288		0	*	1181		7054		1579		3567		27211	
2022-04-02															
2022-04-03															
2022-04-04		885		0	*	3804		21254		4434		10685		72072	
2022-04-05		315		0	*	1534		6417		1938		5506		27068	
2022-04-06		323		0	*	1270		6179		1581		3575		23132	
2022-04-07		240		0	*	1046		6685		1195		2284		20418	
2022-04-08		246		0	*	979		5063		1243		2630		21566	
2022-04-09															
2022-04-10															
2022-04-11		850		0	*	3873		16772		4756		11680		57423	
2022-04-12		224		0	*	1006		4965		1305		2890		17742	
2022-04-13		230		9839		937		4693		1154		2301		16879	
2022-04-14		231		439		1059		4793		1198		2384		0	F

Date	Cell 1	Cell 2		Cell 3A		Cell 3B		Cell 3C		Cell 3D		Cell 3E		Cell 4	
2022-04-15															
2022-04-16															
2022-04-17															
2022-04-18		953		2322		4287		18052		5501		11237		66965	
2022-04-19		252		605		1218		4401		1476		3084		13039	
2022-04-20		269		350		1547		3696		1791		4014		12429	
2022-04-21		280		862		1330		4088		1435		2816		12242	
2022-04-22		238		335		1125		4083		1411		2962		12017	
2022-04-23															
2022-04-24															
2022-04-25		691		1627		3290		11701		4141		8469		35598	
2022-04-26		244		576		1221		3881		1495		3084		12020	
2022-04-27		270		734		1343		3927		1566		3446		12646	
2022-04-28		229		407		1187		3840		1569		3475		10977	
2022-04-29		271		545		1211		3714		1399		2708		10761	
2022-04-30															
2022-05-01															
2022-05-02		679		1274		3248		10801		4058		7086		40899	
2022-05-03		256		608		1330		4343		1436		3049		17554	
2022-05-04		211		229		1064		2756		1746		2393		13270	
2022-05-05		300		625		1460		5116		2725		3969		16364	
2022-05-06		262		486		1256		3346		2017		3076		14956	
2022-05-07															
2022-05-08															
2022-05-09		750		1369		3845		9591		4544		8734		35152	
2022-05-10		241		342		1252		3419		1598		2388		11464	
2022-05-11		252		618		1120		3325		1424		2000		11225	
2022-05-12		251		573		987		3268		1377		0	**	10445	
2022-05-13		200		529		1099		3361		1427		5884		10804	
2022-05-14															
2022-05-15															
2022-05-16		662		1375		3264		9920		4433		6410		9272	
2022-05-17		230		277		1247		3290		1566		2226		9810	
2022-05-18		0		0		0		0		0		0		0	
2022-05-19		448		931		2423		4491		3468		6631		15113	

Date	Cell 1	Cell 2		Cell 3A		Cell 3B		Cell 3C		Cell 3D		Cell 3E		Cell 4	
2022-05-20		234		585		1231		3484		1673		2637		14303	
2022-05-21															
2022-05-22															
2022-05-23															
2022-05-24		815		1683		4375		12716		5556		7064		36558	
2022-05-25		223		513		1215		3333		1513		2138		9418	
2022-05-26		234		457		1267		3345		1536		2236		9912	
2022-05-27		225		434		1106		3276		1464		1995		8923	
2022-05-28															
2022-05-29															
2022-05-30		704		1336		3676		9832		4811		6721		26600	
2022-05-31		209		402		0	**	2956		1324		1428		7884	
2022-06-01	400	189		310		1929		3053		1269		1216		8056	
2022-06-02		194		220		1161		3073		1389		1410		8341	
2022-06-03		200		432		1236		3106		7455		1592		9351	
2022-06-04															
2022-06-05															
2022-06-06		659		1320		3599		9523		4752		5928		25791	
2022-06-07		184		426		298		0	**	1486		1768		7922	
2022-06-08		0	F	0	**	0	**	0	**	715		1908		648	
2022-06-09		0	F	0	**	0	**	0	**	0	**	2450		8000	**
2022-06-10		0	F	400	**	2000		0	**	0	**	1902		5000	**
2022-06-11															
2022-06-12															
2022-06-13	170	0	F	1000	**	4000	**	15	**	15	**	15		1000	**
2022-06-14		180		2000	**	1000	**	1500	**	0	**	6000		19000	**
2022-06-15		987		273		1242		842		0	**	2510		24376	
2022-06-16		391		259		1124		755		0	**	2274		19484	
2022-06-17		268		251		1288		944		9145		1980		7159	
2022-06-18															
2022-06-19															
2022-06-20		811		632		3344		2139		1395		8366		92444	
2022-06-21		258		243		1188		6971		5759		2455		18277	
2022-06-22		240		239		1178		720		2966		2296		19198	
2022-06-23		356		247		1145		692		1762		2737		21899	

Date	Cell 1	Cell 2		Cell 3A		Cell 3B		Cell 3C		Cell 3D		Cell 3E		Cell 4	
2022-06-24		1436		263		1293		804		9456		2896		33336	
2022-06-25															
2022-06-26															
2022-06-27		969		812		3451		3231		0	**	8868		102295	
2022-06-28		250		273		1056		549		0	**	3448		2	F
2022-06-29		272		269		1269		976		0	**	3966		377704	
2022-06-30		307		289		1303		923		0	**	4226		1834	
2022-07-01															
2022-07-02															
2022-07-03															
2022-07-04		1032		1153		4650		865		0	**	14482		80413	
2022-07-05		256		280		1283		0	F	3103		3966		4	F
2022-07-06		287		264		1267		0	F	12984		3597		3	F
2022-07-07		42		92		1111		0	F	220		0	F	0	F
2022-07-08		0	F	1		2	F	0	F	1372		0	F	3933	
2022-07-09															
2022-07-10															
2022-07-11		0	F	0	F	0	F	0	F	845		21323		74328	
2022-07-12		0	F	0	F	0	F	0	F	2839		3927		38180	
2022-07-13		0	F	0	F	1247		0	F	5092		4200		26899	
2022-07-14		0	F	0	F	134		2080		1743		4111		38071	
2022-07-15		0	F	0	F	165		1708		1550		3498		39191	
2022-07-16															
2022-07-17															
2022-07-18		1743		3410		506		3705		4778		10272		13499	
2022-07-19		278		424		79		0		1597		3762		36341	
2022-07-20		329		941		1120		1422		1560		373	F	34824	
2022-07-21		266		329		304		1383		1487		7669		28530	
2022-07-22		299		605		579		1254		1530		3673		23872	
2022-07-23															
2022-07-24															
2022-07-25		804		966		107		3304		4392		9018		57389	
2022-07-26		263		88		15		295		1459		2914		18626	
2022-07-27		267		129		0	***	0	F	1452		2525		15565	
2022-07-28		297		84		0	**	0	F	1472		2491		18895	

Date	Cell 1	Cell 2		Cell 3A		Cell 3B		Cell 3C		Cell 3D		Cell 3E		Cell 4	
2022-07-29		240		30		0	**	0	F	1477		3144		13148	
2022-07-30		290		69		0	**	0	F						
2022-07-31															
2022-08-01															
2022-08-02		1135		215		0	**	5183		6483		12490		60271	
2022-08-03		288		41		0	**	1147		1979		3562		31343	
2022-08-04		273		29		0	**	1011		1801		3636		37976	
2022-08-05		260		4	**	0	**	308		1789		3829		11887	
2022-08-06															
2022-08-07															
2022-08-08		809		174		0	**	1849		4607		9071		72203	
2022-08-09		207		0	**	0	**	1106		1502		3037		1572	
2022-08-10	250	257		0	**	0	**	1044		1501		2629		17977	
2022-08-11		260		0	**	0	**	1024		1547		2851		17842	
2022-08-12		234		0	**	0	**	873		1626		3149		15485	
2022-08-13															
2022-08-14															
2022-08-15		752		0	**	0	**	2660		5092		8789		45671	
2022-08-16		230		0	**	0	**	795		1539		2680		11243	
2022-08-17		231		0	**	0	**	749		1611		2719		14272	
2022-08-18		280		0	**	0	**	727		1483		2379		12888	
2022-08-19		251		0	**	0	**	707		1518		2341		14112	
2022-08-20															
2022-08-21															
2022-08-22		734		0	**	0	**	2153		5643		8539		39245	
2022-08-23		210		0	**	0	**	478		736		2959		8459	
2022-08-24		244		0	**	0	**	866		2271		2895		12449	
2022-08-25		206		4300		0	**	400		714		1824		10611	
2022-08-26		219		122		0	**	645		870		2375		10281	
2022-08-27															
2022-08-28															
2022-08-29		768		341		2323		1900		5184		8672		35450	
2022-08-30		251		71		761		614		1491		1960		10238	
2022-08-31		236		82		691		691		1412		1847		10866	
2022-09-01		234		51		738		1316		1895		1687		10590	

Date	Cell 1	Cell 2		Cell 3A		Cell 3B		Cell 3C		Cell 3D		Cell 3E		Cell 4	
2022-09-02		229		38		628		510		1205		2190		9864	
2022-09-03															
2022-09-04															
2022-09-05															
2022-09-06		936		120		2640		2085		6132		8242		41751	
2022-09-07	50	132		28		592		666		1398		1708		10098	
2022-09-08		259		19		636		635		1589		1792		9952	
2022-09-09		239		26		601		589		1436		1473		9897	
2022-09-10															
2022-09-11															
2022-09-12		68		75		1928		1786		4510		4877		30675	
2022-09-13		224		25		625		570		1426		1504		9674	
2022-09-14		229		14		753		589		1542		1633		9953	
2022-09-15		225		0	**	684		0	**	1618		1698		9769	
2022-09-16		231		20		619		709		1529		1429		9986	
2022-09-17															
2022-09-18															
2022-09-19		667		140		1897		1954		3931		5127		28990	
2022-09-20		220		37		681		601		1521		1542		9385	
2022-09-21		220		25		545		568		1352		1175		7930	
2022-09-22		208		24		572		587		1435		1117		9197	
2022-09-23		225		24		772		615		1707		1681		9927	
2022-09-24															
2022-09-25															
2022-09-26		654		69		1870		1658		4558		4176		27010	
2022-09-27		212		22		598		523		1459		1253		8980	
2022-09-28		215		23		645		566		2281		1450		9537	
2022-09-29		234		22		726		555		1594		1558		5891	
2022-09-30															
2022-10-01															
2022-10-02															
2022-10-03		837		85		2313		2131		5984		5044		40364	
2022-10-04		202		22		617		914		1479		1266		4998	
2022-10-05		212		22		605		315		1509		1321		10014	
2022-10-06		212		29		612		405		1814		1095		8915	

Date	Cell 1	Cell 2		Cell 3A		Cell 3B		Cell 3C		Cell 3D		Cell 3E		Cell 4	
2022-10-07		202		23		558		405		1625		1040		9418	
2022-10-08															
2022-10-09															
2022-10-10															
2022-10-11		858		92		2858		1833		6613		6047		35641	
2022-10-12		200		22		585		313		817		2466		0	**
2022-10-13		197		17		576		447		1419		1432		8113	
2022-10-14		201		23		612		514		1524		1113		0	**
2022-10-15															
2022-10-16															
2022-10-17		608		67		1810		1453		6467		3372		25613	
2022-10-18		212		32		699		516		1552		1238		9456	
2022-10-19		209		18		610		567		1475		1107		8369	
2022-10-20		195		25		721		441		1490		1194		8570	
2022-10-21		0	*	0	**	669		504		1748		1615		9672	
2022-10-22															
2022-10-23															
2022-10-24		370		0	**	2050		1616		4798		4163		25941	
2022-10-25		474		0	**	667		554		1405		1337		8869	
2022-10-26		273		0	**	708		551		1948		1385		8422	
2022-10-27		262		0	**	737		662		591		1325		8786	
2022-10-28		224		0	**	664		448		925		1578		8518	
2022-10-29															
2022-10-30															
2022-10-31		709		0	**	1926		1776		5248		3548		24348	
2022-11-01		224		0	**	653		447		1481		1346		8249	
2022-11-02		220		0	**	589		533		1440		1194		8045	
2022-11-03		234		0	**	627		597		1612		1038		7809	
2022-11-04		228		0	**	561		471		1010		852		7835	
2022-11-05															
2022-11-06															
2022-11-07		711		0	**	1720		1264		4307		4198		24304	
2022-11-08		189		0	**	541		0	F	1177		560		6191	
2022-11-09		206		0	**	474		0	F	1188		662		0	F
2022-11-10		221		0	**	59		0	F	1220		830		0	F

Date	Cell 1	Cell 2		Cell 3A		Cell 3B		Cell 3C		Cell 3D		Cell 3E		Cell 4	
2022-11-11															
2022-11-12															
2022-11-13															
2022-11-14		870		0	**	3056		0	F	4842		4180		0	F
2022-11-15		199		0	**	501		0	F	1085		419	F	0	F
2022-11-16		214		0	**	481		0	F	1040		0	F	0	F
2022-11-17		191		0	**	452		0	F	10	F	0	F	10430	
2022-11-18		194		0	**	489		1542		0	F	0	F	7917	
2022-11-19															
2022-11-20															
2022-11-21		668		0	**	1755		3396		466	F	0	F	44154	
2022-11-22		209		0	**	577		808		0	F	0	F	31595	
2022-11-23		242		0	**	656		924		0	F	0	F	6469	
2022-11-24		235		0	**	550		840		0	F	0	F	0	F
2022-11-25		322		0	**	610		726		0	F	0	F	0	F
2022-11-26															
2022-11-27															
2022-11-28		732		0	**	599		2401		0	F	38678		0	F
2022-11-29		270		0	**	0	F	716		0	F	0	F	0	F
2022-11-30		239		0	**	0	F	703		0	F	5	F	0	F
2022-12-01		256		0	**	0	F	873		0	F	0	F	0	F
2022-12-02		193		0	**	0	F	528		0	F	1	F	0	F
2022-12-03															
2022-12-04															
2022-12-05	200	709		0	**	15	F	1513		0	F	0	F	15	F
2022-12-06	200	240		0	**	0	F	0		0	F	0	F	0	F
2022-12-07		236		0	**	5937		0		0	F	0	F	0	F
2022-12-08		181		0	**	1918		481		0	F	0	F	43633	
2022-12-09		212		0	**	1216		851		19647		37910		8014	
2022-12-10															
2022-12-11															
2022-12-12		663		15	**	2148		2314		20199		51	F	51190	
2022-12-13		214		0	**	648		879		836		0	F	0	F
2022-12-14		184		0	**	570		547		0	F	0	F	0	F
2022-12-15		186		0	**	463		661		0	F	0	F	0	F

Date	Cell 1	Cell 2		Cell 3A		Cell 3B		Cell 3C		Cell 3D		Cell 3E		Cell 4	
2022-12-16		192		0	**	499		664		0	F	0	F	47914	
2022-12-17															
2022-12-18															
2022-12-19		580		0	**	1589		1054		0	F	2858		37435	
2022-12-20		186		0	**	541		365		0	F	983		0	F
2022-12-21		185		0	**	490		719		0	F	703		16241	
2022-12-22		172		0	**	470		679		0	F	735		2699	
2022-12-23		176		0	**	497		691		0	F	663		13730	
2022-12-24															
2022-12-25															
2022-12-26															
2022-12-27		874		0	**	2742		2748		2458		5953		31308	
2022-12-28		242		0	**	768		680		6624		2257		9030	
2022-12-29		240		0	**	691		620		9246		1597		0	F
2022-12-30		221		0	**	583		626		9465		0	F	0	F
2022-12-31															
Total Primary(L)	**1570**	**98641**		**125267**		**311255**		**736219**		**586909**		**925374**		**4545415**	
F = Tank Full	*** Down for Repairs**					****Pump/Line Issues**						*****Pump Replacement**			

APPENDIX F

Leak Detection Liquid Analysis

		Clean Harbors Canada, Inc. - Approval 10348-02					
		2022 Annual Report					
			Section 1.5 Secondary Leachate				
		Field pH & Electrical Conductivity Measurements					
	Qtr 1				Qtr 2		
			Conductivity				Conductivity
	Date	pH	(uS/cm)		Date	pH	(uS/cm)
Cell 1	2022-03-21	7.2	10980	Cell 1	2022-06-13	7.3	11240
Cell 2	2022-03-21	6.4	3218	Cell 2	2022-06-13	6.4	15590
Cell 3A	2022-03-21	7.2	12140	Cell 3A	2022-06-13	7.4	13930
Cell 3B	2022-03-21	7.7	7898	Cell 3B	2022-06-13	8.7	24790
Cell 3C	2022-03-21	7.8	11310	Cell 3C	2022-06-14	7.5	11680
Cell 3D	2022-03-21	7.6	12210	Cell 3D	2022-06-13	7.3	13240
Cell 3E	2022-03-21	7.9	4945	Cell 3E	2022-06-13	8.0	6507
Cell 4	2022-03-21	7.5	14920	Cell 4	2022-06-13	7.3	14820
	Qtr 3				Qtr 4		
			Conductivity				Conductivity
	Date	pH	(uS/cm)		Date	pH	(uS/cm)
Cell 1	2022-09-07	7.3	11710	Cell 1	2022-12-05	7.2	12160
Cell 2	2022-09-07	6.4	15300	Cell 2	2022-12-05	5.6	15770
Cell 3A	2022-09-07	7.2	13730	Cell 3A	2022-12-05	6.9	13800
Cell 3B	2022-09-07	9.0	37600	Cell 3B	2022-12-05	8.5	28550
Cell 3C	2022-09-07	7.8	11500	Cell 3C	2022-12-05	7.8	12090
Cell 3D	2022-09-07	7.3	13270	Cell 3D	2022-12-05	7.5	13930
Cell 3E	2022-09-07	7.8	5204	Cell 3E	2022-12-12	7.9	5875

APPENDIX F

Leak Detection Liquid Analysis

Quarter 1

CERTIFICATE OF ANALYSIS

Work Order	: **EO2201855**	Page	: 1 of 17
Amendment	: **1**		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Stan Yuha	Account Manager	: Pamela Toledo
Address	: 9808 12 Avenue SW Edmonton AB Canada T6X 0J5	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 1 2022	Date Samples Received	: 21-Mar-2022 17:45
PO	: 0000224129	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 20-966635	Issue Date	: 12-Apr-2022 11:01
Sampler	: Murray		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Austin Wasylyshyn	Lab Analyst	Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Metals, Edmonton, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Lisa Watt	Lab Supervisor - Environmental	Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Oscar Ruiz	Lab Assistant	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.
Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
IB:INT	*Ion Balance Reviewed: Imbalance is due to interference or non-measured component.*
TKNI	*TKN result may be biased low due to Nitrate interference. Nitrate-N is > 10x TKN.*

Analytical Results

EO2201855-001

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 1 (SC1)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	1500		10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, carbonate (as CO3)	3812-32-6	<1.0		1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
conductivity	----	10900		1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439340
pH	----	7.64		0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439339
solids, total dissolved [TDS]	----	9500		80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	9490		1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	3.1		3.0	mg/L	E160	-	25-Mar-2022	442313
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	6.00		0.500	mg/L	E298	26-Mar-2022	26-Mar-2022	443345
chloride	16887-00-6	1660	DLDS,	5.00	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439383
nitrate (as N)	14797-55-8	<0.200	DLDS,	0.200	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439381
nitrate + nitrite (as N)	----	<0.224		0.224	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	<0.100	DLDS,	0.100	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439382
phosphorus, total	7723-14-0	0.456		0.020	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	0.418		0.020	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	3720	DLDS,	3.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439384
Kjeldahl nitrogen, total [TKN]	----	86.7		4.00	mg/L	E318	24-Mar-2022	25-Mar-2022	439874
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	322		5.00	mg/L	E358-L	24-Mar-2022	24-Mar-2022	441738
Ion Balance									
ion balance (cations/anions)	----	96.0		0.010	%	EC101	-	23-Mar-2022	-
Total Metals									
chromium, total	7440-47-3	0.111		0.00500	mg/L	E420	23-Mar-2022	24-Mar-2022	439936
mercury, total	7439-97-6	0.0000500		0.0000050	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0374		0.0100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
antimony, dissolved	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
arsenic, dissolved	7440-38-2	0.00594		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
barium, dissolved	7440-39-3	0.126		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
boron, dissolved	7440-42-8	7.78		0.100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cadmium, dissolved	7440-43-9	0.000329		0.0000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
calcium, dissolved	7440-70-2	554		0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
chromium, dissolved	7440-47-3	0.106		0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cobalt, dissolved	7440-48-4	2.38		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
copper, dissolved	7440-50-8	0.00739		0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
iron, dissolved	7439-89-6	21.3		0.100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
lead, dissolved	7439-92-1	0.0139		0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
magnesium, dissolved	7439-95-4	232		0.0500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
manganese, dissolved	7439-96-5	32.6		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
molybdenum, dissolved	7439-98-7	0.0142		0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
nickel, dissolved	7440-02-0	11.8		0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
potassium, dissolved	7440-09-7	26.8		0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
selenium, dissolved	7782-49-2	0.00122		0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
silver, dissolved	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
sodium, dissolved	7440-23-5	2150		0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180

Analytical Results

EO2201855-001

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 1 (SC1)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
strontium, dissolved	7440-24-6	3.16	0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
uranium, dissolved	7440-61-1	0.0491	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
vanadium, dissolved	7440-62-2	0.0300	0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zinc, dissolved	7440-66-6	1.80	0.0100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zirconium, dissolved	7440-67-7	0.00990	0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
dissolved metals filtration location	----	Field	-	-	EP421	-	23-Mar-2022	440180
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	840 DLM,	50	mg/L	E559-L	-	24-Mar-2022	441224
phenols, total (4AAP)	----	0.0020	0.0010	mg/L	E562	22-Mar-2022	22-Mar-2022	439438
Volatile Organic Compounds								
benzene	71-43-2	0.94	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	0.66	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	0.43	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	97.1	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	73.8	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	<100	100	µg/L	EC580	-	29-Mar-2022	-
F2 (C10-C16)	----	480	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	99.3	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	110	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201855-002

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 2 (SC2)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	83.0 DLM,	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
conductivity	----	3150	1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439340
pH	----	6.61	0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439339
solids, total dissolved [TDS]	----	2200	20	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	2770	1.0	mg/L	EC103	-	23-Mar-2022	-

Analytical Results

EO2201855-002

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 2 (SC2)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
solids, total suspended [TSS]	----	232		15.0	mg/L	E160	-	25-Mar-2022	442314
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	2.26		0.125	mg/L	E298	26-Mar-2022	26-Mar-2022	443345
chloride	16887-00-6	61.8	DLDS,	5.00	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439383
nitrate (as N)	14797-55-8	3.62	DLDS,	0.200	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439381
nitrate + nitrite (as N)	----	3.74		0.224	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	0.121	DLDS,	0.100	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439382
phosphorus, total	7723-14-0	1.25		0.020	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	0.065		0.020	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	1820	DLDS,	3.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439384
Kjeldahl nitrogen, total [TKN]	----	7.08		0.400	mg/L	E318	24-Mar-2022	25-Mar-2022	439874
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	23.8		0.50	mg/L	E358-L	24-Mar-2022	24-Mar-2022	441738
Ion Balance									
ion balance (cations/anions)	----	88.6	IB:INT,	0.010	%	EC101	-	23-Mar-2022	-
Total Metals									
chromium, total	7440-47-3	0.0220		0.00250	mg/L	E420	23-Mar-2022	24-Mar-2022	439936
mercury, total	7439-97-6	0.0000145		0.0000050	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.277		0.0050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
antimony, dissolved	7440-36-0	0.00099		0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
arsenic, dissolved	7440-38-2	0.00138		0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
barium, dissolved	7440-39-3	0.135	DTC,	0.00050	mg/L	E421	23-Mar-2022	26-Mar-2022	440180
beryllium, dissolved	7440-41-7	<0.000100	DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
bismuth, dissolved	7440-69-9	<0.000250	DLDS,	0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
boron, dissolved	7440-42-8	0.557		0.050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cadmium, dissolved	7440-43-9	0.000323		0.0000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
calcium, dissolved	7440-70-2	128		0.250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
chromium, dissolved	7440-47-3	<0.00250	DLDS,	0.00250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cobalt, dissolved	7440-48-4	0.0391		0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
copper, dissolved	7440-50-8	0.00295		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
iron, dissolved	7439-89-6	3.12		0.050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
lead, dissolved	7439-92-1	<0.000250	DLDS,	0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
magnesium, dissolved	7439-95-4	39.7		0.0250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
manganese, dissolved	7439-96-5	2.95		0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
molybdenum, dissolved	7439-98-7	0.886		0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
nickel, dissolved	7440-02-0	0.117		0.00250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
potassium, dissolved	7440-09-7	15.6		0.250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
selenium, dissolved	7782-49-2	0.000364		0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
silver, dissolved	7440-22-4	<0.000050	DLDS,	0.000050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
sodium, dissolved	7440-23-5	600		0.250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
strontium, dissolved	7440-24-6	1.64		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
thallium, dissolved	7440-28-0	<0.000050	DLDS,	0.000050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
tin, dissolved	7440-31-5	<0.00050	DLDS,	0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
uranium, dissolved	7440-61-1	0.00141		0.000050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
vanadium, dissolved	7440-62-2	<0.00250	DLDS,	0.00250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zinc, dissolved	7440-66-6	0.205		0.0050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zirconium, dissolved	7440-67-7	<0.00100	DLDS,	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180

Analytical Results

EO2201855-002

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 2 (SC2)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
dissolved metals filtration location	----	Field	-	-	EP421	-	23-Mar-2022	440180
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	142 DLM,	50	mg/L	E559-L	-	24-Mar-2022	441224
phenols, total (4AAP)	----	<0.0010	0.0010	mg/L	E562	22-Mar-2022	22-Mar-2022	439438
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	0.84	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	0.46	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	97.4	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	103	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	<100	100	µg/L	EC580	-	30-Mar-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	94.8	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	111	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201855-003

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3A (SC3A)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	936	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
conductivity	----	11800	1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439340
pH	----	7.65	0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439339
solids, total dissolved [TDS]	----	10800	80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	11600	1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	50.9	3.0	mg/L	E160	-	25-Mar-2022	442314
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	6.44	0.500	mg/L	E298	26-Mar-2022	26-Mar-2022	443345
chloride	16887-00-6	418 DLDS,	5.00	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439383
nitrate (as N)	14797-55-8	<0.200 DLDS,	0.200	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439381
nitrate + nitrite (as N)	----	<0.224	0.224	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	<0.100 DLDS,	0.100	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439382

Analytical Results

EO2201855-003

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3A (SC3A)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients									
phosphorus, total	7723-14-0	0.280		0.020	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	0.042		0.020	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	7120	DLDS,	3.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439384
Kjeldahl nitrogen, total [TKN]	----	13.0		0.800	mg/L	E318	24-Mar-2022	25-Mar-2022	439874
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	76.9		1.00	mg/L	E358-L	24-Mar-2022	24-Mar-2022	441738
Ion Balance									
ion balance (cations/anions)	----	94.8		0.010	%	EC101	-	23-Mar-2022	-
Total Metals									
chromium, total	7440-47-3	0.0113		0.00500	mg/L	E420	23-Mar-2022	24-Mar-2022	439936
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0323		0.0100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
antimony, dissolved	7440-36-0	0.00172		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
arsenic, dissolved	7440-38-2	0.00329		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
barium, dissolved	7440-39-3	0.0656		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
boron, dissolved	7440-42-8	0.308		0.100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cadmium, dissolved	7440-43-9	0.0000678		0.0000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
calcium, dissolved	7440-70-2	408		0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
chromium, dissolved	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cobalt, dissolved	7440-48-4	0.0112		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
copper, dissolved	7440-50-8	<0.00200	DLDS,	0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
iron, dissolved	7439-89-6	5.12		0.100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
lead, dissolved	7439-92-1	<0.000500	DLDS,	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
magnesium, dissolved	7439-95-4	265		0.0500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
manganese, dissolved	7439-96-5	2.88		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
molybdenum, dissolved	7439-98-7	0.209		0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
nickel, dissolved	7440-02-0	0.234		0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
potassium, dissolved	7440-09-7	34.5		0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
selenium, dissolved	7782-49-2	0.000736		0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
silver, dissolved	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
sodium, dissolved	7440-23-5	2820		0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
strontium, dissolved	7440-24-6	5.60		0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
thallium, dissolved	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
tin, dissolved	7440-31-5	0.00227		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
uranium, dissolved	7440-61-1	0.0520		0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
vanadium, dissolved	7440-62-2	<0.00500	DLDS,	0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zinc, dissolved	7440-66-6	0.0843		0.0100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zirconium, dissolved	7440-67-7	0.00337		0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
dissolved metals filtration location	----	Field		-	-	EP421	-	23-Mar-2022	440180
Speciated Metals									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050		0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics									
chemical oxygen demand [COD]	----	173	DLM,	50	mg/L	E559-L	-	24-Mar-2022	441224
phenols, total (4AAP)	----	<0.0010		0.0010	mg/L	E562	22-Mar-2022	22-Mar-2022	439438
Volatile Organic Compounds									

Analytical Results

EO2201855-003

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3A (SC3A)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	0.60	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	93.5	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	102	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	<100	100	µg/L	EC580	-	30-Mar-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	101	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	110	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201855-004

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3B (SC3B)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	1200	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
conductivity	----	7790	1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439340
pH	----	8.14	0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439339
solids, total dissolved [TDS]	----	5950	20	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	6850	1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	67.3	3.0	mg/L	E160	-	25-Mar-2022	442314
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	39.4	5.00	mg/L	E298	26-Mar-2022	26-Mar-2022	443345
chloride	16887-00-6	464 DLDS	5.00	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439531
nitrate (as N)	14797-55-8	<0.200 DLDS	0.200	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439528
nitrate + nitrite (as N)	----	<0.224	0.224	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	<0.100 DLDS	0.100	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439529
phosphorus, total	7723-14-0	3.30	0.050	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	1.78	0.020	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	3450 DLDS	3.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439527
Kjeldahl nitrogen, total [TKN]	----	67.7	4.00	mg/L	E318	24-Mar-2022	25-Mar-2022	439874
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	134	1.00	mg/L	E358-L	24-Mar-2022	24-Mar-2022	441738
Ion Balance								

Analytical Results

EO2201855-004

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3B (SC3B)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Ion Balance								
ion balance (cations/anions)	----	94.8	0.010	%	EC101	-	23-Mar-2022	-
Total Metals								
chromium, total	7440-47-3	0.0204	0.00250	mg/L	E420	23-Mar-2022	24-Mar-2022	439936
mercury, total	7439-97-6	<0.0000050	0.0000050	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0110	0.0050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
antimony, dissolved	7440-36-0	0.00074	0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
arsenic, dissolved	7440-38-2	0.00726	0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
barium, dissolved	7440-39-3	0.116	0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
beryllium, dissolved	7440-41-7	<0.000100 DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
bismuth, dissolved	7440-69-9	<0.000250 DLDS,	0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
boron, dissolved	7440-42-8	5.65	0.050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cadmium, dissolved	7440-43-9	0.000504	0.0000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
calcium, dissolved	7440-70-2	164	0.250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
chromium, dissolved	7440-47-3	0.0151	0.00250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cobalt, dissolved	7440-48-4	0.00307	0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
copper, dissolved	7440-50-8	0.00860	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
iron, dissolved	7439-89-6	0.903	0.050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
lead, dissolved	7439-92-1	0.000383	0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
magnesium, dissolved	7439-95-4	127	0.0250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
manganese, dissolved	7439-96-5	0.950	0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
molybdenum, dissolved	7439-98-7	1.75	0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
nickel, dissolved	7440-02-0	0.0594	0.00250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
potassium, dissolved	7440-09-7	127	0.250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
selenium, dissolved	7782-49-2	0.00234	0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
silver, dissolved	7440-22-4	<0.000050 DLDS,	0.000050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
sodium, dissolved	7440-23-5	1720	0.250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
strontium, dissolved	7440-24-6	1.87	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
thallium, dissolved	7440-28-0	<0.000050 DLDS,	0.000050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
tin, dissolved	7440-31-5	0.00717	0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
uranium, dissolved	7440-61-1	0.0223	0.000050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
vanadium, dissolved	7440-62-2	0.0119	0.00250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zinc, dissolved	7440-66-6	0.0514	0.0050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zirconium, dissolved	7440-67-7	0.00495 DTC,	0.00100	mg/L	E421	23-Mar-2022	26-Mar-2022	440180
dissolved metals filtration location	----	Field	-	-	EP421	-	23-Mar-2022	440180
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	429 DLM,	50	mg/L	E559-L	-	24-Mar-2022	441224
phenols, total (4AAP)	----	0.202	0.0050	mg/L	E562	22-Mar-2022	22-Mar-2022	439438
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	1.28	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	0.47	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								

Analytical Results

EO2201855-004

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3B (SC3B)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	96.2	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	103	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	<100	100	µg/L	EC580	-	30-Mar-2022	-
F2 (C10-C16)	----	410	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	96.0	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	114	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201855-005

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3C (SC3C)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	1500		10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, carbonate (as CO3)	3812-32-6	<1.0		1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
conductivity	----	10900		1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439340
pH	----	8.04		0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439339
solids, total dissolved [TDS]	----	9960		80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	11100		1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	13.5		3.0	mg/L	E160	-	25-Mar-2022	442314
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	6.76		0.500	mg/L	E298	26-Mar-2022	26-Mar-2022	443345
chloride	16887-00-6	229	DLDS,	5.00	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439531
nitrate (as N)	14797-55-8	5.59	DLDS,	0.200	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439528
nitrate + nitrite (as N)	----	5.93		0.224	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	0.339	DLDS,	0.100	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439529
phosphorus, total	7723-14-0	0.090		0.020	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	0.044		0.020	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	6580	DLDS,	3.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439527
Kjeldahl nitrogen, total [TKN]	----	13.0		2.00	mg/L	E318	24-Mar-2022	25-Mar-2022	439874
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	105		1.00	mg/L	E358-L	24-Mar-2022	24-Mar-2022	441738
Ion Balance									
ion balance (cations/anions)	----	95.8		0.010	%	EC101	-	23-Mar-2022	-
Total Metals									
chromium, total	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E420	23-Mar-2022	24-Mar-2022	439936
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0103		0.0100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
antimony, dissolved	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180

Analytical Results

EO2201855-005

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3C (SC3C)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
arsenic, dissolved	7440-38-2	0.00232	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
barium, dissolved	7440-39-3	0.0334 DTC,	0.00100	mg/L	E421	23-Mar-2022	26-Mar-2022	440180
beryllium, dissolved	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
bismuth, dissolved	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
boron, dissolved	7440-42-8	1.19	0.100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cadmium, dissolved	7440-43-9	<0.0000500 DLDS,	0.0000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
calcium, dissolved	7440-70-2	340	0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
chromium, dissolved	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cobalt, dissolved	7440-48-4	0.00173	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
copper, dissolved	7440-50-8	0.00380	0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
iron, dissolved	7439-89-6	0.341	0.100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
magnesium, dissolved	7439-95-4	288	0.0500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
manganese, dissolved	7439-96-5	1.37	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
molybdenum, dissolved	7439-98-7	0.0363	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
nickel, dissolved	7440-02-0	0.0352	0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
potassium, dissolved	7440-09-7	21.3	0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
selenium, dissolved	7782-49-2	0.000687	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
silver, dissolved	7440-22-4	<0.000100 DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
sodium, dissolved	7440-23-5	2740	0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
strontium, dissolved	7440-24-6	3.37	0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
uranium, dissolved	7440-61-1	0.0278	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
vanadium, dissolved	7440-62-2	0.0100	0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zinc, dissolved	7440-66-6	0.0900	0.0100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zirconium, dissolved	7440-67-7	0.00420	0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
dissolved metals filtration location	----	Field	-	-	EP421	-	23-Mar-2022	440180
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	203 DLM,	50	mg/L	E559-L	-	24-Mar-2022	441224
phenols, total (4AAP)	----	<0.0010	0.0010	mg/L	E562	22-Mar-2022	22-Mar-2022	439438
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	95.9	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	102	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	<100	100	µg/L	EC580	-	30-Mar-2022	-
F2 (C10-C16)	----	110	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								

Analytical Results

EO2201855-005

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3C (SC3C)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	69.2	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	112	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201855-006

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3D (SC3D)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	371	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
conductivity	----	11800	1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439340
pH	----	7.94	0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439339
solids, total dissolved [TDS]	----	9250	80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	9300	1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	11.9	3.0	mg/L	E160	-	25-Mar-2022	442314
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.434	0.0500	mg/L	E298	26-Mar-2022	26-Mar-2022	443345
chloride	16887-00-6	2410 DLDS,	5.00	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439531
nitrate (as N)	14797-55-8	370 DLDS,	0.200	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439528
nitrate + nitrite (as N)	----	370	0.224	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	0.216 DLDS,	0.100	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439529
phosphorus, total	7723-14-0	0.551	0.020	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	0.555	0.020	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	2020 DLDS,	3.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439527
Kjeldahl nitrogen, total [TKN]	----	<0.200 TKNI,	0.200	mg/L	E318	24-Mar-2022	24-Mar-2022	439874
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	43.2	1.00	mg/L	E358-L	24-Mar-2022	24-Mar-2022	441738
Ion Balance								
ion balance (cations/anions)	----	102	0.010	%	EC101	-	23-Mar-2022	-
Total Metals								
chromium, total	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E420	23-Mar-2022	24-Mar-2022	439936
mercury, total	7439-97-6	<0.0000050	0.0000050	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0143	0.0100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
antimony, dissolved	7440-36-0	<0.00100 DLDS,	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
arsenic, dissolved	7440-38-2	0.0150	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
barium, dissolved	7440-39-3	0.147	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
beryllium, dissolved	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
bismuth, dissolved	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
boron, dissolved	7440-42-8	13.2	0.100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cadmium, dissolved	7440-43-9	0.00142	0.0000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
calcium, dissolved	7440-70-2	610	0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180

Analytical Results

EO2201855-006

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3D (SC3D)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
chromium, dissolved	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cobalt, dissolved	7440-48-4	0.0236 DTC,	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
copper, dissolved	7440-50-8	0.0167	0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
iron, dissolved	7439-89-6	0.251 DTC,	0.100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
magnesium, dissolved	7439-95-4	409	0.0500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
manganese, dissolved	7439-96-5	1.96	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
molybdenum, dissolved	7439-98-7	4.61	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
nickel, dissolved	7440-02-0	1.16	0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
potassium, dissolved	7440-09-7	203	0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
selenium, dissolved	7782-49-2	0.00446	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
silver, dissolved	7440-22-4	<0.000100 DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
sodium, dissolved	7440-23-5	1750	0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
strontium, dissolved	7440-24-6	3.02	0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
uranium, dissolved	7440-61-1	0.00614	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
vanadium, dissolved	7440-62-2	31.4	0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zinc, dissolved	7440-66-6	0.0609	0.0100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zirconium, dissolved	7440-67-7	<0.00200 DLDS,	0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
dissolved metals filtration location	----	Field	-	-	EP421	-	23-Mar-2022	440180
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	106 DLM,	50	mg/L	E559-L	-	24-Mar-2022	441224
phenols, total (4AAP)	----	0.0022	0.0010	mg/L	E562	22-Mar-2022	22-Mar-2022	439438
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	94.8	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	105	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	<100	100	µg/L	EC580	-	30-Mar-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	99.5	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	118	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201855-007

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3E (SC3E)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	429		10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, carbonate (as CO3)	3812-32-6	<1.0		1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
conductivity	----	4870		1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439340
pH	----	8.22		0.10	pH units	E108	22-Mar-2022	22-Mar-2022	439339
solids, total dissolved [TDS]	----	3150		80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	4120		1.0	mg/L	EC103	-	23-Mar-2022	-
solids, total suspended [TSS]	----	2880		15.0	mg/L	E160	-	25-Mar-2022	442314
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	0.0566		0.0250	mg/L	E298	26-Mar-2022	26-Mar-2022	443345
chloride	16887-00-6	340	DLDS,	5.00	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439531
nitrate (as N)	14797-55-8	9.53	DLDS,	0.200	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439528
nitrate + nitrite (as N)	----	9.53		0.224	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	<0.100	DLDS,	0.100	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439529
phosphorus, total	7723-14-0	0.948		0.020	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	0.035		0.020	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	2130	DLDS,	3.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439527
Kjeldahl nitrogen, total [TKN]	----	2.92		0.200	mg/L	E318	24-Mar-2022	24-Mar-2022	439874
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	29.7		1.00	mg/L	E358-L	24-Mar-2022	24-Mar-2022	441738
Ion Balance									
ion balance (cations/anions)	----	102		0.010	%	EC101	-	23-Mar-2022	-
Total Metals									
chromium, total	7440-47-3	0.0572		0.00250	mg/L	E420	23-Mar-2022	24-Mar-2022	439936
mercury, total	7439-97-6	0.000152		0.0000050	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0531		0.0050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
antimony, dissolved	7440-36-0	0.00124	DTC,	0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
arsenic, dissolved	7440-38-2	0.00162		0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
barium, dissolved	7440-39-3	0.240		0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
beryllium, dissolved	7440-41-7	<0.000100	DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
bismuth, dissolved	7440-69-9	<0.000250	DLDS,	0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
boron, dissolved	7440-42-8	0.998		0.050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cadmium, dissolved	7440-43-9	0.000125		0.0000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
calcium, dissolved	7440-70-2	104		0.250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
chromium, dissolved	7440-47-3	<0.00250	DLDS,	0.00250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cobalt, dissolved	7440-48-4	0.00092		0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
copper, dissolved	7440-50-8	0.0136		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
iron, dissolved	7439-89-6	0.053		0.050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
lead, dissolved	7439-92-1	<0.000250	DLDS,	0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
magnesium, dissolved	7439-95-4	99.5		0.0250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
manganese, dissolved	7439-96-5	0.0415		0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
molybdenum, dissolved	7439-98-7	0.353	DTC,	0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
nickel, dissolved	7440-02-0	0.0791		0.00250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
potassium, dissolved	7440-09-7	21.1		0.250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
selenium, dissolved	7782-49-2	0.00113		0.000250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
silver, dissolved	7440-22-4	<0.000050	DLDS,	0.000050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
sodium, dissolved	7440-23-5	1130		0.250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180

Analytical Results

EO2201855-007

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3E (SC3E)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
strontium, dissolved	7440-24-6	1.53	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
thallium, dissolved	7440-28-0	<0.000050 DLDS,	0.000050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
tin, dissolved	7440-31-5	<0.00050 DLDS,	0.00050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
uranium, dissolved	7440-61-1	0.0244	0.000050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
vanadium, dissolved	7440-62-2	0.224 DTC,	0.00250	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zinc, dissolved	7440-66-6	0.0284	0.0050	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zirconium, dissolved	7440-67-7	0.00118	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
dissolved metals filtration location	----	Field	-	-	EP421	-	23-Mar-2022	440180
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	0.00060	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	121 DLM,	100	mg/L	E559-L	-	24-Mar-2022	441224
phenols, total (4AAP)	----	<0.0010	0.0010	mg/L	E562	22-Mar-2022	22-Mar-2022	439438
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	95.6	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	102	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	<100	100	µg/L	EC580	-	30-Mar-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	100.0	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	112	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2201855-008

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 4 (SC4)

Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	2360	10.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	22-Mar-2022	22-Mar-2022	439341
conductivity	----	14500	1.0	µS/cm	E100	22-Mar-2022	22-Mar-2022	439340
pH	----	7.87	1.00	pH units	E108	22-Mar-2022	22-Mar-2022	439339
solids, total dissolved [TDS]	----	12100	80	mg/L	E162	-	24-Mar-2022	441192
solids, total dissolved [TDS], calculated	----	13200	1.0	mg/L	EC103	-	23-Mar-2022	-

Analytical Results

EO2201855-008

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 4 (SC4)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
solids, total suspended [TSS]	----	21.7		3.0	mg/L	E160	-	25-Mar-2022	442314
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	69.5		5.00	mg/L	E298	26-Mar-2022	26-Mar-2022	443345
chloride	16887-00-6	1490	DLDS,	5.00	mg/L	E235.Cl	22-Mar-2022	22-Mar-2022	439531
nitrate (as N)	14797-55-8	0.220	DLDS,	0.200	mg/L	E235.NO3	22-Mar-2022	22-Mar-2022	439528
nitrate + nitrite (as N)	----	<0.224		0.224	mg/L	EC235.N+N	-	23-Mar-2022	-
nitrite (as N)	14797-65-0	<0.100	DLDS,	0.100	mg/L	E235.NO2	22-Mar-2022	22-Mar-2022	439529
phosphorus, total	7723-14-0	3.05		0.050	mg/L	E372	26-Mar-2022	27-Mar-2022	443325
phosphorus, total dissolved	7723-14-0	2.38		0.050	mg/L	E375-H	26-Mar-2022	27-Mar-2022	443327
sulfate (as SO4)	14808-79-8	6260	DLDS,	3.00	mg/L	E235.SO4	22-Mar-2022	22-Mar-2022	439527
Kjeldahl nitrogen, total [TKN]	----	87.3		4.00	mg/L	E318	24-Mar-2022	25-Mar-2022	439874
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	127		1.00	mg/L	E358-L	24-Mar-2022	24-Mar-2022	441738
Ion Balance									
ion balance (cations/anions)	----	91.5		0.010	%	EC101	-	23-Mar-2022	-
Total Metals									
chromium, total	7440-47-3	0.00643		0.00500	mg/L	E420	23-Mar-2022	24-Mar-2022	439936
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	24-Mar-2022	24-Mar-2022	440977
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0275		0.0100	mg/L	E421	23-Mar-2022	26-Mar-2022	440180
antimony, dissolved	7440-36-0	0.00110		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
arsenic, dissolved	7440-38-2	0.0134		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
barium, dissolved	7440-39-3	0.0687		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
boron, dissolved	7440-42-8	17.2		0.100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cadmium, dissolved	7440-43-9	0.000355		0.0000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
calcium, dissolved	7440-70-2	323		0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
chromium, dissolved	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
cobalt, dissolved	7440-48-4	0.00431		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
copper, dissolved	7440-50-8	<0.00200	DLDS,	0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
iron, dissolved	7439-89-6	0.868		0.100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
lead, dissolved	7439-92-1	<0.000500	DLDS,	0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
magnesium, dissolved	7439-95-4	329		0.0500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
manganese, dissolved	7439-96-5	1.56		0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
molybdenum, dissolved	7439-98-7	1.15		0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
nickel, dissolved	7440-02-0	0.183		0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
potassium, dissolved	7440-09-7	42.2		0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
selenium, dissolved	7782-49-2	0.00141		0.000500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
silver, dissolved	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
sodium, dissolved	7440-23-5	3310		0.500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
strontium, dissolved	7440-24-6	4.62		0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
thallium, dissolved	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
tin, dissolved	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
uranium, dissolved	7440-61-1	0.0518		0.000100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
vanadium, dissolved	7440-62-2	0.245		0.00500	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zinc, dissolved	7440-66-6	0.185		0.0100	mg/L	E421	23-Mar-2022	24-Mar-2022	440180
zirconium, dissolved	7440-67-7	0.0373		0.00200	mg/L	E421	23-Mar-2022	24-Mar-2022	440180

Analytical Results

EO2201855-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 4 (SC4)
Client sampling date / time: 21-Mar-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
dissolved metals filtration location	----	Field	-	-	EP421	-	23-Mar-2022	440180
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	23-Mar-2022	440496
Aggregate Organics								
chemical oxygen demand [COD]	----	367 DLM	50	mg/L	E559-L	-	24-Mar-2022	441224
phenols, total (4AAP)	----	0.0095	0.0010	mg/L	E562	22-Mar-2022	22-Mar-2022	439438
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
toluene	108-88-3	0.99	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, m+p-	179601-23-1	0.58	0.40	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
xylenes, total	1330-20-7	0.58	0.50	µg/L	E611A	24-Mar-2022	29-Mar-2022	441370
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	94.7	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
difluorobenzene, 1,4-	540-36-3	103	1.0	%	E611A	24-Mar-2022	29-Mar-2022	441370
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	24-Mar-2022	29-Mar-2022	441371
F1-BTEX	----	<100	100	µg/L	EC580	-	30-Mar-2022	-
F2 (C10-C16)	----	630	100	µg/L	E601	22-Mar-2022	22-Mar-2022	439439
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	102	1.0	%	E601	22-Mar-2022	22-Mar-2022	439439
dichlorotoluene, 3,4-	97-75-0	111	1.0	%	E581.F1	24-Mar-2022	29-Mar-2022	441371

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2201855**	Page	: 1 of 30
Amendment	: 1		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Stan Yuha	Account Manager	: Pamela Toledo
Address	: 9808 12 Avenue SW Edmonton AB Canada T6X 0J5	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 1 2022	Date Samples Received	: 21-Mar-2022 17:45
PO	: 0000224129	Issue Date	: 12-Apr-2022 11:01
C-O-C number	: 20-966635		
Sampler	: Murray		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 1 (SC1)	E559-L	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 2 (SC2)	E559-L	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3A (SC3A)	E559-L	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3B (SC3B)	E559-L	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3C (SC3C)	E559-L	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3D (SC3D)	E559-L	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3E (SC3E)	E559-L	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 4 (SC4)	E559-L	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 1 (SC1)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 2 (SC2)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3A (SC3A)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3B (SC3B)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3C (SC3C)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3D (SC3D)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3E (SC3E)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 4 (SC4)	E562	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 1 (SC1)	E298	21-Mar-2022	26-Mar-2022	----	----		26-Mar-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 2 (SC2)	E298	21-Mar-2022	26-Mar-2022	----	----		26-Mar-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3A (SC3A)	E298	21-Mar-2022	26-Mar-2022	----	----		26-Mar-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3B (SC3B)	E298	21-Mar-2022	26-Mar-2022	----	----		26-Mar-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3C (SC3C)	E298	21-Mar-2022	26-Mar-2022	----	----		26-Mar-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3D (SC3D)	E298	21-Mar-2022	26-Mar-2022	----	----		26-Mar-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3E (SC3E)	E298	21-Mar-2022	26-Mar-2022	----	----		26-Mar-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 4 (SC4)	E298	21-Mar-2022	26-Mar-2022	----	----		26-Mar-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 1 (SC1)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E235.Cl	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E235.NO3	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E235.NO2	21-Mar-2022	----	----	----		22-Mar-2022	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3C (SC3C)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3D (SC3D)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3E (SC3E)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 4 (SC4)	E235.SO4	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 1 (SC1)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 2 (SC2)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 3A (SC3A)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 3B (SC3B)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 3C (SC3C)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (High Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E375-H	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 1 (SC1)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 2 (SC2)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3E (SC3E)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 4 (SC4)	E318	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 1 (SC1)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 2 (SC2)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3A (SC3A)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3B (SC3B)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3C (SC3C)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3D (SC3D)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3E (SC3E)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 4 (SC4)	E372	21-Mar-2022	26-Mar-2022	----	----		27-Mar-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SECONDARY LEACHATE CELL 1 (SC1)	E421	21-Mar-2022	23-Mar-2022	----	----		24-Mar-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SECONDARY LEACHATE CELL 2 (SC2)	E421	21-Mar-2022	23-Mar-2022	----	----		24-Mar-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SECONDARY LEACHATE CELL 3A (SC3A)	E421	21-Mar-2022	23-Mar-2022	----	----		24-Mar-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SECONDARY LEACHATE CELL 3B (SC3B)	E421	21-Mar-2022	23-Mar-2022	----	----		24-Mar-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SECONDARY LEACHATE CELL 3C (SC3C)	E421	21-Mar-2022	23-Mar-2022	----	----		24-Mar-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SECONDARY LEACHATE CELL 3D (SC3D)	E421	21-Mar-2022	23-Mar-2022	----	----		24-Mar-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SECONDARY LEACHATE CELL 3E (SC3E)	E421	21-Mar-2022	23-Mar-2022	----	----		24-Mar-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SECONDARY LEACHATE CELL 4 (SC4)	E421	21-Mar-2022	23-Mar-2022	----	----		24-Mar-2022	180 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 1 (SC1)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 2 (SC2)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3A (SC3A)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3B (SC3B)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3C (SC3C)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3D (SC3D)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3E (SC3E)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 4 (SC4)	E581.F1	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 1 (SC1)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 2 (SC2)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3A (SC3A)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3B (SC3B)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3C (SC3C)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3D (SC3D)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3E (SC3E)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 4 (SC4)	E601	21-Mar-2022	22-Mar-2022	14 days	1 days	✓	22-Mar-2022	40 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 1 (SC1)	E358-L	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 2 (SC2)	E358-L	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E358-L	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E358-L	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E358-L	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E358-L	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E358-L	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E358-L	21-Mar-2022	24-Mar-2022	----	----		24-Mar-2022	28 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E290	21-Mar-2022	----	----	----		22-Mar-2022	14 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E100	21-Mar-2022	----	----	----		22-Mar-2022	28 days	1 days	✓
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E108	21-Mar-2022	----	----	----		22-Mar-2022	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E162	21-Mar-2022	----	----	----		24-Mar-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE										
SECONDARY LEACHATE CELL 4 (SC4)	E160	21-Mar-2022	----	----	----		25-Mar-2022	7 days	4 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 1 (SC1)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 2 (SC2)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 3A (SC3A)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 3B (SC3B)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 3C (SC3C)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 3D (SC3D)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 3E (SC3E)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 4 (SC4)	E532A	21-Mar-2022	----	----	----		23-Mar-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 1 (SC1)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 2 (SC2)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 4 (SC4)	E508	21-Mar-2022	----	----	----		24-Mar-2022	28 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 1 (SC1)	E420	21-Mar-2022	----	----	----		24-Mar-2022	180 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 2 (SC2)	E420	21-Mar-2022	----	----	----		24-Mar-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E420	21-Mar-2022	----	----	----		24-Mar-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E420	21-Mar-2022	----	----	----		24-Mar-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E420	21-Mar-2022	----	----	----		24-Mar-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E420	21-Mar-2022	----	----	----		24-Mar-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E420	21-Mar-2022	----	----	----		24-Mar-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 4 (SC4)	E420	21-Mar-2022	----	----	----		24-Mar-2022	180 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 1 (SC1)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 2 (SC2)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3A (SC3A)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3B (SC3B)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3C (SC3C)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3D (SC3D)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3E (SC3E)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 4 (SC4)	E611A	21-Mar-2022	24-Mar-2022	----	----		29-Mar-2022	14 days	8 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	443345	1	8	12.5	5.0	✓
BTEX by Headspace GC-MS	E611A	441370	1	18	5.5	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	441371	1	18	5.5	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	441224	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	439383	2	40	5.0	5.0	✓
Conductivity in Water	E100	439340	1	20	5.0	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	440496	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	440180	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	441738	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	439381	2	39	5.1	5.0	✓
Nitrite in Water by IC	E235.NO2	439382	2	39	5.1	5.0	✓
pH by Meter	E108	439339	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	439438	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	439384	2	39	5.1	5.0	✓
TDS by Gravimetry	E162	441192	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (High Level)	E375-H	443327	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	439874	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	440977	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	439936	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry	E372	443325	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	442313	2	40	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	443345	1	8	12.5	5.0	✓
BTEX by Headspace GC-MS	E611A	441370	1	18	5.5	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	441371	1	18	5.5	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	439439	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	441224	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	439383	2	40	5.0	5.0	✓
Conductivity in Water	E100	439340	1	20	5.0	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	440496	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	440180	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	441738	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	439381	2	39	5.1	5.0	✓
Nitrite in Water by IC	E235.NO2	439382	2	39	5.1	5.0	✓
pH by Meter	E108	439339	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	439438	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	439384	2	39	5.1	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
TDS by Gravimetry	E162	441192	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (High Level)	E375-H	443327	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	439874	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	440977	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	439936	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry	E372	443325	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	442313	2	40	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	443345	1	8	12.5	5.0	✓
BTEX by Headspace GC-MS	E611A	441370	1	18	5.5	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	441371	1	18	5.5	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	439439	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	441224	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	439383	2	40	5.0	5.0	✓
Conductivity in Water	E100	439340	1	20	5.0	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	440496	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	440180	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	441738	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	439381	2	39	5.1	5.0	✓
Nitrite in Water by IC	E235.NO2	439382	2	39	5.1	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	439438	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	439384	2	39	5.1	5.0	✓
TDS by Gravimetry	E162	441192	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (High Level)	E375-H	443327	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	439874	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	440977	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	439936	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry	E372	443325	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	442313	2	40	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	443345	1	8	12.5	5.0	✓
BTEX by Headspace GC-MS	E611A	441370	1	18	5.5	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	441224	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	439383	2	40	5.0	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	440496	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	440180	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	441738	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	439381	2	39	5.1	5.0	✓
Nitrite in Water by IC	E235.NO2	439382	2	39	5.1	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	439438	1	14	7.1	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Sulfate in Water by IC	E235.SO4	439384	2	39	5.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (High Level)	E375-H	443327	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	439874	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	440977	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	439936	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry	E372	443325	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Edmonton - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry	E372 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (High Level)	E375-H Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total Metals in Water by CRC ICPMS	E420 Edmonton - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Edmonton - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A Edmonton - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. sample pretreatment involved field or lab filtration following by sample preservation.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
CCME PHC - F1 by Headspace GC-FID	E581.F1 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BTEX by Headspace GC-MS	E611A Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Dissolved Phosphorus in water	EP375 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581 Edmonton - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Edmonton - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EO2201855**	Page	: 1 of 15
Amendment	: **1**		

Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Stan Yuha	Account Manager	: Pamela Toledo
Address	: 9808 12 Avenue SW Edmonton AB Canada T6X 0J5	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 1 2022	Date Samples Received	: 21-Mar-2022 17:45
PO	: 0000224129	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 20-966635	Issue Date	: 12-Apr-2022 11:01
Sampler	: Murray		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Anthony Calero	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Austin Wasylyshyn	Lab Analyst	Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Metals, Edmonton, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Lisa Watt	Lab Supervisor - Environmental	Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta

Oscar Ruiz	Lab Assistant	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 439339)											
EO2201853-003	Anonymous	pH	----	E108	0.10	pH units	8.35	8.36	0.120%	3%	----
Physical Tests (QC Lot: 439340)											
EO2201853-003	Anonymous	conductivity	----	E100	2.0	µS/cm	1210	1210	0.248%	10%	----
Physical Tests (QC Lot: 441192)											
EO2201732-002	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	1730	1720	0.725%	20%	----
Physical Tests (QC Lot: 442313)											
EO2201811-004	Anonymous	solids, total suspended [TSS]	----	E160	7.5	mg/L	110	102	8.02%	20%	----
Physical Tests (QC Lot: 442314)											
EO2201855-002	SECONDARY LEACHATE CELL 2 (SC2)	solids, total suspended [TSS]	----	E160	15.0	mg/L	232	206	11.4%	20%	----
Anions and Nutrients (QC Lot: 439381)											
EO2201851-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.649	0.663	2.07%	20%	----
Anions and Nutrients (QC Lot: 439382)											
EO2201851-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 439383)											
EO2201851-002	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	15.1	14.5	4.29%	20%	----
Anions and Nutrients (QC Lot: 439384)											
EO2201851-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	8.27	7.89	4.65%	20%	----
Anions and Nutrients (QC Lot: 439527)											
FC2200494-006	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 439528)											
FC2200494-006	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 439529)											
FC2200494-006	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 439531)											
FC2200494-006	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	26.9	26.7	0.944%	20%	----
Anions and Nutrients (QC Lot: 439874)											
CG2203241-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.856	0.718	17.5%	20%	----
Anions and Nutrients (QC Lot: 443325)											
EO2201850-004	Anonymous	phosphorus, total	7723-14-0	E372	0.020	mg/L	1.85	1.85	0.368%	20%	----
Anions and Nutrients (QC Lot: 443327)											
EO2201850-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-H	0.100	mg/L	4.97	5.17	3.81%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 443345)											
EO2201855-001	SECONDARY LEACHATE CELL 1 (SC1)	ammonia, total (as N)	7664-41-7	E298	0.500	mg/L	6.00	6.18	3.07%	20%	----
Organic / Inorganic Carbon (QC Lot: 441738)											
EO2201855-001	SECONDARY LEACHATE CELL 1 (SC1)	carbon, dissolved organic [DOC]	----	E358-L	5.00	mg/L	322	332	3.05%	20%	----
Total Metals (QC Lot: 439936)											
EO2201850-006	Anonymous	chromium, total	7440-47-3	E420	0.00500	mg/L	0.00776	0.00683	0.00093	Diff <2x LOR	----
Total Metals (QC Lot: 440977)											
EO2201855-001	SECONDARY LEACHATE CELL 1 (SC1)	mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000500	0.0000457	0.0000043	Diff <2x LOR	----
Dissolved Metals (QC Lot: 440180)											
EO2201853-003	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0021	0.0018	0.0003	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00022	0.00023	0.000010	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00057	0.00058	0.00001	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.146	0.142	3.34%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.045	0.045	0.0002	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000051	<0.0000050	0.00000007	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	85.3	85.5	0.230%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00131	0.00128	2.86%	20%	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00021	0.00021	0.000005	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	46.3	47.0	1.54%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0463	0.0448	3.11%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00322	0.00336	4.22%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00558	0.00554	0.653%	20%	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	3.18	3.13	1.51%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00208	0.00210	0.880%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	195	204	4.22%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	2.97	2.98	0.517%	20%	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00317	0.00310	2.21%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 440180) - continued											
EO2201853-003	Anonymous	vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 440496)											
EO2201855-008	SECONDARY LEACHATE CELL 4 (SC4)	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 439438)											
FC2200494-006	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 441224)											
EO2201851-002	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	35	36	1	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 441370)											
EO2201850-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	33.6	31.6	6.10%	30%	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	5.86	5.63	3.86%	30%	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	1.35	1.31	0.04	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	1.73	1.67	0.06	Diff <2x LOR	----
Hydrocarbons (QC Lot: 441371)											
EO2201850-001	Anonymous	F1 (C6-C10)	----	E581.F1	100	µg/L	440	490	50	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 439340)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 441192)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 442313)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 442314)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 439381)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 439382)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 439383)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 439384)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 439527)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 439528)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 439529)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 439531)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 439874)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 443325)						
phosphorus, total	7723-14-0	E372	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 443327)						
phosphorus, total dissolved	7723-14-0	E375-H	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 443345)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 441738)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 439936)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 440977)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 440180)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Speciated Metals (QCLot: 440496)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 439438)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Aggregate Organics (QCLot: 441224)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 441370)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 439439)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 441371)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 439339)									
pH	----	E108	----	pH units	6 pH units	101	97.0	103	----
Physical Tests (QCLot: 439340)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	101	90.0	110	----
Physical Tests (QCLot: 441192)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	98.8	85.0	115	----
Physical Tests (QCLot: 442313)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	107	85.0	115	----
Physical Tests (QCLot: 442314)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	92.1	85.0	115	----
Anions and Nutrients (QCLot: 439381)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	93.1	90.0	110	----
Anions and Nutrients (QCLot: 439382)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	92.7	90.0	110	----
Anions and Nutrients (QCLot: 439383)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 439384)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 439527)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	106	90.0	110	----
Anions and Nutrients (QCLot: 439528)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 439529)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 439531)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 439874)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 443325)									
phosphorus, total	7723-14-0	E372	0.02	mg/L	0.5 mg/L	100	80.0	120	----
Anions and Nutrients (QCLot: 443327)									
phosphorus, total dissolved	7723-14-0	E375-H	0.02	mg/L	0.5 mg/L	100	80.0	120	----
Anions and Nutrients (QCLot: 443345)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 443345) - continued									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Organic / Inorganic Carbon (QCLot: 441738)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	106	80.0	120	----
Total Metals (QCLot: 439936)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	107	80.0	120	----
Total Metals (QCLot: 440977)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	105	80.0	120	----
Dissolved Metals (QCLot: 440180)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	109	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	104	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	105	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	101	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	97.4	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	92.7	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	106	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	105	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	105	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	98.4	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	95.2	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	109	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	105	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	105	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	94.1	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	101	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	95.9	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	98.9	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	98.6	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	107	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 440180) - continued									
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	100	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
Speciated Metals (QCLot: 440496)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
Aggregate Organics (QCLot: 439438)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	91.2	85.0	115	----
Aggregate Organics (QCLot: 441224)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	90.4	85.0	115	----
Volatile Organic Compounds (QCLot: 441370)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	106	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	95.7	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	103	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	100.0	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	105	70.0	130	----
Hydrocarbons (QCLot: 439439)									
F2 (C10-C16)	----	E601	100	µg/L	3260 µg/L	104	70.0	130	----
Hydrocarbons (QCLot: 441371)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	113	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 439381)										
EO2201851-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.47 mg/L	2.5 mg/L	98.7	75.0	125	----
Anions and Nutrients (QCLot: 439382)										
EO2201851-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.502 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 439383)										
EO2201851-002	Anonymous	chloride	16887-00-6	E235.Cl	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 439384)										
EO2201851-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	97.0 mg/L	100 mg/L	97.0	75.0	125	----
Anions and Nutrients (QCLot: 439527)										
FC2200494-006	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	109 mg/L	100 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 439528)										
FC2200494-006	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.52 mg/L	2.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 439529)										
FC2200494-006	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.514 mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 439531)										
FC2200494-006	Anonymous	chloride	16887-00-6	E235.Cl	97.3 mg/L	100 mg/L	97.3	75.0	125	----
Anions and Nutrients (QCLot: 439874)										
CG2203241-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.59 mg/L	2.5 mg/L	104	70.0	130	----
Anions and Nutrients (QCLot: 443325)										
EO2201850-005	Anonymous	phosphorus, total	7723-14-0	E372	ND mg/L	0.37 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 443327)										
EO2201850-002	Anonymous	phosphorus, total dissolved	7723-14-0	E375-H	ND mg/L	0.37 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 443345)										
EO2201855-002	SECONDARY LEACHATE CELL 2 (SC2)	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Organic / Inorganic Carbon (QCLot: 441738)										
EO2201855-001	SECONDARY LEACHATE CELL 1 (SC1)	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 439936)										
EO2201850-007	Anonymous	chromium, total	7440-47-3	E420	0.0432 mg/L	0.04 mg/L	108	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 440977)										
EO2201855-005	SECONDARY LEACHATE CELL 3C (SC3C)	mercury, total	7439-97-6	E508	0.0000981 mg/L	0.0001 mg/L	98.1	70.0	130	----
Dissolved Metals (QCLot: 440180)										
EO2201853-004	Anonymous	aluminum, dissolved	7429-90-5	E421	0.214 mg/L	0.2 mg/L	107	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0209 mg/L	0.02 mg/L	105	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0218 mg/L	0.02 mg/L	109	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0440 mg/L	0.04 mg/L	110	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00793 mg/L	0.01 mg/L	79.3	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00419 mg/L	0.004 mg/L	105	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0422 mg/L	0.04 mg/L	106	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0201 mg/L	0.02 mg/L	101	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.99 mg/L	2 mg/L	99.6	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0184 mg/L	0.02 mg/L	91.8	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0391 mg/L	0.04 mg/L	97.8	70.0	130	----
		potassium, dissolved	7440-09-7	E421	3.95 mg/L	4 mg/L	98.7	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0446 mg/L	0.04 mg/L	112	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00401 mg/L	0.004 mg/L	100	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00375 mg/L	0.004 mg/L	93.7	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00390 mg/L	0.004 mg/L	97.5	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.110 mg/L	0.1 mg/L	110	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.396 mg/L	0.4 mg/L	99.0	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0422 mg/L	0.04 mg/L	106	70.0	130	----
Speciated Metals (QCLot: 440496)										
EO2201855-008	SECONDARY LEACHATE CELL 4 (SC4)	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0463 mg/L	0.05 mg/L	92.6	70.0	130	----
Aggregate Organics (QCLot: 439438)										
FC2200494-006	Anonymous	phenols, total (4AAP)	----	E562	0.0194 mg/L	0.02 mg/L	96.8	75.0	125	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Aggregate Organics (QCLot: 441224)										
EO2201855-001	SECONDARY LEACHATE CELL 1 (SC1)	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Volatile Organic Compounds (QCLot: 441370)										
EO2201850-002	Anonymous	benzene	71-43-2	E611A	ND µg/L	100 µg/L	ND	50.0	140	MS-B
		ethylbenzene	100-41-4	E611A	102 µg/L	100 µg/L	102	50.0	140	----
		toluene	108-88-3	E611A	77.7 µg/L	100 µg/L	77.7	50.0	140	----
		xylene, m+p-	179601-23-1	E611A	206 µg/L	200 µg/L	103	50.0	140	----
		xylene, o-	95-47-6	E611A	104 µg/L	100 µg/L	104	50.0	140	----

Qualifiers

Qualifier	Description
MS-B	*Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.*

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 966635

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Clean Harbors Canada
Contact:	Todd Webb, Stan Yuha
Phone:	780 663-2513
	Company address below will appear on the final report
Street:	PO Box 390, 5014 Range Road 173
City/Province:	Ryley, AB
Postal Code:	T0B 4A0
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors Canada
Contact:	Robbi Gooding

Project Information

ALS Account # / Quote #:	
Job #:	Secondary Leachate Qtr 1 2022
PO / AFE:	
LSD:	Table 4.4A

ALS Lab Work Order # (ALS use only): EO2201855

Reports / Recipients

Select Report Format: ☐ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: webb.todd@cleanharbors.com

Email 2: yuha.stan@cleanharbors.com

Email 3:

Invoice Recipients

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: gooding.robbi@cleanharbors.com

Email 2:

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Kieran Sampler: Murray

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS: Table 4.4A Leachate + Leak Detection Monitoring	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	Secondary Leachate Cell 1 (SC1)	21-Mar-22	11:00		✓			
	Secondary Leachate Cell 2 (SC2)				✓			
	Secondary Leachate Cell 3A (SC3A)				✓			
	Secondary Leachate Cell 3B (SC3B)				✓			
	Secondary Leachate Cell 3C (SC3C)				✓			
	Secondary Leachate Cell 3D (SC3D)				✓			
	Secondary Leachate Cell 3E (SC3E)				✓			
	Secondary Leachate Cell 4 (SC4)	21-Mar-22	11:00		✓			

Environmental Division
Edmonton
Work Order Reference
EO2201855

Telephone : +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Analyze as per Quote Q82438
Table 4.4A package
Cyanide bottle for Cr(VI) is filtred and preserved
separate report than COC 966636

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☑ ICE PACKS ☐ FROZEN ☑ COOLING INITIATED

Submission Comments Identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
13.6							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Todd Webb	March 21, 2022	16:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
VA	Mar/21/2022	5:45pm

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

APPENDIX F

Leak Detection Liquid Analysis

Quarter 2

CERTIFICATE OF ANALYSIS

Work Order	: **EO2204435**	Page	: 1 of 24
Amendment	: **2**		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Rame Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 2 2022	Date Samples Received	: 14-Jun-2022 13:19
PO	: 225924	Date Analysis Commenced	: 14-Jun-2022
C-O-C number	: ----	Issue Date	: 10-Aug-2022 14:32
Sampler	: Murray		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Austin Wasylyshyn	Lab Analyst	Metals, Edmonton, Alberta
Cynthia Bauer	Organic Supervisor	Organics, Calgary, Alberta
Dan Nguyen	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Jeanie Mark	Laboratory Analyst	Organics, Calgary, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Kira Sampley	Lab Analyst	Inorganics, Edmonton, Alberta
Lisa Watt	Lab Supervisor - Environmental	Inorganics, Edmonton, Alberta
Maqsood UlHassan	Laboratory Analyst	Organics, Calgary, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Sobhithan Pillay		Inorganics, Edmonton, Alberta
Victoria Piguing	Laboratory Analyst	Organics, Calgary, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.
Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DLR	*Detection Limit Raised due to required dilution, limited sample amount, and/or high moisture content (soil samples).*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
IB:INT	*Ion Balance Reviewed: Imbalance is due to interference or non-measured component.*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

EO2204435-001

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 1 (SC1)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	1430	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529807
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529807
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529807
conductivity	----	10200	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529809
hardness (as CaCO3), dissolved	----	1820	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	7.91	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529808
solids, total dissolved [TDS]	----	9220	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	8600	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	6.4	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	5.30	0.100	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	1630 DLDS,	5.00	mg/L	E235.Cl	14-Jun-2022	14-Jun-2022	523637
fluoride	16984-48-8	0.718 DLDS,	0.200	mg/L	E235.F	14-Jun-2022	14-Jun-2022	523638
nitrate (as N)	14797-55-8	<0.200 DLDS,	0.200	mg/L	E235.NO3	14-Jun-2022	14-Jun-2022	523639
nitrate + nitrite (as N)	----	<0.224	0.224	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.100 DLDS,	0.100	mg/L	E235.NO2	14-Jun-2022	14-Jun-2022	523640
phosphorus, total	7723-14-0	0.196 RRV,	0.0050	mg/L	E372-S	06-Jul-2022	13-Jul-2022	549815
phosphorus, total dissolved	7723-14-0	0.508 RRV,	0.0100	mg/L	E375-U	04-Jul-2022	17-Jul-2022	546878
sulfate (as SO4)	14808-79-8	3430 DLDS,	3.00	mg/L	E235.SO4	14-Jun-2022	14-Jun-2022	523641
Kjeldahl nitrogen, total [TKN]	----	90.8	2.50	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	383	5.00	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538784
Ion Balance								
ion balance (cations/anions)	----	81.6 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	0.0500	0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	<0.00100 DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.00892	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.0938	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	7.14	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.00432	0.0000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	574	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	<0.000100 DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.0969	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	2.28	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	0.0507	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	16.3	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	0.115	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	0.474	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	205	0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	37.8	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	0.0000725	0.0000050	mg/L	E508	15-Jun-2022	15-Jun-2022	524171
molybdenum, total	7439-98-7	0.0132 RRV,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	10.9	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	<0.500 DLDS,	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	25.4	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204435-001

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 1 (SC1)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals									
rubidium, total	7440-17-7	0.00692		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.00136		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	8.39		1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	2000		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	3.11		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	1160		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00200	DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.00418		0.00300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.0536		0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	0.0414		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	3.48		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zirconium, total	7440-67-7	0.00915		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0280		0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
antimony, dissolved	7440-36-0	0.00088		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
arsenic, dissolved	7440-38-2	0.00868		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
barium, dissolved	7440-39-3	0.106		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
beryllium, dissolved	7440-41-7	<0.000100	DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
bismuth, dissolved	7440-69-9	<0.000250	DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
boron, dissolved	7440-42-8	4.78		0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cadmium, dissolved	7440-43-9	0.00408		0.0000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
calcium, dissolved	7440-70-2	424		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
chromium, dissolved	7440-47-3	0.0936		0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cobalt, dissolved	7440-48-4	2.08		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
copper, dissolved	7440-50-8	0.0416		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
iron, dissolved	7439-89-6	16.3		0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
lead, dissolved	7439-92-1	0.0920		0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
magnesium, dissolved	7439-95-4	185		0.0250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
manganese, dissolved	7439-96-5	33.2		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
molybdenum, dissolved	7439-98-7	0.0242	DTC,	0.000500	mg/L	E421	18-Jun-2022	21-Jun-2022	529171
nickel, dissolved	7440-02-0	9.54		0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
potassium, dissolved	7440-09-7	26.0		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
selenium, dissolved	7782-49-2	0.00103		0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
silver, dissolved	7440-22-4	<0.000050	DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
sodium, dissolved	7440-23-5	1740		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
strontium, dissolved	7440-24-6	2.43		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
thallium, dissolved	7440-28-0	<0.000050	DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
tin, dissolved	7440-31-5	<0.00050	DLDS,	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
uranium, dissolved	7440-61-1	0.0467		0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
vanadium, dissolved	7440-62-2	0.200		0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zinc, dissolved	7440-66-6	3.23		0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zirconium, dissolved	7440-67-7	0.00884		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
dissolved metals filtration location	----	Field		-	-	EP421	-	18-Jun-2022	529171

Analytical Results

EO2204435-001

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 1 (SC1)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	967 DLM,	50	mg/L	E559-L	-	21-Jun-2022	532047
phenols, total (4AAP)	----	<0.0010	0.0010	mg/L	E562	24-Jun-2022	24-Jun-2022	537871
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
toluene	108-88-3	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	95.5	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
difluorobenzene, 1,4-	540-36-3	97.5	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	524509
F1-BTEX	----	<100	100	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	310	100	µg/L	E601	16-Jun-2022	16-Jun-2022	525803
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	89.1	1.0	%	E601	16-Jun-2022	16-Jun-2022	525803
dichlorotoluene, 3,4-	97-75-0	115	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	524509

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204435-002

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 2 (SC2)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	196	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	14100	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	1790	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	7.21	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	13400	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	13600	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	92.0	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	3.37	0.0500	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	152 DLDS,	5.00	mg/L	E235.Cl	14-Jun-2022	14-Jun-2022	523637
fluoride	16984-48-8	1.72 DLDS,	0.200	mg/L	E235.F	14-Jun-2022	14-Jun-2022	523638
nitrate (as N)	14797-55-8	0.581 DLDS,	0.200	mg/L	E235.NO3	14-Jun-2022	14-Jun-2022	523639
nitrate + nitrite (as N)	----	0.581	0.224	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.100 DLDS,	0.100	mg/L	E235.NO2	14-Jun-2022	14-Jun-2022	523640

Analytical Results

EO2204435-002

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 2 (SC2)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients									
phosphorus, total	7723-14-0	0.578		0.0100	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549815
phosphorus, total dissolved	7723-14-0	0.0638		0.0010	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546878
sulfate (as SO4)	14808-79-8	9560	DLDS,	3.00	mg/L	E235.SO4	14-Jun-2022	14-Jun-2022	523641
Kjeldahl nitrogen, total [TKN]	----	9.90		0.250	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	88.9		0.50	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538784
Ion Balance									
ion balance (cations/anions)	----	82.1	IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals									
aluminum, total	7429-90-5	1.10		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.00398		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.0273	RRV,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	0.488		0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.000456		0.0000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	440		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	0.000520		0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.00604		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.0603		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	<0.00500	DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	10.1		0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	0.000573	RRV,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	0.516		0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	266		0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	14.4		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	15-Jun-2022	15-Jun-2022	524171
molybdenum, total	7439-98-7	0.753		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	0.172	RRV,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	0.650		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	29.3		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
rubidium, total	7440-17-7	0.0318		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.000880		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	14.4		1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	3660		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	7.13		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	3390		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00200	DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	<0.00300	DLDS,	0.00300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	0.0120		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.0113		0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	<0.00500	DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	0.200		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204435-002

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 2 (SC2)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals									
zirconium, total	7440-67-7	0.00250		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.310		0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
antimony, dissolved	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
arsenic, dissolved	7440-38-2	0.00317		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
barium, dissolved	7440-39-3	0.0912	DTC,	0.00100	mg/L	E421	18-Jun-2022	21-Jun-2022	529171
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
boron, dissolved	7440-42-8	0.587		0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cadmium, dissolved	7440-43-9	0.000385		0.0000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
calcium, dissolved	7440-70-2	331		0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
chromium, dissolved	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cobalt, dissolved	7440-48-4	0.0787		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
copper, dissolved	7440-50-8	<0.00200	DLDS,	0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
iron, dissolved	7439-89-6	5.38		0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
lead, dissolved	7439-92-1	0.00135	DTC,	0.000500	mg/L	E421	18-Jun-2022	21-Jun-2022	529171
magnesium, dissolved	7439-95-4	234		0.0500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
manganese, dissolved	7439-96-5	13.2		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
molybdenum, dissolved	7439-98-7	0.546		0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
nickel, dissolved	7440-02-0	0.294	DTC,	0.00500	mg/L	E421	18-Jun-2022	21-Jun-2022	529171
potassium, dissolved	7440-09-7	26.3		0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
selenium, dissolved	7782-49-2	0.000614		0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
silver, dissolved	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
sodium, dissolved	7440-23-5	3050		0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
strontium, dissolved	7440-24-6	5.34		0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
thallium, dissolved	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
tin, dissolved	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
uranium, dissolved	7440-61-1	0.00862		0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
vanadium, dissolved	7440-62-2	<0.00500	DLDS,	0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zinc, dissolved	7440-66-6	0.228		0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zirconium, dissolved	7440-67-7	<0.00200	DLDS,	0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
dissolved metals filtration location	----	Field		-	-	EP421	-	18-Jun-2022	529171
Speciated Metals									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050		0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics									
chemical oxygen demand [COD]	----	253	DLM,	50	mg/L	E559-L	-	21-Jun-2022	532047
phenols, total (4AAP)	----	<0.0010		0.0010	mg/L	E562	24-Jun-2022	24-Jun-2022	537871
Volatile Organic Compounds									
benzene	71-43-2	<0.50		0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
ethylbenzene	100-41-4	<0.50		0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
toluene	108-88-3	<0.50		0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, m+p-	179601-23-1	<0.40		0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, o-	95-47-6	<0.30		0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylenes, total	1330-20-7	<0.50		0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	100		1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
difluorobenzene, 1,4-	540-36-3	97.3		1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
Hydrocarbons									

Analytical Results

EO2204435-002

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 2 (SC2)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	524509
F1-BTEX	----	<100	100	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	16-Jun-2022	16-Jun-2022	525803
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	91.2	1.0	%	E601	16-Jun-2022	16-Jun-2022	525803
dichlorotoluene, 3,4-	97-75-0	106	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	524509

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204435-003

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3A (SC3A)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	1910	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	13100	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	1940	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	7.92	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	11500	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	11900	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	131	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	34.4	0.500	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	1070 DLDS,	5.00	mg/L	E235.Cl	14-Jun-2022	14-Jun-2022	523637
fluoride	16984-48-8	1.53 DLDS,	0.200	mg/L	E235.F	14-Jun-2022	14-Jun-2022	523638
nitrate (as N)	14797-55-8	<0.200 DLDS,	0.200	mg/L	E235.NO3	14-Jun-2022	14-Jun-2022	523639
nitrate + nitrite (as N)	----	<0.224	0.224	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.100 DLDS,	0.100	mg/L	E235.NO2	14-Jun-2022	14-Jun-2022	523640
phosphorus, total	7723-14-0	0.375	0.0100	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	0.134	0.0050	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546878
sulfate (as SO4)	14808-79-8	6330 DLDS,	3.00	mg/L	E235.SO4	14-Jun-2022	14-Jun-2022	523641
Kjeldahl nitrogen, total [TKN]	----	56.9	2.50	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	156	5.00	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538849
Ion Balance								
ion balance (cations/anions)	----	81.9 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	0.280	0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	0.00738	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.0114	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.0306 RRV,	0.00100	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
beryllium, total	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204435-003

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3A (SC3A)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals									
boron, total	7440-42-8	0.346		0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.000176		0.0000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	407		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.0224		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.0169		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	0.0173		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	20.4		0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	0.000921		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	0.632		0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	320		0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	5.46		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	15-Jun-2022	15-Jun-2022	524171
molybdenum, total	7439-98-7	0.307		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	0.695		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	<0.500	DLDS,	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	76.8		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
rubidium, total	7440-17-7	0.0559		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.000925		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	10.6		1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	3140		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	5.73		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	2200		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00200	DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	0.00256		0.00100	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
titanium, total	7440-32-6	0.00967		0.00300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	0.0609		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.0708		0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	0.0184		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	0.168		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zirconium, total	7440-67-7	0.0133		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.103		0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
antimony, dissolved	7440-36-0	0.00579		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
arsenic, dissolved	7440-38-2	0.00594		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
barium, dissolved	7440-39-3	0.102	DTC,	0.00100	mg/L	E421	18-Jun-2022	21-Jun-2022	529171
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
boron, dissolved	7440-42-8	0.355		0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cadmium, dissolved	7440-43-9	0.000142		0.0000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
calcium, dissolved	7440-70-2	330		0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
chromium, dissolved	7440-47-3	0.0154		0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cobalt, dissolved	7440-48-4	0.0150		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
copper, dissolved	7440-50-8	<0.00200	DLDS,	0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
iron, dissolved	7439-89-6	0.538		0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171

Analytical Results

EO2204435-003

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3A (SC3A)

Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
magnesium, dissolved	7439-95-4	272	0.0500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
manganese, dissolved	7439-96-5	4.56	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
molybdenum, dissolved	7439-98-7	0.234	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
nickel, dissolved	7440-02-0	0.602	0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
potassium, dissolved	7440-09-7	67.8	0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
selenium, dissolved	7782-49-2	0.000763	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
silver, dissolved	7440-22-4	<0.000100 DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
sodium, dissolved	7440-23-5	2640	0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
strontium, dissolved	7440-24-6	4.54	0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
tin, dissolved	7440-31-5	0.00202	0.00100	mg/L	E421	18-Jun-2022	21-Jun-2022	529171
uranium, dissolved	7440-61-1	0.0624	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
vanadium, dissolved	7440-62-2	0.00673	0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zinc, dissolved	7440-66-6	0.122	0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zirconium, dissolved	7440-67-7	0.0115	0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
dissolved metals filtration location	----	Field	-	-	EP421	-	18-Jun-2022	529171
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	406 DLM,	50	mg/L	E559-L	-	21-Jun-2022	532047
phenols, total (4AAP)	----	0.0036	0.0010	mg/L	E562	24-Jun-2022	24-Jun-2022	537871
Volatile Organic Compounds								
benzene	71-43-2	0.93	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
toluene	108-88-3	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	96.7	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
difluorobenzene, 1,4-	540-36-3	96.0	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	524509
F1-BTEX	----	<100	100	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	280	100	µg/L	E601	16-Jun-2022	16-Jun-2022	525803
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	85.9	1.0	%	E601	16-Jun-2022	16-Jun-2022	525803
dichlorotoluene, 3,4-	97-75-0	107	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	524509

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204435-004

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3B (SC3B)

Client sampling date / time: 13-Jun-2022 11:00

Analytical Results

EO2204435-004

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3B (SC3B)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	5770	10.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	512	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	22100	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	973	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	8.73	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	17100	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	19600	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	81.2	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	594	10.0	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	3440 DLDS,	10.0	mg/L	E235.Cl	14-Jun-2022	14-Jun-2022	523637
fluoride	16984-48-8	<0.400 DLDS,	0.400	mg/L	E235.F	14-Jun-2022	14-Jun-2022	523638
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	14-Jun-2022	14-Jun-2022	523639
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	14-Jun-2022	14-Jun-2022	523640
phosphorus, total	7723-14-0	4.72	0.100	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	4.29	0.100	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546878
sulfate (as SO4)	14808-79-8	4800 DLDS,	6.00	mg/L	E235.SO4	14-Jun-2022	14-Jun-2022	523641
Kjeldahl nitrogen, total [TKN]	----	744 DLM,	25.0	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	1770	25.0	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538849
Ion Balance								
ion balance (cations/anions)	----	86.7 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	0.0731	0.0600	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	0.00328	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.0538	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.0778	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	<0.000400 DLDS,	0.000400	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.00100 DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	46.1	0.200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.00462	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	131	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	0.0380	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.187	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.00908	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	0.0218	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	1.37	0.200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	0.00202	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	3.70	0.0200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	169	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	0.857	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000500 DLM,	0.0000500	mg/L	E508	15-Jun-2022	15-Jun-2022	524171
molybdenum, total	7439-98-7	12.1	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	0.421	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	6.24	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	1040	1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204435-004

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3B (SC3B)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals									
rubidium, total	7440-17-7	1.61		0.00400	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.0194		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	16.0		2.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	<0.000200	DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	4840		1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	2.09		0.00400	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	1690		10.0	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00400	DLDS,	0.00400	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000200	DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00200	DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	0.00572		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.0610		0.00600	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	4.01		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.00909		0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	0.115		0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	<0.0600	DLDS,	0.0600	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zirconium, total	7440-67-7	0.0250		0.00400	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0216		0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
antimony, dissolved	7440-36-0	0.00272		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
arsenic, dissolved	7440-38-2	0.0489		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
barium, dissolved	7440-39-3	0.0916		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
boron, dissolved	7440-42-8	37.1		0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cadmium, dissolved	7440-43-9	0.00444		0.0000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
calcium, dissolved	7440-70-2	124		0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
chromium, dissolved	7440-47-3	0.172		0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cobalt, dissolved	7440-48-4	0.00786		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
copper, dissolved	7440-50-8	0.0144		0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
iron, dissolved	7439-89-6	1.26		0.100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
lead, dissolved	7439-92-1	0.00123		0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
magnesium, dissolved	7439-95-4	161		0.0500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
manganese, dissolved	7439-96-5	0.837		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
molybdenum, dissolved	7439-98-7	9.78		0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
nickel, dissolved	7440-02-0	0.389		0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
potassium, dissolved	7440-09-7	950		0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
selenium, dissolved	7782-49-2	0.0209		0.000500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
silver, dissolved	7440-22-4	0.000139		0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
sodium, dissolved	7440-23-5	4190		0.500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
strontium, dissolved	7440-24-6	1.98		0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
thallium, dissolved	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
tin, dissolved	7440-31-5	0.00593		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
uranium, dissolved	7440-61-1	0.00998		0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
vanadium, dissolved	7440-62-2	0.107		0.00500	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zinc, dissolved	7440-66-6	0.0184		0.0100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zirconium, dissolved	7440-67-7	0.0322		0.00200	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
dissolved metals filtration location	----	Field		-	-	EP421	-	18-Jun-2022	529171

Analytical Results

EO2204435-004

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3B (SC3B)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	4560 DLHC,	100	mg/L	E559-L	-	21-Jun-2022	532047
phenols, total (4AAP)	----	5.93	0.100	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	0.60	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
toluene	108-88-3	0.76	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	108	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
difluorobenzene, 1,4-	540-36-3	98.4	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
Hydrocarbons								
F1 (C6-C10)	----	260	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	524509
F1-BTEX	----	259	102	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	1310	100	µg/L	E601	16-Jun-2022	16-Jun-2022	525803
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	95.6	1.0	%	E601	16-Jun-2022	16-Jun-2022	525803
dichlorotoluene, 3,4-	97-75-0	101	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	524509

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204435-005

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3D (SC3D)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	310	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	11900	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	2740	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	7.97	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	9540	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	9330	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	7.79 RRV,	0.100	mg/L	E298	01-Jul-2022	09-Jul-2022	546260
chloride	16887-00-6	2610 DLDS,	10.0	mg/L	E235.Cl	14-Jun-2022	14-Jun-2022	523637
fluoride	16984-48-8	1.95 DLDS,	0.400	mg/L	E235.F	14-Jun-2022	14-Jun-2022	523638
nitrate (as N)	14797-55-8	420 DLDS,	0.400	mg/L	E235.NO3	14-Jun-2022	14-Jun-2022	523639
nitrate + nitrite (as N)	----	431	0.447	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	10.6 DLDS,	0.200	mg/L	E235.NO2	14-Jun-2022	14-Jun-2022	523640

Analytical Results

EO2204435-005

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3D (SC3D)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients									
phosphorus, total	7723-14-0	0.574		0.0100	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	0.544		0.0200	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546878
sulfate (as SO4)	14808-79-8	1940	DLDS,	6.00	mg/L	E235.SO4	14-Jun-2022	14-Jun-2022	523641
Kjeldahl nitrogen, total [TKN]	----	<0.500	DLR, RRV,	0.500	mg/L	E318	06-Jul-2022	15-Jul-2022	549006
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	50.9		0.50	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538849
Ion Balance									
ion balance (cations/anions)	----	85.3	IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals									
aluminum, total	7429-90-5	0.0337		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.0147		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.140		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	14.7		0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.00262		0.0000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	581		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.00504		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	0.0143		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	0.140		0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	<0.000500	DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	0.778		0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	380		0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	2.00		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	15-Jun-2022	15-Jun-2022	524171
molybdenum, total	7439-98-7	5.92		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	1.08		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	0.512		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	216		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
rubidium, total	7440-17-7	0.0518		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.00489		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	10.8		1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	1750		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	3.01		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	653		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00200	DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.00463		0.00300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	0.00822		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.00537		0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	29.7		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	0.148		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204435-005

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3D (SC3D)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals								
zirconium, total	7440-67-7	<0.00200 DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0087	0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
antimony, dissolved	7440-36-0	0.00080	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
arsenic, dissolved	7440-38-2	0.0144	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
barium, dissolved	7440-39-3	0.160	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
beryllium, dissolved	7440-41-7	<0.000100 DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
bismuth, dissolved	7440-69-9	<0.000250 DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
boron, dissolved	7440-42-8	11.7	0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cadmium, dissolved	7440-43-9	0.00265	0.0000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
calcium, dissolved	7440-70-2	530	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
chromium, dissolved	7440-47-3	<0.00250 DLDS,	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cobalt, dissolved	7440-48-4	0.00457	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
copper, dissolved	7440-50-8	0.0121	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
iron, dissolved	7439-89-6	0.093	0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
lead, dissolved	7439-92-1	<0.000250 DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
magnesium, dissolved	7439-95-4	345	0.0250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
manganese, dissolved	7439-96-5	1.50	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
molybdenum, dissolved	7439-98-7	5.53	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
nickel, dissolved	7440-02-0	0.984	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
potassium, dissolved	7440-09-7	199	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
selenium, dissolved	7782-49-2	0.00563	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
silver, dissolved	7440-22-4	<0.000050 DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
sodium, dissolved	7440-23-5	1560	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
strontium, dissolved	7440-24-6	2.64	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
thallium, dissolved	7440-28-0	<0.000050 DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
tin, dissolved	7440-31-5	<0.00050 DLDS,	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
uranium, dissolved	7440-61-1	0.00502	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
vanadium, dissolved	7440-62-2	27.1	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zinc, dissolved	7440-66-6	0.102	0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zirconium, dissolved	7440-67-7	0.00174	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
dissolved metals filtration location	----	Field	-	-	EP421	-	18-Jun-2022	529171
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	310 DLM,	100	mg/L	E559-L	-	21-Jun-2022	532047
phenols, total (4AAP)	----	0.0032	0.0010	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
toluene	108-88-3	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	93.9	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
difluorobenzene, 1,4-	540-36-3	97.3	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
Hydrocarbons								

Analytical Results

EO2204435-005

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3D (SC3D)

Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	524509
F1-BTEX	----	<100	100	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	16-Jun-2022	16-Jun-2022	525803
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	94.2	1.0	%	E601	16-Jun-2022	16-Jun-2022	525803
dichlorotoluene, 3,4-	97-75-0	104	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	524509

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204435-006

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3E (SC3E)

Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	558	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	19.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	5870	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	616	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	8.50	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	4820	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	4760	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	631	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0456	0.0050	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	361 DLDS,	5.00	mg/L	E235.Cl	15-Jun-2022	14-Jun-2022	524655
fluoride	16984-48-8	0.772 DLDS,	0.200	mg/L	E235.F	15-Jun-2022	14-Jun-2022	524652
nitrate (as N)	14797-55-8	7.19 DLDS,	0.200	mg/L	E235.NO3	15-Jun-2022	14-Jun-2022	524653
nitrate + nitrite (as N)	----	7.19	0.224	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.100 DLDS,	0.100	mg/L	E235.NO2	15-Jun-2022	14-Jun-2022	524654
phosphorus, total	7723-14-0	0.368	0.0100	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	0.0761	0.0010	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546878
sulfate (as SO4)	14808-79-8	2640 DLDS,	3.00	mg/L	E235.SO4	15-Jun-2022	14-Jun-2022	524656
Kjeldahl nitrogen, total [TKN]	----	2.77	0.200	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	37.6	0.50	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538849
Ion Balance								
ion balance (cations/anions)	----	84.2 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	9.27	0.0150	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	0.00070	0.00050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.0104	0.00050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.207	0.00050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
beryllium, total	7440-41-7	0.000557	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.000250 DLDS,	0.000250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204435-006

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3E (SC3E)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals									
boron, total	7440-42-8	1.24		0.050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.000449		0.0000250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	104		0.250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	0.00197		0.000050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	0.0177		0.00250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.00844		0.00050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	0.0625		0.00250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	20.0		0.050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	0.0138		0.000250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	0.281		0.0050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	109		0.0250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	0.314		0.00050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	0.0000550		0.0000500	mg/L	E508	15-Jun-2022	15-Jun-2022	524171
molybdenum, total	7439-98-7	0.767		0.000250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	0.124		0.00250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	0.367		0.250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	26.0		0.250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
rubidium, total	7440-17-7	0.0231		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.00139		0.000250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	23.2		0.50	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	0.000165		0.000050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	1280		0.250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	1.48		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	895		2.50	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	0.000134		0.000050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	0.00418		0.00050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.00050	DLDS,	0.00050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.0677		0.00150	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	<0.00050	DLDS,	0.00050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.0388		0.000050	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	0.0612		0.00250	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	0.163		0.0150	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zirconium, total	7440-67-7	0.0137		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals									
aluminum, dissolved	7429-90-5	1.42		0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
antimony, dissolved	7440-36-0	0.00076		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
arsenic, dissolved	7440-38-2	0.00196		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
barium, dissolved	7440-39-3	0.137		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
beryllium, dissolved	7440-41-7	<0.000100	DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
bismuth, dissolved	7440-69-9	<0.000250	DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
boron, dissolved	7440-42-8	1.33		0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cadmium, dissolved	7440-43-9	0.000373		0.0000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
calcium, dissolved	7440-70-2	84.8		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
chromium, dissolved	7440-47-3	<0.00250	DLDS,	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
cobalt, dissolved	7440-48-4	0.00100		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
copper, dissolved	7440-50-8	0.0196		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
iron, dissolved	7439-89-6	1.05		0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171

Analytical Results

EO2204435-006

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3E (SC3E)

Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
lead, dissolved	7439-92-1	0.000563	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
magnesium, dissolved	7439-95-4	98.3	0.0250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
manganese, dissolved	7439-96-5	0.0222	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
molybdenum, dissolved	7439-98-7	0.716	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
nickel, dissolved	7440-02-0	0.0946	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
potassium, dissolved	7440-09-7	23.6	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
selenium, dissolved	7782-49-2	0.00115	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
silver, dissolved	7440-22-4	<0.000050 DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
sodium, dissolved	7440-23-5	1160	0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
strontium, dissolved	7440-24-6	1.25	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
thallium, dissolved	7440-28-0	<0.000050 DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
tin, dissolved	7440-31-5	<0.00050 DLDS,	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
uranium, dissolved	7440-61-1	0.0351	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
vanadium, dissolved	7440-62-2	0.0244	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zinc, dissolved	7440-66-6	0.0267	0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
zirconium, dissolved	7440-67-7	0.00250	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529171
dissolved metals filtration location	----	Field	-	-	EP421	-	18-Jun-2022	529171
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	0.00100	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	164 DLM,	100	mg/L	E559-L	-	21-Jun-2022	532047
phenols, total (4AAP)	----	<0.0010	0.0010	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
toluene	108-88-3	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	82.7	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
difluorobenzene, 1,4-	540-36-3	97.1	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	524509
F1-BTEX	----	<100	100	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	16-Jun-2022	16-Jun-2022	525803
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	83.6	1.0	%	E601	16-Jun-2022	16-Jun-2022	525803
dichlorotoluene, 3,4-	97-75-0	103	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	524509

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204435-007

Sub-Matrix: **Water** (Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 4 (SC4)

Client sampling date / time: 13-Jun-2022 11:00

Analytical Results

EO2204435-007

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 4 (SC4)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	1440	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	13300	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	1800	0.50	mg/L	EC100	-	19-Jun-2022	-
pH	----	8.19	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	11600	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	11800	1.0	mg/L	EC103	-	15-Jun-2022	-
solids, total suspended [TSS]	----	8.0	3.0	mg/L	E160	-	15-Jun-2022	524518
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	38.4	1.00	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	1460 DLDS,	5.00	mg/L	E235.Cl	15-Jun-2022	14-Jun-2022	524655
fluoride	16984-48-8	2.46 DLDS,	0.200	mg/L	E235.F	15-Jun-2022	14-Jun-2022	524652
nitrate (as N)	14797-55-8	0.700 DLDS,	0.200	mg/L	E235.NO3	15-Jun-2022	14-Jun-2022	524653
nitrate + nitrite (as N)	----	0.700	0.224	mg/L	EC235.N+N	-	15-Jun-2022	-
nitrite (as N)	14797-65-0	<0.100 DLDS,	0.100	mg/L	E235.NO2	15-Jun-2022	14-Jun-2022	524654
phosphorus, total	7723-14-0	2.53	0.0500	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	2.06	0.0500	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546878
sulfate (as SO4)	14808-79-8	6240 DLDS,	3.00	mg/L	E235.SO4	15-Jun-2022	14-Jun-2022	524656
Kjeldahl nitrogen, total [TKN]	----	45.5	1.00	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	99.1	0.50	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538849
Ion Balance								
ion balance (cations/anions)	----	80.5 IB:INT,	0.010	%	EC101	-	15-Jun-2022	-
Total Metals								
aluminum, total	7429-90-5	0.0387	0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	<0.00100 DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.00772	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.0400 RRV,	0.00100	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
beryllium, total	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	9.43	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	0.000324	0.0000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	366	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	<0.000100 DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.00456	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	<0.00500 DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	1.78	0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	0.402	0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	315	0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	1.59	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000050	0.0000050	mg/L	E508	15-Jun-2022	15-Jun-2022	524171
molybdenum, total	7439-98-7	0.777	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	0.122	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	2.71	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	39.2	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204435-007

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 4 (SC4)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals									
rubidium, total	7440-17-7	0.00788		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.00123		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	7.84		1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	3160		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	5.03		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	2110		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00200	DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	0.00346		0.00300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	0.00118		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.0444		0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	0.139	RRV,	0.00500	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
zinc, total	7440-66-6	0.0548		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zirconium, total	7440-67-7	0.0138		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0098		0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
antimony, dissolved	7440-36-0	0.00113		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
arsenic, dissolved	7440-38-2	0.00593	RRV,	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
barium, dissolved	7440-39-3	0.0545	RRV,	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
beryllium, dissolved	7440-41-7	<0.000100	DLDS,	0.000100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
bismuth, dissolved	7440-69-9	0.000393		0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
boron, dissolved	7440-42-8	5.88		0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cadmium, dissolved	7440-43-9	0.000273		0.0000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
calcium, dissolved	7440-70-2	267		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
chromium, dissolved	7440-47-3	<0.00250	DLDS,	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
cobalt, dissolved	7440-48-4	0.00380		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
copper, dissolved	7440-50-8	<0.00100	DLDS,	0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
iron, dissolved	7439-89-6	0.363		0.050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
lead, dissolved	7439-92-1	<0.000250	DLDS,	0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
magnesium, dissolved	7439-95-4	275		0.0250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
manganese, dissolved	7439-96-5	1.38		0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
molybdenum, dissolved	7439-98-7	0.548		0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
nickel, dissolved	7440-02-0	0.117		0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
potassium, dissolved	7440-09-7	36.1		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
selenium, dissolved	7782-49-2	0.00121		0.000250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
silver, dissolved	7440-22-4	0.000063		0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
sodium, dissolved	7440-23-5	2690		0.250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
strontium, dissolved	7440-24-6	3.65		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
thallium, dissolved	7440-28-0	<0.000050	DLDS,	0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
tin, dissolved	7440-31-5	<0.00050	DLDS,	0.00050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
uranium, dissolved	7440-61-1	0.0353		0.000050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
vanadium, dissolved	7440-62-2	0.386	RRV,	0.00250	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zinc, dissolved	7440-66-6	0.0271		0.0050	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
zirconium, dissolved	7440-67-7	0.0109		0.00100	mg/L	E421	18-Jun-2022	18-Jun-2022	529228
dissolved metals filtration location	----	Field		-	-	EP421	-	18-Jun-2022	529228

Analytical Results

EO2204435-007

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 4 (SC4)
Client sampling date / time: 13-Jun-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Jun-2022	524600
Aggregate Organics								
chemical oxygen demand [COD]	----	377 DLM,	100	mg/L	E559-L	-	21-Jun-2022	532047
phenols, total (4AAP)	----	0.0016	0.0010	mg/L	E562	24-Jun-2022	24-Jun-2022	537934
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
toluene	108-88-3	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	15-Jun-2022	15-Jun-2022	524508
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	86.5	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
difluorobenzene, 1,4-	540-36-3	93.7	1.0	%	E611A	15-Jun-2022	15-Jun-2022	524508
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	15-Jun-2022	15-Jun-2022	524509
F1-BTEX	----	<100	100	µg/L	EC580	-	16-Jun-2022	-
F2 (C10-C16)	----	140	100	µg/L	E601	16-Jun-2022	16-Jun-2022	525803
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	86.0	1.0	%	E601	16-Jun-2022	16-Jun-2022	525803
dichlorotoluene, 3,4-	97-75-0	91.3	1.0	%	E581.F1	15-Jun-2022	15-Jun-2022	524509

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2204435-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3C (SC3C)
Client sampling date / time: 14-Jun-2022 10:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	1830	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	19-Jun-2022	20-Jun-2022	529816
conductivity	----	10500	1.0	µS/cm	E100	19-Jun-2022	20-Jun-2022	529818
hardness (as CaCO3), dissolved	----	1830	0.50	mg/L	EC100	-	21-Jun-2022	-
pH	----	8.09	0.10	pH units	E108	19-Jun-2022	20-Jun-2022	529817
solids, total dissolved [TDS]	----	9550	20	mg/L	E162	-	19-Jun-2022	529775
solids, total dissolved [TDS], calculated	----	10100	1.0	mg/L	EC103	-	17-Jun-2022	-
solids, total suspended [TSS]	----	142	3.0	mg/L	E160	-	16-Jun-2022	525853
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	11.0	0.500	mg/L	E298	01-Jul-2022	01-Jul-2022	546260
chloride	16887-00-6	236 DLDS,	5.00	mg/L	E235.Cl	16-Jun-2022	16-Jun-2022	526264
fluoride	16984-48-8	0.896 DLDS,	0.200	mg/L	E235.F	16-Jun-2022	16-Jun-2022	526263
nitrate (as N)	14797-55-8	<0.200 DLDS,	0.200	mg/L	E235.NO3	16-Jun-2022	16-Jun-2022	526261
nitrate + nitrite (as N)	----	<0.224	0.224	mg/L	EC235.N+N	-	17-Jun-2022	-
nitrite (as N)	14797-65-0	<0.100 DLDS,	0.100	mg/L	E235.NO2	16-Jun-2022	16-Jun-2022	526262

Analytical Results

EO2204435-008

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3C (SC3C)
Client sampling date / time: 14-Jun-2022 10:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients									
phosphorus, total	7723-14-0	0.155		0.0050	mg/L	E372-S	06-Jul-2022	09-Jul-2022	549816
phosphorus, total dissolved	7723-14-0	0.104		0.0050	mg/L	E375-U	04-Jul-2022	05-Jul-2022	546878
sulfate (as SO4)	14808-79-8	5710	DLDS,	3.00	mg/L	E235.SO4	16-Jun-2022	16-Jun-2022	526260
Kjeldahl nitrogen, total [TKN]	----	18.6		0.500	mg/L	E318	06-Jul-2022	06-Jul-2022	549006
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	132		5.00	mg/L	E358-L	25-Jun-2022	25-Jun-2022	538849
Ion Balance									
ion balance (cations/anions)	----	92.9		0.010	%	EC101	-	17-Jun-2022	-
Total Metals									
aluminum, total	7429-90-5	<0.0300	DLDS,	0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
antimony, total	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
arsenic, total	7440-38-2	0.00571		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
barium, total	7440-39-3	0.0286	RRV,	0.00100	mg/L	E420	20-Jun-2022	21-Jun-2022	530405
beryllium, total	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
bismuth, total	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
boron, total	7440-42-8	1.29		0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cadmium, total	7440-43-9	<0.0000500	DLDS,	0.0000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
calcium, total	7440-70-2	368		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cesium, total	7440-46-2	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
chromium, total	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
cobalt, total	7440-48-4	0.00107		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
copper, total	7440-50-8	<0.00500	DLDS,	0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
iron, total	7439-89-6	27.1		0.100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lead, total	7439-92-1	<0.000500	DLDS,	0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
lithium, total	7439-93-2	0.203		0.0100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
magnesium, total	7439-95-4	253		0.0500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
manganese, total	7439-96-5	4.06		0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	16-Jun-2022	16-Jun-2022	526147
molybdenum, total	7439-98-7	0.0201		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
nickel, total	7440-02-0	0.0193		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
phosphorus, total	7723-14-0	<0.500	DLDS,	0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
potassium, total	7440-09-7	21.9		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
rubidium, total	7440-17-7	0.00933		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
selenium, total	7782-49-2	0.000959		0.000500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silicon, total	7440-21-3	9.75		1.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
silver, total	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sodium, total	7440-23-5	2560		0.500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
strontium, total	7440-24-6	3.42		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
sulfur, total	7704-34-9	2010		5.00	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tellurium, total	13494-80-9	<0.00200	DLDS,	0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thallium, total	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
thorium, total	7440-29-1	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tin, total	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
titanium, total	7440-32-6	<0.00300	DLDS,	0.00300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
tungsten, total	7440-33-7	<0.00100	DLDS,	0.00100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
uranium, total	7440-61-1	0.0287		0.000100	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
vanadium, total	7440-62-2	0.0887		0.00500	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
zinc, total	7440-66-6	0.0766		0.0300	mg/L	E420	20-Jun-2022	20-Jun-2022	530405

Analytical Results

EO2204435-008

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3C (SC3C)
Client sampling date / time: 14-Jun-2022 10:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals									
zirconium, total	7440-67-7	0.00959		0.00200	mg/L	E420	20-Jun-2022	20-Jun-2022	530405
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0240		0.0100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
antimony, dissolved	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
arsenic, dissolved	7440-38-2	0.00337		0.00100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
barium, dissolved	7440-39-3	0.0596	DTC,	0.00100	mg/L	E421	20-Jun-2022	21-Jun-2022	530397
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
boron, dissolved	7440-42-8	0.905		0.100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
cadmium, dissolved	7440-43-9	<0.0000500	DLDS,	0.0000500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
calcium, dissolved	7440-70-2	344		0.500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
chromium, dissolved	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
cobalt, dissolved	7440-48-4	<0.00100	DLDS,	0.00100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
copper, dissolved	7440-50-8	0.00353		0.00200	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
iron, dissolved	7439-89-6	0.407		0.100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
lead, dissolved	7439-92-1	<0.000500	DLDS,	0.000500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
magnesium, dissolved	7439-95-4	236		0.0500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
manganese, dissolved	7439-96-5	3.80		0.00100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
molybdenum, dissolved	7439-98-7	0.0162		0.000500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
nickel, dissolved	7440-02-0	0.0166		0.00500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
potassium, dissolved	7440-09-7	20.8		0.500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
selenium, dissolved	7782-49-2	0.000796		0.000500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
silver, dissolved	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
sodium, dissolved	7440-23-5	2460		0.500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
strontium, dissolved	7440-24-6	3.25		0.00200	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
thallium, dissolved	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
tin, dissolved	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
uranium, dissolved	7440-61-1	0.0256		0.000100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
vanadium, dissolved	7440-62-2	0.0224		0.00500	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
zinc, dissolved	7440-66-6	0.0455		0.0100	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
zirconium, dissolved	7440-67-7	0.00872		0.00200	mg/L	E421	20-Jun-2022	20-Jun-2022	530397
dissolved metals filtration location	----	Field		-	-	EP421	-	20-Jun-2022	530397
Speciated Metals									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050		0.00050	mg/L	E532A	-	16-Jun-2022	526355
Aggregate Organics									
chemical oxygen demand [COD]	----	340	DLM,	100	mg/L	E559-L	-	21-Jun-2022	532048
phenols, total (4AAP)	----	0.0025		0.0010	mg/L	E562	24-Jun-2022	24-Jun-2022	538031
Volatile Organic Compounds									
benzene	71-43-2	7.79		0.50	µg/L	E611A	17-Jun-2022	17-Jun-2022	528256
ethylbenzene	100-41-4	<0.50		0.50	µg/L	E611A	17-Jun-2022	17-Jun-2022	528256
toluene	108-88-3	<0.50		0.50	µg/L	E611A	17-Jun-2022	17-Jun-2022	528256
xylene, m+p-	179601-23-1	<0.40		0.40	µg/L	E611A	17-Jun-2022	17-Jun-2022	528256
xylene, o-	95-47-6	<0.30		0.30	µg/L	E611A	17-Jun-2022	17-Jun-2022	528256
xylenes, total	1330-20-7	<0.50		0.50	µg/L	E611A	17-Jun-2022	17-Jun-2022	528256
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	84.4		1.0	%	E611A	17-Jun-2022	17-Jun-2022	528256
difluorobenzene, 1,4-	540-36-3	96.3		1.0	%	E611A	17-Jun-2022	17-Jun-2022	528256
Hydrocarbons									

Analytical Results

EO2204435-008

Sub-Matrix: **Water**
(Matrix: **Water)**

Client sample ID: SECONDARY LEACHATE CELL 3C (SC3C)
Client sampling date / time: 14-Jun-2022 10:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	17-Jun-2022	17-Jun-2022	528255
F1-BTEX	----	<100	100	µg/L	EC580	-	18-Jun-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	17-Jun-2022	17-Jun-2022	527624
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	72.8	1.0	%	E601	17-Jun-2022	17-Jun-2022	527624
dichlorotoluene, 3,4-	97-75-0	86.1	1.0	%	E581.F1	17-Jun-2022	17-Jun-2022	528255

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2204435**	Page	: 1 of 31
Amendment	: **2**		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Rame Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 2 2022	Date Samples Received	: 14-Jun-2022 13:19
PO	: 225924	Issue Date	: 10-Aug-2022 14:30
C-O-C number	: ----		
Sampler	: Murray		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E559-L	14-Jun-2022	----	----	----		21-Jun-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 1 (SC1)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 2 (SC2)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E559-L	13-Jun-2022	----	----	----		21-Jun-2022	28 days	8 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E562	14-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	10 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 1 (SC1)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 2 (SC2)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E562	13-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	11 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3C (SC3C)	E298	14-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	17 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 1 (SC1)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 2 (SC2)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3A (SC3A)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3B (SC3B)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3D (SC3D)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3E (SC3E)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 4 (SC4)	E298	13-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	18 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 1 (SC1)	E235.Cl	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 2 (SC2)	E235.Cl	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3A (SC3A)	E235.Cl	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3B (SC3B)	E235.Cl	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3D (SC3D)	E235.Cl	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3E (SC3E)	E235.Cl	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 4 (SC4)	E235.Cl	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3C (SC3C)	E235.Cl	14-Jun-2022	16-Jun-2022	----	----		16-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 1 (SC1)	E235.F	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 2 (SC2)	E235.F	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3A (SC3A)	E235.F	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3B (SC3B)	E235.F	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3D (SC3D)	E235.F	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3E (SC3E)	E235.F	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 4 (SC4)	E235.F	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3C (SC3C)	E235.F	14-Jun-2022	16-Jun-2022	----	----		16-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 1 (SC1)	E235.NO3	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 2 (SC2)	E235.NO3	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3A (SC3A)	E235.NO3	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3B (SC3B)	E235.NO3	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3D (SC3D)	E235.NO3	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3E (SC3E)	E235.NO3	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 4 (SC4)	E235.NO3	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3C (SC3C)	E235.NO3	14-Jun-2022	16-Jun-2022	----	----		16-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 1 (SC1)	E235.NO2	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 2 (SC2)	E235.NO2	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3A (SC3A)	E235.NO2	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3B (SC3B)	E235.NO2	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3D (SC3D)	E235.NO2	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3E (SC3E)	E235.NO2	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 4 (SC4)	E235.NO2	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3C (SC3C)	E235.NO2	14-Jun-2022	16-Jun-2022	----	----		16-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 1 (SC1)	E235.SO4	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 2 (SC2)	E235.SO4	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3A (SC3A)	E235.SO4	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3B (SC3B)	E235.SO4	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3D (SC3D)	E235.SO4	13-Jun-2022	14-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3E (SC3E)	E235.SO4	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 4 (SC4)	E235.SO4	13-Jun-2022	15-Jun-2022	----	----		14-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3C (SC3C)	E235.SO4	14-Jun-2022	16-Jun-2022	----	----		16-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 3C (SC3C)	E375-U	14-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	21 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 1 (SC1)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 2 (SC2)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 3A (SC3A)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 3B (SC3B)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 3D (SC3D)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E375-U	13-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E318	14-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	22 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 1 (SC1)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 2 (SC2)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E318	13-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	23 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E372-S	14-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	25 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 1 (SC1)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 2 (SC2)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E372-S	13-Jun-2022	06-Jul-2022	----	----		09-Jul-2022	28 days	26 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 1 (SC1)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 2 (SC2)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 4 (SC4)	E421	13-Jun-2022	18-Jun-2022	----	----		18-Jun-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E421	14-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 1 (SC1)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 2 (SC2)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3A (SC3A)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3B (SC3B)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3D (SC3D)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3E (SC3E)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 4 (SC4)	E581.F1	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3C (SC3C)	E581.F1	14-Jun-2022	17-Jun-2022	----	----		17-Jun-2022	14 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 1 (SC1)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 2 (SC2)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3A (SC3A)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3B (SC3B)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3C (SC3C)	E601	14-Jun-2022	17-Jun-2022	14 days	3 days	✓	17-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3D (SC3D)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3E (SC3E)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 4 (SC4)	E601	13-Jun-2022	16-Jun-2022	14 days	3 days	✓	16-Jun-2022	40 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E358-L	14-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	11 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 1 (SC1)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 2 (SC2)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E358-L	13-Jun-2022	25-Jun-2022	----	----		25-Jun-2022	28 days	12 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E290	14-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E290	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	14 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E100	14-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E100	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	28 days	7 days	✓
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E108	14-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E108	13-Jun-2022	19-Jun-2022	----	----		20-Jun-2022	0.25 hrs	20.25 hrs	✖ EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E162	14-Jun-2022	----	----	----		19-Jun-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E162	13-Jun-2022	----	----	----		19-Jun-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E160	14-Jun-2022	----	----	----		16-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E160	13-Jun-2022	----	----	----		15-Jun-2022	7 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) SECONDARY LEACHATE CELL 1 (SC1)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) SECONDARY LEACHATE CELL 2 (SC2)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) SECONDARY LEACHATE CELL 3A (SC3A)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) SECONDARY LEACHATE CELL 3B (SC3B)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) SECONDARY LEACHATE CELL 3C (SC3C)	E532A	14-Jun-2022	----	----	----		16-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) SECONDARY LEACHATE CELL 3D (SC3D)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) SECONDARY LEACHATE CELL 3E (SC3E)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide) SECONDARY LEACHATE CELL 4 (SC4)	E532A	13-Jun-2022	----	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 1 (SC1)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 2 (SC2)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E508	14-Jun-2022	16-Jun-2022	----	----		16-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 4 (SC4)	E508	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	2 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E420	14-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 1 (SC1)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 2 (SC2)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 4 (SC4)	E420	13-Jun-2022	20-Jun-2022	----	----		20-Jun-2022	180 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 1 (SC1)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 2 (SC2)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3A (SC3A)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3B (SC3B)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3D (SC3D)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3E (SC3E)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 4 (SC4)	E611A	13-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3C (SC3C)	E611A	14-Jun-2022	17-Jun-2022	----	----		17-Jun-2022	14 days	3 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	546260	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	524508	2	39	5.1	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	524509	2	22	9.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	532047	2	38	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	523637	3	58	5.1	5.0	✓
Conductivity in Water	E100	529809	2	31	6.4	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	524600	2	21	9.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	529171	3	60	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	538784	2	40	5.0	5.0	✓
Fluoride in Water by IC	E235.F	523638	3	55	5.4	5.0	✓
Nitrate in Water by IC	E235.NO3	523639	3	55	5.4	5.0	✓
Nitrite in Water by IC	E235.NO2	523640	3	54	5.5	5.0	✓
pH by Meter	E108	529808	2	32	6.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	537871	3	60	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	523641	3	54	5.5	5.0	✓
TDS by Gravimetry	E162	529775	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	546878	2	35	5.7	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	549006	3	46	6.5	5.0	✓
Total Mercury in Water by CVAAS	E508	524171	2	35	5.7	5.0	✓
Total Metals in Water by CRC ICPMS	E420	530405	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	549815	3	52	5.7	5.0	✓
TSS by Gravimetry	E160	524518	2	40	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	546260	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	524508	2	39	5.1	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	524509	2	22	9.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	525803	2	36	5.5	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	532047	2	38	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	523637	3	58	5.1	5.0	✓
Conductivity in Water	E100	529809	2	31	6.4	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	524600	2	21	9.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	529171	3	60	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	538784	2	40	5.0	5.0	✓
Fluoride in Water by IC	E235.F	523638	3	55	5.4	5.0	✓
Nitrate in Water by IC	E235.NO3	523639	3	55	5.4	5.0	✓
Nitrite in Water by IC	E235.NO2	523640	3	54	5.5	5.0	✓
pH by Meter	E108	529808	2	32	6.2	5.0	✓

Matrix: **Water**

Evaluation: ✗ = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Phenols (4AAP) in Water by Colorimetry	E562	537871	3	60	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	523641	3	54	5.5	5.0	✓
TDS by Gravimetry	E162	529775	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	546878	2	35	5.7	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	549006	3	46	6.5	5.0	✓
Total Mercury in Water by CVAAS	E508	524171	2	35	5.7	5.0	✓
Total Metals in Water by CRC ICPMS	E420	530405	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	549815	3	52	5.7	5.0	✓
TSS by Gravimetry	E160	524518	2	40	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	546260	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	524508	2	39	5.1	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	524509	2	22	9.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	525803	2	36	5.5	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	532047	2	38	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	523637	3	58	5.1	5.0	✓
Conductivity in Water	E100	529809	2	31	6.4	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	524600	2	21	9.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	529171	3	60	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	538784	2	40	5.0	5.0	✓
Fluoride in Water by IC	E235.F	523638	3	55	5.4	5.0	✓
Nitrate in Water by IC	E235.NO3	523639	3	55	5.4	5.0	✓
Nitrite in Water by IC	E235.NO2	523640	3	54	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	537871	3	60	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	523641	3	54	5.5	5.0	✓
TDS by Gravimetry	E162	529775	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	546878	2	35	5.7	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	549006	3	46	6.5	5.0	✓
Total Mercury in Water by CVAAS	E508	524171	2	35	5.7	5.0	✓
Total Metals in Water by CRC ICPMS	E420	530405	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	549815	3	52	5.7	5.0	✓
TSS by Gravimetry	E160	524518	2	40	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	546260	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	524508	2	39	5.1	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	532047	2	38	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	523637	3	58	5.1	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	524600	1	21	4.7	5.0	✗
Dissolved Metals in Water by CRC ICPMS	E421	529171	3	60	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	538784	2	40	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Fluoride in Water by IC	E235.F	523638	3	55	5.4	5.0	✓
Nitrate in Water by IC	E235.NO3	523639	3	55	5.4	5.0	✓
Nitrite in Water by IC	E235.NO2	523640	3	54	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	537871	3	60	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	523641	3	54	5.5	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	546878	2	35	5.7	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	549006	3	46	6.5	5.0	✓
Total Mercury in Water by CVAAS	E508	524171	2	35	5.7	5.0	✓
Total Metals in Water by CRC ICPMS	E420	530405	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	549815	3	52	5.7	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Edmonton - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Edmonton - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Edmonton - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Edmonton - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourmetrically after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total Metals in Water by CRC ICPMS	E420 Edmonton - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Edmonton - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A Edmonton - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. sample pretreatment involved field or lab filtration following by sample preservation.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide ($K_3Fe(CN)_6$) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
CCME PHC - F1 by Headspace GC-FID	E581.F1 Calgary - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Calgary - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BTEX by Headspace GC-MS	E611A Calgary - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Edmonton - Environmental	Water	APHA 2340B	"Hardness (as $CaCO_3$), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Calgary - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318 Edmonton - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Edmonton - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581 Calgary - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Calgary - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: **EO2204435**	Page	: 1 of 30
Amendment	: **2**		
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Rame Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 2 2022	Date Samples Received	: 14-Jun-2022 13:19
PO	: 225924	Date Analysis Commenced	: 14-Jun-2022
C-O-C number	: ----	Issue Date	: 10-Aug-2022 14:30
Sampler	: Murray		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Austin Wasylyshyn	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Cynthia Bauer	Organic Supervisor	Calgary Organics, Calgary, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Jeanie Mark	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Jing Liu	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Kira Sampley	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Lisa Watt	Lab Supervisor - Environmental	Edmonton Inorganics, Edmonton, Alberta
Maqsood UlHassan	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Muzammil Ali	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Sobhithan Pillay		Edmonton Inorganics, Edmonton, Alberta
Victoria Piguing	Laboratory Analyst	Calgary Organics, Calgary, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 524518)											
EO2204422-008	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	126	150	17.5%	20%	----
Physical Tests (QC Lot: 525853)											
EO2204435-008	SECONDARY LEACHATE CELL 3C (SC3C)	solids, total suspended [TSS]	----	E160	3.0	mg/L	142	152	6.67%	20%	----
Physical Tests (QC Lot: 529775)											
EO2204184-004	Anonymous	solids, total dissolved [TDS]	----	E162	40	mg/L	302	295	7	Diff <2x LOR	----
Physical Tests (QC Lot: 529808)											
EO2204438-008	Anonymous	pH	----	E108	0.10	pH units	8.34	8.31	0.360%	3%	----
Physical Tests (QC Lot: 529809)											
EO2204438-008	Anonymous	conductivity	----	E100	1.0	µS/cm	14200	14200	0.352%	10%	----
Physical Tests (QC Lot: 529817)											
FC2201268-004	Anonymous	pH	----	E108	0.10	pH units	7.56	7.57	0.132%	3%	----
Physical Tests (QC Lot: 529818)											
FC2201268-004	Anonymous	conductivity	----	E100	1.0	µS/cm	4550	4580	0.657%	10%	----
Anions and Nutrients (QC Lot: 523637)											
FC2201255-011	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	176	176	0.0669%	20%	----
Anions and Nutrients (QC Lot: 523638)											
FC2201255-011	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.211	0.200	5.35%	20%	----
Anions and Nutrients (QC Lot: 523639)											
FC2201255-011	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 523640)											
FC2201255-011	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 523641)											
FC2201255-011	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	178	178	0.00225%	20%	----
Anions and Nutrients (QC Lot: 524652)											
EO2204461-004	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.555	0.569	2.49%	20%	----
Anions and Nutrients (QC Lot: 524653)											
EO2204461-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.031	0.032	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 524654)											
EO2204461-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	0.015	0.014	0.0008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 524655)											
EO2204461-004	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	13.9	13.8	0.404%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 524656)											
EO2204461-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1.08	1.07	0.007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 526260)											
FC2201269-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	309	310	0.306%	20%	----
Anions and Nutrients (QC Lot: 526261)											
FC2201269-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 526262)											
FC2201269-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 526263)											
FC2201269-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.134	0.133	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 526264)											
FC2201269-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	19.4	19.3	0.383%	20%	----
Anions and Nutrients (QC Lot: 546260)											
FC2201255-004	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0500	mg/L	2.27	2.30	1.23%	20%	----
Anions and Nutrients (QC Lot: 546878)											
EO2203771-003	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	0.0050	mg/L	0.107	0.108	1.30%	20%	----
Anions and Nutrients (QC Lot: 549006)											
EO2204435-001	SECONDARY LEACHATE CELL 1 (SC1)	Kjeldahl nitrogen, total [TKN]	----	E318	2.50	mg/L	90.8	88.6	2.55%	20%	----
Anions and Nutrients (QC Lot: 549815)											
EO2204348-026	Anonymous	phosphorus, total	7723-14-0	E372-S	0.0100	mg/L	0.760	0.751	1.26%	20%	----
Anions and Nutrients (QC Lot: 549816)											
EO2204435-003	SECONDARY LEACHATE CELL 3A (SC3A)	phosphorus, total	7723-14-0	E372-S	0.0100	mg/L	0.375	0.350	6.93%	20%	----
Anions and Nutrients (QC Lot: 557208)											
EO2204297-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	1.09	1.14	0.053	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 558478)											
EO2204236-001	Anonymous	phosphorus, total	7723-14-0	E372-S	0.0200	mg/L	1.75	1.73	0.747%	20%	----
Anions and Nutrients (QC Lot: 560740)											
EO2204119-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.938	0.770	19.6%	20%	----
Anions and Nutrients (QC Lot: 560990)											
EO2204435-001	SECONDARY LEACHATE CELL 1 (SC1)	phosphorus, total dissolved	7723-14-0	E375-U	0.0100	mg/L	0.508	0.451	11.9%	20%	----
Organic / Inorganic Carbon (QC Lot: 538784)											
EO2204366-019	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	16.8	17.3	3.00%	20%	----
Organic / Inorganic Carbon (QC Lot: 538849)											
GP2201046-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	11.2	11.7	4.48%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 524171)											
EO2204422-018	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 526147)											
EO2204435-008	SECONDARY LEACHATE CELL 3C (SC3C)	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 530405)											
EO2204435-001	SECONDARY LEACHATE CELL 1 (SC1)	aluminum, total	7429-90-5	E420	0.0300	mg/L	0.0500	0.0455	0.0044	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00100	mg/L	0.00892	0.00898	0.00005	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00100	mg/L	0.0938	0.0921	1.92%	20%	----
		beryllium, total	7440-41-7	E420	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.100	mg/L	7.14	7.28	1.87%	20%	----
		cadmium, total	7440-43-9	E420	0.0000500	mg/L	0.00432	0.00434	0.342%	20%	----
		calcium, total	7440-70-2	E420	0.500	mg/L	574	558	2.76%	20%	----
		cesium, total	7440-46-2	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00500	mg/L	0.0969	0.0974	0.509%	20%	----
		cobalt, total	7440-48-4	E420	0.00100	mg/L	2.28	2.38	4.57%	20%	----
		copper, total	7440-50-8	E420	0.00500	mg/L	0.0507	0.0490	0.00174	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.100	mg/L	16.3	16.4	0.833%	20%	----
		lead, total	7439-92-1	E420	0.000500	mg/L	0.115	0.116	0.456%	20%	----
		lithium, total	7439-93-2	E420	0.0100	mg/L	0.474	0.491	3.56%	20%	----
		magnesium, total	7439-95-4	E420	0.0500	mg/L	205	216	5.09%	20%	----
		manganese, total	7439-96-5	E420	0.00100	mg/L	37.8	36.4	3.72%	20%	----
		molybdenum, total	7439-98-7	E420	0.000500	mg/L	0.0132	0.0129	2.50%	20%	----
		nickel, total	7440-02-0	E420	0.00500	mg/L	10.9	11.5	5.71%	20%	----
		phosphorus, total	7723-14-0	E420	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.500	mg/L	25.4	25.8	1.44%	20%	----
		rubidium, total	7440-17-7	E420	0.00200	mg/L	0.00692	0.00747	0.00055	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000500	mg/L	0.00136	0.00137	0.000010	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	1.00	mg/L	8.39	8.60	0.21	Diff <2x LOR	----
		silver, total	7440-22-4	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.500	mg/L	2000	2060	2.84%	20%	----
		strontium, total	7440-24-6	E420	0.00200	mg/L	3.11	3.10	0.296%	20%	----
		sulfur, total	7704-34-9	E420	5.00	mg/L	1160	1160	0.399%	20%	----
		tellurium, total	13494-80-9	E420	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 530405) - continued											
EO2204435-001	SECONDARY LEACHATE CELL 1 (SC1)	thallium, total	7440-28-0	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00300	mg/L	0.00418	0.00377	0.00041	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000100	mg/L	0.0536	0.0528	1.45%	20%	----
		vanadium, total	7440-62-2	E420	0.00500	mg/L	0.0414	0.0418	0.00037	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0300	mg/L	3.48	3.52	0.921%	20%	----
		zirconium, total	7440-67-7	E420	0.00200	mg/L	0.00915	0.00939	0.00024	Diff <2x LOR	----
Dissolved Metals (QC Lot: 529171)											
EO2204422-012	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00021	0.00018	0.00003	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00028	0.00025	0.00003	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0841	0.0833	0.973%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.118	0.107	9.80%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000590	0.0000672	13.0%	20%	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	212	188	12.2%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00025	0.00024	0.00001	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00029	0.00027	0.00002	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.030	mg/L	0.960	0.932	3.00%	20%	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	37.4	37.8	0.940%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.181	0.173	4.16%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00554	0.00484	13.5%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.0102	0.00962	6.25%	20%	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	5.35	4.80	10.8%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00105	0.00109	3.68%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	19.8	18.6	6.41%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.928	0.828	11.4%	20%	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000037	0.000036	0.000001	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 529171) - continued											
EO2204422-012	Anonymous	uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00332	0.00315	5.22%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0069	0.0064	0.0005	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 529228)											
EO2204435-007	SECONDARY LEACHATE CELL 4 (SC4)	aluminum, dissolved	7429-90-5	E421	0.0050	mg/L	0.0098	0.0096	0.0002	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00050	mg/L	0.00113	0.00113	0.0000009	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00050	mg/L	0.00593	0.00624	5.04%	20%	----
		barium, dissolved	7440-39-3	E421	0.00050	mg/L	0.0545	0.0580	6.31%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000250	mg/L	0.000393	<0.000250	0.000143	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.050	mg/L	5.88	6.92	16.2%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000250	mg/L	0.000273	0.000280	2.58%	20%	----
		calcium, dissolved	7440-70-2	E421	0.250	mg/L	267	319	18.0%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00050	mg/L	0.00380	0.00369	0.00010	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.050	mg/L	0.363	0.374	0.011	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0250	mg/L	275	283	2.96%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00050	mg/L	1.38	1.41	1.99%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000250	mg/L	0.548	0.642	15.8%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00250	mg/L	0.117	0.120	2.49%	20%	----
		potassium, dissolved	7440-09-7	E421	0.250	mg/L	36.1	35.3	2.09%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000250	mg/L	0.00121	0.00124	0.000036	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000050	mg/L	0.000063	0.000053	0.000010	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.250	mg/L	2690	2780	3.17%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00100	mg/L	3.65	4.30	16.4%	20%	----
		thallium, dissolved	7440-28-0	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000050	mg/L	0.0353	0.0425	18.5%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00250	mg/L	0.386	0.393	1.79%	20%	----
		zinc, dissolved	7440-66-6	E421	0.0050	mg/L	0.0271	0.0254	0.0017	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00100	mg/L	0.0109	0.0130	17.6%	20%	----
Dissolved Metals (QC Lot: 530397)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 530397) - continued											
EO2204422-016	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0031	0.0020	0.0010	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00019	0.00019	0.000003	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00050	0.00051	0.00001	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0765	0.0767	0.292%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.132	0.130	1.18%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000295	0.0000265	0.0000030	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	248	244	1.42%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00044	0.00046	0.00002	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00073	0.00068	0.00005	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	45.8	45.9	0.196%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.0862	0.0848	1.60%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00467	0.00460	1.52%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00599	0.00598	0.188%	20%	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	5.40	4.72	13.4%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00105	0.00100	4.46%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	28.7	28.6	0.128%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	1.02	1.02	0.251%	20%	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000023	0.000024	0.0000006	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00474	0.00478	0.631%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0020	0.0022	0.0002	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	0.00026	0.00025	0.000010	Diff <2x LOR	----
Speciated Metals (QC Lot: 524600)											
EO2204438-008	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 526355)											
EO2204435-008	SECONDARY LEACHATE CELL 3C (SC3C)	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 532047)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Aggregate Organics (QC Lot: 532047) - continued											
EO2204363-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	316	349	10.1%	20%	----
Aggregate Organics (QC Lot: 532048)											
EO2204435-008	SECONDARY LEACHATE CELL 3C (SC3C)	chemical oxygen demand [COD]	----	E559-L	100	mg/L	340	326	14	Diff <2x LOR	----
Aggregate Organics (QC Lot: 537871)											
YL2200638-016	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 537934)											
EO2204447-003	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 538031)											
FC2201255-002	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 524508)											
CG2207481-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 528256)											
CG2206616-006	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 524509)											
CG2207481-001	Anonymous	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 528255)											
CG2206616-006	Anonymous	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 524518)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 525853)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 529775)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 529809)						
conductivity	----	E100	1	µS/cm	1.3	----
Physical Tests (QCLot: 529818)						
conductivity	----	E100	1	µS/cm	1.5	----
Anions and Nutrients (QCLot: 523637)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 523638)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 523639)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 523640)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 523641)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 524652)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 524653)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 524654)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 524655)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 524656)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 526260)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 526261)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 526262)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 526263)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 526264)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 546260)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 546878)						
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 549006)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 549815)						
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 549816)						
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 557208)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 558478)						
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 560740)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 560990)						
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	<0.0010	----
Organic / Inorganic Carbon (QCLot: 538784)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 538849)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 524171)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 526147)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 530405)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 530405) - continued						
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 529171)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 529171) - continued						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 529228)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 529228) - continued						
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 530397)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 530397) - continued						
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Speciated Metals (QCLot: 524600)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Speciated Metals (QCLot: 526355)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 532047)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 532048)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 537871)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 537934)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 538031)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 524508)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 528256)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 528256) - continued						
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 524509)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 525803)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 527624)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 528255)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 524518)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	112	85.0	115	----
Physical Tests (QCLot: 525853)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	106	85.0	115	----
Physical Tests (QCLot: 529775)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	97.4	85.0	115	----
Physical Tests (QCLot: 529808)									
pH	----	E108	----	pH units	6 pH units	101	97.0	103	----
Physical Tests (QCLot: 529809)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	96.6	90.0	110	----
Physical Tests (QCLot: 529817)									
pH	----	E108	----	pH units	6 pH units	101	97.0	103	----
Physical Tests (QCLot: 529818)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	94.5	90.0	110	----
Anions and Nutrients (QCLot: 523637)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 523638)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.0	90.0	110	----
Anions and Nutrients (QCLot: 523639)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 523640)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 523641)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.8	90.0	110	----
Anions and Nutrients (QCLot: 524652)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 524653)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 524654)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 524655)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 524656)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 524656) - continued									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 526260)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 526261)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	107	90.0	110	----
Anions and Nutrients (QCLot: 526262)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	95.5	90.0	110	----
Anions and Nutrients (QCLot: 526263)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.0	90.0	110	----
Anions and Nutrients (QCLot: 526264)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 546260)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	98.4	85.0	115	----
Anions and Nutrients (QCLot: 546878)									
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	0.05 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 549006)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	98.7	75.0	125	----
Anions and Nutrients (QCLot: 549815)									
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	0.05 mg/L	104	80.0	120	----
Anions and Nutrients (QCLot: 549816)									
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	0.05 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 557208)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	95.5	75.0	125	----
Anions and Nutrients (QCLot: 558478)									
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	0.05 mg/L	97.0	80.0	120	----
Anions and Nutrients (QCLot: 560740)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	97.0	75.0	125	----
Anions and Nutrients (QCLot: 560990)									
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	0.05 mg/L	105	80.0	120	----
Organic / Inorganic Carbon (QCLot: 538784)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	105	80.0	120	----
Organic / Inorganic Carbon (QCLot: 538849)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Total Metals (QCLot: 524171)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	92.7	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 526147)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	98.6	80.0	120	----
Total Metals (QCLot: 530405)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	104	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	104	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	101	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	91.2	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	96.8	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	96.5	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	94.4	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	99.0	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	101	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	99.6	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	97.6	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	96.4	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	98.9	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	94.2	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	95.4	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	98.8	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	97.9	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	97.0	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	98.3	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	99.5	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	98.6	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	95.3	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	93.7	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	98.7	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	95.7	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	98.8	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	92.5	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	88.3	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	97.2	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	93.6	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	91.4	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Total Metals (QCLot: 530405) - continued									
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	95.5	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	99.2	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	92.8	80.0	120	----
Dissolved Metals (QCLot: 529171)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	98.8	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	95.2	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	95.8	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	94.7	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	91.9	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	86.9	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	89.2	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	99.4	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	98.4	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.1	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	97.2	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	97.1	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	89.4	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	97.3	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	98.1	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	94.6	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	93.9	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	92.6	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	91.8	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	103	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	88.6	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	82.2	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	93.5	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	99.5	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	94.8	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	92.7	80.0	120	----
Dissolved Metals (QCLot: 529228)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	95.8	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 529228) - continued									
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	88.1	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	96.2	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	96.3	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	96.6	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	97.4	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	92.2	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	98.0	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	97.5	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.6	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	97.8	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	99.6	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	96.3	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	102	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	95.1	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	87.4	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	93.5	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	92.8	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	89.9	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	90.2	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.8	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	87.4	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	99.4	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	94.7	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	95.5	80.0	120	----
Dissolved Metals (QCLot: 530397)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	106	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	97.9	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	95.5	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	105	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	98.6	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	96.0	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	102	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 530397) - continued									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.7	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	98.0	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	101	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.3	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	108	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	95.9	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.5	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	102	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	94.8	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	99.9	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	98.6	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	96.3	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	98.7	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	99.2	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	98.4	80.0	120	----
Speciated Metals (QCLot: 524600)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
Speciated Metals (QCLot: 526355)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	95.9	80.0	120	----
Aggregate Organics (QCLot: 532047)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	101	85.0	115	----
Aggregate Organics (QCLot: 532048)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	102	85.0	115	----
Aggregate Organics (QCLot: 537871)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	101	85.0	115	----
Aggregate Organics (QCLot: 537934)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	101	85.0	115	----
Aggregate Organics (QCLot: 538031)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	94.8	85.0	115	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 524508)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	90.5	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	87.3	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	82.9	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	97.4	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	92.0	70.0	130	----
Volatile Organic Compounds (QCLot: 528256)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	123	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	92.5	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	114	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	109	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	106	70.0	130	----
Hydrocarbons (QCLot: 524509)									
F1 (C6-C10)	----	E581.F1	100	µg/L	100 µg/L	104	70.0	130	----
Hydrocarbons (QCLot: 525803)									
F2 (C10-C16)	----	E601	100	µg/L	3669.135 µg/L	108	70.0	130	----
Hydrocarbons (QCLot: 527624)									
F2 (C10-C16)	----	E601	100	µg/L	3669.135 µg/L	109	70.0	130	----
Hydrocarbons (QCLot: 528255)									
F1 (C6-C10)	----	E581.F1	100	µg/L	100 µg/L	82.2	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 523637)										
FC2201255-011	Anonymous	chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 523638)										
FC2201255-011	Anonymous	fluoride	16984-48-8	E235.F	0.918 mg/L	1 mg/L	91.8	75.0	125	----
Anions and Nutrients (QCLot: 523639)										
FC2201255-011	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.71 mg/L	2.5 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 523640)										
FC2201255-011	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.509 mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 523641)										
FC2201255-011	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 524652)										
EO2204461-004	Anonymous	fluoride	16984-48-8	E235.F	0.972 mg/L	1 mg/L	97.2	75.0	125	----
Anions and Nutrients (QCLot: 524653)										
EO2204461-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.89 mg/L	2.5 mg/L	116	75.0	125	----
Anions and Nutrients (QCLot: 524654)										
EO2204461-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.519 mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 524655)										
EO2204461-004	Anonymous	chloride	16887-00-6	E235.Cl	108 mg/L	100 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 524656)										
EO2204461-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	110 mg/L	100 mg/L	110	75.0	125	----
Anions and Nutrients (QCLot: 526260)										
FC2201269-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 526261)										
FC2201269-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.76 mg/L	2.5 mg/L	110	75.0	125	----
Anions and Nutrients (QCLot: 526262)										
FC2201269-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.489 mg/L	0.5 mg/L	97.7	75.0	125	----
Anions and Nutrients (QCLot: 526263)										
FC2201269-001	Anonymous	fluoride	16984-48-8	E235.F	0.971 mg/L	1 mg/L	97.1	75.0	125	----
Anions and Nutrients (QCLot: 526264)										

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 526264) - continued										
FC2201269-001	Anonymous	chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 546260)										
FC2201255-004	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 546878)										
EO2204406-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	0.0640 mg/L	0.067 mg/L	95.5	70.0	130	----
Anions and Nutrients (QCLot: 549006)										
EO2204435-002	SECONDARY LEACHATE CELL 2 (SC2)	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 549815)										
EO2204348-027	Anonymous	phosphorus, total	7723-14-0	E372-S	ND mg/L	0.067 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 549816)										
EO2204435-004	SECONDARY LEACHATE CELL 3B (SC3B)	phosphorus, total	7723-14-0	E372-S	ND mg/L	0.067 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 557208)										
EO2204297-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.50 mg/L	2.5 mg/L	100	70.0	130	----
Anions and Nutrients (QCLot: 558478)										
EO2204236-002	Anonymous	phosphorus, total	7723-14-0	E372-S	ND mg/L	0.067 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 560740)										
EO2204429-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.27 mg/L	2.5 mg/L	90.6	70.0	130	----
Anions and Nutrients (QCLot: 560990)										
EO2204438-002	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	ND mg/L	0.067 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 538784)										
EO2204366-020	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 538849)										
GP2201046-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 524171)										
EO2204422-019	Anonymous	mercury, total	7439-97-6	E508	0.0000889 mg/L	0.0001 mg/L	88.9	70.0	130	----
Total Metals (QCLot: 526147)										
EO2204473-001	Anonymous	mercury, total	7439-97-6	E508	0.0000930 mg/L	0.0001 mg/L	93.0	70.0	130	----
Total Metals (QCLot: 530405)										
EO2204435-002	SECONDARY LEACHATE CELL 2 (SC2)	aluminum, total	7429-90-5	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, total	7440-36-0	E420	0.0209 mg/L	0.02 mg/L	105	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0213 mg/L	0.02 mg/L	106	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 530405) - continued										
EO2204435-002	SECONDARY LEACHATE CELL 2 (SC2)	barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0387 mg/L	0.04 mg/L	96.7	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00953 mg/L	0.01 mg/L	95.3	70.0	130	----
		boron, total	7440-42-8	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00390 mg/L	0.004 mg/L	97.5	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0107 mg/L	0.01 mg/L	107	70.0	130	----
		chromium, total	7440-47-3	E420	0.0434 mg/L	0.04 mg/L	108	70.0	130	----
		cobalt, total	7440-48-4	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		copper, total	7440-50-8	E420	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		iron, total	7439-89-6	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, total	7439-92-1	E420	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		lithium, total	7439-93-2	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, total	7440-02-0	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		phosphorus, total	7723-14-0	E420	11.2 mg/L	10 mg/L	112	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		selenium, total	7782-49-2	E420	0.0461 mg/L	0.04 mg/L	115	70.0	130	----
		silicon, total	7440-21-3	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, total	7440-22-4	E420	0.00400 mg/L	0.004 mg/L	100.0	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0427 mg/L	0.04 mg/L	107	70.0	130	----
		thallium, total	7440-28-0	E420	0.00389 mg/L	0.004 mg/L	97.3	70.0	130	----
		thorium, total	7440-29-1	E420	0.0171 mg/L	0.02 mg/L	85.4	70.0	130	----
		tin, total	7440-31-5	E420	0.0205 mg/L	0.02 mg/L	103	70.0	130	----
		titanium, total	7440-32-6	E420	0.0421 mg/L	0.04 mg/L	105	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		uranium, total	7440-61-1	E420	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, total	7440-62-2	E420	0.114 mg/L	0.1 mg/L	114	70.0	130	----
		zinc, total	7440-66-6	E420	0.345 mg/L	0.4 mg/L	86.2	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0429 mg/L	0.04 mg/L	107	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 529171)										
EO2204422-013	Anonymous	aluminum, dissolved	7429-90-5	E421	0.194 mg/L	0.2 mg/L	97.2	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0170 mg/L	0.02 mg/L	85.3	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0384 mg/L	0.04 mg/L	95.9	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00750 mg/L	0.01 mg/L	75.0	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00382 mg/L	0.004 mg/L	95.5	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0386 mg/L	0.04 mg/L	96.6	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0186 mg/L	0.02 mg/L	93.2	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0176 mg/L	0.02 mg/L	88.2	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.90 mg/L	2 mg/L	95.2	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0171 mg/L	0.02 mg/L	85.4	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0167 mg/L	0.02 mg/L	83.6	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0352 mg/L	0.04 mg/L	88.0	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0434 mg/L	0.04 mg/L	108	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00377 mg/L	0.004 mg/L	94.3	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00345 mg/L	0.004 mg/L	86.3	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0168 mg/L	0.02 mg/L	84.1	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.341 mg/L	0.4 mg/L	85.2	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0378 mg/L	0.04 mg/L	94.6	70.0	130	----
Dissolved Metals (QCLot: 529228)										
EO2204438-001	Anonymous	aluminum, dissolved	7429-90-5	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0176 mg/L	0.02 mg/L	88.1	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0380 mg/L	0.04 mg/L	95.0	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00851 mg/L	0.01 mg/L	85.1	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 529228) - continued										
EO2204438-001	Anonymous	boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00381 mg/L	0.004 mg/L	95.3	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, dissolved	7440-47-3	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0181 mg/L	0.02 mg/L	90.6	70.0	130	----
		iron, dissolved	7439-89-6	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0170 mg/L	0.02 mg/L	85.1	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0335 mg/L	0.04 mg/L	83.7	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00328 mg/L	0.004 mg/L	81.9	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00341 mg/L	0.004 mg/L	85.3	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0170 mg/L	0.02 mg/L	85.0	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00303 mg/L	0.004 mg/L	75.6	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.352 mg/L	0.4 mg/L	88.1	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 530397)										
EO2204422-017	Anonymous	aluminum, dissolved	7429-90-5	E421	0.207 mg/L	0.2 mg/L	103	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0216 mg/L	0.02 mg/L	108	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0432 mg/L	0.04 mg/L	108	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00927 mg/L	0.01 mg/L	92.7	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00411 mg/L	0.004 mg/L	103	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0196 mg/L	0.02 mg/L	98.2	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0188 mg/L	0.02 mg/L	94.0	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 530397) - continued										
EO2204422-017	Anonymous	iron, dissolved	7439-89-6	E421	1.96 mg/L	2 mg/L	98.2	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0189 mg/L	0.02 mg/L	94.6	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0379 mg/L	0.04 mg/L	94.8	70.0	130	----
		potassium, dissolved	7440-09-7	E421	4.28 mg/L	4 mg/L	107	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0434 mg/L	0.04 mg/L	108	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00384 mg/L	0.004 mg/L	96.0	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00373 mg/L	0.004 mg/L	93.2	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.108 mg/L	0.1 mg/L	108	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.350 mg/L	0.4 mg/L	87.5	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0416 mg/L	0.04 mg/L	104	70.0	130	----
Speciated Metals (QCLot: 524600)										
EO2204438-008	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0458 mg/L	0.05 mg/L	91.6	70.0	130	----
Aggregate Organics (QCLot: 532047)										
EO2204363-002	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Aggregate Organics (QCLot: 532048)										
EO2204438-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Aggregate Organics (QCLot: 537871)										
YL2200638-016	Anonymous	phenols, total (4AAP)	----	E562	0.0200 mg/L	0.02 mg/L	100	75.0	125	----
Aggregate Organics (QCLot: 537934)										
EO2204447-003	Anonymous	phenols, total (4AAP)	----	E562	0.0210 mg/L	0.02 mg/L	105	75.0	125	----
Aggregate Organics (QCLot: 538031)										
FC2201255-002	Anonymous	phenols, total (4AAP)	----	E562	0.0192 mg/L	0.02 mg/L	95.8	75.0	125	----
Volatile Organic Compounds (QCLot: 524508)										
CG2207481-001	Anonymous	benzene	71-43-2	E611A	108 µg/L	100 µg/L	108	70.0	130	----
		ethylbenzene	100-41-4	E611A	91.2 µg/L	100 µg/L	91.2	70.0	130	----
		toluene	108-88-3	E611A	99.6 µg/L	100 µg/L	99.6	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	193 µg/L	200 µg/L	96.6	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 524508) - continued										
CG2207481-001	Anonymous	xylene, o-	95-47-6	E611A	94.4 µg/L	100 µg/L	94.4	70.0	130	----
Volatile Organic Compounds (QCLot: 528256)										
CG2206616-006	Anonymous	benzene	71-43-2	E611A	105 µg/L	100 µg/L	105	70.0	130	----
		ethylbenzene	100-41-4	E611A	70.4 µg/L	100 µg/L	70.4	70.0	130	----
		toluene	108-88-3	E611A	86.0 µg/L	100 µg/L	86.0	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	163 µg/L	200 µg/L	81.6	70.0	130	----
		xylene, o-	95-47-6	E611A	81.6 µg/L	100 µg/L	81.6	70.0	130	----

ALS Canada Ltd.
8081 Lougheed Hwy
Burnaby, BC, Canada V5A 1W9
T +1 604 253 4188

right solutions.
right partner.

August 8, 2022

Email Address(es): webb.todd@cleanharbors.com

Dear Todd,

Re: CAR22560 – Discrepancy in pdf report results when dilutions required.

We have discovered that during a brief period between May-July,2022, there was a discrepancy in reporting that has affected some of your results. Where a sample needed a dilution, and the sample result was less than the raised limit of reporting (<LOR) and a report setting was set to report non-detected results as <LOR, the displayed result was incorrectly appearing as less than the undiluted limit of reporting. This issue affected only the PDF format reports for results that had dilutions and the report settings applied. Electronic data deliverables (EDD) and Excel format reports are not affected by this issue and displayed the correct results during this period.

The cause of this discrepancy has been addressed and reported results after July 28,2022 are not affected.

Attached is a summary file outlining the original results reported in PDF format (Old LOR), and their corrected values (New LOR). Please inform us if you will require an amended PDF report and we will supply that for you as soon as possible.

We understand that this issue may have affected your operations and we apologize for this. ALS appreciates that clients rely on analytical test results to make important, confident, and cost-effective decisions. ALS takes these types of issues very seriously and is committed to working with clients to provide the best service and the most reliable test results possible.

Regards,

Maureen Olinek
Edmonton Client Services Manager
Maureeen.olinek@alsglobal.com

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page of

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Environmental Division Edmonton

Work Order Reference

EO2204435

Telephone : +1 780 413 5227

Report To	Contact and company name below will appear on the final report	Reports / Recipients	Turnaround Time (TAT) Requested
Company:	Clean Harbors Canada	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	☑ Routine [R] if received by 3pm M-F - no surcharges apply
Contact:	Todd Webb, Stan Yuha	Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A	☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge
Phone:	(780) 663-2513	☐ Compare Results to Criteria on Report - provide details below if box checked	☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge
Street:	PO Box 390, 50114 Range Road 173	Email 1 or Fax webb.todd@cleanharbors.com	☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge
City/Province:	Ryley, AB	Email 2 yuha.stan@cleanharbors.com	☐ Same day [E2] if received by 10am M-S - 200% rush sur
Postal Code:	T0B 4A0	Email 3	Additional fees may apply to rush requests on wee
Invoice To	Same as Report To ☐ YES ☐ NO	**Invoice Recipients**	**Date and Time Required for all E&P TATs:**
	Copy of Invoice with Report ☐ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	For all tests with rush TATs requested, ple.
Company:	Clean Harbors Canada	Email 1 or Fax gooding.robbi@cleanharbors.com	
Contact:	Robbi Gooding	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q82438	AFE/Cost Center:	PO#
Job #:	Secondary Leachate Qtr 2 2022	Major/Minor Code:	Routing Code:
PO / AFE:	225924	Requisitioner:	
LSD:	Table 4.4A	Location:	

ALS Lab Work Order # (ALS use only): EO2204435 ALS Contact: Pamela Toledo Sampler: Murray

Analysis Request

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Table 4.4A Leachate	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	Secondary Leachate Cell 1 (SC1)	13-Jun-22	11:00		12	R				
	Secondary Leachate Cell 2 (SC2)	13-Jun-22	11:00		12	R				
	Secondary Leachate Cell 3A (SC3A)	13-Jun-22	11:00		12	R				
	Secondary Leachate Cell 3B (SC3B)	13-Jun-22	11:00		12	R				
	Secondary Leachate Cell 3D (SC3D)	13-Jun-22	11:00		12	R				
	Secondary Leachate Cell 3E (SC3E)	13-Jun-22	11:00		12	R				
	Secondary Leachate Cell 4 (SC4)	13-Jun-22	11:00		12	R				

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Analyze as per Quote Q82438, Table 4.4A package (Attached). Same as last time COC 966636

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
15.7							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Todd Webb	Date: 14-Jun-22	Time:	Received by: RM	Date: 6/14/22	Time: 1220	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

TABLE 4.4-A: LEACHATE AND LEAK DETECTION LIQUID MONITORING

PARAMETERS		
pH (field and laboratory)	TDS	Nutrients
Electrical conductivity (field and laboratory)	TSS	BTEX
COD	Metals	Phenols
DOC	Major Ions	Petroleum Hydrocarbons Fractions F1 and F2

"metals" means the following:

Aluminum, dissolved	Chromium, dissolved (hexavalent)	Nickel, dissolved
Antimony, dissolved	Cobalt, dissolved	Selenium, dissolved
Arsenic, dissolved	Copper, dissolved	Silver, dissolved
Barium, dissolved	Lead, dissolved	Thallium, dissolved
Boron, dissolved	Manganese, dissolved	Tin, dissolved
Cadmium, dissolved	Mercury, total	Uranium, dissolved
Chromium, total	Molybdenum, dissolved	Zinc, dissolved

"major ions" means the following:

Calcium	Carbonate
Magnesium	Bicarbonate
Sodium	Chloride
Potassium	Sulfate

"nutrients" means the following:

Ammonia nitrogen	Nitrite nitrogen
Total Kjeldahl nitrogen	Total phosphorus
Nitrate nitrogen	Dissolved phosphorus

APPENDIX F

Leak Detection Liquid Analysis

Quarter 3

CERTIFICATE OF ANALYSIS

Work Order	: **EO2207398**	Page	: 1 of 17
Amendment	: **2**		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 3 2022	Date Samples Received	: 08-Sep-2022 11:21
PO	: 0000227865	Date Analysis Commenced	: 08-Sep-2022
C-O-C number	: ----	Issue Date	: 04-Oct-2022 11:49
Sampler	: Murry		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Austin Wasylyshyn	Lab Analyst	Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Jessica Maitland	Lab Assistant	Inorganics, Edmonton, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Ryan Huynh	Lab Assistant	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Sobhithan Pillay		Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.
Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
IB:INT	*Ion Balance Reviewed: Imbalance is due to interference or non-measured component.*
SFP	*Sample was filtered and preserved at the laboratory.*
TKNI	*TKN result may be biased low due to Nitrate interference. Nitrate-N is > 10x TKN.*

Analytical Results

EO2207398-001

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 1 (SC1)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	1440		1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	<1.0		1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	10500		1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	7.90		0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	9210		20	mg/L	E162	-	08-Sep-2022	638379
solids, total dissolved [TDS], calculated	----	9150		1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	36.4		3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	7.80		0.100	mg/L	E298	12-Sep-2022	13-Sep-2022	642823
chloride	16887-00-6	1730	DLDS,	5.00	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638312
nitrate (as N)	14797-55-8	<0.200	DLDS,	0.200	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638310
nitrate + nitrite (as N)	----	<0.224		0.224	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<0.100	DLDS,	0.100	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638311
phosphorus, total	7723-14-0	0.477		0.0200	mg/L	E372-U	09-Sep-2022	14-Sep-2022	639337
phosphorus, total dissolved	7723-14-0	0.407	DLHC,	0.0100	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	3330	DLDS,	3.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638313
Kjeldahl nitrogen, total [TKN]	----	93.8		4.00	mg/L	E318	12-Sep-2022	12-Sep-2022	641762
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	382		10.0	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640170
Ion Balance									
ion balance (cations/anions)	----	99.3		0.010	%	EC101	-	09-Sep-2022	-
Total Metals									
chromium, total	7440-47-3	0.118		0.00500	mg/L	E420	11-Sep-2022	11-Sep-2022	641899
mercury, total	7439-97-6	0.0000077		0.0000050	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0191		0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.00525		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.128		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	7.93		0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	<0.0000500	DLDS,	0.0000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	528		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	0.113		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	2.37		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	0.00394		0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	19.1		0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	0.00956		0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	219		0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	38.3		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	0.0116		0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
nickel, dissolved	7440-02-0	12.0		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	25.8		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.00131		0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	2140		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849

Analytical Results

EO2207398-001

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 1 (SC1)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
strontium, dissolved	7440-24-6	3.12	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.0470	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	0.0499	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	0.251	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	0.0108	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641849
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	966	10	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	0.0189	0.0010	mg/L	E562	09-Sep-2022	09-Sep-2022	640243
Volatile Organic Compounds								
benzene	71-43-2	1.64	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	<100	100	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	450	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	100	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	93.5	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	91.1	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	108	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207398-002

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 2 (SC2)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	144	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	13900	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	6.90	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	14000	20	mg/L	E162	-	08-Sep-2022	638379
solids, total dissolved [TDS], calculated	----	14600	1.0	mg/L	EC103	-	09-Sep-2022	-

Analytical Results

EO2207398-002

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 2 (SC2)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
solids, total suspended [TSS]	----	109		3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	3.53		0.0500	mg/L	E298	12-Sep-2022	13-Sep-2022	642823
chloride	16887-00-6	171	DLDS,	5.00	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638312
nitrate (as N)	14797-55-8	<0.200	DLDS,	0.200	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638310
nitrate + nitrite (as N)	----	<0.224		0.224	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<0.100	DLDS,	0.100	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638311
phosphorus, total	7723-14-0	1.20	DLHC,	0.0400	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639337
phosphorus, total dissolved	7723-14-0	0.0398		0.0020	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	9990	DLDS,	3.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638313
Kjeldahl nitrogen, total [TKN]	----	7.20		1.00	mg/L	E318	12-Sep-2022	12-Sep-2022	641762
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	82.0		0.50	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640170
Ion Balance									
ion balance (cations/anions)	----	91.6		0.010	%	EC101	-	09-Sep-2022	-
Total Metals									
chromium, total	7440-47-3	0.00712		0.00500	mg/L	E420	11-Sep-2022	11-Sep-2022	641899
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.252		0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.00282		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.0794	DTC,	0.00100	mg/L	E421	11-Sep-2022	12-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	0.452		0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.000114		0.0000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	399		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.0237		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	0.00481		0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	2.19		0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	<0.000500	DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	245		0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	14.1		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	0.205		0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
nickel, dissolved	7440-02-0	0.0717		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	30.1		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.000879		0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	3580		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
strontium, dissolved	7440-24-6	6.92		0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.00179		0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	<0.00500	DLDS,	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	0.107		0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	<0.00200	DLDS,	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849

Analytical Results

EO2207398-002

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 2 (SC2)

Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641849
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	209	10	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	<0.0010	0.0010	mg/L	E562	09-Sep-2022	09-Sep-2022	640243
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	<100	100	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	99.3	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	87.8	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	104	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	94.5	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207398-003

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3A (SC3A)

Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	1130	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	12500	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	7.87	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	11800	20	mg/L	E162	-	08-Sep-2022	638379
solids, total dissolved [TDS], calculated	----	12800	1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	77.0	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	22.4	0.500	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	445 DLDS	50.0	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638312
nitrate (as N)	14797-55-8	<2.00 DLDS	2.00	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638310
nitrate + nitrite (as N)	----	<2.24	2.24	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<1.00 DLDS	1.00	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638311

Analytical Results

EO2207398-003

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3A (SC3A)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Anions and Nutrients								
phosphorus, total	7723-14-0	0.160 DLHC,	0.0040	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639337
phosphorus, total dissolved	7723-14-0	0.0601	0.0020	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	7810 DLDS,	30.0	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638313
Kjeldahl nitrogen, total [TKN]	----	36.3	2.00	mg/L	E318	12-Sep-2022	12-Sep-2022	641762
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	115	2.50	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640170
Ion Balance								
ion balance (cations/anions)	----	92.8	0.010	%	EC101	-	09-Sep-2022	-
Total Metals								
chromium, total	7440-47-3	0.0281	0.00500	mg/L	E420	11-Sep-2022	11-Sep-2022	641899
mercury, total	7439-97-6	<0.0000050	0.0000050	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0597	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	0.00329	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.00398	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.0940 DTC,	0.00100	mg/L	E421	11-Sep-2022	12-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	0.292	0.100	mg/L	E421	11-Sep-2022	12-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.0000740	0.0000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	397	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	0.0106	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.0302 DTC,	0.00100	mg/L	E421	11-Sep-2022	12-Sep-2022	641849
copper, dissolved	7440-50-8	0.00239	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	2.11	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	310	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	6.77	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	0.159	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
nickel, dissolved	7440-02-0	0.455	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	56.8	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.000623	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	3020	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
strontium, dissolved	7440-24-6	5.03	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	0.00308	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.0371	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	<0.00500 DLDS,	0.00500	mg/L	E421	11-Sep-2022	12-Sep-2022	641849
zinc, dissolved	7440-66-6	0.137	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	0.00655	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641849
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	308	10	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	0.0032	0.0010	mg/L	E562	09-Sep-2022	09-Sep-2022	640243
Volatile Organic Compounds								

Analytical Results

EO2207398-003

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3A (SC3A)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Volatile Organic Compounds								
benzene	71-43-2	1.36	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	0.46	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	<100	100	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	210	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	102	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	99.1	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	104	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	99.9	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207398-004

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3B (SC3B)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	7350	10.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	1600	10.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	33000	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	9.00	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	26900	20	mg/L	E162	-	08-Sep-2022	638379
solids, total dissolved [TDS], calculated	----	31200	1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	101	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	1090	25.0	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	8380 DLDS,	10.0	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638312
nitrate (as N)	14797-55-8	<0.400 DLDS,	0.400	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638310
nitrate + nitrite (as N)	----	<0.447	0.447	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<0.200 DLDS,	0.200	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638311
phosphorus, total	7723-14-0	3.53 DLHC,	0.100	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639337
phosphorus, total dissolved	7723-14-0	3.46 DLHC,	0.200	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	3410 DLDS,	6.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638313
Kjeldahl nitrogen, total [TKN]	----	1650	25.0	mg/L	E318	12-Sep-2022	12-Sep-2022	641762
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	3560 SFP,	50.0	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640170
Ion Balance								

Analytical Results

EO2207398-004

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3B (SC3B)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Ion Balance								
ion balance (cations/anions)	----	92.3	0.010	%	EC101	-	09-Sep-2022	-
Total Metals								
chromium, total	7440-47-3	0.548	0.0250	mg/L	E420	13-Sep-2022	13-Sep-2022	642171
mercury, total	7439-97-6	<0.0000500 DLM,	0.0000500	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals								
aluminum, dissolved	7429-90-5	<0.0500 DLDS,	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	0.00534	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.0882	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.233	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.00250 DLDS,	0.00250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	94.6	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.00831 DTC,	0.000250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	41.6	2.50	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	0.406	0.0250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.0181	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	0.0203	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	2.75	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	0.00253	0.00250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	104	0.250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	1.31	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	19.8	0.00250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
nickel, dissolved	7440-02-0	0.826	0.0250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	1960	2.50	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.0389	0.00250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	7030	2.50	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
strontium, dissolved	7440-24-6	1.30	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	0.00661	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.108	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	0.223	0.0250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	0.0541	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	0.0937	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641849
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	10800 DLHC,	100	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	12.0	0.200	mg/L	E562	09-Sep-2022	09-Sep-2022	640243
Volatile Organic Compounds								
benzene	71-43-2	2.69	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	1.28	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	0.50	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	0.37	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	0.87	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								

Analytical Results

EO2207398-004

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3B (SC3B)

Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Hydrocarbons								
F1 (C6-C10)	----	650	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	645	172	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	1710	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	101	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	91.9	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	101	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	102	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207398-005

Sub-Matrix:**Water** (Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3C (SC3C)

Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	1380	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	10400	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	8.25	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	9400	20	mg/L	E162	-	08-Sep-2022	638379
solids, total dissolved [TDS], calculated	----	10800	1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	9.8	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	4.17	0.0500	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	272 DLDS,	5.00	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638312
nitrate (as N)	14797-55-8	5.49 DLDS,	0.200	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638310
nitrate + nitrite (as N)	----	5.62	0.224	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	0.125 DLDS,	0.100	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638311
phosphorus, total	7723-14-0	0.0780	0.0020	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639337
phosphorus, total dissolved	7723-14-0	0.0820	0.0020	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	6640 DLDS,	3.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638313
Kjeldahl nitrogen, total [TKN]	----	10.6	1.00	mg/L	E318	12-Sep-2022	12-Sep-2022	641762
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	113	2.50	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640170
Ion Balance								
ion balance (cations/anions)	----	86.4	0.010	%	EC101	-	09-Sep-2022	-
Total Metals								
chromium, total	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E420	11-Sep-2022	11-Sep-2022	641899
mercury, total	7439-97-6	<0.0000050	0.0000050	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals								
aluminum, dissolved	7429-90-5	<0.0100 DLDS,	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849

Analytical Results

EO2207398-005

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3C (SC3C)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals									
arsenic, dissolved	7440-38-2	0.00224		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.0396	DTC,	0.00100	mg/L	E421	11-Sep-2022	12-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	1.04		0.100	mg/L	E421	11-Sep-2022	12-Sep-2022	641849
cadmium, dissolved	7440-43-9	<0.0000500	DLDS,	0.0000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	284		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.00106		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	0.00732	DTC,	0.00200	mg/L	E421	11-Sep-2022	12-Sep-2022	641849
iron, dissolved	7439-89-6	<0.100	DLDS,	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	<0.000500	DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	234		0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	1.93		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	0.0151		0.000500	mg/L	E421	11-Sep-2022	12-Sep-2022	641849
nickel, dissolved	7440-02-0	0.0200		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	17.9		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.000829		0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	2560		0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
strontium, dissolved	7440-24-6	2.87		0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.0257		0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	0.00681		0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	0.0569		0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	0.00394		0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
dissolved metals filtration location	----	Field		-	-	EP421	-	11-Sep-2022	641849
Speciated Metals									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050		0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics									
chemical oxygen demand [COD]	----	266		10	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	<0.0010		0.0010	mg/L	E562	09-Sep-2022	09-Sep-2022	640243
Volatile Organic Compounds									
benzene	71-43-2	<0.50		0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	<0.50		0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	<0.50		0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	<0.40		0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	<0.30		0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	<0.50		0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons									
F1 (C6-C10)	----	<100		100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	<100		100	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	110		100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	101		1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	72.4		1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates									

Analytical Results

EO2207398-005

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3C (SC3C)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	89.8	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	111	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207398-006

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3D (SC3D)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	402	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	11800	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	7.88	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	9400	20	mg/L	E162	-	08-Sep-2022	638379
solids, total dissolved [TDS], calculated	----	10000	1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	<3.0	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	1.14	0.0250	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	2820 DLDS,	10.0	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638312
nitrate (as N)	14797-55-8	440 DLDS,	0.400	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638310
nitrate + nitrite (as N)	----	441	0.447	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	1.01 DLDS,	0.200	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638311
phosphorus, total	7723-14-0	0.552 DLHC,	0.0200	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639337
phosphorus, total dissolved	7723-14-0	0.508 DLHC,	0.0200	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	2130 DLDS,	6.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638313
Kjeldahl nitrogen, total [TKN]	----	2.12 TKNI,	0.200	mg/L	E318	12-Sep-2022	12-Sep-2022	641762
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	47.3	0.50	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640170
Ion Balance								
ion balance (cations/anions)	----	83.3 IB:INT,	0.010	%	EC101	-	09-Sep-2022	-
Total Metals								
chromium, total	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E420	11-Sep-2022	11-Sep-2022	641899
mercury, total	7439-97-6	<0.0000050	0.0000050	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals								
aluminum, dissolved	7429-90-5	<0.0100 DLDS,	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.0149	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.174	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	19.3	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.00262	0.0000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	390	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849

Analytical Results

EO2207398-006

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3D (SC3D)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
chromium, dissolved	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.00584	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	0.0153	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	0.119	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	358	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	1.94	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	4.20	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
nickel, dissolved	7440-02-0	1.09	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	213	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.00546	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	1860	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
strontium, dissolved	7440-24-6	2.00	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.00518	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	30.5	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	0.111	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	<0.00200 DLDS,	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641849
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	156	10	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	<0.0010	0.0010	mg/L	E562	10-Sep-2022	10-Sep-2022	641206
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	<100	100	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	120	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	102	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	113	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	89.5	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	101	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207398-007

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3E (SC3E)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	562	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	4.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	4750	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	8.33	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	3680	20	mg/L	E162	-	08-Sep-2022	638379
solids, total dissolved [TDS], calculated	----	3770	1.0	mg/L	EC103	-	09-Sep-2022	-
solids, total suspended [TSS]	----	33.4	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	<0.0050	0.0050	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	246 DLDS,	2.50	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638312
nitrate (as N)	14797-55-8	6.49 DLDS,	0.100	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638310
nitrate + nitrite (as N)	----	6.49	0.112	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<0.050 DLDS,	0.050	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638311
phosphorus, total	7723-14-0	0.0398	0.0020	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639337
phosphorus, total dissolved	7723-14-0	0.0254	0.0020	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	1960 DLDS,	1.50	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638313
Kjeldahl nitrogen, total [TKN]	----	1.67	0.200	mg/L	E318	12-Sep-2022	12-Sep-2022	641762
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	28.3	0.50	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640170
Ion Balance								
ion balance (cations/anions)	----	96.9	0.010	%	EC101	-	09-Sep-2022	-
Total Metals								
chromium, total	7440-47-3	<0.00250 DLDS,	0.00250	mg/L	E420	11-Sep-2022	11-Sep-2022	641899
mercury, total	7439-97-6	<0.0000050	0.0000050	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0085	0.0050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	0.00057	0.00050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.00117	0.00050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.0758	0.00050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.000250 DLDS,	0.000250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	1.17	0.050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.000161	0.0000250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	92.9	0.250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	<0.00250 DLDS,	0.00250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	<0.00050 DLDS,	0.00050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	0.0161	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	<0.050 DLDS,	0.050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	<0.000250 DLDS,	0.000250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	81.8	0.0250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	0.0214	0.00050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	0.303	0.000250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
nickel, dissolved	7440-02-0	0.0716	0.00250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	21.9	0.250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.000888	0.000250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	<0.000050 DLDS,	0.000050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	1010	0.250	mg/L	E421	11-Sep-2022	11-Sep-2022	641849

Analytical Results

EO2207398-007

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 3E (SC3E)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals									
strontium, dissolved	7440-24-6	1.22		0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000050	DLDS,	0.000050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	<0.00050	DLDS,	0.00050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.0263		0.000050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	0.314	DTC,	0.00250	mg/L	E421	11-Sep-2022	12-Sep-2022	641849
zinc, dissolved	7440-66-6	0.0294		0.0050	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	<0.00100	DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
dissolved metals filtration location	----	Field		-	-	EP421	-	11-Sep-2022	641849
Speciated Metals									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050		0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics									
chemical oxygen demand [COD]	----	64		10	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	<0.0010		0.0010	mg/L	E562	10-Sep-2022	10-Sep-2022	641206
Volatile Organic Compounds									
benzene	71-43-2	<0.50		0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	<0.50		0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	<0.50		0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	<0.40		0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	<0.30		0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	<0.50		0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons									
F1 (C6-C10)	----	<100		100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	<100		100	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	<100		100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	102		1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	80.4		1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	90.5		1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	106		1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2207398-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 4 (SC4)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	1260	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	09-Sep-2022	09-Sep-2022	639116
conductivity	----	12300	1.0	µS/cm	E100	09-Sep-2022	09-Sep-2022	639115
pH	----	7.80	0.10	pH units	E108	09-Sep-2022	09-Sep-2022	639114
solids, total dissolved [TDS]	----	10900	20	mg/L	E162	-	08-Sep-2022	638379
solids, total dissolved [TDS], calculated	----	11200	1.0	mg/L	EC103	-	09-Sep-2022	-

Analytical Results

EO2207398-008

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 4 (SC4)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
solids, total suspended [TSS]	----	16.6	3.0	mg/L	E160	-	09-Sep-2022	639389
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	14.1	0.250	mg/L	E298	12-Sep-2022	13-Sep-2022	643078
chloride	16887-00-6	1320 DLDS,	5.00	mg/L	E235.Cl	08-Sep-2022	08-Sep-2022	638318
nitrate (as N)	14797-55-8	1.84 DLDS,	0.200	mg/L	E235.NO3	08-Sep-2022	08-Sep-2022	638315
nitrate + nitrite (as N)	----	1.84	0.224	mg/L	EC235.N+N	-	09-Sep-2022	-
nitrite (as N)	14797-65-0	<0.100 DLDS,	0.100	mg/L	E235.NO2	08-Sep-2022	08-Sep-2022	638316
phosphorus, total	7723-14-0	1.98 DLHC,	0.0400	mg/L	E372-U	09-Sep-2022	13-Sep-2022	639337
phosphorus, total dissolved	7723-14-0	1.56 DLHC,	0.0400	mg/L	E375-T	09-Sep-2022	10-Sep-2022	639343
sulfate (as SO4)	14808-79-8	5470 DLDS,	3.00	mg/L	E235.SO4	08-Sep-2022	08-Sep-2022	638314
Kjeldahl nitrogen, total [TKN]	----	22.1	2.00	mg/L	E318	12-Sep-2022	12-Sep-2022	641762
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	96.1	0.50	mg/L	E358-L	09-Sep-2022	09-Sep-2022	640170
Ion Balance								
ion balance (cations/anions)	----	99.4	0.010	%	EC101	-	09-Sep-2022	-
Total Metals								
chromium, total	7440-47-3	0.0313	0.00500	mg/L	E420	11-Sep-2022	11-Sep-2022	641899
mercury, total	7439-97-6	<0.0000050	0.0000050	mg/L	E508	09-Sep-2022	09-Sep-2022	639000
Dissolved Metals								
aluminum, dissolved	7429-90-5	<0.0100 DLDS,	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
antimony, dissolved	7440-36-0	0.00148	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
arsenic, dissolved	7440-38-2	0.00303	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
barium, dissolved	7440-39-3	0.0708 DTC,	0.00100	mg/L	E421	11-Sep-2022	12-Sep-2022	641849
beryllium, dissolved	7440-41-7	<0.000200 DLDS,	0.000200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
bismuth, dissolved	7440-69-9	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
boron, dissolved	7440-42-8	5.67	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cadmium, dissolved	7440-43-9	0.000863	0.0000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
calcium, dissolved	7440-70-2	351	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
chromium, dissolved	7440-47-3	<0.00500 DLDS,	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
cobalt, dissolved	7440-48-4	0.00469	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
copper, dissolved	7440-50-8	<0.00200 DLDS,	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
iron, dissolved	7439-89-6	0.917	0.100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
lead, dissolved	7439-92-1	<0.000500 DLDS,	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
magnesium, dissolved	7439-95-4	305	0.0500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
manganese, dissolved	7439-96-5	1.45	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
molybdenum, dissolved	7439-98-7	1.93	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
nickel, dissolved	7440-02-0	0.129	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
potassium, dissolved	7440-09-7	41.0	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
selenium, dissolved	7782-49-2	0.00188	0.000500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
silver, dissolved	7440-22-4	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
sodium, dissolved	7440-23-5	2910	0.500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
strontium, dissolved	7440-24-6	4.95	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
thallium, dissolved	7440-28-0	<0.000100 DLDS,	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
tin, dissolved	7440-31-5	<0.00100 DLDS,	0.00100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
uranium, dissolved	7440-61-1	0.0916	0.000100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
vanadium, dissolved	7440-62-2	0.0567	0.00500	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zinc, dissolved	7440-66-6	0.118	0.0100	mg/L	E421	11-Sep-2022	11-Sep-2022	641849
zirconium, dissolved	7440-67-7	0.0117	0.00200	mg/L	E421	11-Sep-2022	11-Sep-2022	641849

Analytical Results

EO2207398-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: Secondary Leachate Cell 4 (SC4)
Client sampling date / time: 07-Sep-2022 11:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Sep-2022	641849
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	08-Sep-2022	638298
Aggregate Organics								
chemical oxygen demand [COD]	----	386	10	mg/L	E559-L	-	14-Sep-2022	646277
phenols, total (4AAP)	----	0.0015	0.0010	mg/L	E562	10-Sep-2022	10-Sep-2022	641206
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
toluene	108-88-3	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	10-Sep-2022	10-Sep-2022	641049
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	10-Sep-2022	10-Sep-2022	641050
F1-BTEX	----	<100	100	µg/L	EC580	-	14-Sep-2022	-
F2 (C10-C16)	----	200	100	µg/L	E601	13-Sep-2022	14-Sep-2022	644239
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	99.2	1.0	%	E601	13-Sep-2022	14-Sep-2022	644239
dichlorotoluene, 3,4-	97-75-0	106	1.0	%	E581.F1	10-Sep-2022	10-Sep-2022	641050
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	89.6	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049
difluorobenzene, 1,4-	540-36-3	99.5	1.0	%	E611A	10-Sep-2022	10-Sep-2022	641049

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2207398**	Page	: 1 of 30
Amendment	: **2**		
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 3 2022	Date Samples Received	: 08-Sep-2022 11:21
PO	: 0000227865	Issue Date	: 04-Oct-2022 11:49
C-O-C number	: ----		
Sampler	: Murry		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 1 (SC1)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 2 (SC2)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3A (SC3A)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3B (SC3B)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3C (SC3C)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3D (SC3D)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3E (SC3E)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 4 (SC4)	E559-L	07-Sep-2022	----	----	----		14-Sep-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 1 (SC1)	E562	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 2 (SC2)	E562	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3A (SC3A)	E562	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3B (SC3B)	E562	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3C (SC3C)	E562	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3D (SC3D)	E562	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3E (SC3E)	E562	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 4 (SC4)	E562	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 1 (SC1)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 2 (SC2)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3A (SC3A)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3B (SC3B)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3C (SC3C)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3D (SC3D)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3E (SC3E)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 4 (SC4)	E298	07-Sep-2022	12-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Secondary Leachate Cell 1 (SC1)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Secondary Leachate Cell 2 (SC2)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Secondary Leachate Cell 3A (SC3A)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Secondary Leachate Cell 3B (SC3B)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Secondary Leachate Cell 3C (SC3C)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Secondary Leachate Cell 3D (SC3D)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Secondary Leachate Cell 3E (SC3E)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Secondary Leachate Cell 4 (SC4)	E235.Cl	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Secondary Leachate Cell 1 (SC1)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Secondary Leachate Cell 2 (SC2)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Secondary Leachate Cell 3A (SC3A)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Secondary Leachate Cell 3B (SC3B)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Secondary Leachate Cell 3C (SC3C)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Secondary Leachate Cell 3D (SC3D)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Secondary Leachate Cell 3E (SC3E)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Secondary Leachate Cell 4 (SC4)	E235.NO3	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Secondary Leachate Cell 1 (SC1)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Secondary Leachate Cell 2 (SC2)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Secondary Leachate Cell 3A (SC3A)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Secondary Leachate Cell 3B (SC3B)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Secondary Leachate Cell 3C (SC3C)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Secondary Leachate Cell 3D (SC3D)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Secondary Leachate Cell 3E (SC3E)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Secondary Leachate Cell 4 (SC4)	E235.NO2	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Secondary Leachate Cell 1 (SC1)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Secondary Leachate Cell 2 (SC2)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Secondary Leachate Cell 3A (SC3A)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Secondary Leachate Cell 3B (SC3B)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Secondary Leachate Cell 3C (SC3C)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Secondary Leachate Cell 3D (SC3D)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Secondary Leachate Cell 3E (SC3E)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Secondary Leachate Cell 4 (SC4)	E235.SO4	07-Sep-2022	08-Sep-2022	----	----		08-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 1 (SC1)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 2 (SC2)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 3A (SC3A)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 3B (SC3B)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 3C (SC3C)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 3D (SC3D)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 3E (SC3E)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 4 (SC4)	E375-T	07-Sep-2022	09-Sep-2022	----	----		10-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 1 (SC1)	E318	07-Sep-2022	12-Sep-2022	----	----		12-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 2 (SC2)	E318	07-Sep-2022	12-Sep-2022	----	----		12-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3A (SC3A)	E318	07-Sep-2022	12-Sep-2022	----	----		12-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3B (SC3B)	E318	07-Sep-2022	12-Sep-2022	----	----		12-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3C (SC3C)	E318	07-Sep-2022	12-Sep-2022	----	----		12-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3D (SC3D)	E318	07-Sep-2022	12-Sep-2022	----	----		12-Sep-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3E (SC3E)	E318	07-Sep-2022	12-Sep-2022	----	----		12-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 4 (SC4)	E318	07-Sep-2022	12-Sep-2022	----	----		12-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 2 (SC2)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3A (SC3A)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3B (SC3B)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3C (SC3C)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3D (SC3D)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 3E (SC3E)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 4 (SC4)	E372-U	07-Sep-2022	09-Sep-2022	----	----		13-Sep-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Secondary Leachate Cell 1 (SC1)	E372-U	07-Sep-2022	09-Sep-2022	----	----		14-Sep-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Secondary Leachate Cell 1 (SC1)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Secondary Leachate Cell 2 (SC2)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Secondary Leachate Cell 3A (SC3A)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Secondary Leachate Cell 3B (SC3B)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Secondary Leachate Cell 3C (SC3C)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Secondary Leachate Cell 3D (SC3D)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Secondary Leachate Cell 3E (SC3E)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Secondary Leachate Cell 4 (SC4)	E421	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Secondary Leachate Cell 1 (SC1)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Secondary Leachate Cell 2 (SC2)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Secondary Leachate Cell 3A (SC3A)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Secondary Leachate Cell 3B (SC3B)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Secondary Leachate Cell 3C (SC3C)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Secondary Leachate Cell 3D (SC3D)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Secondary Leachate Cell 3E (SC3E)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Secondary Leachate Cell 4 (SC4)	E581.F1	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Secondary Leachate Cell 1 (SC1)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Secondary Leachate Cell 2 (SC2)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Secondary Leachate Cell 3A (SC3A)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Secondary Leachate Cell 3B (SC3B)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Secondary Leachate Cell 3C (SC3C)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Secondary Leachate Cell 3D (SC3D)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Secondary Leachate Cell 3E (SC3E)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
Secondary Leachate Cell 4 (SC4)	E601	07-Sep-2022	13-Sep-2022	14 days	6 days	✓	14-Sep-2022	40 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 1 (SC1)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 2 (SC2)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 3A (SC3A)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 3B (SC3B)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 3C (SC3C)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 3D (SC3D)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 3E (SC3E)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
Secondary Leachate Cell 4 (SC4)	E358-L	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
Secondary Leachate Cell 1 (SC1)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
Secondary Leachate Cell 2 (SC2)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
Secondary Leachate Cell 3A (SC3A)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE										
Secondary Leachate Cell 3B (SC3B)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
Secondary Leachate Cell 3C (SC3C)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
Secondary Leachate Cell 3D (SC3D)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
Secondary Leachate Cell 3E (SC3E)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
Secondary Leachate Cell 4 (SC4)	E290	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	14 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Secondary Leachate Cell 1 (SC1)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Secondary Leachate Cell 2 (SC2)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Secondary Leachate Cell 3A (SC3A)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Secondary Leachate Cell 3B (SC3B)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE										
Secondary Leachate Cell 3C (SC3C)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Secondary Leachate Cell 3D (SC3D)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Secondary Leachate Cell 3E (SC3E)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Secondary Leachate Cell 4 (SC4)	E100	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE										
Secondary Leachate Cell 1 (SC1)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
Secondary Leachate Cell 2 (SC2)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
Secondary Leachate Cell 3A (SC3A)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
Secondary Leachate Cell 3B (SC3B)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
Secondary Leachate Cell 3C (SC3C)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE Secondary Leachate Cell 3D (SC3D)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Secondary Leachate Cell 3E (SC3E)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Secondary Leachate Cell 4 (SC4)	E108	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	0.25 hrs	1.58 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE Secondary Leachate Cell 1 (SC1)	E162	07-Sep-2022	----	----	----		08-Sep-2022	7 days	1 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Secondary Leachate Cell 2 (SC2)	E162	07-Sep-2022	----	----	----		08-Sep-2022	7 days	1 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Secondary Leachate Cell 3A (SC3A)	E162	07-Sep-2022	----	----	----		08-Sep-2022	7 days	1 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Secondary Leachate Cell 3B (SC3B)	E162	07-Sep-2022	----	----	----		08-Sep-2022	7 days	1 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Secondary Leachate Cell 3C (SC3C)	E162	07-Sep-2022	----	----	----		08-Sep-2022	7 days	1 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Secondary Leachate Cell 3D (SC3D)	E162	07-Sep-2022	----	----	----		08-Sep-2022	7 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE										
Secondary Leachate Cell 3E (SC3E)	E162	07-Sep-2022	----	----	----		08-Sep-2022	7 days	1 days	✓
Physical Tests : TDS by Gravimetry										
HDPE										
Secondary Leachate Cell 4 (SC4)	E162	07-Sep-2022	----	----	----		08-Sep-2022	7 days	1 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
Secondary Leachate Cell 1 (SC1)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
Secondary Leachate Cell 2 (SC2)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
Secondary Leachate Cell 3A (SC3A)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
Secondary Leachate Cell 3B (SC3B)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
Secondary Leachate Cell 3C (SC3C)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
Secondary Leachate Cell 3D (SC3D)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
Secondary Leachate Cell 3E (SC3E)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE										
Secondary Leachate Cell 4 (SC4)	E160	07-Sep-2022	----	----	----		09-Sep-2022	7 days	2 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Secondary Leachate Cell 1 (SC1)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Secondary Leachate Cell 2 (SC2)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Secondary Leachate Cell 3A (SC3A)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Secondary Leachate Cell 3B (SC3B)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Secondary Leachate Cell 3C (SC3C)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Secondary Leachate Cell 3D (SC3D)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Secondary Leachate Cell 3E (SC3E)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
Secondary Leachate Cell 4 (SC4)	E532A	07-Sep-2022	----	----	----		08-Sep-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
Secondary Leachate Cell 1 (SC1)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
Secondary Leachate Cell 2 (SC2)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
Secondary Leachate Cell 3A (SC3A)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
Secondary Leachate Cell 3B (SC3B)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
Secondary Leachate Cell 3C (SC3C)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
Secondary Leachate Cell 3D (SC3D)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
Secondary Leachate Cell 3E (SC3E)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
Secondary Leachate Cell 4 (SC4)	E508	07-Sep-2022	09-Sep-2022	----	----		09-Sep-2022	28 days	2 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Secondary Leachate Cell 1 (SC1)	E420	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Secondary Leachate Cell 2 (SC2)	E420	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Secondary Leachate Cell 3A (SC3A)	E420	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Secondary Leachate Cell 3C (SC3C)	E420	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Secondary Leachate Cell 3D (SC3D)	E420	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Secondary Leachate Cell 3E (SC3E)	E420	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Secondary Leachate Cell 4 (SC4)	E420	07-Sep-2022	11-Sep-2022	----	----		11-Sep-2022	180 days	4 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Secondary Leachate Cell 3B (SC3B)	E420	07-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
Secondary Leachate Cell 1 (SC1)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
Secondary Leachate Cell 2 (SC2)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Secondary Leachate Cell 3A (SC3A)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Secondary Leachate Cell 3B (SC3B)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Secondary Leachate Cell 3C (SC3C)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Secondary Leachate Cell 3D (SC3D)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Secondary Leachate Cell 3E (SC3E)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Secondary Leachate Cell 4 (SC4)	E611A	07-Sep-2022	10-Sep-2022	----	----		10-Sep-2022	14 days	3 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	642823	2	40	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	641049	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	641050	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	646277	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	638312	2	36	5.5	5.0	✓
Conductivity in Water	E100	639115	1	17	5.8	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	638298	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	641849	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	640170	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	638310	2	34	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	638311	2	34	5.8	5.0	✓
pH by Meter	E108	639114	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	640243	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	638313	2	38	5.2	5.0	✓
TDS by Gravimetry	E162	638379	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	639343	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	641762	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	639000	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	641899	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	639337	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	639389	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	642823	2	40	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	641049	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	641050	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	644239	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	646277	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	638312	2	36	5.5	5.0	✓
Conductivity in Water	E100	639115	1	17	5.8	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	638298	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	641849	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	640170	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	638310	2	34	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	638311	2	34	5.8	5.0	✓
pH by Meter	E108	639114	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	640243	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	638313	2	38	5.2	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
TDS by Gravimetry	E162	638379	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	639343	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	641762	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	639000	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	641899	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	639337	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	639389	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	642823	2	40	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	641049	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	641050	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	644239	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	646277	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	638312	2	36	5.5	5.0	✓
Conductivity in Water	E100	639115	1	17	5.8	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	638298	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	641849	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	640170	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	638310	2	34	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	638311	2	34	5.8	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	640243	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	638313	2	38	5.2	5.0	✓
TDS by Gravimetry	E162	638379	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	639343	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	641762	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	639000	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	641899	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	639337	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	639389	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	642823	2	40	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	641049	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	646277	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	638312	2	36	5.5	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	638298	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	641849	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	640170	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	638310	2	34	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	638311	2	34	5.8	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	640243	2	40	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Sulfate in Water by IC	E235.SO4	638313	2	38	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	639343	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	641762	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	639000	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	641899	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	639337	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Edmonton - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Edmonton - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Edmonton - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Edmonton - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total metals in Water by CRC ICPMS	E420 Edmonton - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Edmonton - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A Edmonton - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. sample pretreatment involved field or lab filtration following by sample preservation.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
CCME PHC - F1 by Headspace GC-FID	E581.F1 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BTEX by Headspace GC-MS	E611A Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Edmonton - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Edmonton - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581 Edmonton - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Edmonton - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: **EO2207398**	Page	: 1 of 14
Amendment	: **2**		
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 3 2022	Date Samples Received	: 08-Sep-2022 11:21
PO	: 0000227865	Date Analysis Commenced	: 08-Sep-2022
C-O-C number	: ----	Issue Date	: 04-Oct-2022 11:49
Sampler	: Murry		
Site	: Table 4.4A		
Quote number	: Q82438		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Austin Wasylyshyn	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Edmonton Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Jessica Maitland	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Jing Liu	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Edmonton Organics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Edmonton Inorganics, Edmonton, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Ryan Huynh	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Sobhithan Pillay		Edmonton Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Edmonton Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 638379)											
EO2207362-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	406	412	1.47%	20%	----
Physical Tests (QC Lot: 639114)											
EO2207403-008	Anonymous	pH	----	E108	0.10	pH units	8.35	8.37	0.239%	3%	----
Physical Tests (QC Lot: 639115)											
EO2207403-008	Anonymous	conductivity	----	E100	1.0	µS/cm	13200	13300	0.151%	10%	----
Physical Tests (QC Lot: 639389)											
EO2207398-001	Secondary Leachate Cell 1 (SC1)	solids, total suspended [TSS]	----	E160	3.0	mg/L	36.4	36.0	1.10%	20%	----
Anions and Nutrients (QC Lot: 638310)											
EO2207408-007	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 638311)											
EO2207408-007	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 638312)											
EO2207408-007	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 638313)											
EO2207408-007	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 638314)											
EO2207411-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	88.7	91.6	3.22%	20%	----
Anions and Nutrients (QC Lot: 638315)											
EO2207411-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.410	0.438	6.60%	20%	----
Anions and Nutrients (QC Lot: 638316)											
EO2207411-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 638318)											
EO2207411-004	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	8.10	8.70	7.08%	20%	----
Anions and Nutrients (QC Lot: 639337)											
EO2207398-001	Secondary Leachate Cell 1 (SC1)	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.477	0.479	0.377%	20%	----
Anions and Nutrients (QC Lot: 639343)											
CG2212153-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0089	0.0086	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 641762)											
EO2207365-003	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 642823)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 642823) - continued											
EO2207393-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 643078)											
EO2207398-008	Secondary Leachate Cell 4 (SC4)	ammonia, total (as N)	7664-41-7	E298	0.250	mg/L	14.1	14.0	0.606%	20%	----
Organic / Inorganic Carbon (QC Lot: 640170)											
FC2202123-010	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	13.3	13.3	0.488%	20%	----
Total Metals (QC Lot: 639000)											
EO2207398-001	Secondary Leachate Cell 1 (SC1)	mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000077	0.0000159	0.0000082	Diff <2x LOR	----
Total Metals (QC Lot: 641899)											
EO2207398-001	Secondary Leachate Cell 1 (SC1)	chromium, total	7440-47-3	E420	0.00500	mg/L	0.118	0.115	2.25%	20%	----
Total Metals (QC Lot: 642171)											
EO2207403-003	Anonymous	chromium, total	7440-47-3	E420	0.0250	mg/L	0.229	0.223	0.00580	Diff <2x LOR	----
Dissolved Metals (QC Lot: 641849)											
EO2207373-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	0.0012	0.0002	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00021	0.00018	0.00003	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.229	0.225	1.84%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0355 µg/L	0.0000320	0.0000035	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	34.7	33.6	3.03%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00025	0.00021	0.00004	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	16.0	15.8	1.24%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00050	0.00049	0.00001	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000487	0.000437	0.000050	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.455	0.452	0.003	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.809 µg/L	0.000802	0.888%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	1.86	1.86	0.0210%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 641849) - continued											
EO2207373-001	Anonymous	strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0879	0.0854	2.87%	20%	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000297	0.000309	4.06%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0063	0.0075	0.0012	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 638298)											
FC2202096-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 640243)											
EO2207372-001	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 641206)											
CG2212181-002	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0029	0.0023	0.0006	Diff <2x LOR	----
Aggregate Organics (QC Lot: 646277)											
EO2207385-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 641049)											
EO2207398-001	Secondary Leachate Cell 1 (SC1)	benzene	71-43-2	E611A	0.50	µg/L	1.64	1.63	0.009	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 641050)											
EO2207398-001	Secondary Leachate Cell 1 (SC1)	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 638379)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 639115)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 639389)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 638310)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 638311)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 638312)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 638313)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 638314)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 638315)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 638316)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 638318)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 639337)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 639343)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 641762)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 642823)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 643078)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 640170)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 639000)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 641899)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 642171)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Dissolved Metals (QCLot: 641849)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Speciated Metals (QCLot: 638298)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Aggregate Organics (QCLot: 640243)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 641206)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 646277)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 641049)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 641050)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 644239)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 638379)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	98.5	85.0	115	----
Physical Tests (QCLot: 639114)									
pH	----	E108	----	pH units	6 pH units	102	97.0	103	----
Physical Tests (QCLot: 639115)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	97.2	90.0	110	----
Physical Tests (QCLot: 639389)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	96.9	85.0	115	----
Anions and Nutrients (QCLot: 638310)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 638311)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	98.7	90.0	110	----
Anions and Nutrients (QCLot: 638312)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 638313)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 638314)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	106	90.0	110	----
Anions and Nutrients (QCLot: 638315)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	106	90.0	110	----
Anions and Nutrients (QCLot: 638316)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 638318)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 639337)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	97.7	80.0	120	----
Anions and Nutrients (QCLot: 639343)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.03 mg/L	94.4	80.0	120	----
Anions and Nutrients (QCLot: 641762)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 642823)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	96.0	85.0	115	----
Anions and Nutrients (QCLot: 643078)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Anions and Nutrients (QCLot: 643078) - continued									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.4	85.0	115	----
Organic / Inorganic Carbon (QCLot: 640170)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----
Total Metals (QCLot: 639000)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	89.0	80.0	120	----
Total Metals (QCLot: 641899)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	112	80.0	120	----
Total Metals (QCLot: 642171)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	98.0	80.0	120	----
Dissolved Metals (QCLot: 641849)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.0	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	99.3	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	97.7	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	98.4	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	95.2	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.4	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.7	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	99.5	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	98.0	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	97.8	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	96.6	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	97.8	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	97.4	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	99.1	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	97.6	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	97.5	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	92.4	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	98.1	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	95.2	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 641849) - continued									
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	92.6	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	99.8	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	97.2	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	101	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	93.6	80.0	120	----
Speciated Metals (QCLot: 638298)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	99.9	80.0	120	----
Aggregate Organics (QCLot: 640243)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	91.2	85.0	115	----
Aggregate Organics (QCLot: 641206)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	94.1	85.0	115	----
Aggregate Organics (QCLot: 646277)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	94.0	85.0	115	----
Volatile Organic Compounds (QCLot: 641049)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	108	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	108	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	91.1	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	117	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	107	70.0	130	----
Hydrocarbons (QCLot: 641050)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	97.3	70.0	130	----
Hydrocarbons (QCLot: 644239)									
F2 (C10-C16)	----	E601	100	µg/L	3260 µg/L	111	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 638310)										
EO2207408-007	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.73 mg/L	2.5 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 638311)										
EO2207408-007	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.516 mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 638312)										
EO2207408-007	Anonymous	chloride	16887-00-6	E235.Cl	103 mg/L	100 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 638313)										
EO2207408-007	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	103 mg/L	100 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 638314)										
EO2207411-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 638315)										
EO2207411-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.69 mg/L	2.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 638316)										
EO2207411-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.499 mg/L	0.5 mg/L	99.9	75.0	125	----
Anions and Nutrients (QCLot: 638318)										
EO2207411-004	Anonymous	chloride	16887-00-6	E235.Cl	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 639337)										
EO2207398-001	Secondary Leachate Cell 1 (SC1)	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 639343)										
CG2212162-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 641762)										
EO2207365-004	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.62 mg/L	2.5 mg/L	105	70.0	130	----
Anions and Nutrients (QCLot: 642823)										
EO2207393-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.103 mg/L	0.1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 643078)										
EO2207398-008	Secondary Leachate Cell 4 (SC4)	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Organic / Inorganic Carbon (QCLot: 640170)										
FC2202123-011	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 639000)										
EO2207398-002	Secondary Leachate Cell 2 (SC2)	mercury, total	7439-97-6	E508	0.0000864 mg/L	0.0001 mg/L	86.4	70.0	130	----
Total Metals (QCLot: 641899)										
EO2207398-002	Secondary Leachate Cell 2 (SC2)	chromium, total	7440-47-3	E420	0.0392 mg/L	0.04 mg/L	98.0	70.0	130	----
Total Metals (QCLot: 642171)										
EO2207403-002	Anonymous	chromium, total	7440-47-3	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 641849)										
EO2207373-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.211 mg/L	0.2 mg/L	106	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0240 mg/L	0.02 mg/L	120	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00798 mg/L	0.01 mg/L	79.8	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.092 mg/L	0.1 mg/L	92.5	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00397 mg/L	0.004 mg/L	99.3	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0198 mg/L	0.02 mg/L	98.9	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0186 mg/L	0.02 mg/L	93.0	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.98 mg/L	2 mg/L	99.1	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0182 mg/L	0.02 mg/L	90.8	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0198 mg/L	0.02 mg/L	99.3	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0372 mg/L	0.04 mg/L	93.0	70.0	130	----
		potassium, dissolved	7440-09-7	E421	4.14 mg/L	4 mg/L	104	70.0	130	----
		selenium, dissolved	7782-49-2	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00373 mg/L	0.004 mg/L	93.2	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00368 mg/L	0.004 mg/L	91.9	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0186 mg/L	0.02 mg/L	93.3	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.382 mg/L	0.4 mg/L	95.6	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0414 mg/L	0.04 mg/L	104	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Speciated Metals (QCLot: 638298)										
FC2202140-002	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0506 mg/L	0.05 mg/L	101	70.0	130	----
Aggregate Organics (QCLot: 640243)										
EO2207372-001	Anonymous	phenols, total (4AAP)	----	E562	0.0187 mg/L	0.02 mg/L	93.3	75.0	125	----
Aggregate Organics (QCLot: 641206)										
CG2212181-002	Anonymous	phenols, total (4AAP)	----	E562	0.0161 mg/L	0.02 mg/L	80.4	75.0	125	----
Aggregate Organics (QCLot: 646277)										
EO2207398-001	Secondary Leachate Cell 1 (SC1)	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Volatile Organic Compounds (QCLot: 641049)										
EO2207398-002	Secondary Leachate Cell 2 (SC2)	benzene	71-43-2	E611A	102 µg/L	100 µg/L	102	50.0	140	----
		ethylbenzene	100-41-4	E611A	101 µg/L	100 µg/L	101	50.0	140	----
		toluene	108-88-3	E611A	74.9 µg/L	100 µg/L	74.9	50.0	140	----
		xylene, m+p-	179601-23-1	E611A	228 µg/L	200 µg/L	114	50.0	140	----
		xylene, o-	95-47-6	E611A	108 µg/L	100 µg/L	108	50.0	140	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page of

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Report To	Contact and company name below will appear on the final report
Company:	Clean Harbors Canada
Contact:	Todd Webb, Stan Yuha
Phone:	(780) 663-2513
	Company address below will appear on the final report
Street:	PO Box 390, 50114 Range Road 173
City/Province:	Ryley, AB
Postal Code:	T0B 4A0
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors Canada
Contact:	Robbi Gooding

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: webb.todd@cleanharbors.com

Email 2: yuha.stan@cleanharbors.com

Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: gooding.robbi@cleanharbors.com

Email 2: yuha.stan@cleanharbors.com

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: d-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:	Q82438
Job #:	Secondary Leachate Qtr 3 2022
PO / AFE:	0000227865
LSD:	Table 4.4A

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): EO2207398

ALS Contact: Pamela Toledo **Sampler:** Murray

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Table 4.4A Leachate	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
1	Secondary Leachate Cell 1 (SC1)	7-Sep-22	11:00		11	R			
2	Secondary Leachate Cell 2 (SC2)	7-Sep-22	11:00		11	R			
3	Secondary Leachate Cell 3A (SC3A)	7-Sep-22	11:00		11	R			
4	Secondary Leachate Cell 3B (SC3B)	7-Sep-22	11:00		11	R			
5	Secondary Leachate Cell 3C (SC3C)	7-Sep-22	12:00		11	R			
6	Secondary Leachate Cell 3D (SC3D)	7-Sep-22	11:00		11	R			
7	Secondary Leachate Cell 3E (SC3E)	7-Sep-22	11:00		11	R			
8	Secondary Leachate Cell 4 (SC4)	7-Sep-22	11:00		11	R			

Environmental Division
Edmonton
Work Order Reference
EO2207398

Telephone: +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Analyze as per Quote Q82438, Table 4.4A package (Attached). Same as COC 966636

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C			
9.7C	7.3C				

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Todd Webb	7-Sep-22	14:30

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
MK	8/9/22	9:00am

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

TABLE 4.4-A: LEACHATE AND LEAK DETECTION LIQUID MONITORING

PARAMETERS		
pH (field and laboratory)	TDS	Nutrients
Electrical conductivity (field and laboratory)	TSS	BTEX
COD	Metals	Phenols
DOC	Major Ions	Petroleum Hydrocarbons Fractions F1 and F2

"metals" means the following:

Aluminum, dissolved	Chromium, dissolved (hexavalent)	Nickel, dissolved
Antimony, dissolved	Cobalt, dissolved	Selenium, dissolved
Arsenic, dissolved	Copper, dissolved	Silver, dissolved
Barium, dissolved	Lead, dissolved	Thallium, dissolved
Boron, dissolved	Manganese, dissolved	Tin, dissolved
Cadmium, dissolved	Mercury, total	Uranium, dissolved
Chromium, total	Molybdenum, dissolved	Zinc, dissolved

"major ions" means the following:

Calcium	Carbonate
Magnesium	Bicarbonate
Sodium	Chloride
Potassium	Sulfate

"nutrients" means the following:

Ammonia nitrogen	Nitrite nitrogen
Total Kjeldahl nitrogen	Total phosphorus
Nitrate nitrogen	Dissolved phosphorus

APPENDIX F

Leak Detection Liquid Analysis

Quarter 4

ALS Canada Ltd.

right solutions.
right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **EO2210704**	Page	: 1 of 11
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 4 2022	Date Samples Received	: 06-Dec-2022 14:53
PO	: 0000230062	Date Analysis Commenced	: 06-Dec-2022
C-O-C number	: ----	Issue Date	: 19-Dec-2022 11:54
Sampler	: JA		
Site	: TABLE 4.4A		
Quote number	: EO22-CHES100-008		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Alex Drake	Lab Analyst	Metals, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Metals, Edmonton, Alberta
Greg Pokocky	Supervisor - Inorganic	Metals, Waterloo, Ontario
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Leah Yee	Lab Assistant	Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Rebecca McCaig	Lab Assistant	Metals, Edmonton, Alberta
Remy Gatabazi	Lab Analyst	Organics, Edmonton, Alberta
Ryan Huynh	Lab Assistant	Inorganics, Edmonton, Alberta
Samantha Mayor	Lab Assistant	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
IB:INT	*Ion Balance Reviewed: Imbalance is due to interference or non-measured component.*
RRV	*Reported result verified by repeat analysis.*
SFP	*Sample was filtered and preserved at the laboratory.*
SP	*Sample was preserved at the laboratory.*
TKNI	*TKN result may be biased low due to Nitrate interference. Nitrate-N is > 10x TKN.*

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	SECONDARY LEACHATE CELL 1 (SC1)	SECONDARY LEACHATE CELL 2 (SC2)	SECONDARY LEACHATE CELL 3A (SC3A)	SECONDARY LEACHATE CELL 3B (SC3B)	SECONDARY LEACHATE CELL 3C (SC3C)
					Client sampling date / time	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022
						EO2210704-001	EO2210704-002	EO2210704-003	EO2210704-004	EO2210704-005
						Result	Result	Result	Result	Result
Physical Tests										
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L		1570	38.4 RRV	1440	5340	1510
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L		<1.0	<1.0 RRV	<1.0	541	<1.0
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L		<1.0	<1.0 RRV	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		1290	31.5 RRV	1180	5280	1240
conductivity	----	E100	1.0	µS/cm		11100	14400 RRV	12600	26000	10900
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		2240	2170	2160	734	1650
pH	----	E108	0.10	pH units		7.42	5.73	7.24	8.62	8.07
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L		9680	16600	13000	21400	11000
solids, total suspended [TSS]	----	E160	3.0	mg/L		72.8	172	207	68.0	53.0
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		7.46	5.51	18.8	699	4.13
chloride	16887-00-6	E235.Cl	0.50	mg/L		1840 DLDS	279 DLDS	420 DLDS	5260 DLDS	265 DLDS
fluoride	16984-48-8	E235.F	0.020	mg/L		2.43 DLDS	4.63 DLDS	2.00 DLDS	3.46 DLDS	0.781 DLDS
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L		<0.200 DLDS	0.371 DLDS	1.66 DLDS	<0.400 DLDS	4.82 DLDS
nitrate + nitrite (as N)	----	EC235.N+N	0.0032	mg/L		<0.224	0.371	2.42	<0.447	4.94
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L		<0.100 DLDS	<0.100 DLDS	0.762 DLDS	<0.200 DLDS	0.123 DLDS
phosphorus, total	7723-14-0	E372-S	0.0010	mg/L		0.533	2.38	0.606	7.32 SP	0.0952
phosphorus, total dissolved	7723-14-0	E375-U	0.0010	mg/L		0.489	0.0465	0.114	5.68 SFP	0.0832
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		3590 DLDS	11700 DLDS	7900 DLDS	3900 DLDS	6830 DLDS
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L		122	12.0	35.4	752	11.7
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		350	60.5	117	962 SFP	108
Ion Balance										
ion balance (cations/anions)	----	EC101	0.010	%		96.0	83.3 IB:INT	89.0	104	81.7 IB:INT
Total Metals										
chromium, total	7440-47-3	E420	0.00050	mg/L		0.127	0.0513	0.0203	0.242	<0.00500 DLDS
mercury, total	7439-97-6	E508	0.0000050	mg/L		0.0000650	<0.0000050	<0.0000050	<0.0000500 DLM	<0.0000050
Dissolved Metals										

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	SECONDARY LEACHATE CELL 1 (SC1)	SECONDARY LEACHATE CELL 2 (SC2)	SECONDARY LEACHATE CELL 3A (SC3A)	SECONDARY LEACHATE CELL 3B (SC3B)	SECONDARY LEACHATE CELL 3C (SC3C)
					Client sampling date / time	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022
						EO2210704-001	EO2210704-002	EO2210704-003	EO2210704-004	EO2210704-005
						Result	Result	Result	Result	Result
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0526	3.03	0.0728	<0.100 DLDS	<0.0100 DLDS
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		0.00106	<0.00100 DLDS	0.00320	<0.0100 DLDS	<0.00100 DLDS
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.00633	0.00315	0.00940	0.0673	0.00231
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.112	0.0900	0.0714	0.172	0.0237
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L		<0.000200 DLDS	0.000507	<0.000200 DLDS	<0.00200 DLDS	<0.000200 DLDS
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000500 DLDS	<0.000500 DLDS	<0.000500 DLDS	<0.00500 DLDS	<0.000500 DLDS
boron, dissolved	7440-42-8	E421	0.010	mg/L		9.81	0.737	0.441	66.8	1.21
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		0.0000803	0.000318	0.000163	0.00326	<0.0000500 DLDS
calcium, dissolved	7440-70-2	E421	0.050	mg/L		520	433	405	35.2	256
cesium, dissolved	7440-46-2	E421	0.000010	mg/L		<0.000100 DLDS	0.000572	0.000111	0.0356	<0.000100 DLDS
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		0.126	<0.00500 DLDS	0.0172	0.248	<0.00500 DLDS
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		2.19	0.0248	0.0189	0.0128	0.00106
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.00566	0.00542	0.00289	0.0507	<0.00200 DLDS
iron, dissolved	7439-89-6	E421	0.010	mg/L		33.6	4.33	31.2	2.62	<0.100 DLDS
lead, dissolved	7439-92-1	E421	0.000050	mg/L		0.00731	<0.000500 DLDS	0.00344	<0.00500 DLDS	<0.000500 DLDS
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		0.576	0.585	0.550	4.44	0.209
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		228	265	280	157	246
manganese, dissolved	7439-96-5	E421	0.00010	mg/L		36.6	15.0	7.21	0.698	0.766
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.0133	0.179	0.296	8.80	0.0287
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		11.5	0.109	0.431	0.551	0.0214
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		0.672	<0.500 DLDS	<0.500 DLDS	7.29	<0.500 DLDS
potassium, dissolved	7440-09-7	E421	0.050	mg/L		25.8	32.8	55.2	1150	19.0
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L		0.00536	0.0294	0.0395	1.72	0.00669
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.00125	0.000502	0.000598	0.0113	0.000908
silicon, dissolved	7440-21-3	E421	0.050	mg/L		9.06	19.2	10.5	13.1	6.57
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000100 DLDS	<0.000100 DLDS	<0.000100 DLDS	<0.00100 DLDS	<0.000100 DLDS
sodium, dissolved	7440-23-5	E421	0.050	mg/L		2250	3770	3010	5880	2510
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		3.20	7.23	5.36	1.61	2.71
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		1230	3380	2450	1190	2020

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	SECONDARY LEACHATE CELL 1 (SC1)	SECONDARY LEACHATE CELL 2 (SC2)	SECONDARY LEACHATE CELL 3A (SC3A)	SECONDARY LEACHATE CELL 3B (SC3B)	SECONDARY LEACHATE CELL 3C (SC3C)
					Client sampling date / time	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022
						EO2210704-001	EO2210704-002	EO2210704-003	EO2210704-004	EO2210704-005
						Result	Result	Result	Result	Result
Dissolved Metals										
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L		<0.00200 DLDS	<0.00200 DLDS	<0.00200 DLDS	<0.0200 DLDS	<0.00200 DLDS
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000100 DLDS	<0.000100 DLDS	<0.000100 DLDS	<0.00100 DLDS	<0.000100 DLDS
thorium, dissolved	7440-29-1	E421	0.00010	mg/L		<0.00100 DLDS	0.00123	<0.00100 DLDS	<0.0100 DLDS	<0.00100 DLDS
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00100 DLDS	<0.00100 DLDS	0.00750	<0.0100 DLDS	<0.00100 DLDS
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		0.00498	<0.00300 DLDS	0.00883	0.0915	<0.00300 DLDS
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L		<0.00100 DLDS	0.00625	0.0512	6.32	0.00209
uranium, dissolved	7440-61-1	E421	0.000010	mg/L		0.0421	0.0110	0.0278	0.0325	0.0277
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L		0.0571	0.312	0.217	0.197	0.0148
zinc, dissolved	7440-66-6	E421	0.0010	mg/L		0.338	0.253	0.234	<0.100 DLDS	0.0568
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L		0.0120	<0.00200 DLDS	0.0131	0.0572	0.00412
dissolved metals filtration location	----	EP421	-	-		Field	Field	Field	Field	Field
Speciated Metals										
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	0.00804	<0.00050
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L		1250	202	380	5640 DLHC	323
phenols, total (4AAP)	----	E562	0.0010	mg/L		0.0033	<0.0010	0.0014	2.54	<0.0010
Volatile Organic Compounds										
benzene	71-43-2	E611A	0.50	µg/L		2.18	<0.50	3.60	1.23	<0.50
ethylbenzene	100-41-4	E611A	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
toluene	108-88-3	E611A	0.50	µg/L		0.98	<0.50	0.88	1.32	<0.50
xylene, m+p-	179601-23-1	E611A	0.40	µg/L		0.41	<0.40	<0.40	<0.40	<0.40
xylene, o-	95-47-6	E611A	0.30	µg/L		<0.30	<0.30	<0.30	<0.30	<0.30
xylenes, total	1330-20-7	E611A	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Hydrocarbons										
F1 (C6-C10)	----	E581.F1	100	µg/L		<100	<100	<100	150	<100
F1-BTEX	----	EC580	25	µg/L		<100	<100	<100	147	<100
F2 (C10-C16)	----	E601	100	µg/L		480	<100	110	1110	<100
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%		97.7	99.3	100	99.5	97.5

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	SECONDARY LEACHATE CELL 1 (SC1)	SECONDARY LEACHATE CELL 2 (SC2)	SECONDARY LEACHATE CELL 3A (SC3A)	SECONDARY LEACHATE CELL 3B (SC3B)	SECONDARY LEACHATE CELL 3C (SC3C)
					Client sampling date / time	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022
						EO2210704-001	EO2210704-002	EO2210704-003	EO2210704-004	EO2210704-005
						Result	Result	Result	Result	Result
Hydrocarbons Surrogates										
dichlorotoluene, 3,4-	97-75-0	E581.F1	1.0	%		130	107	115	105	109
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%		87.2	85.9	80.0	83.5	84.9
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%		102	102	104	107	102

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	SECONDARY LEACHATE CELL 3D (SC3D)	SECONDARY LEACHATE CELL 3E (SC3E)	SECONDARY LEACHATE CELL 4 (SC4)	----	----
					Client sampling date / time	05-Dec-2022	05-Dec-2022	05-Dec-2022	----	----
						EO2210704-006	EO2210704-007	EO2210704-008	--------	--------
						Result	Result	Result	----	----
Physical Tests										
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L		447	648	2070	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L		<1.0	<1.0	<1.0	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L		<1.0	<1.0	<1.0	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		366	531	1700	----	----
conductivity	----	E100	1.0	µS/cm		12500	5690	14400	----	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		2970	705	2270	----	----
pH	----	E108	0.10	pH units		7.84	8.13	7.86	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L		10200	4540	12500	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L		56.0	159	123	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.194	0.492	58.7	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		2830 DLDS	307 DLDS	1510 DLDS	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		2.46 DLDS	1.08 DLDS	3.45 DLDS	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L		436 DLDS	7.10 DLDS	6.12 DLDS	----	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0032	mg/L		436	7.16	6.33	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L		<0.200 DLDS	0.060 DLDS	0.210 DLDS	----	----
phosphorus, total	7723-14-0	E372-S	0.0010	mg/L		0.761	0.154 RRV	1.34	----	----
phosphorus, total dissolved	7723-14-0	E375-U	0.0010	mg/L		0.684	0.240 RRV	1.07	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		2070 DLDS	2500 DLDS	5890 DLDS	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L		2.11 TKNI	2.47	76.8	----	----
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		41.7	28.6	131	----	----
Ion Balance										
ion balance (cations/anions)	----	EC101	0.010	%		93.8	86.9	91.5	----	----
Total Metals										
chromium, total	7440-47-3	E420	0.00050	mg/L		<0.00500 DLDS	0.0103	0.0100	----	----
mercury, total	7439-97-6	E508	0.0000050	mg/L		<0.0000050	0.0000099	<0.0000050	----	----
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		<0.0100 DLDS	0.0367	0.0125	----	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	SECONDARY LEACHATE CELL 3D (SC3D)	SECONDARY LEACHATE CELL 3E (SC3E)	SECONDARY LEACHATE CELL 4 (SC4)	----	----
					Client sampling date / time	05-Dec-2022	05-Dec-2022	05-Dec-2022	----	----
						EO2210704-006	EO2210704-007	EO2210704-008	--------	--------
						Result	Result	Result	----	----
Dissolved Metals										
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		<0.00100 DLDS	0.00200	0.00210	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.0162	0.00136	0.00341	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.140	0.108	0.0697	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L		<0.000200 DLDS	<0.000200 DLDS	<0.000200 DLDS	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000500 DLDS	<0.000500 DLDS	<0.000500 DLDS	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L		26.0	0.857	6.84	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		0.00222	0.000154	0.000936	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L		547	106	342	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L		<0.000100 DLDS	<0.000100 DLDS	<0.000100 DLDS	----	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		<0.00500 DLDS	0.0127	<0.00500 DLDS	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		0.00430	<0.00100 DLDS	0.00573	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.0180	0.0310	0.00353	----	----
iron, dissolved	7439-89-6	E421	0.010	mg/L		0.103	0.150	0.480	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L		<0.000500 DLDS	<0.000500 DLDS	<0.000500 DLDS	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		1.04	0.253	0.331	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		390	107	344	----	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L		1.14	0.103	1.56	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		5.33	0.461	3.42	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		1.07	0.0870	0.177	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		0.730	<0.500 DLDS	1.11	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L		221	21.8	54.1	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L		0.0427	0.00426	0.0118	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.00421	0.00132	0.00288	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L		11.7	5.62	7.86	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000100 DLDS	<0.000100 DLDS	<0.000100 DLDS	----	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L		1970	1100	3040	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		2.90	1.48	4.48	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		665	854	2140	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L		<0.00200 DLDS	<0.00200 DLDS	<0.00200 DLDS	----	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	SECONDARY LEACHATE CELL 3D (SC3D)	SECONDARY LEACHATE CELL 3E (SC3E)	SECONDARY LEACHATE CELL 4 (SC4)	----	----
					Client sampling date / time	05-Dec-2022	05-Dec-2022	05-Dec-2022	----	----
						EO2210704-006	EO2210704-007	EO2210704-008	--------	--------
						Result	Result	Result	----	----
Dissolved Metals										
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000100 DLDS	<0.000100 DLDS	<0.000100 DLDS	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L		<0.00100 DLDS	<0.00100 DLDS	<0.00100 DLDS	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00100 DLDS	<0.00100	<0.00100 DLDS	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		0.00704	<0.00300 DLDS	0.00540	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L		0.00213	0.00129	0.00137	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L		0.00802	0.0527	0.115	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L		30.9	0.00988	0.0892	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L		0.0702	0.0342	0.0708	----	----
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L		0.00218	<0.00200 DLDS	0.0326	----	----
dissolved metals filtration location	----	EP421	-	-		Field	Field	Field	----	----
Speciated Metals										
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	----	----
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L		398	87	614	----	----
phenols, total (4AAP)	----	E562	0.0010	mg/L		<0.0010	<0.0010	0.0039	----	----
Volatile Organic Compounds										
benzene	71-43-2	E611A	0.50	µg/L		<0.50	<0.50	<0.50	----	----
ethylbenzene	100-41-4	E611A	0.50	µg/L		<0.50	<0.50	<0.50	----	----
toluene	108-88-3	E611A	0.50	µg/L		<0.50	<0.50	0.51	----	----
xylene, m+p-	179601-23-1	E611A	0.40	µg/L		<0.40	<0.40	<0.40	----	----
xylene, o-	95-47-6	E611A	0.30	µg/L		<0.30	<0.30	<0.30	----	----
xylenes, total	1330-20-7	E611A	0.50	µg/L		<0.50	<0.50	<0.50	----	----
Hydrocarbons										
F1 (C6-C10)	----	E581.F1	100	µg/L		<100	<100	<100	----	----
F1-BTEX	----	EC580	25	µg/L		<100	<100	<100	----	----
F2 (C10-C16)	----	E601	100	µg/L		<100	<100	300	----	----
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%		99.2	101	98.7	----	----
dichlorotoluene, 3,4-	97-75-0	E581.F1	1.0	%		116	95.8	95.5	----	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	SECONDARY LEACHATE CELL 3D (SC3D)	SECONDARY LEACHATE CELL 3E (SC3E)	SECONDARY LEACHATE CELL 4 (SC4)	----	----
					Client sampling date / time	05-Dec-2022	05-Dec-2022	05-Dec-2022	----	----
						EO2210704-006	EO2210704-007	EO2210704-008	--------	--------
						Result	Result	Result	----	----
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%		83.5	115	118	----	----
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%		104	102	103	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

CERTIFICATE OF ANALYSIS

Work Order	: **EO2210704**	Page	: 1 of 19
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 4 2022	Date Samples Received	: 06-Dec-2022 14:53
PO	: 0000230062	Date Analysis Commenced	: 06-Dec-2022
C-O-C number	: ----	Issue Date	: 19-Dec-2022 11:54
Sampler	: JA		
Site	: TABLE 4.4A		
Quote number	: EO22-CHES100-008		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Alex Drake	Lab Analyst	Metals, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Metals, Edmonton, Alberta
Greg Pokocky	Supervisor - Inorganic	Metals, Waterloo, Ontario
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Leah Yee	Lab Assistant	Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Rebecca McCaig	Lab Assistant	Metals, Edmonton, Alberta
Remy Gatabazi	Lab Analyst	Organics, Edmonton, Alberta
Ryan Huynh	Lab Assistant	Inorganics, Edmonton, Alberta
Samantha Mayor	Lab Assistant	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.
Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
IB:INT	*Ion Balance Reviewed: Imbalance is due to interference or non-measured component.*
RRV	*Reported result verified by repeat analysis.*
SFP	*Sample was filtered and preserved at the laboratory.*
SP	*Sample was preserved at the laboratory.*
TKNI	*TKN result may be biased low due to Nitrate interference. Nitrate-N is > 10x TKN.*

Analytical Results

EO2210704-001

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 1 (SC1)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	1570		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, carbonate (as CO3)	3812-32-6	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, total (as CaCO3)	----	1290		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
conductivity	----	11100		1.0	µS/cm	E100	07-Dec-2022	07-Dec-2022	770132
hardness (as CaCO3), dissolved	----	2240		0.50	mg/L	EC100	-	10-Dec-2022	-
pH	----	7.42		0.10	pH units	E108	07-Dec-2022	07-Dec-2022	770131
solids, total dissolved [TDS], calculated	----	9680		1.0	mg/L	EC103	-	07-Dec-2022	-
solids, total suspended [TSS]	----	72.8		3.0	mg/L	E160	-	10-Dec-2022	772267
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	7.46		0.100	mg/L	E298	07-Dec-2022	07-Dec-2022	770815
chloride	16887-00-6	1840	DLDS,	5.00	mg/L	E235.Cl	07-Dec-2022	07-Dec-2022	770083
fluoride	16984-48-8	2.43	DLDS,	0.200	mg/L	E235.F	07-Dec-2022	07-Dec-2022	770080
nitrate (as N)	14797-55-8	<0.200	DLDS,	0.200	mg/L	E235.NO3	07-Dec-2022	07-Dec-2022	770081
nitrate + nitrite (as N)	----	<0.224		0.224	mg/L	EC235.N+N	-	07-Dec-2022	-
nitrite (as N)	14797-65-0	<0.100	DLDS,	0.100	mg/L	E235.NO2	07-Dec-2022	07-Dec-2022	770084
phosphorus, total	7723-14-0	0.533		0.0100	mg/L	E372-S	07-Dec-2022	07-Dec-2022	769887
phosphorus, total dissolved	7723-14-0	0.489		0.0100	mg/L	E375-U	07-Dec-2022	07-Dec-2022	769892
sulfate (as SO4)	14808-79-8	3590	DLDS,	3.00	mg/L	E235.SO4	07-Dec-2022	07-Dec-2022	770082
Kjeldahl nitrogen, total [TKN]	----	122		2.50	mg/L	E318	07-Dec-2022	08-Dec-2022	770138
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	350		5.00	mg/L	E358-L	06-Dec-2022	06-Dec-2022	769472
Ion Balance									
ion balance (cations/anions)	----	96.0		0.010	%	EC101	-	07-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.127		0.00500	mg/L	E420	09-Dec-2022	10-Dec-2022	773212
mercury, total	7439-97-6	0.0000650		0.0000050	mg/L	E508	07-Dec-2022	07-Dec-2022	769906
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0526		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
antimony, dissolved	7440-36-0	0.00106		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
arsenic, dissolved	7440-38-2	0.00633		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
barium, dissolved	7440-39-3	0.112		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
boron, dissolved	7440-42-8	9.81		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cadmium, dissolved	7440-43-9	0.0000803		0.0000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
calcium, dissolved	7440-70-2	520		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cesium, dissolved	7440-46-2	<0.000100	DLDS,	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
chromium, dissolved	7440-47-3	0.126		0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cobalt, dissolved	7440-48-4	2.19		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
copper, dissolved	7440-50-8	0.00566		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
iron, dissolved	7439-89-6	33.6		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lead, dissolved	7439-92-1	0.00731		0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lithium, dissolved	7439-93-2	0.576		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
magnesium, dissolved	7439-95-4	228		0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
manganese, dissolved	7439-96-5	36.6		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744

Analytical Results

EO2210704-001

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 1 (SC1)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	0.0133	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
nickel, dissolved	7440-02-0	11.5	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
phosphorus, dissolved	7723-14-0	0.672	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
potassium, dissolved	7440-09-7	25.8	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
rubidium, dissolved	7440-17-7	0.00536	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
selenium, dissolved	7782-49-2	0.00125	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silicon, dissolved	7440-21-3	9.06	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silver, dissolved	7440-22-4	<0.000100 DLDS	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sodium, dissolved	7440-23-5	2250	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
strontium, dissolved	7440-24-6	3.20	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sulfur, dissolved	7704-34-9	1230	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tellurium, dissolved	13494-80-9	<0.00200 DLDS	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thallium, dissolved	7440-28-0	<0.000100 DLDS	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thorium, dissolved	7440-29-1	<0.00100 DLDS	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tin, dissolved	7440-31-5	<0.00100 DLDS	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
titanium, dissolved	7440-32-6	0.00498	0.00300	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tungsten, dissolved	7440-33-7	<0.00100 DLDS	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
uranium, dissolved	7440-61-1	0.0421	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
vanadium, dissolved	7440-62-2	0.0571	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zinc, dissolved	7440-66-6	0.338	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zirconium, dissolved	7440-67-7	0.0120	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
dissolved metals filtration location	----	Field	-	-	EP421	-	07-Dec-2022	770744
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	09-Dec-2022	773067
Aggregate Organics								
chemical oxygen demand [COD]	----	1250	10	mg/L	E559-L	-	08-Dec-2022	771715
phenols, total (4AAP)	----	0.0033	0.0010	mg/L	E562	07-Dec-2022	07-Dec-2022	770924
Volatile Organic Compounds								
benzene	71-43-2	2.18	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
toluene	108-88-3	0.98	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, m+p-	179601-23-1	0.41	0.40	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	07-Dec-2022	07-Dec-2022	770179
F1-BTEX	----	<100	100	µg/L	EC580	-	09-Dec-2022	-
F2 (C10-C16)	----	480	100	µg/L	E601	07-Dec-2022	07-Dec-2022	769882
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	97.7	1.0	%	E601	07-Dec-2022	07-Dec-2022	769882
dichlorotoluene, 3,4-	97-75-0	130	1.0	%	E581.F1	07-Dec-2022	07-Dec-2022	770179
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	87.2	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178
difluorobenzene, 1,4-	540-36-3	102	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210704-002

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 2 (SC2)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	38.4	RRV.	1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, carbonate (as CO3)	3812-32-6	<1.0	RRV.	1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	RRV.	1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, total (as CaCO3)	----	31.5	RRV.	1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
conductivity	----	14400	RRV.	1.0	µS/cm	E100	07-Dec-2022	07-Dec-2022	770132
hardness (as CaCO3), dissolved	----	2170		0.50	mg/L	EC100	-	10-Dec-2022	-
pH	----	5.73		0.10	pH units	E108	07-Dec-2022	07-Dec-2022	770131
solids, total dissolved [TDS], calculated	----	16600		1.0	mg/L	EC103	-	07-Dec-2022	-
solids, total suspended [TSS]	----	172		3.0	mg/L	E160	-	10-Dec-2022	772267
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	5.51		0.100	mg/L	E298	07-Dec-2022	07-Dec-2022	770815
chloride	16887-00-6	279	DLDS.	5.00	mg/L	E235.Cl	07-Dec-2022	07-Dec-2022	770083
fluoride	16984-48-8	4.63	DLDS.	0.200	mg/L	E235.F	07-Dec-2022	07-Dec-2022	770080
nitrate (as N)	14797-55-8	0.371	DLDS.	0.200	mg/L	E235.NO3	07-Dec-2022	07-Dec-2022	770081
nitrate + nitrite (as N)	----	0.371		0.224	mg/L	EC235.N+N	-	07-Dec-2022	-
nitrite (as N)	14797-65-0	<0.100	DLDS.	0.100	mg/L	E235.NO2	07-Dec-2022	07-Dec-2022	770084
phosphorus, total	7723-14-0	2.38		0.0500	mg/L	E372-S	07-Dec-2022	07-Dec-2022	769887
phosphorus, total dissolved	7723-14-0	0.0465		0.0010	mg/L	E375-U	07-Dec-2022	07-Dec-2022	769892
sulfate (as SO4)	14808-79-8	11700	DLDS.	3.00	mg/L	E235.SO4	07-Dec-2022	07-Dec-2022	770082
Kjeldahl nitrogen, total [TKN]	----	12.0		0.200	mg/L	E318	07-Dec-2022	08-Dec-2022	770138
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	60.5		0.50	mg/L	E358-L	06-Dec-2022	06-Dec-2022	769472
Ion Balance									
ion balance (cations/anions)	----	83.3	IB:INT.	0.010	%	EC101	-	07-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.0513		0.00500	mg/L	E420	09-Dec-2022	10-Dec-2022	773212
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	07-Dec-2022	07-Dec-2022	769906
Dissolved Metals									
aluminum, dissolved	7429-90-5	3.03		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
antimony, dissolved	7440-36-0	<0.00100	DLDS.	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
arsenic, dissolved	7440-38-2	0.00315		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
barium, dissolved	7440-39-3	0.0900		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
beryllium, dissolved	7440-41-7	0.000507		0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
bismuth, dissolved	7440-69-9	<0.000500	DLDS.	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
boron, dissolved	7440-42-8	0.737		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cadmium, dissolved	7440-43-9	0.000318		0.0000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
calcium, dissolved	7440-70-2	433		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cesium, dissolved	7440-46-2	0.000572		0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
chromium, dissolved	7440-47-3	<0.00500	DLDS.	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cobalt, dissolved	7440-48-4	0.0248		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
copper, dissolved	7440-50-8	0.00542		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
iron, dissolved	7439-89-6	4.33		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lead, dissolved	7439-92-1	<0.000500	DLDS.	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lithium, dissolved	7439-93-2	0.585		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
magnesium, dissolved	7439-95-4	265		0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
manganese, dissolved	7439-96-5	15.0		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744

Analytical Results

EO2210704-002

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 2 (SC2)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals									
molybdenum, dissolved	7439-98-7	0.179		0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
nickel, dissolved	7440-02-0	0.109		0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
phosphorus, dissolved	7723-14-0	<0.500	DLDS,	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
potassium, dissolved	7440-09-7	32.8		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
rubidium, dissolved	7440-17-7	0.0294		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
selenium, dissolved	7782-49-2	0.000502		0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silicon, dissolved	7440-21-3	19.2		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silver, dissolved	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sodium, dissolved	7440-23-5	3770		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
strontium, dissolved	7440-24-6	7.23		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sulfur, dissolved	7704-34-9	3380		5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tellurium, dissolved	13494-80-9	<0.00200	DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thallium, dissolved	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thorium, dissolved	7440-29-1	0.00123		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tin, dissolved	7440-31-5	<0.00100	DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
titanium, dissolved	7440-32-6	<0.00300	DLDS,	0.00300	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tungsten, dissolved	7440-33-7	0.00625		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
uranium, dissolved	7440-61-1	0.0110		0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
vanadium, dissolved	7440-62-2	0.312		0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zinc, dissolved	7440-66-6	0.253		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zirconium, dissolved	7440-67-7	<0.00200	DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
dissolved metals filtration location	----	Field		-	-	EP421	-	07-Dec-2022	770744
Speciated Metals									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050		0.00050	mg/L	E532A	-	09-Dec-2022	773067
Aggregate Organics									
chemical oxygen demand [COD]	----	202		10	mg/L	E559-L	-	08-Dec-2022	771715
phenols, total (4AAP)	----	<0.0010		0.0010	mg/L	E562	07-Dec-2022	07-Dec-2022	770924
Volatile Organic Compounds									
benzene	71-43-2	<0.50		0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
ethylbenzene	100-41-4	<0.50		0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
toluene	108-88-3	<0.50		0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, m+p-	179601-23-1	<0.40		0.40	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, o-	95-47-6	<0.30		0.30	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylenes, total	1330-20-7	<0.50		0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
Hydrocarbons									
F1 (C6-C10)	----	<100		100	µg/L	E581.F1	07-Dec-2022	07-Dec-2022	770179
F1-BTEX	----	<100		100	µg/L	EC580	-	09-Dec-2022	-
F2 (C10-C16)	----	<100		100	µg/L	E601	07-Dec-2022	07-Dec-2022	769882
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	99.3		1.0	%	E601	07-Dec-2022	07-Dec-2022	769882
dichlorotoluene, 3,4-	97-75-0	107		1.0	%	E581.F1	07-Dec-2022	07-Dec-2022	770179
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	85.9		1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178
difluorobenzene, 1,4-	540-36-3	102		1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210704-003

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3A (SC3A)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	1440		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, carbonate (as CO3)	3812-32-6	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, total (as CaCO3)	----	1180		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
conductivity	----	12600		1.0	µS/cm	E100	07-Dec-2022	07-Dec-2022	770132
hardness (as CaCO3), dissolved	----	2160		0.50	mg/L	EC100	-	10-Dec-2022	-
pH	----	7.24		0.10	pH units	E108	07-Dec-2022	07-Dec-2022	770131
solids, total dissolved [TDS], calculated	----	13000		1.0	mg/L	EC103	-	07-Dec-2022	-
solids, total suspended [TSS]	----	207		3.0	mg/L	E160	-	10-Dec-2022	772267
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	18.8		1.00	mg/L	E298	07-Dec-2022	07-Dec-2022	770815
chloride	16887-00-6	420	DLDS,	5.00	mg/L	E235.Cl	07-Dec-2022	07-Dec-2022	770083
fluoride	16984-48-8	2.00	DLDS,	0.200	mg/L	E235.F	07-Dec-2022	07-Dec-2022	770080
nitrate (as N)	14797-55-8	1.66	DLDS,	0.200	mg/L	E235.NO3	07-Dec-2022	07-Dec-2022	770081
nitrate + nitrite (as N)	----	2.42		0.224	mg/L	EC235.N+N	-	07-Dec-2022	-
nitrite (as N)	14797-65-0	0.762	DLDS,	0.100	mg/L	E235.NO2	07-Dec-2022	07-Dec-2022	770084
phosphorus, total	7723-14-0	0.606		0.0100	mg/L	E372-S	07-Dec-2022	07-Dec-2022	769887
phosphorus, total dissolved	7723-14-0	0.114		0.0050	mg/L	E375-U	07-Dec-2022	07-Dec-2022	769892
sulfate (as SO4)	14808-79-8	7900	DLDS,	3.00	mg/L	E235.SO4	07-Dec-2022	07-Dec-2022	770082
Kjeldahl nitrogen, total [TKN]	----	35.4		0.500	mg/L	E318	07-Dec-2022	08-Dec-2022	770138
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	117		2.50	mg/L	E358-L	06-Dec-2022	06-Dec-2022	769472
Ion Balance									
ion balance (cations/anions)	----	89.0		0.010	%	EC101	-	07-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.0203		0.00500	mg/L	E420	09-Dec-2022	10-Dec-2022	773212
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	07-Dec-2022	07-Dec-2022	769906
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0728		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
antimony, dissolved	7440-36-0	0.00320		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
arsenic, dissolved	7440-38-2	0.00940		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
barium, dissolved	7440-39-3	0.0714		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
boron, dissolved	7440-42-8	0.441		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cadmium, dissolved	7440-43-9	0.000163		0.0000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
calcium, dissolved	7440-70-2	405		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cesium, dissolved	7440-46-2	0.000111		0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
chromium, dissolved	7440-47-3	0.0172		0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cobalt, dissolved	7440-48-4	0.0189		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
copper, dissolved	7440-50-8	0.00289		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
iron, dissolved	7439-89-6	31.2		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lead, dissolved	7439-92-1	0.00344		0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lithium, dissolved	7439-93-2	0.550		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
magnesium, dissolved	7439-95-4	280		0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
manganese, dissolved	7439-96-5	7.21		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744

Analytical Results

EO2210704-003

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3A (SC3A)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	0.296	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
nickel, dissolved	7440-02-0	0.431	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
phosphorus, dissolved	7723-14-0	<0.500 DLDS	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
potassium, dissolved	7440-09-7	55.2	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
rubidium, dissolved	7440-17-7	0.0395	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
selenium, dissolved	7782-49-2	0.000598	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silicon, dissolved	7440-21-3	10.5	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silver, dissolved	7440-22-4	<0.000100 DLDS	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sodium, dissolved	7440-23-5	3010	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
strontium, dissolved	7440-24-6	5.36	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sulfur, dissolved	7704-34-9	2450	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tellurium, dissolved	13494-80-9	<0.00200 DLDS	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thallium, dissolved	7440-28-0	<0.000100 DLDS	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thorium, dissolved	7440-29-1	<0.00100 DLDS	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tin, dissolved	7440-31-5	0.00750	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
titanium, dissolved	7440-32-6	0.00883	0.00300	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tungsten, dissolved	7440-33-7	0.0512	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
uranium, dissolved	7440-61-1	0.0278	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
vanadium, dissolved	7440-62-2	0.217	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zinc, dissolved	7440-66-6	0.234	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zirconium, dissolved	7440-67-7	0.0131	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
dissolved metals filtration location	----	Field	-	-	EP421	-	07-Dec-2022	770744
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	09-Dec-2022	773067
Aggregate Organics								
chemical oxygen demand [COD]	----	380	10	mg/L	E559-L	-	08-Dec-2022	771715
phenols, total (4AAP)	----	0.0014	0.0010	mg/L	E562	07-Dec-2022	07-Dec-2022	770924
Volatile Organic Compounds								
benzene	71-43-2	3.60	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
toluene	108-88-3	0.88	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	07-Dec-2022	07-Dec-2022	770179
F1-BTEX	----	<100	100	µg/L	EC580	-	09-Dec-2022	-
F2 (C10-C16)	----	110	100	µg/L	E601	07-Dec-2022	07-Dec-2022	769882
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	100	1.0	%	E601	07-Dec-2022	07-Dec-2022	769882
dichlorotoluene, 3,4-	97-75-0	115	1.0	%	E581.F1	07-Dec-2022	07-Dec-2022	770179
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	80.0	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178
difluorobenzene, 1,4-	540-36-3	104	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210704-004

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3B (SC3B)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	5340		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, carbonate (as CO3)	3812-32-6	541		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, total (as CaCO3)	----	5280		10.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
conductivity	----	26000		1.0	µS/cm	E100	07-Dec-2022	07-Dec-2022	770132
hardness (as CaCO3), dissolved	----	734		5	mg/L	EC100	-	10-Dec-2022	-
pH	----	8.62		0.10	pH units	E108	07-Dec-2022	07-Dec-2022	770131
solids, total dissolved [TDS], calculated	----	21400		1.0	mg/L	EC103	-	07-Dec-2022	-
solids, total suspended [TSS]	----	68.0		3.0	mg/L	E160	-	10-Dec-2022	772267
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	699		10.0	mg/L	E298	07-Dec-2022	07-Dec-2022	770815
chloride	16887-00-6	5260	DLDS,	10.0	mg/L	E235.Cl	07-Dec-2022	07-Dec-2022	770083
fluoride	16984-48-8	3.46	DLDS,	0.400	mg/L	E235.F	07-Dec-2022	07-Dec-2022	770080
nitrate (as N)	14797-55-8	<0.400	DLDS,	0.400	mg/L	E235.NO3	07-Dec-2022	07-Dec-2022	770081
nitrate + nitrite (as N)	----	<0.447		0.447	mg/L	EC235.N+N	-	07-Dec-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS,	0.200	mg/L	E235.NO2	07-Dec-2022	07-Dec-2022	770084
phosphorus, total	7723-14-0	7.32	SP,	0.100	mg/L	E372-S	07-Dec-2022	07-Dec-2022	769887
phosphorus, total dissolved	7723-14-0	5.68	SFP,	0.100	mg/L	E375-U	07-Dec-2022	07-Dec-2022	769892
sulfate (as SO4)	14808-79-8	3900	DLDS,	6.00	mg/L	E235.SO4	07-Dec-2022	07-Dec-2022	770082
Kjeldahl nitrogen, total [TKN]	----	752		10.0	mg/L	E318	07-Dec-2022	08-Dec-2022	770138
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	962	SFP,	25.0	mg/L	E358-L	06-Dec-2022	06-Dec-2022	769472
Ion Balance									
ion balance (cations/anions)	----	104		0.010	%	EC101	-	07-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.242		0.0500	mg/L	E420	09-Dec-2022	10-Dec-2022	773212
mercury, total	7439-97-6	<0.0000500	DLM,	0.0000500	mg/L	E508	07-Dec-2022	07-Dec-2022	769906
Dissolved Metals									
aluminum, dissolved	7429-90-5	<0.100	DLDS,	0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
antimony, dissolved	7440-36-0	<0.0100	DLDS,	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
arsenic, dissolved	7440-38-2	0.0673		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
barium, dissolved	7440-39-3	0.172		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
beryllium, dissolved	7440-41-7	<0.00200	DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
bismuth, dissolved	7440-69-9	<0.00500	DLDS,	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
boron, dissolved	7440-42-8	66.8		1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cadmium, dissolved	7440-43-9	0.00326		0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
calcium, dissolved	7440-70-2	35.2		5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cesium, dissolved	7440-46-2	0.0356		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
chromium, dissolved	7440-47-3	0.248		0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cobalt, dissolved	7440-48-4	0.0128		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
copper, dissolved	7440-50-8	0.0507		0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
iron, dissolved	7439-89-6	2.62		1.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lead, dissolved	7439-92-1	<0.00500	DLDS,	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lithium, dissolved	7439-93-2	4.44		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
magnesium, dissolved	7439-95-4	157		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
manganese, dissolved	7439-96-5	0.698		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744

Analytical Results

EO2210704-004

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3B (SC3B)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	8.80	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
nickel, dissolved	7440-02-0	0.551	0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
phosphorus, dissolved	7723-14-0	7.29	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
potassium, dissolved	7440-09-7	1150	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
rubidium, dissolved	7440-17-7	1.72	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
selenium, dissolved	7782-49-2	0.0113	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silicon, dissolved	7440-21-3	13.1	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silver, dissolved	7440-22-4	<0.00100 DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sodium, dissolved	7440-23-5	5880	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
strontium, dissolved	7440-24-6	1.61	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sulfur, dissolved	7704-34-9	1190	50.0	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tellurium, dissolved	13494-80-9	<0.0200 DLDS,	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thallium, dissolved	7440-28-0	<0.00100 DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thorium, dissolved	7440-29-1	<0.0100 DLDS,	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tin, dissolved	7440-31-5	<0.0100 DLDS,	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
titanium, dissolved	7440-32-6	0.0915	0.0300	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tungsten, dissolved	7440-33-7	6.32	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
uranium, dissolved	7440-61-1	0.0325	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
vanadium, dissolved	7440-62-2	0.197	0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zinc, dissolved	7440-66-6	<0.100 DLDS,	0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zirconium, dissolved	7440-67-7	0.0572	0.0200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
dissolved metals filtration location	----	Field	-	-	EP421	-	07-Dec-2022	770744
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	0.00804	0.00050	mg/L	E532A	-	09-Dec-2022	773067
Aggregate Organics								
chemical oxygen demand [COD]	----	5640 DLHC,	100	mg/L	E559-L	-	08-Dec-2022	771715
phenols, total (4AAP)	----	2.54	0.100	mg/L	E562	07-Dec-2022	07-Dec-2022	770924
Volatile Organic Compounds								
benzene	71-43-2	1.23	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
toluene	108-88-3	1.32	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
Hydrocarbons								
F1 (C6-C10)	----	150	100	µg/L	E581.F1	07-Dec-2022	07-Dec-2022	770179
F1-BTEX	----	147	100	µg/L	EC580	-	09-Dec-2022	-
F2 (C10-C16)	----	1110	100	µg/L	E601	07-Dec-2022	07-Dec-2022	769882
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	99.5	1.0	%	E601	07-Dec-2022	07-Dec-2022	769882
dichlorotoluene, 3,4-	97-75-0	105	1.0	%	E581.F1	07-Dec-2022	07-Dec-2022	770179
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	83.5	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178
difluorobenzene, 1,4-	540-36-3	107	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210704-005

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3C (SC3C)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	1510		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, carbonate (as CO3)	3812-32-6	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, total (as CaCO3)	----	1240		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
conductivity	----	10900		1.0	µS/cm	E100	07-Dec-2022	07-Dec-2022	770132
hardness (as CaCO3), dissolved	----	1650		0.50	mg/L	EC100	-	10-Dec-2022	-
pH	----	8.07		0.10	pH units	E108	07-Dec-2022	07-Dec-2022	770131
solids, total dissolved [TDS], calculated	----	11000		1.0	mg/L	EC103	-	07-Dec-2022	-
solids, total suspended [TSS]	----	53.0		3.0	mg/L	E160	-	10-Dec-2022	772267
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	4.13		0.100	mg/L	E298	07-Dec-2022	07-Dec-2022	770815
chloride	16887-00-6	265	DLDS,	5.00	mg/L	E235.Cl	07-Dec-2022	07-Dec-2022	770083
fluoride	16984-48-8	0.781	DLDS,	0.200	mg/L	E235.F	07-Dec-2022	07-Dec-2022	770080
nitrate (as N)	14797-55-8	4.82	DLDS,	0.200	mg/L	E235.NO3	07-Dec-2022	07-Dec-2022	770081
nitrate + nitrite (as N)	----	4.94		0.224	mg/L	EC235.N+N	-	07-Dec-2022	-
nitrite (as N)	14797-65-0	0.123	DLDS,	0.100	mg/L	E235.NO2	07-Dec-2022	07-Dec-2022	770084
phosphorus, total	7723-14-0	0.0952		0.0010	mg/L	E372-S	07-Dec-2022	07-Dec-2022	769887
phosphorus, total dissolved	7723-14-0	0.0832		0.0010	mg/L	E375-U	07-Dec-2022	07-Dec-2022	769892
sulfate (as SO4)	14808-79-8	6830	DLDS,	3.00	mg/L	E235.SO4	07-Dec-2022	07-Dec-2022	770082
Kjeldahl nitrogen, total [TKN]	----	11.7		0.200	mg/L	E318	07-Dec-2022	08-Dec-2022	770138
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	108		2.50	mg/L	E358-L	06-Dec-2022	06-Dec-2022	769472
Ion Balance									
ion balance (cations/anions)	----	81.7	IB:INT,	0.010	%	EC101	-	07-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E420	09-Dec-2022	10-Dec-2022	773212
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	07-Dec-2022	07-Dec-2022	769906
Dissolved Metals									
aluminum, dissolved	7429-90-5	<0.0100	DLDS,	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
antimony, dissolved	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
arsenic, dissolved	7440-38-2	0.00231		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
barium, dissolved	7440-39-3	0.0237		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
boron, dissolved	7440-42-8	1.21		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cadmium, dissolved	7440-43-9	<0.0000500	DLDS,	0.0000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
calcium, dissolved	7440-70-2	256		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cesium, dissolved	7440-46-2	<0.000100	DLDS,	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
chromium, dissolved	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cobalt, dissolved	7440-48-4	0.00106		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
copper, dissolved	7440-50-8	<0.00200	DLDS,	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
iron, dissolved	7439-89-6	<0.100	DLDS,	0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lead, dissolved	7439-92-1	<0.000500	DLDS,	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lithium, dissolved	7439-93-2	0.209		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
magnesium, dissolved	7439-95-4	246		0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
manganese, dissolved	7439-96-5	0.766		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744

Analytical Results

EO2210704-005

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3C (SC3C)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	0.0287	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
nickel, dissolved	7440-02-0	0.0214	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
phosphorus, dissolved	7723-14-0	<0.500 DLDS	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
potassium, dissolved	7440-09-7	19.0	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
rubidium, dissolved	7440-17-7	0.00669	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
selenium, dissolved	7782-49-2	0.000908	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silicon, dissolved	7440-21-3	6.57	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silver, dissolved	7440-22-4	<0.000100 DLDS	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sodium, dissolved	7440-23-5	2510	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
strontium, dissolved	7440-24-6	2.71	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sulfur, dissolved	7704-34-9	2020	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tellurium, dissolved	13494-80-9	<0.00200 DLDS	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thallium, dissolved	7440-28-0	<0.000100 DLDS	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thorium, dissolved	7440-29-1	<0.00100 DLDS	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tin, dissolved	7440-31-5	<0.00100 DLDS	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
titanium, dissolved	7440-32-6	<0.00300 DLDS	0.00300	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tungsten, dissolved	7440-33-7	0.00209	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
uranium, dissolved	7440-61-1	0.0277	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
vanadium, dissolved	7440-62-2	0.0148	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zinc, dissolved	7440-66-6	0.0568	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zirconium, dissolved	7440-67-7	0.00412	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
dissolved metals filtration location	----	Field	-	-	EP421	-	07-Dec-2022	770744
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	09-Dec-2022	773067
Aggregate Organics								
chemical oxygen demand [COD]	----	323	10	mg/L	E559-L	-	08-Dec-2022	771715
phenols, total (4AAP)	----	<0.0010	0.0010	mg/L	E562	07-Dec-2022	07-Dec-2022	770924
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
toluene	108-88-3	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	07-Dec-2022	07-Dec-2022	770179
F1-BTEX	----	<100	100	µg/L	EC580	-	09-Dec-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	07-Dec-2022	07-Dec-2022	769882
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	97.5	1.0	%	E601	07-Dec-2022	07-Dec-2022	769882
dichlorotoluene, 3,4-	97-75-0	109	1.0	%	E581.F1	07-Dec-2022	07-Dec-2022	770179
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	84.9	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178
difluorobenzene, 1,4-	540-36-3	102	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210704-006

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3D (SC3D)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	447		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, carbonate (as CO3)	3812-32-6	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
alkalinity, total (as CaCO3)	----	366		1.0	mg/L	E290	07-Dec-2022	07-Dec-2022	770133
conductivity	----	12500		1.0	µS/cm	E100	07-Dec-2022	07-Dec-2022	770132
hardness (as CaCO3), dissolved	----	2970		0.50	mg/L	EC100	-	10-Dec-2022	-
pH	----	7.84		0.10	pH units	E108	07-Dec-2022	07-Dec-2022	770131
solids, total dissolved [TDS], calculated	----	10200		1.0	mg/L	EC103	-	07-Dec-2022	-
solids, total suspended [TSS]	----	56.0		3.0	mg/L	E160	-	10-Dec-2022	772267
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	0.194		0.0050	mg/L	E298	07-Dec-2022	07-Dec-2022	770815
chloride	16887-00-6	2830	DLDS,	10.0	mg/L	E235.Cl	07-Dec-2022	07-Dec-2022	770083
fluoride	16984-48-8	2.46	DLDS,	0.400	mg/L	E235.F	07-Dec-2022	07-Dec-2022	770080
nitrate (as N)	14797-55-8	436	DLDS,	0.400	mg/L	E235.NO3	07-Dec-2022	07-Dec-2022	770081
nitrate + nitrite (as N)	----	436		0.447	mg/L	EC235.N+N	-	07-Dec-2022	-
nitrite (as N)	14797-65-0	<0.200	DLDS,	0.200	mg/L	E235.NO2	07-Dec-2022	07-Dec-2022	770084
phosphorus, total	7723-14-0	0.761		0.0100	mg/L	E372-S	07-Dec-2022	07-Dec-2022	769887
phosphorus, total dissolved	7723-14-0	0.684		0.0100	mg/L	E375-U	07-Dec-2022	07-Dec-2022	769892
sulfate (as SO4)	14808-79-8	2070	DLDS,	6.00	mg/L	E235.SO4	07-Dec-2022	07-Dec-2022	770082
Kjeldahl nitrogen, total [TKN]	----	2.11	TKNI,	0.200	mg/L	E318	07-Dec-2022	08-Dec-2022	770138
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	41.7		0.50	mg/L	E358-L	06-Dec-2022	06-Dec-2022	769472
Ion Balance									
ion balance (cations/anions)	----	93.8		0.010	%	EC101	-	07-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E420	09-Dec-2022	10-Dec-2022	773212
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	07-Dec-2022	07-Dec-2022	769906
Dissolved Metals									
aluminum, dissolved	7429-90-5	<0.0100	DLDS,	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
antimony, dissolved	7440-36-0	<0.00100	DLDS,	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
arsenic, dissolved	7440-38-2	0.0162		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
barium, dissolved	7440-39-3	0.140		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
boron, dissolved	7440-42-8	26.0		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cadmium, dissolved	7440-43-9	0.00222		0.0000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
calcium, dissolved	7440-70-2	547		0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cesium, dissolved	7440-46-2	<0.000100	DLDS,	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
chromium, dissolved	7440-47-3	<0.00500	DLDS,	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
cobalt, dissolved	7440-48-4	0.00430		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
copper, dissolved	7440-50-8	0.0180		0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
iron, dissolved	7439-89-6	0.103		0.100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lead, dissolved	7439-92-1	<0.000500	DLDS,	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
lithium, dissolved	7439-93-2	1.04		0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
magnesium, dissolved	7439-95-4	390		0.0500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
manganese, dissolved	7439-96-5	1.14		0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744

Analytical Results

EO2210704-006

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3D (SC3D)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	5.33	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
nickel, dissolved	7440-02-0	1.07	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
phosphorus, dissolved	7723-14-0	0.730	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
potassium, dissolved	7440-09-7	221	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
rubidium, dissolved	7440-17-7	0.0427	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
selenium, dissolved	7782-49-2	0.00421	0.000500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silicon, dissolved	7440-21-3	11.7	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
silver, dissolved	7440-22-4	<0.000100 DLDS	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sodium, dissolved	7440-23-5	1970	0.500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
strontium, dissolved	7440-24-6	2.90	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
sulfur, dissolved	7704-34-9	665	5.00	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tellurium, dissolved	13494-80-9	<0.00200 DLDS	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thallium, dissolved	7440-28-0	<0.000100 DLDS	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
thorium, dissolved	7440-29-1	<0.00100 DLDS	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tin, dissolved	7440-31-5	<0.00100 DLDS	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
titanium, dissolved	7440-32-6	0.00704	0.00300	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
tungsten, dissolved	7440-33-7	0.00213	0.00100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
uranium, dissolved	7440-61-1	0.00802	0.000100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
vanadium, dissolved	7440-62-2	30.9	0.00500	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zinc, dissolved	7440-66-6	0.0702	0.0100	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
zirconium, dissolved	7440-67-7	0.00218	0.00200	mg/L	E421	07-Dec-2022	09-Dec-2022	770744
dissolved metals filtration location	----	Field	-	-	EP421	-	07-Dec-2022	770744
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	09-Dec-2022	773067
Aggregate Organics								
chemical oxygen demand [COD]	----	398	10	mg/L	E559-L	-	08-Dec-2022	771715
phenols, total (4AAP)	----	<0.0010	0.0010	mg/L	E562	07-Dec-2022	07-Dec-2022	770924
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
toluene	108-88-3	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	07-Dec-2022	07-Dec-2022	770178
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	07-Dec-2022	07-Dec-2022	770179
F1-BTEX	----	<100	100	µg/L	EC580	-	09-Dec-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	07-Dec-2022	07-Dec-2022	769882
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	99.2	1.0	%	E601	07-Dec-2022	07-Dec-2022	769882
dichlorotoluene, 3,4-	97-75-0	116	1.0	%	E581.F1	07-Dec-2022	07-Dec-2022	770179
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	83.5	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178
difluorobenzene, 1,4-	540-36-3	104	1.0	%	E611A	07-Dec-2022	07-Dec-2022	770178

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210704-007

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3E (SC3E)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	648		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, carbonate (as CO3)	3812-32-6	<1.0		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, total (as CaCO3)	----	531		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
conductivity	----	5690		1.0	µS/cm	E100	13-Dec-2022	13-Dec-2022	777291
hardness (as CaCO3), dissolved	----	705		0.50	mg/L	EC100	-	17-Dec-2022	-
pH	----	8.13		0.10	pH units	E108	13-Dec-2022	13-Dec-2022	777290
solids, total dissolved [TDS], calculated	----	4540		1.0	mg/L	EC103	-	14-Dec-2022	-
solids, total suspended [TSS]	----	159		3.0	mg/L	E160	-	14-Dec-2022	777244
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	0.492		0.0050	mg/L	E298	13-Dec-2022	13-Dec-2022	777233
chloride	16887-00-6	307	DLDS,	2.50	mg/L	E235.Cl	13-Dec-2022	13-Dec-2022	777253
fluoride	16984-48-8	1.08	DLDS,	0.100	mg/L	E235.F	13-Dec-2022	13-Dec-2022	777250
nitrate (as N)	14797-55-8	7.10	DLDS,	0.100	mg/L	E235.NO3	13-Dec-2022	13-Dec-2022	777251
nitrate + nitrite (as N)	----	7.16		0.112	mg/L	EC235.N+N	-	14-Dec-2022	-
nitrite (as N)	14797-65-0	0.060	DLDS,	0.050	mg/L	E235.NO2	13-Dec-2022	13-Dec-2022	777252
phosphorus, total	7723-14-0	0.154	RRV,	0.0050	mg/L	E372-S	15-Dec-2022	15-Dec-2022	778090
phosphorus, total dissolved	7723-14-0	0.240	RRV,	0.0050	mg/L	E375-U	15-Dec-2022	15-Dec-2022	778089
sulfate (as SO4)	14808-79-8	2500	DLDS,	1.50	mg/L	E235.SO4	13-Dec-2022	13-Dec-2022	777249
Kjeldahl nitrogen, total [TKN]	----	2.47		0.200	mg/L	E318	13-Dec-2022	14-Dec-2022	777161
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	28.6		0.50	mg/L	E358-L	13-Dec-2022	13-Dec-2022	777478
Ion Balance									
ion balance (cations/anions)	----	86.9		0.010	%	EC101	-	14-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.0103		0.00500	mg/L	E420	14-Dec-2022	15-Dec-2022	777880
mercury, total	7439-97-6	0.0000099		0.0000050	mg/L	E508	15-Dec-2022	15-Dec-2022	779354
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0367		0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
antimony, dissolved	7440-36-0	0.00200		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
arsenic, dissolved	7440-38-2	0.00136		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
barium, dissolved	7440-39-3	0.108		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
beryllium, dissolved	7440-41-7	<0.000200	DLDS,	0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
bismuth, dissolved	7440-69-9	<0.000500	DLDS,	0.000500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
boron, dissolved	7440-42-8	0.857		0.100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cadmium, dissolved	7440-43-9	0.000154		0.0000500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
calcium, dissolved	7440-70-2	106		0.500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cesium, dissolved	7440-46-2	<0.000100	DLDS,	0.000100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
chromium, dissolved	7440-47-3	0.0127		0.00500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cobalt, dissolved	7440-48-4	<0.00100	DLDS,	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
copper, dissolved	7440-50-8	0.0310		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
iron, dissolved	7439-89-6	0.150		0.100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
lead, dissolved	7439-92-1	<0.000500	DLDS,	0.000500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
lithium, dissolved	7439-93-2	0.253		0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
magnesium, dissolved	7439-95-4	107		0.0500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
manganese, dissolved	7439-96-5	0.103		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882

Analytical Results

EO2210704-007

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 3E (SC3E)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals									
molybdenum, dissolved	7439-98-7	0.461		0.000500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
nickel, dissolved	7440-02-0	0.0870		0.00500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
phosphorus, dissolved	7723-14-0	<0.500	DLDS,	0.500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
potassium, dissolved	7440-09-7	21.8		0.500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
rubidium, dissolved	7440-17-7	0.00426		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
selenium, dissolved	7782-49-2	0.00132		0.000500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
silicon, dissolved	7440-21-3	5.62		0.500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
silver, dissolved	7440-22-4	<0.000100	DLDS,	0.000100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
sodium, dissolved	7440-23-5	1100		0.500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
strontium, dissolved	7440-24-6	1.48		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
sulfur, dissolved	7704-34-9	854		5.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tellurium, dissolved	13494-80-9	<0.00200	DLDS,	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
thallium, dissolved	7440-28-0	<0.000100	DLDS,	0.000100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
thorium, dissolved	7440-29-1	<0.00100	DLDS,	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tin, dissolved	7440-31-5	<0.00100		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
titanium, dissolved	7440-32-6	<0.00300	DLDS,	0.00300	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tungsten, dissolved	7440-33-7	0.00129		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
uranium, dissolved	7440-61-1	0.0527		0.000100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
vanadium, dissolved	7440-62-2	0.00988		0.00500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
zinc, dissolved	7440-66-6	0.0342		0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
zirconium, dissolved	7440-67-7	<0.00200	DLDS,	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
dissolved metals filtration location	----	Field		-	-	EP421	-	14-Dec-2022	777882
Speciated Metals									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050		0.00050	mg/L	E532A	-	15-Dec-2022	780035
Aggregate Organics									
chemical oxygen demand [COD]	----	87		10	mg/L	E559-L	-	15-Dec-2022	779429
phenols, total (4AAP)	----	<0.0010		0.0010	mg/L	E562	13-Dec-2022	13-Dec-2022	777248
Volatile Organic Compounds									
benzene	71-43-2	<0.50		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
ethylbenzene	100-41-4	<0.50		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
toluene	108-88-3	<0.50		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylene, m+p-	179601-23-1	<0.40		0.40	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylene, o-	95-47-6	<0.30		0.30	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylenes, total	1330-20-7	<0.50		0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
Hydrocarbons									
F1 (C6-C10)	----	<100		100	µg/L	E581.F1	17-Dec-2022	17-Dec-2022	782188
F1-BTEX	----	<100		100	µg/L	EC580	-	17-Dec-2022	-
F2 (C10-C16)	----	<100		100	µg/L	E601	14-Dec-2022	14-Dec-2022	778042
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	101		1.0	%	E601	14-Dec-2022	14-Dec-2022	778042
dichlorotoluene, 3,4-	97-75-0	95.8		1.0	%	E581.F1	17-Dec-2022	17-Dec-2022	782188
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	115		1.0	%	E611A	17-Dec-2022	17-Dec-2022	782189
difluorobenzene, 1,4-	540-36-3	102		1.0	%	E611A	17-Dec-2022	17-Dec-2022	782189

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

EO2210704-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 4 (SC4)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result		LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests									
alkalinity, bicarbonate (as HCO3)	71-52-3	2070		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, carbonate (as CO3)	3812-32-6	<1.0		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, hydroxide (as OH)	14280-30-9	<1.0		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
alkalinity, total (as CaCO3)	----	1700		1.0	mg/L	E290	13-Dec-2022	13-Dec-2022	777289
conductivity	----	14400		1.0	µS/cm	E100	13-Dec-2022	13-Dec-2022	777291
hardness (as CaCO3), dissolved	----	2270		0.50	mg/L	EC100	-	17-Dec-2022	-
pH	----	7.86		0.10	pH units	E108	13-Dec-2022	13-Dec-2022	777290
solids, total dissolved [TDS], calculated	----	12500		1.0	mg/L	EC103	-	14-Dec-2022	-
solids, total suspended [TSS]	----	123		3.0	mg/L	E160	-	14-Dec-2022	777244
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	58.7		1.00	mg/L	E298	13-Dec-2022	13-Dec-2022	777233
chloride	16887-00-6	1510	DLDS	5.00	mg/L	E235.Cl	13-Dec-2022	13-Dec-2022	777253
fluoride	16984-48-8	3.45	DLDS	0.200	mg/L	E235.F	13-Dec-2022	13-Dec-2022	777250
nitrate (as N)	14797-55-8	6.12	DLDS	0.200	mg/L	E235.NO3	13-Dec-2022	13-Dec-2022	777251
nitrate + nitrite (as N)	----	6.33		0.224	mg/L	EC235.N+N	-	14-Dec-2022	-
nitrite (as N)	14797-65-0	0.210	DLDS	0.100	mg/L	E235.NO2	13-Dec-2022	13-Dec-2022	777252
phosphorus, total	7723-14-0	1.34		0.0500	mg/L	E372-S	15-Dec-2022	15-Dec-2022	778090
phosphorus, total dissolved	7723-14-0	1.07		0.0500	mg/L	E375-U	15-Dec-2022	15-Dec-2022	778089
sulfate (as SO4)	14808-79-8	5890	DLDS	3.00	mg/L	E235.SO4	13-Dec-2022	13-Dec-2022	777249
Kjeldahl nitrogen, total [TKN]	----	76.8		2.50	mg/L	E318	13-Dec-2022	14-Dec-2022	777161
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	131		5.00	mg/L	E358-L	13-Dec-2022	13-Dec-2022	777478
Ion Balance									
ion balance (cations/anions)	----	91.5		0.010	%	EC101	-	14-Dec-2022	-
Total Metals									
chromium, total	7440-47-3	0.0100		0.00500	mg/L	E420	14-Dec-2022	15-Dec-2022	777880
mercury, total	7439-97-6	<0.0000050		0.0000050	mg/L	E508	15-Dec-2022	15-Dec-2022	779354
Dissolved Metals									
aluminum, dissolved	7429-90-5	0.0125		0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
antimony, dissolved	7440-36-0	0.00210		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
arsenic, dissolved	7440-38-2	0.00341		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
barium, dissolved	7440-39-3	0.0697		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
beryllium, dissolved	7440-41-7	<0.000200	DLDS	0.000200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
bismuth, dissolved	7440-69-9	<0.000500	DLDS	0.000500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
boron, dissolved	7440-42-8	6.84		0.100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cadmium, dissolved	7440-43-9	0.000936		0.0000500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
calcium, dissolved	7440-70-2	342		0.500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cesium, dissolved	7440-46-2	<0.000100	DLDS	0.000100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
chromium, dissolved	7440-47-3	<0.00500	DLDS	0.00500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
cobalt, dissolved	7440-48-4	0.00573		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
copper, dissolved	7440-50-8	0.00353		0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
iron, dissolved	7439-89-6	0.480		0.100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
lead, dissolved	7439-92-1	<0.000500	DLDS	0.000500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
lithium, dissolved	7439-93-2	0.331		0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
magnesium, dissolved	7439-95-4	344		0.0500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
manganese, dissolved	7439-96-5	1.56		0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882

Analytical Results

EO2210704-008

Sub-Matrix:**Water**
(Matrix: **Water**)

Client sample ID: SECONDARY LEACHATE CELL 4 (SC4)
Client sampling date / time: 05-Dec-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
molybdenum, dissolved	7439-98-7	3.42	0.000500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
nickel, dissolved	7440-02-0	0.177	0.00500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
phosphorus, dissolved	7723-14-0	1.11	0.500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
potassium, dissolved	7440-09-7	54.1	0.500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
rubidium, dissolved	7440-17-7	0.0118	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
selenium, dissolved	7782-49-2	0.00288	0.000500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
silicon, dissolved	7440-21-3	7.86	0.500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
silver, dissolved	7440-22-4	<0.000100 DLDS	0.000100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
sodium, dissolved	7440-23-5	3040	0.500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
strontium, dissolved	7440-24-6	4.48	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
sulfur, dissolved	7704-34-9	2140	5.00	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tellurium, dissolved	13494-80-9	<0.00200 DLDS	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
thallium, dissolved	7440-28-0	<0.000100 DLDS	0.000100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
thorium, dissolved	7440-29-1	<0.00100 DLDS	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tin, dissolved	7440-31-5	<0.00100 DLDS	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
titanium, dissolved	7440-32-6	0.00540	0.00300	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
tungsten, dissolved	7440-33-7	0.00137	0.00100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
uranium, dissolved	7440-61-1	0.115	0.000100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
vanadium, dissolved	7440-62-2	0.0892	0.00500	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
zinc, dissolved	7440-66-6	0.0708	0.0100	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
zirconium, dissolved	7440-67-7	0.0326	0.00200	mg/L	E421	14-Dec-2022	15-Dec-2022	777882
dissolved metals filtration location	----	Field	-	-	EP421	-	14-Dec-2022	777882
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	15-Dec-2022	780035
Aggregate Organics								
chemical oxygen demand [COD]	----	614	10	mg/L	E559-L	-	15-Dec-2022	779429
phenols, total (4AAP)	----	0.0039	0.0010	mg/L	E562	13-Dec-2022	13-Dec-2022	777248
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
toluene	108-88-3	0.51	0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	17-Dec-2022	17-Dec-2022	782189
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	17-Dec-2022	17-Dec-2022	782188
F1-BTEX	----	<100	100	µg/L	EC580	-	17-Dec-2022	-
F2 (C10-C16)	----	300	100	µg/L	E601	14-Dec-2022	14-Dec-2022	778042
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	98.7	1.0	%	E601	14-Dec-2022	14-Dec-2022	778042
dichlorotoluene, 3,4-	97-75-0	95.5	1.0	%	E581.F1	17-Dec-2022	17-Dec-2022	782188
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	118	1.0	%	E611A	17-Dec-2022	17-Dec-2022	782189
difluorobenzene, 1,4-	540-36-3	103	1.0	%	E611A	17-Dec-2022	17-Dec-2022	782189

Please refer to the General Comments section for an explanation of any qualifiers detected.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2210704**	Page	: 1 of 31
Client	: **Clean Harbors Environmental Services, Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 4 2022	Date Samples Received	: 06-Dec-2022 14:53
PO	: 0000230062	Issue Date	: 19-Dec-2022 11:55
C-O-C number	: ----		
Sampler	: JA		
Site	: TABLE 4.4A		
Quote number	: EO22-CHES100-008		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- Matrix Spike outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Dissolved Metals	EO2210704-008	SECONDARY LEACHATE CELL 4 (SC4)	tungsten, dissolved	7440-33-7	E421	131 % MES	70.0-130%	Recovery greater than upper data quality objective

Result Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E559-L	05-Dec-2022	----	----	----		15-Dec-2022	28 days	10 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E559-L	05-Dec-2022	----	----	----		15-Dec-2022	28 days	10 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 1 (SC1)	E559-L	05-Dec-2022	----	----	----		08-Dec-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 2 (SC2)	E559-L	05-Dec-2022	----	----	----		08-Dec-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E559-L	05-Dec-2022	----	----	----		08-Dec-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E559-L	05-Dec-2022	----	----	----		08-Dec-2022	28 days	3 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E559-L	05-Dec-2022	----	----	----		08-Dec-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3D (SC3D)	E559-L	05-Dec-2022	----	----	----		08-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 1 (SC1)	E562	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 2 (SC2)	E562	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3A (SC3A)	E562	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3B (SC3B)	E562	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3C (SC3C)	E562	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3D (SC3D)	E562	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3E (SC3E)	E562	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 4 (SC4)	E562	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 1 (SC1)	E298	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 2 (SC2)	E298	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3A (SC3A)	E298	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3B (SC3B)	E298	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3C (SC3C)	E298	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3D (SC3D)	E298	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 3E (SC3E)	E298	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
SECONDARY LEACHATE CELL 4 (SC4)	E298	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 1 (SC1)	E235.Cl	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E235.Cl	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E235.Cl	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E235.Cl	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E235.Cl	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E235.Cl	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E235.Cl	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E235.Cl	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E235.F	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E235.F	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E235.F	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E235.F	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E235.F	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E235.F	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E235.F	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E235.F	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E235.NO3	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E235.NO3	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E235.NO3	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E235.NO3	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E235.NO3	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E235.NO3	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E235.NO3	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	3 days	9 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E235.NO3	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	3 days	9 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E235.NO2	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E235.NO2	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E235.NO2	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E235.NO2	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E235.NO2	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E235.NO2	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E235.NO2	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	3 days	9 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E235.NO2	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	3 days	9 days	× EHT
Anions and Nutrients : Sulfate in Water by IC										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E235.SO4	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E235.SO4	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E235.SO4	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E235.SO4	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E235.SO4	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3D (SC3D)	E235.SO4	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 3E (SC3E)	E235.SO4	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
SECONDARY LEACHATE CELL 4 (SC4)	E235.SO4	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 3E (SC3E)	E375-U	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 4 (SC4)	E375-U	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 1 (SC1)	E375-U	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 2 (SC2)	E375-U	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 3A (SC3A)	E375-U	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid)										
SECONDARY LEACHATE CELL 3B (SC3B)	E375-U	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E375-U	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E375-U	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E318	05-Dec-2022	13-Dec-2022	----	----		14-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E318	05-Dec-2022	13-Dec-2022	----	----		14-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 1 (SC1)	E318	05-Dec-2022	07-Dec-2022	----	----		08-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 2 (SC2)	E318	05-Dec-2022	07-Dec-2022	----	----		08-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E318	05-Dec-2022	07-Dec-2022	----	----		08-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E318	05-Dec-2022	07-Dec-2022	----	----		08-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E318	05-Dec-2022	07-Dec-2022	----	----		08-Dec-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E318	05-Dec-2022	07-Dec-2022	----	----		08-Dec-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E372-S	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E372-S	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 1 (SC1)	E372-S	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 2 (SC2)	E372-S	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E372-S	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E372-S	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E372-S	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E372-S	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E421	05-Dec-2022	14-Dec-2022	----	----		15-Dec-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 4 (SC4)	E421	05-Dec-2022	14-Dec-2022	----	----		15-Dec-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 1 (SC1)	E421	05-Dec-2022	07-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 2 (SC2)	E421	05-Dec-2022	07-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E421	05-Dec-2022	07-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E421	05-Dec-2022	07-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E421	05-Dec-2022	07-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E421	05-Dec-2022	07-Dec-2022	----	----		09-Dec-2022	180 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3E (SC3E)	E581.F1	05-Dec-2022	17-Dec-2022	----	----		17-Dec-2022	14 days	12 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 4 (SC4)	E581.F1	05-Dec-2022	17-Dec-2022	----	----		17-Dec-2022	14 days	12 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 1 (SC1)	E581.F1	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 2 (SC2)	E581.F1	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3A (SC3A)	E581.F1	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3B (SC3B)	E581.F1	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3C (SC3C)	E581.F1	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3D (SC3D)	E581.F1	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 1 (SC1)	E601	05-Dec-2022	07-Dec-2022	14 days	2 days	✓	07-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 2 (SC2)	E601	05-Dec-2022	07-Dec-2022	14 days	2 days	✓	07-Dec-2022	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3A (SC3A)	E601	05-Dec-2022	07-Dec-2022	14 days	2 days	✓	07-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3B (SC3B)	E601	05-Dec-2022	07-Dec-2022	14 days	2 days	✓	07-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3C (SC3C)	E601	05-Dec-2022	07-Dec-2022	14 days	2 days	✓	07-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3D (SC3D)	E601	05-Dec-2022	07-Dec-2022	14 days	2 days	✓	07-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 3E (SC3E)	E601	05-Dec-2022	14-Dec-2022	14 days	9 days	✓	14-Dec-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SECONDARY LEACHATE CELL 4 (SC4)	E601	05-Dec-2022	14-Dec-2022	14 days	9 days	✓	14-Dec-2022	40 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 1 (SC1)	E358-L	05-Dec-2022	06-Dec-2022	----	----		06-Dec-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 2 (SC2)	E358-L	05-Dec-2022	06-Dec-2022	----	----		06-Dec-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E358-L	05-Dec-2022	06-Dec-2022	----	----		06-Dec-2022	28 days	2 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E358-L	05-Dec-2022	06-Dec-2022	----	----		06-Dec-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E358-L	05-Dec-2022	06-Dec-2022	----	----		06-Dec-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E358-L	05-Dec-2022	06-Dec-2022	----	----		06-Dec-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E358-L	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SECONDARY LEACHATE CELL 4 (SC4)	E358-L	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E290	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E290	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E290	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E290	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E290	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E290	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E290	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	14 days	9 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E290	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	14 days	9 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E100	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E100	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E100	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E100	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E100	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E100	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E100	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Physical Tests : Conductivity in Water										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E100	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	28 days	9 days	✓
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E108	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E108	05-Dec-2022	13-Dec-2022	----	----		13-Dec-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E108	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	0.25 hrs	3.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E108	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	0.25 hrs	3.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E108	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	0.25 hrs	3.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E108	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	0.25 hrs	3.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E108	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	0.25 hrs	3.25 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE SECONDARY LEACHATE CELL 3D (SC3D)	E108	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	0.25 hrs	3.25 hrs	✖ EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3E (SC3E)	E160	05-Dec-2022	----	----	----		14-Dec-2022	7 days	10 days	✖ EHT
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 4 (SC4)	E160	05-Dec-2022	----	----	----		14-Dec-2022	7 days	10 days	✖ EHT
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 1 (SC1)	E160	05-Dec-2022	----	----	----		10-Dec-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 2 (SC2)	E160	05-Dec-2022	----	----	----		10-Dec-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3A (SC3A)	E160	05-Dec-2022	----	----	----		10-Dec-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3B (SC3B)	E160	05-Dec-2022	----	----	----		10-Dec-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SECONDARY LEACHATE CELL 3C (SC3C)	E160	05-Dec-2022	----	----	----		10-Dec-2022	7 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE										
SECONDARY LEACHATE CELL 3D (SC3D)	E160	05-Dec-2022	----	----	----		10-Dec-2022	7 days	5 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 3E (SC3E)	E532A	05-Dec-2022	----	----	----		15-Dec-2022	28 days	11 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 4 (SC4)	E532A	05-Dec-2022	----	----	----		15-Dec-2022	28 days	11 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 1 (SC1)	E532A	05-Dec-2022	----	----	----		09-Dec-2022	28 days	4 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 2 (SC2)	E532A	05-Dec-2022	----	----	----		09-Dec-2022	28 days	4 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 3A (SC3A)	E532A	05-Dec-2022	----	----	----		09-Dec-2022	28 days	4 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 3B (SC3B)	E532A	05-Dec-2022	----	----	----		09-Dec-2022	28 days	4 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 3C (SC3C)	E532A	05-Dec-2022	----	----	----		09-Dec-2022	28 days	4 days	✓
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC										
HDPE - dissolved (sodium hydroxide)										
SECONDARY LEACHATE CELL 3D (SC3D)	E532A	05-Dec-2022	----	----	----		09-Dec-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E508	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 4 (SC4)	E508	05-Dec-2022	15-Dec-2022	----	----		15-Dec-2022	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 1 (SC1)	E508	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 2 (SC2)	E508	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E508	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E508	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E508	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E508	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	28 days	2 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3E (SC3E)	E420	05-Dec-2022	14-Dec-2022	----	----		15-Dec-2022	180 days	11 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 4 (SC4)	E420	05-Dec-2022	14-Dec-2022	----	----		15-Dec-2022	180 days	11 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 1 (SC1)	E420	05-Dec-2022	09-Dec-2022	----	----		10-Dec-2022	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 2 (SC2)	E420	05-Dec-2022	09-Dec-2022	----	----		10-Dec-2022	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3A (SC3A)	E420	05-Dec-2022	09-Dec-2022	----	----		10-Dec-2022	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3B (SC3B)	E420	05-Dec-2022	09-Dec-2022	----	----		10-Dec-2022	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3C (SC3C)	E420	05-Dec-2022	09-Dec-2022	----	----		10-Dec-2022	180 days	5 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) SECONDARY LEACHATE CELL 3D (SC3D)	E420	05-Dec-2022	09-Dec-2022	----	----		10-Dec-2022	180 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3E (SC3E)	E611A	05-Dec-2022	17-Dec-2022	----	----		17-Dec-2022	14 days	12 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 4 (SC4)	E611A	05-Dec-2022	17-Dec-2022	----	----		17-Dec-2022	14 days	12 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 1 (SC1)	E611A	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 2 (SC2)	E611A	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3A (SC3A)	E611A	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3B (SC3B)	E611A	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3C (SC3C)	E611A	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SECONDARY LEACHATE CELL 3D (SC3D)	E611A	05-Dec-2022	07-Dec-2022	----	----		07-Dec-2022	14 days	3 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	770133	2	24	8.3	5.0	✓
Ammonia by Fluorescence	E298	770815	2	32	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	770178	2	20	10.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	770179	2	20	10.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	771715	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	770083	2	35	5.7	5.0	✓
Conductivity in Water	E100	770132	2	24	8.3	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	773067	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	770744	2	35	5.7	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	769472	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	770080	2	36	5.5	5.0	✓
Nitrate in Water by IC	E235.NO3	770081	2	40	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	770084	2	38	5.2	5.0	✓
pH by Meter	E108	770131	2	25	8.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	770924	2	29	6.9	5.0	✓
Sulfate in Water by IC	E235.SO4	770082	2	33	6.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	769892	2	18	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	770138	2	27	7.4	5.0	✓
Total Mercury in Water by CVAAS	E508	769906	2	28	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	773212	2	18	11.1	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	769887	2	37	5.4	5.0	✓
TSS by Gravimetry	E160	772267	2	40	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	770133	2	24	8.3	5.0	✓
Ammonia by Fluorescence	E298	770815	2	32	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	770178	2	20	10.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	770179	2	20	10.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	769882	2	27	7.4	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	771715	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	770083	2	35	5.7	5.0	✓
Conductivity in Water	E100	770132	2	24	8.3	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	773067	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	770744	2	35	5.7	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	769472	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	770080	2	36	5.5	5.0	✓
Nitrate in Water by IC	E235.NO3	770081	2	40	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Nitrite in Water by IC	E235.NO2	770084	2	38	5.2	5.0	✓
pH by Meter	E108	770131	2	25	8.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	770924	2	29	6.9	5.0	✓
Sulfate in Water by IC	E235.SO4	770082	2	33	6.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	769892	2	18	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	770138	2	27	7.4	5.0	✓
Total Mercury in Water by CVAAS	E508	769906	2	28	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	773212	2	18	11.1	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	769887	2	37	5.4	5.0	✓
TSS by Gravimetry	E160	772267	2	40	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	770133	2	24	8.3	5.0	✓
Ammonia by Fluorescence	E298	770815	2	32	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	770178	2	20	10.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	770179	2	20	10.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	769882	2	27	7.4	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	771715	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	770083	2	35	5.7	5.0	✓
Conductivity in Water	E100	770132	2	24	8.3	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	773067	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	770744	2	35	5.7	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	769472	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	770080	2	36	5.5	5.0	✓
Nitrate in Water by IC	E235.NO3	770081	2	40	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	770084	2	38	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	770924	2	29	6.9	5.0	✓
Sulfate in Water by IC	E235.SO4	770082	2	33	6.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	769892	2	18	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	770138	2	27	7.4	5.0	✓
Total Mercury in Water by CVAAS	E508	769906	2	28	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	773212	2	18	11.1	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	769887	2	37	5.4	5.0	✓
TSS by Gravimetry	E160	772267	2	40	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	770815	2	32	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	770178	2	20	10.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	771715	2	40	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	770083	2	35	5.7	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	773067	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Dissolved Metals in Water by CRC ICPMS	E421	770744	2	35	5.7	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	769472	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	770080	2	36	5.5	5.0	✓
Nitrate in Water by IC	E235.NO3	770081	2	40	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	770084	2	38	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	770924	2	29	6.9	5.0	✓
Sulfate in Water by IC	E235.SO4	770082	2	33	6.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	769892	2	18	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	770138	2	27	7.4	5.0	✓
Total Mercury in Water by CVAAS	E508	769906	2	28	7.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	773212	2	18	11.1	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	769887	2	37	5.4	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Edmonton - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Edmonton - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Edmonton - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourmetrically after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total metals in Water by CRC ICPMS	E420 Edmonton - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Edmonton - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A Waterloo - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. sample pretreatment involved field or lab filtration following by sample preservation.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
CCME PHC - F1 by Headspace GC-FID	E581.F1 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BTEX by Headspace GC-MS	E611A Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Edmonton - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Edmonton - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Edmonton - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581 Edmonton - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Edmonton - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

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QUALITY CONTROL REPORT

Work Order	: **EO2210704**	Page	: 1 of 26
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	:	Telephone	: +1 780 413 5227
Project	: Secondary Leachate Qtr 4 2022	Date Samples Received	: 06-Dec-2022 14:53
PO	: 0000230062	Date Analysis Commenced	: 06-Dec-2022
C-O-C number	: ----	Issue Date	: 19-Dec-2022 11:55
Sampler	: JA 780 663 2513		
Site	: TABLE 4.4A		
Quote number	: EO22-CHES100-008		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Alex Drake	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Edmonton Metals, Edmonton, Alberta
Greg Pokocky	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario
Jing Liu	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Leah Yee	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Rebecca McCaig	Lab Assistant	Edmonton Metals, Edmonton, Alberta
Remy Gatabazi	Lab Analyst	Edmonton Organics, Edmonton, Alberta
Ryan Huynh	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Samantha Mayor	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Edmonton Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 770131)											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	pH	----	E108	0.10	pH units	7.42	7.44	0.269%	3%	----
Physical Tests (QC Lot: 770132)											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	conductivity	----	E100	1.0	µS/cm	11100	11000	0.724%	10%	----
Physical Tests (QC Lot: 770133)											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	1290	1300	0.882%	20%	----
Physical Tests (QC Lot: 772267)											
EO2210656-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	17.6	19.6	2.0	Diff <2x LOR	----
Physical Tests (QC Lot: 777244)											
EO2210686-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	34.6	33.8	2.34%	20%	----
Physical Tests (QC Lot: 777289)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	531	530	0.0754%	20%	----
Physical Tests (QC Lot: 777290)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	pH	----	E108	0.10	pH units	8.13	8.13	0.00%	3%	----
Physical Tests (QC Lot: 777291)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	conductivity	----	E100	1.0	µS/cm	5690	5730	0.700%	10%	----
Anions and Nutrients (QC Lot: 769887)											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	phosphorus, total	7723-14-0	E372-S	0.0100	mg/L	0.533	0.525	1.43%	20%	----
Anions and Nutrients (QC Lot: 769892)											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	phosphorus, total dissolved	7723-14-0	E375-U	0.0100	mg/L	0.489	0.428	13.3%	20%	----
Anions and Nutrients (QC Lot: 770080)											
EO2210683-008	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	0.173	0.172	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 770081)											
EO2210683-008	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 770082)											
EO2210683-008	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	1160	1160	0.235%	20%	----
Anions and Nutrients (QC Lot: 770083)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 770083) - continued											
EO2210683-008	Anonymous	chloride	16887-00-6	E235.Cl	2.50	mg/L	138	139	0.617%	20%	----
Anions and Nutrients (QC Lot: 770084)											
EO2210683-008	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 770138)											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	Kjeldahl nitrogen, total [TKN]	----	E318	2.50	mg/L	122	108	12.2%	20%	----
Anions and Nutrients (QC Lot: 770815)											
FC2202939-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.100	mg/L	6.69	6.76	1.01%	20%	----
Anions and Nutrients (QC Lot: 777161)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	2.47	2.45	0.971%	20%	----
Anions and Nutrients (QC Lot: 777233)											
EO2210882-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.100	mg/L	6.96	7.15	2.65%	20%	----
Anions and Nutrients (QC Lot: 777249)											
EO2210889-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	422	424	0.344%	20%	----
Anions and Nutrients (QC Lot: 777250)											
EO2210889-002	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.159	0.167	0.008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 777251)											
EO2210889-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.578	0.582	0.725%	20%	----
Anions and Nutrients (QC Lot: 777252)											
EO2210889-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 777253)											
EO2210889-002	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	5.25	5.27	0.456%	20%	----
Anions and Nutrients (QC Lot: 778089)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	phosphorus, total dissolved	7723-14-0	E375-U	0.0050	mg/L	0.240	0.242	0.647%	20%	----
Anions and Nutrients (QC Lot: 778090)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	phosphorus, total	7723-14-0	E372-S	0.0050	mg/L	0.154	0.143	7.79%	20%	----
Organic / Inorganic Carbon (QC Lot: 769472)											
FC2202922-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	7.75	8.09	4.30%	20%	----
Organic / Inorganic Carbon (QC Lot: 777478)											
FC2202952-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	17.2	18.2	5.66%	20%	----
Total Metals (QC Lot: 769906)											
EO2210683-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	0.000112	0.000110	1.80%	20%	----
Total Metals (QC Lot: 773212)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 773212) - continued											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	chromium, total	7440-47-3	E420	0.00500	mg/L	0.127	0.126	1.05%	20%	----
Total Metals (QC Lot: 777880)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	chromium, total	7440-47-3	E420	0.00500	mg/L	0.0103	0.0124	0.00214	Diff <2x LOR	----
Total Metals (QC Lot: 779354)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000099	0.0000137	0.0000038	Diff <2x LOR	----
Dissolved Metals (QC Lot: 770744)											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	0.0526	0.0540	0.0014	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00100	mg/L	0.00106	<0.00100	0.00006	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	0.00633	0.00628	0.00005	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.112	0.121	7.22%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.100	mg/L	9.81	9.53	2.90%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	0.0000803	0.0000822	0.0000019	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.500	mg/L	520	544	4.61%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00500	mg/L	0.126	0.123	2.54%	20%	----
		cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	2.19	2.10	4.26%	20%	----
		copper, dissolved	7440-50-8	E421	0.00200	mg/L	0.00566	0.00567	0.000010	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.100	mg/L	33.6	32.0	5.01%	20%	----
		lead, dissolved	7439-92-1	E421	0.000500	mg/L	0.00731	0.00721	1.38%	20%	----
		lithium, dissolved	7439-93-2	E421	0.0100	mg/L	0.576	0.548	5.05%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	228	220	3.82%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00100	mg/L	36.6	35.8	2.05%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	0.0133	0.0127	4.42%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00500	mg/L	11.5	11.0	3.64%	20%	----
		phosphorus, dissolved	7723-14-0	E421	0.500	mg/L	0.672	0.701	0.029	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	25.8	25.6	0.460%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00200	mg/L	0.00536	0.00502	0.00034	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000500	mg/L	0.00125	0.00133	0.000079	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.500	mg/L	9.06	8.46	6.84%	20%	----
		silver, dissolved	7440-22-4	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 770744) - continued											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	sodium, dissolved	7440-23-5	E421	0.500	mg/L	2250	2310	2.63%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00200	mg/L	3.20	3.12	2.39%	20%	----
		sulfur, dissolved	7704-34-9	E421	5.00	mg/L	1230	1170	4.74%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00300	mg/L	0.00498	0.00524	0.00025	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000100	mg/L	0.0421	0.0412	2.18%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	0.0571	0.0566	0.878%	20%	----
		zinc, dissolved	7440-66-6	E421	0.0100	mg/L	0.338	0.334	1.40%	20%	----
		zirconium, dissolved	7440-67-7	E421	0.00200	mg/L	0.0120	0.0116	0.00041	Diff <2x LOR	----
Dissolved Metals (QC Lot: 777882)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	0.0367	0.0284	0.0083	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00100	mg/L	0.00200	0.00176	0.00024	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	0.00136	0.00114	0.00022	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.108	0.109	0.618%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.100	mg/L	0.857	0.913	0.056	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	0.000154	0.000144	0.0000098	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.500	mg/L	106	108	2.30%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00500	mg/L	0.0127	<0.00500	0.00773	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	<0.00100	0.00103	0.00003	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00200	mg/L	0.0310	0.0307	0.746%	20%	----
		iron, dissolved	7439-89-6	E421	0.100	mg/L	0.150	<0.100	0.050	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0100	mg/L	0.253	0.265	4.50%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	107	106	1.27%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00100	mg/L	0.103	0.104	1.04%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	0.461	0.471	2.18%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 777882) - continued											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	nickel, dissolved	7440-02-0	E421	0.00500	mg/L	0.0870	0.0849	2.39%	20%	----
		phosphorus, dissolved	7723-14-0	E421	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	21.8	22.2	1.81%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00200	mg/L	0.00426	0.00432	0.00005	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000500	mg/L	0.00132	0.00117	0.000154	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.500	mg/L	5.62	5.64	0.372%	20%	----
		silver, dissolved	7440-22-4	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.500	mg/L	1100	1130	2.94%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00200	mg/L	1.48	1.55	4.31%	20%	----
		sulfur, dissolved	7704-34-9	E421	5.00	mg/L	854	875	2.46%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00100	mg/L	0.00129	0.00141	0.00012	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000100	mg/L	0.0527	0.0547	3.81%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	0.00988	0.00971	0.00016	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0100	mg/L	0.0342	0.0339	0.0002	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 773067)											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 780035)											
FC2202997-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 770924)											
VA22C9491-001	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0022	0.0022	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 771715)											
EO2210652-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	28	30	2	Diff <2x LOR	----
Aggregate Organics (QC Lot: 777248)											
CG2217108-001	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 779429)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	chemical oxygen demand [COD]	----	E559-L	10	mg/L	87	90	3	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Volatile Organic Compounds (QC Lot: 770178)											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	benzene	71-43-2	E611A	0.50	µg/L	2.18	2.23	0.05	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	0.98	1.01	0.03	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	0.41	<0.40	0.007	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 782189)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 770179)											
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 782188)											
EO2210704-007	SECONDARY LEACHATE CELL 3E (SC3E)	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 770132)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 770133)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 772267)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 777244)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 777289)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 777291)						
conductivity	----	E100	1	µS/cm	1.9	----
Anions and Nutrients (QCLot: 769887)						
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 769892)						
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 770080)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 770081)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 770082)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 770083)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 770084)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 770138)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 770815)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 777161)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 777233)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 777233) - continued						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 777249)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 777250)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 777251)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 777252)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 777253)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 778089)						
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 778090)						
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	<0.0010	----
Organic / Inorganic Carbon (QCLot: 769472)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 777478)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 769906)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 773212)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 777880)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 779354)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 770744)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 770744) - continued						
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 777882)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 777882) - continued						
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 777882) - continued						
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Speciated Metals (QCLot: 773067)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Speciated Metals (QCLot: 780035)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 770924)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 771715)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 777248)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 779429)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 770178)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 782189)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 769882)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 770179)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 778042)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 782188)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 770131)									
pH	----	E108	----	pH units	6 pH units	99.7	97.0	103	----
Physical Tests (QCLot: 770132)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	102	90.0	110	----
Physical Tests (QCLot: 770133)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	107	85.0	115	----
Physical Tests (QCLot: 772267)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	98.5	85.0	115	----
Physical Tests (QCLot: 777244)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	94.9	85.0	115	----
Physical Tests (QCLot: 777289)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	108	85.0	115	----
Physical Tests (QCLot: 777290)									
pH	----	E108	----	pH units	6 pH units	100	97.0	103	----
Physical Tests (QCLot: 777291)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	96.7	90.0	110	----
Anions and Nutrients (QCLot: 769887)									
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	0.05 mg/L	106	80.0	120	----
Anions and Nutrients (QCLot: 769892)									
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	0.05 mg/L	101	80.0	120	----
Anions and Nutrients (QCLot: 770080)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 770081)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 770082)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 770083)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 770084)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 770138)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	92.2	75.0	125	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 770815)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 777161)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 777233)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	113	85.0	115	----
Anions and Nutrients (QCLot: 777249)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 777250)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 777251)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 777252)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	94.5	90.0	110	----
Anions and Nutrients (QCLot: 777253)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 778089)									
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	0.05 mg/L	97.6	80.0	120	----
Anions and Nutrients (QCLot: 778090)									
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	0.05 mg/L	97.6	80.0	120	----
Organic / Inorganic Carbon (QCLot: 769472)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----
Organic / Inorganic Carbon (QCLot: 777478)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	98.2	80.0	120	----
Total Metals (QCLot: 769906)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	90.1	80.0	120	----
Total Metals (QCLot: 773212)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
Total Metals (QCLot: 777880)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	97.5	80.0	120	----
Total Metals (QCLot: 779354)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	94.2	80.0	120	----
Dissolved Metals (QCLot: 770744)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 770744) - continued									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	106	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	104	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	110	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	108	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	112	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	98.6	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	110	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	107	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	113	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	110	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	110	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	107	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	93.5	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	115	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	109	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	117	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	108	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	102	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	97.4	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	113	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	107	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	96.4	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	105	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	104	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	111	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	106	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	111	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 770744) - continued									
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	112	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	109	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	95.6	80.0	120	----
Dissolved Metals (QCLot: 777882)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	109	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	91.0	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	87.6	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	97.6	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	88.1	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	114	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	81.5	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	89.2	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.7	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	91.7	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	106	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	107	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	106	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	97.8	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	83.7	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	103	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	114	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	99.9	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	106	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	102	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	86.8	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	90.6	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	111	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	97.4	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	95.6	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 777882) - continued									
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	91.1	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	103	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	118	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	94.2	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	80.5	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
Speciated Metals (QCLot: 773067)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.025 mg/L	98.5	80.0	120	----
Speciated Metals (QCLot: 780035)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
Aggregate Organics (QCLot: 770924)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	101	85.0	115	----
Aggregate Organics (QCLot: 771715)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	106	85.0	115	----
Aggregate Organics (QCLot: 777248)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	100	85.0	115	----
Aggregate Organics (QCLot: 779429)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	105	85.0	115	----
Volatile Organic Compounds (QCLot: 770178)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	92.1	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	94.2	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	93.2	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	92.6	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	100	70.0	130	----
Volatile Organic Compounds (QCLot: 782189)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	89.2	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	88.1	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	84.9	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	95.0	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	102	70.0	130	----
Hydrocarbons (QCLot: 769882)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Hydrocarbons (QCLot: 769882) - continued									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	125	70.0	130	----
Hydrocarbons (QCLot: 770179)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	82.9	70.0	130	----
Hydrocarbons (QCLot: 778042)									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	117	70.0	130	----
Hydrocarbons (QCLot: 782188)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	112	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 769887)										
EO2210704-002	SECONDARY LEACHATE CELL 2 (SC2)	phosphorus, total	7723-14-0	E372-S	ND mg/L	0.067 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 769892)										
EO2210704-002	SECONDARY LEACHATE CELL 2 (SC2)	phosphorus, total dissolved	7723-14-0	E375-U	0.0505 mg/L	0.067 mg/L	75.3	70.0	130	----
Anions and Nutrients (QCLot: 770080)										
FC2202942-004	Anonymous	fluoride	16984-48-8	E235.F	1.08 mg/L	1 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 770081)										
FC2202942-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.55 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 770082)										
FC2202942-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	98.7 mg/L	100 mg/L	98.7	75.0	125	----
Anions and Nutrients (QCLot: 770083)										
FC2202942-004	Anonymous	chloride	16887-00-6	E235.Cl	99.8 mg/L	100 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 770084)										
FC2202942-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.478 mg/L	0.5 mg/L	95.7	75.0	125	----
Anions and Nutrients (QCLot: 770138)										
EO2210704-002	SECONDARY LEACHATE CELL 2 (SC2)	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 770815)										
FC2202939-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 777161)										
EO2210704-008	SECONDARY LEACHATE CELL 4 (SC4)	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 777233)										
EO2210882-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 777249)										
EO2210889-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 777250)										
EO2210889-002	Anonymous	fluoride	16984-48-8	E235.F	0.960 mg/L	1 mg/L	96.0	75.0	125	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 777251)										
EO2210889-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.64 mg/L	2.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 777252)										
EO2210889-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.510 mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 777253)										
EO2210889-002	Anonymous	chloride	16887-00-6	E235.Cl	106 mg/L	100 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 778089)										
EO2210704-008	SECONDARY LEACHATE CELL 4 (SC4)	phosphorus, total dissolved	7723-14-0	E375-U	ND mg/L	0.067 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 778090)										
EO2210704-008	SECONDARY LEACHATE CELL 4 (SC4)	phosphorus, total	7723-14-0	E372-S	ND mg/L	0.067 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 769472)										
FC2202922-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 777478)										
FC2202952-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 769906)										
EO2210683-002	Anonymous	mercury, total	7439-97-6	E508	0.000115 mg/L	0.0001 mg/L	115	70.0	130	----
Total Metals (QCLot: 773212)										
EO2210704-002	SECONDARY LEACHATE CELL 2 (SC2)	chromium, total	7440-47-3	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
Total Metals (QCLot: 777880)										
EO2210704-008	SECONDARY LEACHATE CELL 4 (SC4)	chromium, total	7440-47-3	E420	0.0402 mg/L	0.04 mg/L	100	70.0	130	----
Total Metals (QCLot: 779354)										
EO2210704-008	SECONDARY LEACHATE CELL 4 (SC4)	mercury, total	7439-97-6	E508	0.0000801 mg/L	0.0001 mg/L	80.1	70.0	130	----
Dissolved Metals (QCLot: 770744)										
EO2210704-002	SECONDARY LEACHATE CELL 2 (SC2)	aluminum, dissolved	7429-90-5	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0402 mg/L	0.04 mg/L	101	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00870 mg/L	0.01 mg/L	87.0	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 770744) - continued										
EO2210704-002	SECONDARY LEACHATE CELL 2 (SC2)	cadmium, dissolved	7440-43-9	E421	0.00418 mg/L	0.004 mg/L	104	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0103 mg/L	0.01 mg/L	103	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0414 mg/L	0.04 mg/L	103	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0187 mg/L	0.02 mg/L	93.6	70.0	130	----
		iron, dissolved	7439-89-6	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0182 mg/L	0.02 mg/L	91.1	70.0	130	----
		lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.2 mg/L	10 mg/L	112	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0398 mg/L	0.04 mg/L	99.5	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00369 mg/L	0.004 mg/L	92.3	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0414 mg/L	0.04 mg/L	103	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00371 mg/L	0.004 mg/L	92.8	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0195 mg/L	0.02 mg/L	97.3	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0434 mg/L	0.04 mg/L	108	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.381 mg/L	0.4 mg/L	95.3	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0424 mg/L	0.04 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 777882)										
EO2210704-008	SECONDARY LEACHATE CELL 4 (SC4)	aluminum, dissolved	7429-90-5	E421	0.222 mg/L	0.2 mg/L	111	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0198 mg/L	0.02 mg/L	99.1	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 777882) - continued										
EO2210704-008	SECONDARY LEACHATE CELL 4 (SC4)	arsenic, dissolved	7440-38-2	E421	0.0187 mg/L	0.02 mg/L	93.7	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0428 mg/L	0.04 mg/L	107	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0121 mg/L	0.01 mg/L	121	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00344 mg/L	0.004 mg/L	86.0	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00961 mg/L	0.01 mg/L	96.1	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0433 mg/L	0.04 mg/L	108	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0211 mg/L	0.02 mg/L	105	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		iron, dissolved	7439-89-6	E421	2.06 mg/L	2 mg/L	103	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.4 mg/L	10 mg/L	114	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0423 mg/L	0.04 mg/L	106	70.0	130	----
		silicon, dissolved	7440-21-3	E421	11.8 mg/L	10 mg/L	118	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00368 mg/L	0.004 mg/L	92.0	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0455 mg/L	0.04 mg/L	114	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00408 mg/L	0.004 mg/L	102	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0446 mg/L	0.04 mg/L	112	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0262 mg/L	0.02 mg/L	131	70.0	130	MES
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.109 mg/L	0.1 mg/L	109	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 777882) - continued										
EO2210704-008	SECONDARY LEACHATE CELL 4 (SC4)	zinc, dissolved	7440-66-6	E421	0.304 mg/L	0.4 mg/L	76.1	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0515 mg/L	0.04 mg/L	129	70.0	130	----
Speciated Metals (QCLot: 773067)										
EO2210704-001	SECONDARY LEACHATE CELL 1 (SC1)	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0386 mg/L	0.04 mg/L	96.4	70.0	130	----
Speciated Metals (QCLot: 780035)										
FC2202997-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0463 mg/L	0.05 mg/L	92.6	70.0	130	----
Aggregate Organics (QCLot: 770924)										
VA22C9491-001	Anonymous	phenols, total (4AAP)	----	E562	0.0194 mg/L	0.02 mg/L	96.8	75.0	125	----
Aggregate Organics (QCLot: 771715)										
EO2210653-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	98 mg/L	100 mg/L	98.2	75.0	125	----
Aggregate Organics (QCLot: 777248)										
CG2217108-001	Anonymous	phenols, total (4AAP)	----	E562	0.0191 mg/L	0.02 mg/L	95.6	75.0	125	----
Aggregate Organics (QCLot: 779429)										
EO2210704-008	SECONDARY LEACHATE CELL 4 (SC4)	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Volatile Organic Compounds (QCLot: 770178)										
EO2210704-002	SECONDARY LEACHATE CELL 2 (SC2)	benzene	71-43-2	E611A	86.9 µg/L	100 µg/L	86.9	50.0	140	----
		ethylbenzene	100-41-4	E611A	95.7 µg/L	100 µg/L	95.7	50.0	140	----
		toluene	108-88-3	E611A	95.4 µg/L	100 µg/L	95.4	50.0	140	----
		xylene, m+p-	179601-23-1	E611A	187 µg/L	200 µg/L	93.6	50.0	140	----
		xylene, o-	95-47-6	E611A	102 µg/L	100 µg/L	102	50.0	140	----
Volatile Organic Compounds (QCLot: 782189)										
EO2210704-008	SECONDARY LEACHATE CELL 4 (SC4)	benzene	71-43-2	E611A	91.4 µg/L	100 µg/L	91.4	50.0	140	----
		ethylbenzene	100-41-4	E611A	87.1 µg/L	100 µg/L	87.1	50.0	140	----
		toluene	108-88-3	E611A	83.6 µg/L	100 µg/L	83.6	50.0	140	----
		xylene, m+p-	179601-23-1	E611A	182 µg/L	200 µg/L	90.8	50.0	140	----
		xylene, o-	95-47-6	E611A	100 µg/L	100 µg/L	100	50.0	140	----

Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 22 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Clean Harbors Canada
Contact:	Todd Webb, Stan Yuha
Phone:	(780) 663-2513
	Company address below will appear on the final report
Street:	PO Box 390, 50114 Range Road 173
City/Province:	Ryley, AB
Postal Code:	T0B 4A0
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors Canada
Contact:	Robbi Gooding, Stephanie Dennis

Project Information

ALS Account # / Quote #:	EO22-CHES100-008
Job #:	Secondary Leachate Qtr 4 2022
PO / AFE:	0000230062
LSD:	Table 4.4A

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: webb.todd@cleanharbors.com

Email 2: yuha.stan@cleanharbors.com

Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: gooding.robbi@cleanharbors.com

Email 2: dennis.stephanie@cleanharbors.com

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

ALS Lab Work Order # (ALS use only):

ALS Contact: Pamela Toledo **Sampler:** James

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Table 4.4A Leachate	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	Secondary Leachate Cell 1 (SC1)	5-Dec-22	12:00		11	R			
	Secondary Leachate Cell 2 (SC2)	5-Dec-22	12:00		11	R			
	Secondary Leachate Cell 3A (SC3A)	5-Dec-22	12:00		11	R			
	Secondary Leachate Cell 3B (SC3B)	5-Dec-22	12:00		11	R			
	Secondary Leachate Cell 3C (SC3C)	5-Dec-22	12:00		11	R			
	Secondary Leachate Cell 3D (SC3D)	5-Dec-22	12:00		11	R			

Environmental Division
Edmonton
Work Order Reference
EO2210704

Telephone : +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Analyze as per Quote EO22-CHES100-008, Table 4.4A package (Attached). Same as COC 966636

Cooling Method: ☐ N ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
6.8							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Todd Webb	6-Dec-22	11:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	DEC 6, 22	2:53 PM

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page of

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Canada Toll Free: 1 800 668 9878

Report To	Contact and company name below will appear on the final report
Company:	Clean Harbors Canada
Contact:	Todd Webb, Stan Yuha
Phone:	(780) 663-2513
	Company address below will appear on the final report
Street:	PO Box 390, 50114 Range Road 173
City/Province:	Ryley, AB
Postal Code:	T0B 4A0
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	Clean Harbors Canada
Contact:	Robbi Gooding, Stephanie Dennis

Project Information	
ALS Account # / Quote #:	EO22-CHES100-008
Job #:	Secondary Leachate Qtr 4 2022
PO / AFE:	0000230062
LSD:	Table 4.4A

Reports / Recipients	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	webb.todd@cleanharbors.com
Email 2	yuha.stan@cleanharbors.com
Email 3	

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	gooding.robbi@cleanharbors.com
Email 2	dennis.stephanie@cleanharbors.com

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Pamela Toledo **Sampler:** James

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Table 4.4A Leachate	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
					11	R			
					11	R			
					11	R			
					11	R			
					11	R			
					11	R			
	Secondary Leachate Cell 3E (SC3E)	12-Dec-22	12:00						
	Secondary Leachate Cell 4 (SC4)	12-Dec-22	12:00						

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

Turnaround Time (TAT) Requested

- ☑ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- ☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

Environmental Division
Edmonton
Work Order Reference
EO2210704

Telephone : +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Add to report for EO2210704

Analyze as per Quote EO22-CHES100-008, Table 4.4A package (Attached). Same as COC 966636

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C			
11.6						

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Todd Webb	13-Dec-22	11:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	DEC 13 22	10:35A

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

APPENDIX G

Volume of Leak Detection Liquid Removed

CLEAN HARBORS CANADA, INC.
Liquid Removed from Leak Detection Systems 2022

CELL 1			CELL 2			CELL 3A (3)			CELL 3B (4)			Cell 3C (5)			Cell 3D (6)			Cell 3E (7)			Cell 4			
# of hectares		0.688	# of hectares		1.353	# of hectares		2.125	# of hectares		**2.125**	# of hectares		**2.546**	# of hectares		**2.535**	# of hectares		**3.08**	# of hectares		**2.43**	
DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	
1-1-22			1-1-22		0.0	1-1-22		0.0	1-1-22		0.0	1-1-22		0.0	1-1-22		0.0	1-1-22		0.0	1-1-22		0.0	
1-2-22			1-2-22		0.0	1-2-22		0.0	1-2-22		0.0	1-2-22		0.0	1-2-22		0.0	1-2-22		0.0	1-2-22		0.0	
1-3-22			1-3-22	12.0	8.9	1-3-22	0.0	0.0	1-3-22	0.0	0.0	1-3-22	0.0	0.0	1-3-22	5.0	2.0	1-3-22	10.0	3.2	1-3-22	234.0	96.3	
1-4-22			1-4-22	0.0	0.0	1-4-22	0.0	0.0	1-4-22	0.0	0.0	1-4-22	0.0	0.0	1-4-22	0.0	0.0	1-4-22	5.0	1.6	1-4-22	0.0	0.0	
1-5-22			1-5-22	0.0	0.0	1-5-22	0.0	0.0	1-5-22	0.0	0.0	1-5-22	0.0	0.0	1-5-22	10.0	3.9	1-5-22	5.0	1.6	1-5-22	113.0	46.5	
1-6-22			1-6-22	6.0	4.4	1-6-22	100.0	47.1	1-6-22	0.0	0.0	1-6-22	0.0	0.0	1-6-22	5.0	2.0	1-6-22	0.0	0.0	1-6-22	19.0	7.8	
1-7-22			1-7-22	0.0	0.0	1-7-22	0.0	0.0	1-7-22	0.0	0.0	1-7-22	22.0	8.6	1-7-22	3.0	1.2	1-7-22	0.0	0.0	1-7-22	0.0	0.0	
1-8-22			1-8-22		0.0	1-8-22		0.0	1-8-22		0.0	1-8-22		0.0	1-8-22		0.0	1-8-22		0.0	1-8-22		0.0	
1-9-22			1-9-22		0.0	1-9-22		0.0	1-9-22		0.0	1-9-22		0.0	1-9-22		0.0	1-9-22		0.0	1-9-22		0.0	
1-10-22			1-10-22	0.0	0.0	1-10-22	0.0	0.0	1-10-22	0.0	0.0	1-10-22	0.0	0.0	1-10-22	2.0	0.8	1-10-22	7.0	2.3	1-10-22	329.0	135.4	
1-11-22			1-11-22	0.0	0.0	1-11-22	0.0	0.0	1-11-22	0.0	0.0	1-11-22	5.0	2.0	1-11-22	10.0	3.9	1-11-22	3.0	1.0	1-11-22	0.0	0.0	
1-12-22			1-12-22	7.0	5.2	1-12-22	36.0	16.9	1-12-22	0.0	0.0	1-12-22	0.0	0.0	1-12-22	11.0	4.3	1-12-22	3.0	1.0	1-12-22	166.0	68.3	
1-13-22			1-13-22	11.0	8.1	1-13-22	5.0	2.4	1-13-22	0.0	0.0	1-13-22	0.0	0.0	1-13-22	5.0	2.0	1-13-22	0.0	0.0	1-13-22	119.0	49.0	
1-14-22			1-14-22	2.0	1.5	1-14-22	5.0	2.4	1-14-22	0.0	0.0	1-14-22	0.0	0.0	1-14-22	0.0	0.0	1-14-22	0.0	0.0	1-14-22	1529.0	629.2	
1-15-22			1-15-22		0.0	1-15-22		0.0	1-15-22		0.0	1-15-22		0.0	1-15-22		0.0	1-15-22		0.0	1-15-22		0.0	
1-16-22			1-16-22		0.0	1-16-22		0.0	1-16-22		0.0	1-16-22		0.0	1-16-22		0.0	1-16-22		0.0	1-16-22		0.0	
1-17-22			1-17-22	5.0	3.7	1-17-22	10.0	4.7	1-17-22	0.0	0.0	1-17-22	12.0	4.7	1-17-22	0.0	0.0	1-17-22	0.0	0.0	1-17-22	209.0	86.0	
1-18-22			1-18-22	7.0	5.2	1-18-22	0.0	0.0	1-18-22	0.0	0.0	1-18-22	0.0	0.0	1-18-22	0.0	0.0	1-18-22	5.0	1.6	1-18-22	0.0	0.0	
1-19-22			1-19-22	6.0	4.4	1-19-22	0.0	0.0	1-19-22	0.0	0.0	1-19-22	0.0	0.0	1-19-22	10.0	3.9	1-19-22	0.0	0.0	1-19-22	524.0	215.6	
1-20-22			1-20-22	1.0	0.7	1-20-22	0.0	0.0	1-20-22	0.0	0.0	1-20-22	0.0	0.0	1-20-22	0.0	0.0	1-20-22	0.0	0.0	1-20-22	665.0	273.7	
1-21-22			1-21-22	1.0	0.7	1-21-22	0.0	0.0	1-21-22	0.0	0.0	1-21-22	0.0	0.0	1-21-22	12.0	4.7	1-21-22	0.0	0.0	1-21-22	577.0	237.4	
1-22-22			1-22-22		0.0	1-22-22		0.0	1-22-22		0.0	1-22-22		0.0	1-22-22		0.0	1-22-22		0.0	1-22-22		0.0	
1-23-22			1-23-22		0.0	1-23-22		0.0	1-23-22		0.0	1-23-22		0.0	1-23-22		0.0	1-23-22		0.0	1-23-22		0.0	
1-24-22			1-24-22	2.0	1.5	1-24-22	0.0	0.0	1-24-22	0.0	0.0	1-24-22	0.0	0.0	1-24-22	43.0	17.0	1-24-22	0.0	0.0	1-24-22	1021.0	420.2	
1-25-22			1-25-22	0.0	0.0	1-25-22	3.0	1.4	1-25-22	0.0	0.0	1-25-22	0.0	0.0	1-25-22	0.0	0.0	1-25-22	0.0	0.0	1-25-22	0.0	0.0	
1-26-22			1-26-22	1.0	0.7	1-26-22	5.0	2.4	1-26-22	0.0	0.0	1-26-22	0.0	0.0	1-26-22	0.0	0.0	1-26-22	0.0	0.0	1-26-22	701.0	288.5	
1-27-22			1-27-22	0.0	0.0	1-27-22	0.0	0.0	1-27-22	0.0	0.0	1-27-22	0.0	0.0	1-27-22	0.0	0.0	1-27-22	0.0	0.0	1-27-22	266.0	109.5	
1-28-22			1-28-22	0.0	0.0	1-28-22	0.0	0.0	1-28-22	0.0	0.0	1-28-22	0.0	0.0	1-28-22	2.0	0.8	1-28-22	0.0	0.0	1-28-22	28.0	11.5	
1-29-22			1-29-22		0.0	1-29-22		0.0	1-29-22		0.0	1-29-22		0.0	1-29-22		0.0	1-29-22		0.0	1-29-22		0.0	
1-30-22			1-30-22		0.0	1-30-22		0.0	1-30-22		0.0	1-30-22		0.0	1-30-22		0.0	1-30-22		0.0	1-30-22		0.0	
1-31-22			1-31-22	0.0	0.0	1-31-22	0.0	0.0	1-31-22	0.0	0.0	1-31-22	1.0	0.4	1-31-22	0.0	0.0	1-31-22	0.0	0.0	1-31-22	92.0	37.9	
2-1-22			2-1-22	0.0	0.0	2-1-22	0.0	0.0	2-1-22	0.0	0.0	2-1-22	0.0	0.0	2-1-22	0.0	0.0	2-1-22	0.0	0.0	2-1-22	237.0	97.5	
2-2-22			2-2-22	0.0	0.0	2-2-22	0.0	0.0	2-2-22	0.0	0.0	2-2-22	0.0	0.0	2-2-22	0.0	0.0	2-2-22	0.0	0.0	2-2-22	67.0	27.6	
2-3-22			2-3-22	0.0	0.0	2-3-22	0.0	0.0	2-3-22	0.0	0.0	2-3-22	0.0	0.0	2-3-22	0.0	0.0	2-3-22	0.0	0.0	2-3-22	0.0	0.0	
2-4-22			2-4-22	0.0	0.0	2-4-22	0.0	0.0	2-4-22	0.0	0.0	2-4-22	0.0	0.0	2-4-22	0.0	0.0	2-4-22	0.0	0.0	2-4-22	51.0	21.0	
2-5-22			2-5-22		0.0	2-5-22		0.0	2-5-22		0.0	2-5-22		0.0	2-5-22		0.0	2-5-22		0.0	2-5-22		0.0	
2-6-22			2-6-22		0.0	2-6-22		0.0	2-6-22		0.0	2-6-22		0.0	2-6-22		0.0	2-6-22		0.0	2-6-22		0.0	
2-7-22			2-7-22	0.0	0.0	2-7-22	0.0	0.0	2-7-22	0.0	0.0	2-7-22	21.0	8.2	2-7-22	0.0	0.0	2-7-22	3.0	1.0	2-7-22	255.0	104.9	
2-8-22			2-8-22	7.0	5.2	2-8-22	0.0	0.0	2-8-22	0.0	0.0	2-8-22	0.0	0.0	2-8-22	0.0	0.0	2-8-22	139.0	45.1	2-8-22	95.0	39.1	
2-9-22			2-9-22	15.0	11.1	2-9-22	0.0	0.0	2-9-22	20.0	9.4	2-9-22	0.0	0.0	2-9-22	0.0	0.0	2-9-22	40.0	13.0	2-9-22	75.0	30.9	
2-10-22			2-10-22	402.0	297.1	2-10-22	0.0	0.0	2-10-22	0.0	0.0	2-10-22	9.0	3.5	2-10-22	8.0	3.2	2-10-22	23.0	7.5	2-10-22	5.0	2.1	
2-11-22			2-11-22	75.0	55.4	2-11-22	0.0	0.0	2-11-22	0.0	0.0	2-11-22	0.0	0.0	2-11-22	0.0	0.0	2-11-22	15.0	4.9	2-11-22	0.0	0.0	*
2-12-22			2-12-22		0.0	2-12-22		0.0	2-12-22		0.0	2-12-22		0.0	2-12-22		0.0	2-12-22		0.0	2-12-22		0.0	
2-13-22			2-13-22		0.0	2-13-22		0.0	2-13-22		0.0	2-13-22		0.0	2-13-22		0.0	2-13-22		0.0	2-13-22		0.0	
2-14-22			2-14-22	31.0	22.9	2-14-22	0.0	0.0	2-14-22	0.0	0.0	2-14-22	0.0	0.0	2-14-22	0.0	0.0	2-14-22	0.0	0.0	2-14-22	0.0	0.0	*
2-15-22			2-15-22	18.0	13.3	2-15-22	0.0	0.0	2-15-22	0.0	0.0	2-15-22	0.0	0.0	2-15-22	0.0	0.0	2-15-22	0.0	0.0	2-15-22	0.0	0.0	*
2-16-22			2-16-22	5.0	3.7	2-16-22	0.0	0.0	2-16-22	0.0	0.0	2-16-22	0.0	0.0	2-16-22	0.0	0.0	2-16-22	4.0	1.3	2-16-22	0.0	0.0	*
2-17-22			2-17-22	0.0	0.0	2-17-22	0.0	0.0	2-17-22	0.0	0.0	2-17-22	14.0	5.5	2-17-22	0.0	0.0	2-17-22	17.0	5.5	2-17-22	0.0	0.0	*
2-18-22			2-18-22	0.0	0.0	2-18-22	0.0	0.0	2-18-22	0.0	0.0	2-18-22	0.0	0.0	2-18-22	0.0	0.0	2-18-22	10.0	3.2	2-18-22	0.0	0.0	*
2-19-22			2-19-22		0.0	2-19-22		0.0	2-19-22		0.0	2-19-22		0.0	2-19-22		0.0	2-19-22		0.0	2-19-22		0.0	
2-20-22			2-20-22		0.0	2-20-22		0.0	2-20-22		0.0	2-20-22		0.0	2-20-22		0.0	2-20-22		0.0	2-20-22		0.0	
2-21-22			2-21-22		0.0	2-21-22		0.0	2-21-22		0.0	2-21-22		0.0	2-21-22		0.0	2-21-22		0.0	2-21-22		0.0	
2-22-22			2-22-22	25.0	18.5	2-22-22	20.0	9.4	2-22-22	0.0	0.0	2-22-22	0.0	0.0	2-22-22	40.0	15.8	2-22-22	20.0	6.5	2-22-22	0.0	0.0	*
2-23-22			2-23-22	10.0	7.4	2-23-22	0.0	0.0	**	2-23-22	0.0	0.0	2-23-22	0.0	0.0	2-23-22	0.0	0.0	2-23-22	19.0	6.2	2-23-22	0.0	0.0	*
2-24-22			2-24-22	0.0	0.0	2-24-22	10.0	4.7	2-24-22	0.0	0.0	2-24-22	0.0	0.0	2-24-22	0.0	0.0	2-24-22	8.0	2.6	2-24-22	0.0	0.0	*
2-25-22			2-25-22	0.0	0.0	2-25-22	10.0	4.7	2-25-22	0.0	0.0	2-25-22	0.0	0.0	2-25-22	0.0	0.0	2-25-22	16.0	5.2	2-25-22	356.0	146.5	
2-26-22			2-26-22	25.0	18.5	2-26-22	10.0	4.7	2-26-22	0.0	0.0	2-26-22	40.0	15.7	2-26-22	0.0	0.0	2-26-22	5.0	1.6	2-26-22	70.0	28.8	
2-27-22			2-27-22		0.0	2-27-22		0.0	2-27-22		0.0	2-27-22		0.0	2-27-22		0.0	2-27-22		0.0	2-27-22		0.0	
2-28-22			2-28-22		0.0	2-28-22		0.0	2-28-22		0.0	2-28-22		0.0	2-28-22		0.0	2-28-22		0.0	2-28-22		0.0	
3-1-22			3-1-22	5.0	3.7	3-1-22	5.0	2.4	3-1-22	0.0	0.0	3-1-22	0.0	0.0	3-1-22	0.0	0.0	3-1-22	10.0	3.2	3-1-22	61.0	25.1	
3-2-22			3-2-22	5.0	3.7	3-2-22	3.0	1.4	3-2-22	0.0	0.0	3-2-22	0.0	0.0	3-2-22	0.0	0.0	3-2-22	17.0	5.5	3-2-22	44.0	18.1	
3-3-22			3-3-22	10.0	7.4	3-3-22	5.0	2.4	3-3-22	0.0	0.0	3-3-22	0.0	0.0	3-3-22	0.0	0.0	3-3-22	16.0	5.2	3-3-22	19.0	7.8	

CLEAN HARBORS CANADA, INC.
Liquid Removed from Leak Detection Systems 2022

CELL 1			CELL 2			CELL 3A (3)				CELL 3B (4)			Cell 3C (5)			Cell 3D (6)			Cell 3E (7)			Cell 4		
# of hectares		0.688	# of hectares		1.353	# of hectares		2.125		# of hectares		**2.125**	# of hectares		**2.546**	# of hectares		**2.535**	# of hectares		**3.08**	# of hectares		**2.43**
DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)		DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)
3-4-22			3-4-22	2.0	1.5	3-4-22	0.0	0.0		3-4-22	0.0	0.0	3-4-22	0.0	0.0	3-4-22	0.0	0.0	3-4-22	15.0	4.9	3-4-22	0.0	0.0
3-5-22			3-5-22	10.0	7.4	3-5-22	5.0	2.4		3-5-22	0.0	0.0	3-5-22	0.0	0.0	3-5-22	0.0	0.0	3-5-22	17.0	5.5	3-5-22	0.0	0.0
3-6-22			3-6-22		0.0	3-6-22		0.0		3-6-22		0.0	3-6-22		0.0	3-6-22		0.0	3-6-22		0.0	3-6-22		0.0
3-7-22			3-7-22		0.0	3-7-22		0.0		3-7-22		0.0	3-7-22		0.0	3-7-22		0.0	3-7-22		0.0	3-7-22		0.0
3-8-22			3-8-22	30.0	22.2	3-8-22	10.0	4.7		3-8-22	10.0	4.7	3-8-22	0.0	0.0	3-8-22	0.0	0.0	3-8-22	15.0	4.9	3-8-22	97.0	39.9
3-9-22			3-9-22	15.0	11.1	3-9-22	5.0	2.4		3-9-22	0.0	0.0	3-9-22	0.0	0.0	3-9-22	0.0	0.0	3-9-22	13.0	4.2	3-9-22	67.0	27.6
3-10-22			3-10-22	1.0	0.7	3-10-22	0.0	0.0	**	3-10-22	0.0	0.0	3-10-22	0.0	0.0	3-10-22	0.0	0.0	3-10-22	11.0	3.6	3-10-22	29.0	11.9
3-11-22			3-11-22	10.0	7.4	3-11-22	0.0	0.0	**	3-11-22	0.0	0.0	3-11-22	0.0	0.0	3-11-22	0.0	0.0	3-11-22	4.0	1.3	3-11-22	0.0	0.0
3-12-22			3-12-22		0.0	3-12-22		0.0		3-12-22		0.0	3-12-22		0.0	3-12-22		0.0	3-12-22		0.0	3-12-22		0.0
3-13-22			3-13-22		0.0	3-13-22		0.0		3-13-22		0.0	3-13-22		0.0	3-13-22		0.0	3-13-22		0.0	3-13-22		0.0
3-14-22			3-14-22	5.0	3.7	3-14-22	0.0	0.0	**	3-14-22	0.0	0.0	3-14-22	2.0	0.8	3-14-22	0.0	0.0	3-14-22	19.0	6.2	3-14-22	508.0	209.1
3-15-22			3-15-22	0.0	0.0	3-15-22	0.0	0.0	**	3-15-22	0.0	0.0	3-15-22	7.0	2.7	3-15-22	0.0	0.0	3-15-22	28.0	9.1	3-15-22	0.0	0.0
3-16-22			3-16-22	25.0	18.5	3-16-22	0.0	0.0	**	3-16-22	10.0	4.7	3-16-22	0.0	0.0	3-16-22	0.0	0.0	3-16-22	20.0	6.5	3-16-22	0.0	0.0
3-17-22			3-17-22	80.0	59.1	3-17-22	0.0	0.0	**	3-17-22	66.0	31.1	3-17-22	0.0	0.0	3-17-22	8.0	3.2	3-17-22	30.0	9.7	3-17-22	23.0	9.5
3-18-22			3-18-22	88.0	65.0	3-18-22	0.0	0.0	**	3-18-22	230.0	108.2	3-18-22	2.0	0.8	3-18-22	10.0	3.9	3-18-22	25.0	8.1	3-18-22	0.0	0.0
3-19-22			3-19-22		0.0	3-19-22		0.0		3-19-22		0.0	3-19-22		0.0	3-19-22		0.0	3-19-22		0.0	3-19-22		0.0
3-20-22			3-20-22		0.0	3-20-22		0.0		3-20-22		0.0	3-20-22		0.0	3-20-22		0.0	3-20-22		0.0	3-20-22		0.0
3-21-22	800.0		3-21-22	123.0	90.9	3-21-22	15.0	7.1	**	3-21-22	45.0	21.2	3-21-22	15.0	5.9	3-21-22	20.0	7.9	3-21-22	25.0	8.1	3-21-22	200.0	82.3
3-22-22			3-22-22	53.0	39.2	3-22-22	0.0	0.0	**	3-22-22	51.0	24.0	3-22-22	0.0	0.0	3-22-22	11.0	4.3	3-22-22	25.0	8.1	3-22-22	20.0	8.2
3-23-22			3-23-22	60.0	44.3	3-23-22	0.0	0.0	**	3-23-22	16.0	7.5	3-23-22	25.0	9.8	3-23-22	0.0	0.0	3-23-22	34.0	11.0	3-23-22	0.0	0.0
3-24-22			3-24-22	60.0	44.3	3-24-22	0.0	0.0	**	3-24-22	24.0	11.3	3-24-22	0.0	0.0	3-24-22	0.0	0.0	3-24-22	44.0	14.3	3-24-22	126.0	51.9
3-25-22			3-25-22	40.0	29.6	3-25-22	0.0	0.0	**	3-25-22	17.0	8.0	3-25-22	0.0	0.0	3-25-22	0.0	0.0	3-25-22	36.0	11.7	3-25-22	0.0	0.0
3-26-22			3-26-22		0.0	3-26-22		0.0		3-26-22		0.0	3-26-22		0.0	3-26-22		0.0	3-26-22		0.0	3-26-22		0.0
3-27-22			3-27-22		0.0	3-27-22		0.0		3-27-22		0.0	3-27-22		0.0	3-27-22		0.0	3-27-22		0.0	3-27-22		0.0
3-28-22			3-28-22	82.0	60.6	3-28-22	0.0	0.0	**	3-28-22	14.0	6.6	3-28-22	23.0	9.0	3-28-22	0.0	0.0	3-28-22	35.0	11.4	3-28-22	33.0	13.6
3-29-22			3-29-22	31.0	22.9	3-29-22	0.0	0.0	**	3-29-22	30.0	14.1	3-29-22	30.0	11.8	3-29-22	0.0	0.0	3-29-22	63.0	20.5	3-29-22	389.0	160.1
3-30-22			3-30-22	70.0	51.7	3-30-22	0.0	0.0	**	3-30-22	0.0	0.0	3-30-22	25.0	9.8	3-30-22	30.0	11.8	3-30-22	25.0	8.1	3-30-22	129.0	53.1
3-31-22			3-31-22	65.0	48.0	3-31-22	0.0	0.0	**	3-31-22	0.0	0.0	3-31-22	0.0	0.0	3-31-22	0.0	0.0	3-31-22	23.0	7.5	3-31-22	4.0	1.6
4-1-22			4-1-22	49.0	36.2	4-1-22	0.0	0.0	**	4-1-22	0.0	0.0	4-1-22	0.0	0.0	4-1-22	0.0	0.0	4-1-22	21.0	6.8	4-1-22	0.0	0.0
4-2-22			4-2-22		0.0	4-2-22		0.0		4-2-22		0.0	4-2-22		0.0	4-2-22		0.0	4-2-22		0.0	4-2-22		0.0
4-3-22			4-3-22		0.0	4-3-22		0.0		4-3-22		0.0	4-3-22		0.0	4-3-22		0.0	4-3-22		0.0	4-3-22		0.0
4-4-22			4-4-22	232.0	171.5	4-4-22	0.0	0.0	**	4-4-22	40.0	18.8	4-4-22	60.0	23.6	4-4-22	0.0	0.0	4-4-22	18.0	5.8	4-4-22	340.0	139.9
4-5-22			4-5-22	118.0	87.2	4-5-22	0.0	0.0	**	4-5-22	0.0	0.0	4-5-22	0.0	0.0	4-5-22	0.0	0.0	4-5-22	18.0	5.8	4-5-22	14.0	5.8
4-6-22			4-6-22	95.0	70.2	4-6-22	0.0	0.0	**	4-6-22	5.0	2.4	4-6-22	0.0	0.0	4-6-22	0.0	0.0	4-6-22	10.0	3.2	4-6-22	8.0	3.3
4-7-22			4-7-22	54.0	39.9	4-7-22	0.0	0.0	**	4-7-22	3.0	1.4	4-7-22	0.0	0.0	4-7-22	5.0	2.0	4-7-22	15.0	4.9	4-7-22	125.0	51.4
4-8-22			4-8-22	112.0	82.8	4-8-22	0.0	0.0	**	4-8-22	33.0	15.5	4-8-22	0.0	0.0	4-8-22	0.0	0.0	4-8-22	20.0	6.5	4-8-22	208.0	85.6
4-9-22			4-9-22		0.0	4-9-22		0.0		4-9-22		0.0	4-9-22		0.0	4-9-22		0.0	4-9-22		0.0	4-9-22		0.0
4-10-22			4-10-22		0.0	4-10-22		0.0		4-10-22		0.0	4-10-22		0.0	4-10-22		0.0	4-10-22		0.0	4-10-22		0.0
4-11-22			4-11-22	325.0	240.2	4-11-22	0.0	0.0	**	4-11-22	194.0	91.3	4-11-22	0.0	0.0	4-11-22	5.0	2.0	4-11-22	20.0	6.5	4-11-22	399.0	164.2
4-12-22			4-12-22	264.0	195.1	4-12-22	40.0	18.8		4-12-22	171.0	80.5	4-12-22	0.0	0.0	4-12-22	5.0	2.0	4-12-22	20.0	6.5	4-12-22	0.0	0.0
4-13-22			4-13-22	85.0	62.8	4-13-22	5.0	2.4		4-13-22	123.0	57.9	4-13-22	0.0	0.0	4-13-22	8.0	3.2	4-13-22	20.0	6.5	4-13-22	0.0	0.0
4-14-22			4-14-22	105.0	77.6	4-14-22	0.0	0.0		4-14-22	106.0	49.9	4-14-22	0.0	0.0	4-14-22	0.0	0.0	4-14-22	13.0	4.2	4-14-22	0.0	0.0
4-15-22			4-15-22		0.0	4-15-22		0.0		4-15-22		0.0	4-15-22		0.0	4-15-22		0.0	4-15-22		0.0	4-15-22		0.0
4-16-22			4-16-22		0.0	4-16-22		0.0		4-16-22		0.0	4-16-22		0.0	4-16-22		0.0	4-16-22		0.0	4-16-22		0.0
4-17-22			4-17-22		0.0	4-17-22		0.0		4-17-22		0.0	4-17-22		0.0	4-17-22		0.0	4-17-22		0.0	4-17-22		0.0
4-18-22			4-18-22	394.0	291.2	4-18-22	4.0	1.9		4-18-22	1.0	0.5	4-18-22	10.0	3.9	4-18-22	0.0	0.0	4-18-22	14.0	4.5	4-18-22	132.0	54.3
4-19-22			4-19-22	173.0	127.9	4-19-22	8.0	3.8		4-19-22	190.0	89.4	4-19-22	65.0	25.5	4-19-22	6.0	2.4	4-19-22	20	6.5	4-19-22	296.0	121.8
4-20-22			4-20-22	107.0	79.1	4-20-22	0.0	0.0		4-20-22	69.0	32.5	4-20-22	0.0	0.0	4-20-22	0.0	0.0	4-20-22	12.0	3.9	4-20-22	54.0	22.2
4-21-22			4-21-22	113.0	83.5	4-21-22	5.0	2.4		4-21-22	108.0	50.8	4-21-22	5.0	2.0	4-21-22	0.0	0.0	4-21-22	14.0	4.5	4-21-22	31.0	12.8
4-22-22			4-22-22	95.0	70.2	4-22-22	0.0	0.0		4-22-22	129.0	60.7	4-22-22	0.0	0.0	4-22-22	0.0	0.0	4-22-22	52.0	16.9	4-22-22	99.0	40.7
4-23-22			4-23-22		0.0	4-23-22		0.0		4-23-22		0.0	4-23-22		0.0	4-23-22		0.0	4-23-22		0.0	4-23-22		0.0
4-24-22			4-24-22		0.0	4-24-22		0.0		4-24-22		0.0	4-24-22		0.0	4-24-22		0.0	4-24-22		0.0	4-24-22		0.0
4-25-22			4-25-22	358.0	264.6	4-25-22	20.0	9.4		4-25-22	550.0	258.8	4-25-22	0.0	0.0	4-25-22	2.0	0.8	4-25-22	72.0	23.4	4-25-22	123.0	50.6
4-26-22			4-26-22	132.0	97.6	4-26-22	5.0	2.4		4-26-22	771.0	362.8	4-26-22	2.0	0.8	4-26-22	0.0	0.0	4-26-22	73.0	23.7	4-26-22	259.0	106.6
4-27-22			4-27-22	52.0	38.4	4-27-22	5.0	2.4		4-27-22	279.0	131.3	4-27-22	76.0	29.9	4-27-22	0.0	0.0	4-27-22	81.0	26.3	4-27-22	40.0	16.5
4-28-22			4-28-22	79.0	58.4	4-28-22	0.0	0.0		4-28-22	219.0	103.1	4-28-22	26.0	10.2	4-28-22	0.0	0.0	4-28-22	79.0	25.6	4-28-22	99.0	40.7
4-29-22			4-29-22	118.0	87.2	4-29-22	0.0	0.0		4-29-22	215.0	101.2	4-29-22	5.0	2.0	4-29-22	0.0	0.0	4-29-22	74.0	24.0	4-29-22	70.0	28.8
4-30-22			4-30-22		0.0	4-30-22		0.0		4-30-22		0.0	4-30-22		0.0	4-30-22		0.0	4-30-22		0.0	4-30-22		0.0
5-1-22			5-1-22		0.0	5-1-22		0.0		5-1-22		0.0	5-1-22		0.0	5-1-22		0.0	5-1-22		0.0	5-1-22		0.0
5-2-22			5-2-22	272.0	201.0	5-2-22	5.0	2.4		5-2-22	380.0	178.8	5-2-22	46.0	18.1	5-2-22	0.0	0.0	5-2-22	60.0	19.5	5-2-22	387.0	159.3
5-3-22			5-3-22	65.0	48.0	5-3-22	5.0	2.4		5-3-22	221.0	104.0	5-3-22	23.0	9.0	5-3-22	25.0	9.9	5-3-22	124.0	40.3	5-3-22	25.0	10.3
5-4-22			5-4-22	86.0	63.6	5-4-22	10.0	4.7		5-4-22	152.0	71.5	5-4-22	35.0	13.7	5-4-22	0.0	0.0	5-4-22	142.0	46.1	5-4-22	0.0	0.0

CLEAN HARBORS CANADA, INC.
Liquid Removed from Leak Detection Systems 2022

CELL 1			CELL 2			CELL 3A (3)			CELL 3B (4)			Cell 3C (5)			Cell 3D (6)			Cell 3E (7)			Cell 4		
# of hectares		0.688	# of hectares		1.353	# of hectares		2.125	# of hectares		**2.125**	# of hectares		**2.546**	# of hectares		**2.535**	# of hectares		**3.08**	# of hectares		**2.43**
DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)
5-5-22			5-5-22	128.0	94.6	5-5-22	10.0	4.7	5-5-22	97.0	45.6	5-5-22	28.0	11.0	5-5-22	0.0	0.0	5-5-22	12.0	3.9	5-5-22	0.0	0.0
5-6-22			5-6-22	77.0	56.9	5-6-22	5.0	2.4	5-6-22	112.0	52.7	5-6-22	38.0	14.9	5-6-22	0.0	0.0	5-6-22	8.0	2.6	5-6-22	138.0	56.8
5-7-22			5-7-22		0.0	5-7-22		0.0	5-7-22		0.0	5-7-22		0.0	5-7-22		0.0	5-7-22		0.0	5-7-22		0.0
5-8-22			5-8-22		0.0	5-8-22		0.0	5-8-22		0.0	5-8-22		0.0	5-8-22		0.0	5-8-22		0.0	5-8-22		0.0
5-9-22			5-9-22	230.0	170.0	5-9-22	0.0	0.0	5-9-22	39.0	18.4	5-9-22	6.0	2.4	5-9-22	0.0	0.0	5-9-22	0.0	0.0	5-9-22	454.0	186.8
5-10-22			5-10-22	60.0	44.3	5-10-22	0.0	0.0	5-10-22	0.0	0.0	5-10-22	0.0	0.0	5-10-22	0.0	0.0	5-10-22	0.0	0.0	5-10-22	0.0	0.0
5-11-22			5-11-22	41.0	30.3	5-11-22	0.0	0.0	5-11-22	57.0	26.8	5-11-22	0.0	0.0	5-11-22	0.0	0.0	5-11-22	0.0	0.0	5-11-22	1.0	0.4
5-12-22			5-12-22	75.0	55.4	5-12-22	0.0	0.0	5-12-22	82.0	38.6	5-12-22	0.0	0.0	5-12-22	0.0	0.0	5-12-22	3.0	1.0	5-12-22	101.0	41.6
5-13-22			5-13-22	80.0	59.1	5-13-22	0.0	0.0	5-13-22	61.0	28.7	5-13-22	2.0	0.8	5-13-22	0.0	0.0	5-13-22	4.0	1.3	5-13-22	125.0	51.4
5-14-22			5-14-22		0.0	5-14-22		0.0	5-14-22		0.0	5-14-22		0.0	5-14-22		0.0	5-14-22		0.0	5-14-22		0.0
5-15-22			5-15-22		0.0	5-15-22		0.0	5-15-22		0.0	5-15-22		0.0	5-15-22		0.0	5-15-22		0.0	5-15-22		0.0
5-16-22			5-16-22	210.0	155.2	5-16-22	15.0	7.1	5-16-22	73.0	34.4	5-16-22	10.0	3.9	5-16-22	0.0	0.0	5-16-22	15.0	4.9	5-16-22	216.0	88.9
5-17-22			5-17-22	60.0	44.3	5-17-22	20.0	9.4	5-17-22	15.0	7.1	5-17-22	15.0	5.9	5-17-22	20.0	7.9	5-17-22	5.0	1.6	5-17-22	185.0	76.1
5-18-22			5-18-22	57.0	42.1	5-18-22	10.0	4.7	5-18-22	0.0	0.0	5-18-22	0.0	0.0	5-18-22	0.0	0.0	5-18-22	5.0	1.6	5-18-22	0.0	0.0
5-19-22			5-19-22	41.0	30.3	5-19-22	30.0	14.1	5-19-22	10.0	4.7	5-19-22	8.0	3.1	5-19-22	0.0	0.0	5-19-22	2.0	0.6	5-19-22	40.0	16.5
5-20-22			5-20-22	56.0	41.4	5-20-22	20.0	9.4	5-20-22	0.0	0.0	5-20-22	0.0	0.0	5-20-22	0.0	0.0	5-20-22	5.0	1.6	5-20-22	0.0	0.0
5-21-22			5-21-22		0.0	5-21-22		0.0	5-21-22		0.0	5-21-22		0.0	5-21-22		0.0	5-21-22		0.0	5-21-22		0.0
5-22-22			5-22-22		0.0	5-22-22		0.0	5-22-22		0.0	5-22-22		0.0	5-22-22		0.0	5-22-22		0.0	5-22-22		0.0
5-23-22			5-23-22		0.0	5-23-22		0.0	5-23-22		0.0	5-23-22		0.0	5-23-22		0.0	5-23-22		0.0	5-23-22		0.0
5-24-22			5-24-22	179.0	132.3	5-24-22	0.0	0.0	5-24-22	0.0	0.0	5-24-22	0.0	0.0	5-24-22	0.0	0.0	5-24-22	0.0	0.0	5-24-22	295.0	121.4
5-25-22			5-25-22	29.0	21.4	5-25-22	12.0	5.6	5-25-22	0.0	0.0	5-25-22	14.0	5.5	5-25-22	0.0	0.0	5-25-22	0.0	0.0	5-25-22	182.0	74.9
5-26-22			5-26-22	41.0	30.3	5-26-22	21.0	9.9	5-26-22	0.0	0.0	5-26-22	0.0	0.0	5-26-22	0.0	0.0	5-26-22	5.0	1.6	5-26-22	125.0	51.4
5-27-22			5-27-22	29.0	21.4	5-27-22	0.0	0.0	5-27-22	0.0	0.0	5-27-22	12.0	4.7	5-27-22	0.0	0.0	5-27-22	0.0	0.0	5-27-22	37.0	15.2
5-28-22			5-28-22	86.0	63.6	5-28-22	0.0	0.0	5-28-22	0.0	0.0	5-28-22	0.0	0.0	5-28-22	0.0	0.0	5-28-22	0.0	0.0	5-28-22	323.0	132.9
5-29-22			5-29-22		0.0	5-29-22		0.0	5-29-22		0.0	5-29-22		0.0	5-29-22		0.0	5-29-22		0.0	5-29-22		0.0
5-30-22			5-30-22		0.0	5-30-22		0.0	5-30-22		0.0	5-30-22		0.0	5-30-22		0.0	5-30-22		0.0	5-30-22		0.0
5-31-22			5-31-22	21.0	15.5	5-31-22	20.0	9.4	5-31-22	14.0	6.6	5-31-22	0.0	0.0	5-31-22	0.0	0.0	5-31-22	5.0	1.6	5-31-22	472.0	194.2
6-1-22	3000.0		6-1-22	35.0	25.9	6-1-22	0.0	0.0	6-1-22	10.0	4.7	6-1-22	0.0	0.0	6-1-22	0.0	0.0	6-1-22	0.0	0.0	6-1-22	0.0	0.0
6-2-22			6-2-22	34.0	25.1	6-2-22	2.0	0.9	6-2-22	0.0	0.0	6-2-22	0.0	0.0	6-2-22	0.0	0.0	6-2-22	0.0	0.0	6-2-22	34.0	14.0
6-3-22			6-3-22	35.0	25.9	6-3-22	10.0	4.7	6-3-22	0.0	0.0	6-3-22	3.0	1.2	6-3-22	0.0	0.0	6-3-22	10.0	3.2	6-3-22	30.0	12.3
6-4-22			6-4-22		0.0	6-4-22		0.0	6-4-22		0.0	6-4-22		0.0	6-4-22		0.0	6-4-22		0.0	6-4-22		0.0
6-5-22			6-5-22		0.0	6-5-22		0.0	6-5-22		0.0	6-5-22		0.0	6-5-22		0.0	6-5-22		0.0	6-5-22		0.0
6-6-22			6-6-22	106.0	78.3	6-6-22	50.0	23.5	6-6-22	10.0	4.7	6-6-22	4.0	1.6	6-6-22	20.0	7.9	6-6-22	25.0	8.1	6-6-22	457.0	188.1
6-7-22			6-7-22	36.0	26.6	6-7-22	50.0	23.5	6-7-22	0.0	0.0	6-7-22	0.0	0.0	6-7-22	0.0	0.0	6-7-22	10.0	3.2	6-7-22	0.0	0.0
6-8-22			6-8-22	44.0	32.5	6-8-22	60.0	28.2	6-8-22	2.0	0.9	6-8-22	0.0	0.0	6-8-22	0.0	0.0	6-8-22	10.0	3.2	6-8-22	0.0	0.0
6-9-22			6-9-22	53.0	39.2	6-9-22	50.0	23.5	6-9-22	0.0	0.0	6-9-22	3.0	1.2	6-9-22	0.0	0.0	6-9-22	5.0	1.6	6-9-22	0.0	0.0
6-10-22			6-10-22	48.0	35.5	6-10-22	43.0	20.2	6-10-22	2.0	0.9	6-10-22	11.0	4.3	6-10-22	0.0	0.0	6-10-22	10.0	3.2	6-10-22	0.0	0.0
6-11-22			6-11-22		0.0	6-11-22		0.0	6-11-22		0.0	6-11-22		0.0	6-11-22		0.0	6-11-22		0.0	6-11-22		0.0
6-12-22			6-12-22		0.0	6-12-22		0.0	6-12-22		0.0	6-12-22		0.0	6-12-22		0.0	6-12-22		0.0	6-12-22		0.0
6-13-22	300.0		6-13-22	15.0	11.1	6-13-22	80.0	37.6	6-13-22	15.0	7.1	6-13-22	0.0	0.0	6-13-22	15.0	5.9	6-13-22	15.0	4.9	6-13-22	15.0	6.2
6-14-22			6-14-22	38.0	28.1	6-14-22	47.0	22.1	6-14-22	10.0	4.7	6-14-22	30.0	11.8	6-14-22	2.0	0.8	6-14-22	84.0	27.3	6-14-22	646.0	265.8
6-15-22			6-15-22	48.0	35.5	6-15-22	42.0	19.8	6-15-22	15.0	7.1	6-15-22	25.0	9.8	6-15-22	0.0	0.0	6-15-22	2098.0	681.2	6-15-22	98.0	40.3
6-16-22			6-16-22	45.0	33.3	6-16-22	25.0	11.8	6-16-22	0.0	0.0	6-16-22	0.0	0.0	6-16-22	0.0	0.0	6-16-22	363.0	117.9	6-16-22	20.0	8.2
6-17-22			6-17-22	42.0	31.0	6-17-22	34.0	16.0	6-17-22	0.0	0.0	6-17-22	0.0	0.0	6-17-22	0.0	0.0	6-17-22	10.0	3.2	6-17-22	0.0	0.0
6-18-22			6-18-22		0.0	6-18-22		0.0	6-18-22		0.0	6-18-22		0.0	6-18-22		0.0	6-18-22		0.0	6-18-22		0.0
6-19-22			6-19-22		0.0	6-19-22		0.0	6-19-22		0.0	6-19-22		0.0	6-19-22		0.0	6-19-22		0.0	6-19-22		0.0
6-20-22			6-20-22	66.0	48.8	6-20-22	81.0	38.1	6-20-22	0.0	0.0	6-20-22	0.0	0.0	6-20-22	0.0	0.0	6-20-22	15.0	4.9	6-20-22	0.0	0.0
6-21-22	100.0		6-21-22	51.0	37.7	6-21-22	46.0	21.6	6-21-22	0.0	0.0	6-21-22	0.0	0.0	6-21-22	0.0	0.0	6-21-22	23.0	7.5	6-21-22	255.0	104.9
6-22-22			6-22-22	45.0	33.3	6-22-22	30.0	14.1	6-22-22	25.0	11.8	6-22-22	3.0	1.2	6-22-22	0.0	0.0	6-22-22	15.0	4.9	6-22-22	72.0	29.6
6-23-22			6-23-22	30.0	22.2	6-23-22	40.0	18.8	6-23-22	0.0	0.0	6-23-22	0.0	0.0	6-23-22	0.0	0.0	6-23-22	17.0	5.5	6-23-22	2.0	0.8
6-24-22			6-24-22	34.0	25.1	6-24-22	38.0	17.9	6-24-22	0.0	0.0	6-24-22	0.0	0.0	6-24-22	0.0	0.0	6-24-22	135.0	43.8	6-24-22	6.0	2.5
6-25-22			6-25-22		0.0	6-25-22		0.0	6-25-22		0.0	6-25-22		0.0	6-25-22		0.0	6-25-22		0.0	6-25-22		0.0
6-26-22			6-26-22		0.0	6-26-22		0.0	6-26-22		0.0	6-26-22		0.0	6-26-22		0.0	6-26-22		0.0	6-26-22		0.0
6-27-22			6-27-22	237.0	175.2	6-27-22	86.0	40.5	6-27-22	490.0	230.6	6-27-22	5.0	2.0	6-27-22	0.0	0.0 *	6-27-22	129.0	41.9	6-27-22	205.0	84.4
6-28-22			6-28-22	418.0	308.9	6-28-22	30.0	14.1	6-28-22	467.0	219.8	6-28-22	17.0	6.7	6-28-22	0.0	0.0 *	6-28-22	112.0	36.4	6-28-22	0.0	0.0
6-29-22			6-29-22	190.0	140.4	6-29-22	43.0	20.2	6-29-22	512.0	240.9	6-29-22	4.0	1.6	6-29-22	0.0	0.0 *	6-29-22	37.0	12.0	6-29-22	0.0	0.0
6-30-22			6-30-22	128.0	94.6	6-30-22	57.0	26.8	6-30-22	288.0	135.5	6-30-22	4.0	1.6	6-30-22	0.0	0.0 *	6-30-22	75.0	24.4	6-30-22	0.0	0.0
7-1-22			7-1-22		0.0	7-1-22		0.0	7-1-22		0.0	7-1-22		0.0	7-1-22		0.0	7-1-22		0.0	7-1-22		0.0
7-2-22			7-2-22		0.0	7-2-22		0.0	7-2-22		0.0	7-2-22		0.0	7-2-22		0.0	7-2-22		0.0	7-2-22		0.0
7-3-22			7-3-22		0.0	7-3-22		0.0	7-3-22		0.0	7-3-22		0.0	7-3-22		0.0	7-3-22		0.0	7-3-22		0.0
7-4-22			7-4-22	325.0	240.2	7-4-22	164.0	77.2	7-4-22	306.0	144.0	7-4-22	6.0	2.4	7-4-22	0.0	0.0 *	7-4-22	82.0	26.6	7-4-22	625.0	257.2
7-5-22			7-5-22	106.0	78.3	7-5-22	233.0	109.6	7-5-22	106.0	49.9	7-5-22	0.0	0.0	7-5-22	0.0	0.0 *	7-5-22	75.0	24.4	7-5-22	582.0	239.5

CLEAN HARBORS CANADA, INC.
Liquid Removed from Leak Detection Systems 2022

CELL 1			CELL 2			CELL 3A (3)			CELL 3B (4)			Cell 3C (5)			Cell 3D (6)			Cell 3E (7)			Cell 4		
# of hectares		0.688	# of hectares		1.353	# of hectares		2.125	# of hectares		**2.125**	# of hectares		**2.546**	# of hectares		**2.535**	# of hectares		**3.08**	# of hectares		**2.43**
DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)
7-6-22			7-6-22	62.0	45.8	7-6-22	280.0	131.8	7-6-22	32.0	15.1	7-6-22	0.0	0.0	7-6-22	4.0	1.6	7-6-22	0.0	0.0	7-6-22	0.0	0.0
7-7-22			7-7-22	70.0	51.7	7-7-22	173.0	81.4	7-7-22	62.0	29.2	7-7-22	0.0	0.0	7-7-22	0.0	0.0	7-7-22	0.0	0.0	7-7-22	0.0	0.0
7-8-22			7-8-22	64.0	47.3	7-8-22	138.0	64.9	7-8-22	22.0	10.4	7-8-22	0.0	0.0	7-8-22	0.0	0.0	7-8-22	0.0	0.0	7-8-22	65.0	26.7
7-9-22			7-9-22		0.0	7-9-22		0.0	7-9-22		0.0	7-9-22		0.0	7-9-22		0.0	7-9-22		0.0	7-9-22		0.0
7-10-22			7-10-22		0.0	7-10-22		0.0	7-10-22		0.0	7-10-22		0.0	7-10-22		0.0	7-10-22		0.0	7-10-22		0.0
7-11-22			7-11-22	0.0	0.0	7-11-22	0.0	0.0	7-11-22	0.0	0.0	7-11-22	0.0	0.0	7-11-22	0.0	0.0	7-11-22	54.0	17.5	7-11-22	903.0	371.6
7-12-22			7-12-22	222.0	164.1	7-12-22	464.0	218.4	7-12-22	113.0	53.2	7-12-22	20.0	7.9	7-12-22	0.0	0.0	7-12-22	54.0	17.5	7-12-22	1384.0	569.5
7-13-22			7-13-22	50.0	37.0	7-13-22	88.0	41.4	7-13-22	15.0	7.1	7-13-22	30.0	11.8	7-13-22	0.0	0.0	7-13-22	60.0	19.5	7-13-22	267.0	109.9
7-14-22			7-14-22	56.0	41.4	7-14-22	90.0	42.4	7-14-22	5.0	2.4	7-14-22	10.0	3.9	7-14-22	7.0	2.8	7-14-22	49.0	15.9	7-14-22	100.0	41.2
7-15-22			7-15-22	57.0	42.1	7-15-22	101.0	47.5	7-15-22	20.0	9.4	7-15-22	5.0	2.0	7-15-22	0.0	0.0	7-15-22	45.0	14.6	7-15-22	46.0	18.9
7-16-22			7-16-22		0.0	7-16-22		0.0	7-16-22		0.0	7-16-22		0.0	7-16-22		0.0	7-16-22		0.0	7-16-22		0.0
7-17-22			7-17-22		0.0	7-17-22		0.0	7-17-22		0.0	7-17-22		0.0	7-17-22		0.0	7-17-22		0.0	7-17-22		0.0
7-18-22			7-18-22	180.0	133.0	7-18-22	300.0	141.2	7-18-22	50.0	23.5	7-18-22	15.0	5.9	7-18-22	0.0	0.0	7-18-22	55.0	17.9	7-18-22	301.0	123.9
7-19-22			7-19-22	37.0	27.3	7-19-22	35.0	16.5	7-19-22	0.0	0.0	7-19-22	6.0	2.4	7-19-22	0.0	0.0	7-19-22	40.0	13.0	7-19-22	51.0	21.0
7-20-22			7-20-22	45.0	33.3	7-20-22	75.0	35.3	7-20-22	10.0	4.7	7-20-22	0.0	0.0	7-20-22	0.0	0.0	7-20-22	40.0	13.0	7-20-22	90.0	37.0
7-21-22			7-21-22	36.0	26.6	7-21-22	64.0	30.1	7-21-22	0.0	0.0	7-21-22	3.0	1.2	7-21-22	3.0	1.2	7-21-22	38.0	12.3	7-21-22	10.0	4.1
7-22-22			7-22-22	40.0	29.6	7-22-22	48.0	22.6	7-22-22	0.0	0.0	7-22-22	2.0	0.8	7-22-22	0.0	0.0	7-22-22	36.0	11.7	7-22-22	0.0	0.0
7-23-22			7-23-22		0.0	7-23-22		0.0	7-23-22		0.0	7-23-22		0.0	7-23-22		0.0	7-23-22		0.0	7-23-22		0.0
7-24-22			7-24-22		0.0	7-24-22		0.0	7-24-22		0.0	7-24-22		0.0	7-24-22		0.0	7-24-22		0.0	7-24-22		0.0
7-25-22			7-25-22	70.0	51.7	7-25-22	240.0	112.9	7-25-22	10.0	4.7	7-25-22	0.0	0.0	7-25-22	10.0	3.9	7-25-22	40.0	13.0	7-25-22	303.0	124.7
7-26-22			7-26-22	52.0	38.4	7-26-22	42.0	19.8	7-26-22	0.0	0.0	7-26-22	5.0	2.0	7-26-22	10.0	3.9	7-26-22	30.0	9.7	7-26-22	139.0	57.2
7-27-22			7-27-22	50.0	37.0	7-27-22	82.0	38.6	7-27-22	0.0	0.0	7-27-22	15.0	5.9	7-27-22	0.0	0.0	7-27-22	32.0	10.4	7-27-22	70.0	28.8
7-28-22			7-28-22	65.0	48.0	7-28-22	75.0	35.3	7-28-22	15.0	7.1	7-28-22	0.0	0.0	7-28-22	0.0	0.0	7-28-22	40.0	13.0	7-28-22	50.0	20.6
7-29-22			7-29-22	35.0	25.9	7-29-22	35.0	16.5	7-29-22	0.0	0.0	7-29-22	0.0	0.0	7-29-22	0.0	0.0	7-29-22	15.0	4.9	7-29-22	0.0	0.0
7-30-22			7-30-22		0.0	7-30-22		0.0	7-30-22		0.0	7-30-22		0.0	7-30-22		0.0	7-30-22		0.0	7-30-22		0.0
7-31-22			7-31-22		0.0	7-31-22		0.0	7-31-22		0.0	7-31-22		0.0	7-31-22		0.0	7-31-22		0.0	7-31-22		0.0
8-1-22			8-1-22		0.0	8-1-22		0.0	8-1-22		0.0	8-1-22		0.0	8-1-22		0.0	8-1-22		0.0	8-1-22		0.0
8-2-22			8-2-22	67.0	49.5	8-2-22	194.0	91.3	8-2-22	6.0	2.8	8-2-22	0.0	0.0	8-2-22	0.0	0.0	8-2-22	12.0	3.9	8-2-22	4.0	1.6
8-3-22			8-3-22	55.0	40.7	8-3-22	170.0	80.0	8-3-22	15.0	7.1	8-3-22	20.0	7.9	8-3-22	0.0	0.0	8-3-22	24.0	7.8	8-3-22	750.0	308.6
8-4-22			8-4-22	32.0	23.7	8-4-22	43.0	20.2	8-4-22	0.0	0.0	8-4-22	0.0	0.0	8-4-22	0.0	0.0	8-4-22	24.0	7.8	8-4-22	110.0	45.3
8-5-22			8-5-22	28.0	20.7	8-5-22	24.0	11.3	8-5-22	0.0	0.0	8-5-22	0.0	0.0	8-5-22	0.0	0.0	8-5-22	25.0	8.1	8-5-22	68.0	28.0
8-6-22			8-6-22		0.0	8-6-22		0.0	8-6-22		0.0	8-6-22		0.0	8-6-22		0.0	8-6-22		0.0	8-6-22		0.0
8-7-22			8-7-22		0.0	8-7-22		0.0	8-7-22		0.0	8-7-22		0.0	8-7-22		0.0	8-7-22		0.0	8-7-22		0.0
8-8-22			8-8-22	50.0	37.0	8-8-22	22.0	10.4	8-8-22	10.0	4.7	8-8-22	0.0	0.0	8-8-22	0.0	0.0	8-8-22	35.0	11.4	8-8-22	583.0	239.9
8-9-22			8-9-22	39.0	28.8	8-9-22	6.0	2.8	8-9-22	0.0	0.0	8-9-22	0.0	0.0	8-9-22	0.0	0.0	8-9-22	25.0	8.1	8-9-22	52.0	21.4
8-10-22	1000.0		8-10-22	40.0	29.6	8-10-22	0.0	0.0 **	8-10-22	10.0	4.7	8-10-22	0.0	0.0	8-10-22	0.0	0.0	8-10-22	27.0	8.8	8-10-22	110.0	45.3
8-11-22			8-11-22	70.0	51.7	8-11-22	0.0	0.0 **	8-11-22	0.0	0.0	8-11-22	5.0	2.0	8-11-22	0.0	0.0	8-11-22	25.0	8.1	8-11-22	0.0	0.0
8-12-22			8-12-22	25.0	18.5	8-12-22	0.0	0.0 **	8-12-22	0.0	0.0	8-12-22	0.0	0.0	8-12-22	10.0	3.9	8-12-22	25.0	8.1	8-12-22	0.0	0.0
8-13-22			8-13-22		0.0	8-13-22		0.0	8-13-22		0.0	8-13-22		0.0	8-13-22		0.0	8-13-22		0.0	8-13-22		0.0
8-14-22			8-14-22		0.0	8-14-22		0.0	8-14-22		0.0	8-14-22		0.0	8-14-22		0.0	8-14-22		0.0	8-14-22		0.0
8-15-22			8-15-22	42.0	31.0	8-15-22	0.0	0.0 **	8-15-22	15.0	7.1	8-15-22	0.0	0.0	8-15-22	0.0	0.0	8-15-22	26.0	8.4	8-15-22	650.0	267.5
8-16-22			8-16-22	34.0	25.1	8-16-22	439.0	206.6	8-16-22	0.0	0.0	8-16-22	0.0	0.0	8-16-22	0.0	0.0	8-16-22	23.0	7.5	8-16-22	0.0	0.0
8-17-22			8-17-22	33.0	24.4	8-17-22	46.0	21.6	8-17-22	0.0	0.0	8-17-22	0.0	0.0	8-17-22	0.0	0.0	8-17-22	24.0	7.8	8-17-22	81.0	33.3
8-18-22			8-18-22	23.0	17.0	8-18-22	0.0	0.0 **	8-18-22	0.0	0.0	8-18-22	0.0	0.0	8-18-22	0.0	0.0	8-18-22	22.0	7.1	8-18-22	0.0	0.0
8-19-22			8-19-22	35.0	25.9	8-19-22	0.0	0.0 **	8-19-22	0.0	0.0	8-19-22	0.0	0.0	8-19-22	0.0	0.0	8-19-22	23.0	7.5	8-19-22	0.0	0.0
8-20-22			8-20-22		0.0	8-20-22		0.0	8-20-22		0.0	8-20-22		0.0	8-20-22		0.0	8-20-22		0.0	8-20-22		0.0
8-21-22			8-21-22		0.0	8-21-22		0.0	8-21-22		0.0	8-21-22		0.0	8-21-22		0.0	8-21-22		0.0	8-21-22		0.0
8-22-22			8-22-22	50.0	37.0	8-22-22	0.0	0.0 **	8-22-22	0.0	0.0	8-22-22	0.0	0.0	8-22-22	0.0	0.0	8-22-22	53.0	17.2	8-22-22	431.0	177.4
8-23-22			8-23-22	31.0	22.9	8-23-22	0.0	0.0 **	8-23-22	0.0	0.0	8-23-22	0.0	0.0	8-23-22	0.0	0.0	8-23-22	35.0	11.4	8-23-22	155.0	63.8
8-24-22			8-24-22	30.0	22.2	8-24-22	144.0	67.8	8-24-22	0.0	0.0	8-24-22	0.0	0.0	8-24-22	0.0	0.0	8-24-22	18.0	5.8	8-24-22	0.0	0.0
8-25-22			8-25-22	35.0	25.9	8-25-22	25.0	11.8	8-25-22	15.0	7.1	8-25-22	0.0	0.0	8-25-22	0.0	0.0	8-25-22	33.0	10.7	8-25-22	140.0	57.6
8-26-22			8-26-22	5.0	3.7	8-26-22	25.0	11.8	8-26-22	0.0	0.0	8-26-22	10.0	3.9	8-26-22	0.0	0.0	8-26-22	20.0	6.5	8-26-22	0.0	0.0
8-27-22			8-27-22		0.0	8-27-22		0.0	8-27-22		0.0	8-27-22		0.0	8-27-22		0.0	8-27-22		0.0	8-27-22		0.0
8-28-22			8-28-22		0.0	8-28-22		0.0	8-28-22		0.0	8-28-22		0.0	8-28-22		0.0	8-28-22		0.0	8-28-22		0.0
8-29-22			8-29-22	40.0	29.6	8-29-22	64.0	30.1	8-29-22	230.0	108.2	8-29-22	0.0	0.0	8-29-22	0.0	0.0	8-29-22	30.0	9.7	8-29-22	342.0	140.7
8-30-22			8-30-22	5.0	3.7	8-30-22	30.0	14.1	8-30-22	5.0	2.4	8-30-22	0.0	0.0	8-30-22	0.0	0.0	8-30-22	15.0	4.9	8-30-22	0.0	0.0
8-31-22			8-31-22	8.0	5.9	8-31-22	24.0	11.3	8-31-22	45.0	21.2	8-31-22	0.0	0.0	8-31-22	0.0	0.0	8-31-22	12.0	3.9	8-31-22	148.0	60.9
9-1-22			9-1-22	3.0	2.2	9-1-22	25.0	11.8	9-1-22	10.0	4.7	9-1-22	0.0	0.0	9-1-22	0.0	0.0	9-1-22	10.0	3.2	9-1-22	0.0	0.0
9-2-22			9-2-22	11.0	8.1	9-2-22	19.0	8.9	9-2-22	0.0	0.0	9-2-22	0.0	0.0	9-2-22	0.0	0.0	9-2-22	10.0	3.2	9-2-22	93.0	38.3
9-3-22			9-3-22		0.0	9-3-22		0.0	9-3-22		0.0	9-3-22		0.0	9-3-22		0.0	9-3-22		0.0	9-3-22		0.0
9-4-22			9-4-22		0.0	9-4-22		0.0	9-4-22		0.0	9-4-22		0.0	9-4-22		0.0	9-4-22		0.0	9-4-22		0.0
9-5-22			9-5-22		0.0	9-5-22		0.0	9-5-22		0.0	9-5-22		0.0	9-5-22		0.0	9-5-22		0.0	9-5-22		0.0

CLEAN HARBORS CANADA, INC.
Liquid Removed from Leak Detection Systems 2022

CELL 1			CELL 2			CELL 3A (3)			CELL 3B (4)			Cell 3C (5)			Cell 3D (6)			Cell 3E (7)			Cell 4		
# of hectares		0.688	# of hectares		1.353	# of hectares		2.125	# of hectares		**2.125**	# of hectares		**2.546**	# of hectares		**2.535**	# of hectares		**3.08**	# of hectares		**2.43**
DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)
9-6-22			9-6-22	35.0	25.9	9-6-22	85.0	40.0	9-6-22	25.0	11.8	9-6-22	0.0	0.0	9-6-22	15.0	5.9	9-6-22	40.0	13.0	9-6-22	557.0	229.2
9-7-22	625.0		9-7-22	20.0	14.8	9-7-22	30.0	14.1	9-7-22	10.0	4.7	9-7-22	20.0	7.9	9-7-22	0.0	0.0	9-7-22	5.0	1.6	9-7-22	127.0	52.3
9-8-22			9-8-22	14.0	10.3	9-8-22	20.0	9.4	9-8-22	6.0	2.8	9-8-22	0.0	0.0	9-8-22	0.0	0.0	9-8-22	5.0	1.6	9-8-22	47.0	19.3
9-9-22			9-9-22	12.0	8.9	9-9-22	18.0	8.5	9-9-22	11.0	5.2	9-9-22	0.0	0.0	9-9-22	0.0	0.0	9-9-22	6.0	1.9	9-9-22	68.0	28.0
9-10-22			9-10-22		0.0	9-10-22		0.0	9-10-22		0.0	9-10-22		0.0	9-10-22		0.0	9-10-22		0.0	9-10-22		0.0
9-11-22			9-11-22		0.0	9-11-22		0.0	9-11-22		0.0	9-11-22		0.0	9-11-22		0.0	9-11-22		0.0	9-11-22		0.0
9-12-22			9-12-22	34.0	25.1	9-12-22	59.0	27.8	9-12-22	0.0	0.0	9-12-22	0.0	0.0	9-12-22	0.0	0.0	9-12-22	7.0	2.3	9-12-22	211.0	86.8
9-13-22			9-13-22	18.0	13.3	9-13-22	20.0	9.4	9-13-22	1.0	0.5	9-13-22	0.0	0.0	9-13-22	0.0	0.0	9-13-22	7.0	2.3	9-13-22	142.0	58.4
9-14-22			9-14-22	15.0	11.1	9-14-22	0.0	0.0	9-14-22	10.0	4.7	9-14-22	20.0	7.9	9-14-22	0.0	0.0	9-14-22	10.0	3.2	9-14-22	133.0	54.7
9-15-22			9-15-22	18.0	13.3	9-15-22	0.0	0.0	9-15-22	0.0	0.0	9-15-22	0.0	0.0	9-15-22	0.0	0.0	9-15-22	15.0	4.9	9-15-22	141.0	58.0
9-16-22			9-16-22	5.0	3.7	9-16-22	53.0	24.9	9-16-22	0.0	0.0	9-16-22	0.0	0.0	9-16-22	0.0	0.0	9-16-22	8.0	2.6	9-16-22	99.0	40.7
9-17-22			9-17-22		0.0	9-17-22		0.0	9-17-22		0.0	9-17-22		0.0	9-17-22		0.0	9-17-22		0.0	9-17-22		0.0
9-18-22			9-18-22		0.0	9-18-22		0.0	9-18-22		0.0	9-18-22		0.0	9-18-22		0.0	9-18-22		0.0	9-18-22		0.0
9-19-22			9-19-22	29.0	21.4	9-19-22	50.0	23.5	9-19-22	4.0	1.9	9-19-22	0.0	0.0	9-19-22	0.0	0.0	9-19-22	6.0	1.9	9-19-22	69.0	28.4
9-20-22			9-20-22	2.0	1.5	9-20-22	17.0	8.0	9-20-22	0.0	0.0	9-20-22	0.0	0.0	9-20-22	0.0	0.0	9-20-22	7.0	2.3	9-20-22	64.0	26.3
9-21-22			9-21-22	4.0	3.0	9-21-22	20.0	9.4	9-21-22	0.0	0.0	9-21-22	0.0	0.0	9-21-22	0.0	0.0	9-21-22	9.0	2.9	9-21-22	125.0	51.4
9-22-22			9-22-22	0.0	0.0	9-22-22	18.0	8.5	9-22-22	0.0	0.0	9-22-22	0.0	0.0	9-22-22	0.0	0.0	9-22-22	6.0	1.9	9-22-22	57.0	23.5
9-23-22			9-23-22	1.0	0.7	9-23-22	20.0	9.4	9-23-22	0.0	0.0	9-23-22	0.0	0.0	9-23-22	0.0	0.0	9-23-22	6.0	1.9	9-23-22	16.0	6.6
9-24-22			9-24-22		0.0	9-24-22		0.0	9-24-22		0.0	9-24-22		0.0	9-24-22		0.0	9-24-22		0.0	9-24-22		0.0
9-25-22			9-25-22		0.0	9-25-22		0.0	9-25-22		0.0	9-25-22		0.0	9-25-22		0.0	9-25-22		0.0	9-25-22		0.0
9-26-22			9-26-22	24.0	17.7	9-26-22	48.0	22.6	9-26-22	0.0	0.0	9-26-22	0.0	0.0	9-26-22	0.0	0.0	9-26-22	7.0	2.3	9-26-22	109.0	44.9
9-27-22			9-27-22	6.0	4.4	9-27-22	16.0	7.5	9-27-22	0.0	0.0	9-27-22	0.0	0.0	9-27-22	0.0	0.0	9-27-22	7.0	2.3	9-27-22	21.0	8.6
9-28-22			9-28-22	0.0	0.0	9-28-22	14.0	6.6	9-28-22	0.0	0.0	9-28-22	0.0	0.0	9-28-22	0.0	0.0	9-28-22	6.0	1.9	9-28-22	1.0	0.4
9-29-22			9-29-22	5.0	3.7	9-29-22	16.0	7.5	9-29-22	0.0	0.0	9-29-22	0.0	0.0	9-29-22	0.0	0.0	9-29-22	7.0	2.3	9-29-22	0.0	0.0
9-30-22			9-30-22		0.0	9-30-22		0.0	9-30-22		0.0	9-30-22		0.0	9-30-22		0.0	9-30-22		0.0	9-30-22		0.0
10-1-22			10-1-22		0.0	10-1-22		0.0	10-1-22		0.0	10-1-22		0.0	10-1-22		0.0	10-1-22		0.0	10-1-22		0.0
10-2-22			10-2-22		0.0	10-2-22		0.0	10-2-22		0.0	10-2-22		0.0	10-2-22		0.0	10-2-22		0.0	10-2-22		0.0
10-3-22			10-3-22	36.0	26.6	10-3-22	68.0	32.0	10-3-22	0.0	0.0	10-3-22	0.0	0.0	10-3-22	0.0	0.0	10-3-22	7.0	2.3	10-3-22	262.0	107.8
10-4-22			10-4-22	13.0	9.6	10-4-22	17.0	8.0	10-4-22	1.0	0.5	10-4-22	0.0	0.0	10-4-22	1.0	0.4	10-4-22	7.0	2.3	10-4-22	68.0	28.0
10-5-22			10-5-22	4.0	3.0	10-5-22	15.0	7.1	10-5-22	10.0	4.7	10-5-22	0.0	0.0	10-5-22	0.0	0.0	10-5-22	8.0	2.6	10-5-22	0.0	0.0
10-6-22			10-6-22	4.0	3.0	10-6-22	16.0	7.5	10-6-22	0.0	0.0	10-6-22	0.0	0.0	10-6-22	0.0	0.0	10-6-22	7.0	2.3	10-6-22	82.0	33.7
10-7-22			10-7-22	4.0	3.0	10-7-22	22.0	10.4	10-7-22	0.0	0.0	10-7-22	0.0	0.0	10-7-22	0.0	0.0	10-7-22	11.0	3.6	10-7-22	0.0	0.0
10-8-22			10-8-22		0.0	10-8-22		0.0	10-8-22		0.0	10-8-22		0.0	10-8-22		0.0	10-8-22		0.0	10-8-22		0.0
10-9-22			10-9-22		0.0	10-9-22		0.0	10-9-22		0.0	10-9-22		0.0	10-9-22		0.0	10-9-22		0.0	10-9-22		0.0
10-10-22			10-10-22		0.0	10-10-22		0.0	10-10-22		0.0	10-10-22		0.0	10-10-22		0.0	10-10-22		0.0	10-10-22		0.0
10-11-22			10-11-22	38.0	28.1	10-11-22	66.0	31.1	10-11-22	10.0	4.7	10-11-22	25.0	9.8	10-11-22	0.0	0.0	10-11-22	35.0	11.4	10-11-22	455.0	187.2
10-12-22			10-12-22	15.0	11.1	10-12-22	22.0	10.4	10-12-22	10.0	4.7	10-12-22	0.0	0.0	10-12-22	0.0	0.0	10-12-22	20.0	6.5	10-12-22	0.0	0.0
10-13-22			10-13-22	8.0	5.9	10-13-22	15.0	7.1	10-13-22	0.0	0.0	10-13-22	0.0	0.0	10-13-22	40.0	15.8	10-13-22	5.0	1.6	10-13-22	58.0	23.9
10-14-22			10-14-22	10.0	7.4	10-14-22	13.0	6.1	10-14-22	2.0	0.9	10-14-22	0.0	0.0	10-14-22	0.0	0.0	10-14-22	5.0	1.6	10-14-22	71.0	29.2
10-15-22			10-15-22		0.0	10-15-22		0.0	10-15-22		0.0	10-15-22		0.0	10-15-22		0.0	10-15-22		0.0	10-15-22		0.0
10-16-22			10-16-22		0.0	10-16-22		0.0	10-16-22		0.0	10-16-22		0.0	10-16-22		0.0	10-16-22		0.0	10-16-22		0.0
10-17-22			10-17-22	25.0	18.5	10-17-22	46.0	21.6	10-17-22	4.0	1.9	10-17-22	0.0	0.0	10-17-22	0.0	0.0	10-17-22	6.0	1.9	10-17-22	102.0	42.0
10-18-22			10-18-22	15.0	11.1	10-18-22	25.0	11.8	10-18-22	2.0	0.9	10-18-22	3.0	1.2	10-18-22	0.0	0.0	10-18-22	6.0	1.9	10-18-22	0.0	0.0
10-19-22			10-19-22	5.0	3.7	10-19-22	25.0	11.8	10-19-22	0.0	0.0	10-19-22	0.0	0.0	10-19-22	0.0	0.0	10-19-22	5.0	1.6	10-19-22	101.0	41.6
10-20-22			10-20-22	3.0	2.2	10-20-22	18.0	8.5	10-20-22	5.0	2.4	10-20-22	7.0	2.7	10-20-22	0.0	0.0	10-20-22	4.0	1.3	10-20-22	72.0	29.6
10-21-22			10-21-22	0.0	0.0 *	10-21-22	0.0	0.0 **	10-21-22	2.0	0.9	10-21-22	5.0	2.0	10-21-22	0.0	0.0	10-21-22	4.0	1.3	10-21-22	0.0	0.0
10-22-22			10-22-22		0.0	10-22-22		0.0	10-22-22		0.0	10-22-22		0.0	10-22-22		0.0	10-22-22		0.0	10-22-22		0.0
10-23-22			10-23-22		0.0	10-23-22		0.0	10-23-22		0.0	10-23-22		0.0	10-23-22		0.0	10-23-22		0.0	10-23-22		0.0
10-24-22			10-24-22	28.0	20.7	10-24-22	0.0	0.0 **	10-24-22	30.0	14.1	10-24-22	20.0	7.9	10-24-22	0.0	0.0	10-24-22	5.0	1.6	10-24-22	164.0	67.5
10-25-22			10-25-22	6.0	4.4	10-25-22	0.0	0.0 **	10-25-22	0.0	0.0	10-25-22	0.0	0.0	10-25-22	0.0	0.0	10-25-22	5.0	1.6	10-25-22	0.0	0.0
10-26-22			10-26-22	18.0	13.3	10-26-22	0.0	0.0 **	10-26-22	4.0	1.9	10-26-22	15.0	5.9	10-26-22	0.0	0.0	10-26-22	7.0	2.3	10-26-22	69.0	28.4
10-27-22			10-27-22	10.0	7.4	10-27-22	0.0	0.0 **	10-27-22	0.0	0.0	10-27-22	3.0	1.2	10-27-22	0.0	0.0	10-27-22	5.0	1.6	10-27-22	22.0	9.1
10-28-22			10-28-22	3.0	2.2	10-28-22	0.0	0.0 **	10-28-22	0.0	0.0	10-28-22	0.0	0.0	10-28-22	0.0	0.0	10-28-22	3.0	1.0	10-28-22	0.0	0.0
10-29-22			10-29-22		0.0	10-29-22		0.0	10-29-22		0.0	10-29-22		0.0	10-29-22		0.0	10-29-22		0.0	10-29-22		0.0
10-30-22			10-30-22		0.0	10-30-22		0.0	10-30-22		0.0	10-30-22		0.0	10-30-22		0.0	10-30-22		0.0	10-30-22		0.0
10-31-22			10-31-22	22.0	16.3	10-31-22	0.0	0.0 **	10-31-22	10.0	4.7	10-31-22	0.0	0.0	10-31-22	0.0	0.0	10-31-22	4.0	1.3	10-31-22	335.0	137.9
11-1-22			11-1-22	3.0	2.2	11-1-22	0.0	0.0 **	11-1-22	3.0	1.4	11-1-22	0.0	0.0	11-1-22	0.0	0.0	11-1-22	3.0	1.0	11-1-22	106.0	43.6
11-2-22			11-2-22	1.0	0.7	11-2-22	0.0	0.0 **	11-2-22	3.0	1.4	11-2-22	0.0	0.0	11-2-22	0.0	0.0	11-2-22	6.0	1.9	11-2-22	74.0	30.5
11-3-22			11-3-22	1.0	0.7	11-3-22	0.0	0.0 **	11-3-22	3.0	1.4	11-3-22	0.0	0.0	11-3-22	0.0	0.0	11-3-22	1.0	0.3	11-3-22	0.0	0.0
11-4-22			11-4-22	1.0	0.7	11-4-22	0.0	0.0 **	11-4-22	0.0	0.0	11-4-22	3.0	1.2	11-4-22	0.0	0.0	11-4-22	1.0	0.3	11-4-22	0.0	0.0
11-5-22			11-5-22		0.0	11-5-22		0.0	11-5-22		0.0	11-5-22		0.0	11-5-22		0.0	11-5-22		0.0	11-5-22		0.0
11-6-22			11-6-22		0.0	11-6-22		0.0	11-6-22		0.0	11-6-22		0.0	11-6-22		0.0	11-6-22		0.0	11-6-22		0.0

CLEAN HARBORS CANADA, INC.
Liquid Removed from Leak Detection Systems 2022

CELL 1			CELL 2			CELL 3A (3)				CELL 3B (4)			Cell 3C (5)			Cell 3D (6)			Cell 3E (7)			Cell 4		
# of hectares		0.688	# of hectares		1.353	# of hectares		2.125		# of hectares		**2.125**	# of hectares		**2.546**	# of hectares		**2.535**	# of hectares		**3.08**	# of hectares		**2.43**
DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)		DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)	DATE	VOLUME (litres)	Volume (litres/Ha/ day)
11-7-22			11-7-22	18.0	13.3	11-7-22	0.0	0.0	**	11-7-22	0.0	0.0	11-7-22	0.0	0.0	11-7-22	0.0	0.0	11-7-22	3.0	1.0	11-7-22	272.0	111.9
11-8-22			11-8-22	3.0	2.2	11-8-22	0.0	0.0	**	11-8-22	0.0	0.0	11-8-22	0.0	0.0	11-8-22	0.0	0.0	11-8-22	0.0	0.0	11-8-22	5.0	2.1
11-9-22			11-9-22	5.0	3.7	11-9-22	0.0	0.0	**	11-9-22	0.0	0.0	11-9-22	0.0	0.0	11-9-22	0.0	0.0	11-9-22	0.0	0.0	11-9-22	0.0	0.0
11-10-22			11-10-22	5.0	3.7	11-10-22	0.0	0.0	**	11-10-22	2.0	0.9	11-10-22	0.0	0.0	11-10-22	0.0	0.0	11-10-22	5.0	1.6	11-10-22	0.0	0.0
11-11-22			11-11-22		0.0	11-11-22		0.0		11-11-22		0.0	11-11-22		0.0	11-11-22		0.0	11-11-22		0.0	11-11-22		0.0
11-12-22			11-12-22		0.0	11-12-22		0.0		11-12-22		0.0	11-12-22		0.0	11-12-22		0.0	11-12-22		0.0	11-12-22		0.0
11-13-22			11-13-22		0.0	11-13-22		0.0		11-13-22		0.0	11-13-22		0.0	11-13-22		0.0	11-13-22		0.0	11-13-22		0.0
11-14-22			11-14-22	25.0	18.5	11-14-22	0.0	0.0	**	11-14-22	0.0	0.0	11-14-22	0.0	0.0	11-14-22	0.0	0.0	11-14-22	4.0	1.3	11-14-22	402.0	165.4
11-15-22			11-15-22	8.0	5.9	11-15-22	0.0	0.0	**	11-15-22	0.0	0.0	11-15-22	0.0	0.0	11-15-22	0.0	0.0	11-15-22	5.0	1.6	11-15-22	0.0	0.0
11-16-22			11-16-22	4.0	3.0	11-16-22	0.0	0.0	**	11-16-22	0.0	0.0	11-16-22	0.0	0.0	11-16-22	3.0	1.2	11-16-22	8.0	2.6	11-16-22	3.0	1.2
11-17-22			11-17-22	5.0	3.7	11-17-22	0.0	0.0	**	11-17-22	0.0	0.0	11-17-22	0.0	0.0	11-17-22	0.0	0.0	11-17-22	6.0	1.9	11-17-22	102.0	42.0
11-18-22			11-18-22	2.0	1.5	11-18-22	0.0	0.0	**	11-18-22	0.0	0.0	11-18-22	0.0	0.0	11-18-22	0.0	0.0	11-18-22	5.0	1.6	11-18-22	90.0	37.0
11-19-22			11-19-22		0.0	11-19-22		0.0		11-19-22		0.0	11-19-22		0.0	11-19-22		0.0	11-19-22		0.0	11-19-22		0.0
11-20-22			11-20-22		0.0	11-20-22		0.0		11-20-22		0.0	11-20-22		0.0	11-20-22		0.0	11-20-22		0.0	11-20-22		0.0
11-21-22			11-21-22	20.0	14.8	11-21-22	0.0	0.0	**	11-21-22	0.0	0.0	11-21-22	5.0	2.0	11-21-22	0.0	0.0	11-21-22	4.0	1.3	11-21-22	481.0	197.9
11-22-22			11-22-22	1.0	0.7	11-22-22	0.0	0.0	**	11-22-22	0.0	0.0	11-22-22	12.0	4.7	11-22-22	0.0	0.0	11-22-22	3.0	1.0	11-22-22	8.0	3.3
11-23-22			11-23-22	2.0	1.5	11-23-22	0.0	0.0	**	11-23-22	0.0	0.0	11-23-22	0.0	0.0	11-23-22	2.0	0.8	11-23-22	3.0	1.0	11-23-22	68.0	28.0
11-24-22			11-24-22	0.0	0.0	11-24-22	0.0	0.0	**	11-24-22	1.0	0.5	11-24-22	0.0	0.0	11-24-22	0.0	0.0	11-24-22	2.0	0.6	11-24-22	5.0	2.1
11-25-22			11-25-22	3.0	2.2	11-25-22	0.0	0.0	**	11-25-22	4.0	1.9	11-25-22	3.0	1.2	11-25-22	3.0	1.2	11-25-22	2.0	0.6	11-25-22	6.0	2.5
11-26-22			11-26-22		0.0	11-26-22		0.0		11-26-22		0.0	11-26-22		0.0	11-26-22		0.0	11-26-22		0.0	11-26-22		0.0
11-27-22			11-27-22		0.0	11-27-22		0.0		11-27-22		0.0	11-27-22		0.0	11-27-22		0.0	11-27-22		0.0	11-27-22		0.0
11-28-22			11-28-22	7.0	5.2	11-28-22	0.0	0.0	**	11-28-22	0.0	0.0	11-28-22	0.0	0.0	11-28-22	0.0	0.0	11-28-22	3.0	1.0	11-28-22	185.0	76.1
11-29-22			11-29-22	2.0	1.5	11-29-22	0.0	0.0	**	11-29-22	11.0	5.2	11-29-22	0.0	0.0	11-29-22	1.0	0.4	11-29-22	2.0	0.6	11-29-22	50.0	20.6
11-30-22			11-30-22	2.0	1.5	11-30-22	0.0	0.0	**	11-30-22	0.0	0.0	11-30-22	0.0	0.0	11-30-22	2.0	0.8	11-30-22	3.0	1.0	11-30-22	106.0	43.6
12-1-22			12-1-22	3.0	2.2	12-1-22	0.0	0.0	**	12-1-22	0.0	0.0	12-1-22	0.0	0.0	12-1-22	0.0	0.0	12-1-22	5.0	1.6	12-1-22	0.0	0.0
12-2-22			12-2-22	1.0	0.7	12-2-22	15.0	7.1	**	12-2-22	0.0	0.0	12-2-22	0.0	0.0	12-2-22	0.0	0.0	12-2-22	0.0	0.0	*	12-2-22	5.0	2.1
12-3-22			12-3-22		0.0	12-3-22		0.0		12-3-22		0.0	12-3-22		0.0	12-3-22		0.0	12-3-22		0.0	12-3-22		0.0
12-4-22			12-4-22		0.0	12-4-22		0.0		12-4-22		0.0	12-4-22		0.0	12-4-22		0.0	12-4-22		0.0	12-4-22		0.0
12-5-22			12-5-22	15.0	11.1	12-5-22	0.0	0.0	**	12-5-22	15.0	7.1	12-5-22	15.0	5.9	12-5-22	15.0	5.9	12-5-22	0.0	0.0	*	12-5-22	0.0	0.0
12-6-22	900.0		12-6-22	0.0	0.0	12-6-22	0.0	0.0	**	12-6-22	0.0	0.0	12-6-22	0.0	0.0	12-6-22	0.0	0.0	12-6-22	0.0	0.0	*	12-6-22	0.0	0.0
12-7-22			12-7-22	4.0	3.0	12-7-22	0.0	0.0	**	12-7-22	0.0	0.0	12-7-22	4.0	1.6	12-7-22	0.0	0.0	12-7-22	0.0	0.0	*	12-7-22	0.0	0.0
12-8-22			12-8-22	1.0	0.7	12-8-22	0.0	0.0	**	12-8-22	0.0	0.0	12-8-22	1.0	0.4	12-8-22	0.0	0.0	12-8-22	0.0	0.0	*	12-8-22	8.0	3.3
12-9-22			12-9-22	2.0	1.5	12-9-22	0.0	0.0	**	12-9-22	0.0	0.0	12-9-22	13.0	5.1	12-9-22	0.0	0.0	12-9-22	0.0	0.0	***	12-9-22	0.0	0.0
12-10-22			12-10-22		0.0	12-10-22		0.0		12-10-22		0.0	12-10-22		0.0	12-10-22		0.0	12-10-22		0.0	12-10-22		0.0
12-11-22			12-11-22		0.0	12-11-22		0.0		12-11-22		0.0	12-11-22		0.0	12-11-22		0.0	12-11-22		0.0	12-11-22		0.0
12-12-22			12-12-22	6.0	4.4	12-12-22	0.0	0.0	**	12-12-22	0.0	0.0	12-12-22	0.0	0.0	12-12-22	1.0	0.4	12-12-22	15.0	4.9	12-12-22	80.0	32.9
12-13-22			12-13-22	0.0	0.0	12-13-22	0.0	0.0	**	12-13-22	0.0	0.0	12-13-22	0.0	0.0	12-13-22	0.0	0.0	12-13-22	0.0	0.0	12-13-22	0.0	0.0
12-14-22			12-14-22	2.0	1.5	12-14-22	0.0	0.0	**	12-14-22	0.0	0.0	12-14-22	0.0	0.0	12-14-22	2.0	0.8	12-14-22	0.0	0.0	12-14-22	0.0	0.0
12-15-22			12-15-22	1.0	0.7	12-15-22	0.0	0.0	**	12-15-22	0.0	0.0	12-15-22	0.0	0.0	12-15-22	2.0	0.8	12-15-22	0.0	0.0	12-15-22	106.0	43.6
12-16-22			12-16-22	1.0	0.7	12-16-22	0.0	0.0	**	12-16-22	3.0	1.4	12-16-22	2.0	0.8	12-16-22	3.0	1.2	12-16-22	0.0	0.0	12-16-22	37.0	15.2
12-17-22			12-17-22		0.0	12-17-22		0.0		12-17-22		0.0	12-17-22		0.0	12-17-22		0.0	12-17-22		0.0	12-17-22		0.0
12-18-22			12-18-22		0.0	12-18-22		0.0		12-18-22		0.0	12-18-22		0.0	12-18-22		0.0	12-18-22		0.0	12-18-22		0.0
12-19-22			12-19-22	1.0	0.7	12-19-22	0.0	0.0	**	12-19-22	1.0	0.5	12-19-22	0.0	0.0	12-19-22	0.0	0.0	12-19-22	0.0	0.0	12-19-22	69.0	28.4
12-20-22			12-20-22	0.0	0.0	12-20-22	0.0	0.0	**	12-20-22	0.0	0.0	12-20-22	0.0	0.0	12-20-22	0.0	0.0	12-20-22	0.0	0.0	12-20-22	0.0	0.0
12-21-22			12-21-22	3.0	2.2	12-21-22	0.0	0.0	**	12-21-22	1.0	0.5	12-21-22	0.0	0.0	12-21-22	0.0	0.0	12-21-22	0.0	0.0	12-21-22	0.0	0.0
12-22-22			12-22-22	4.0	3.0	12-22-22	0.0	0.0	**	12-22-22	2.0	0.9	12-22-22	0.0	0.0	12-22-22	0.0	0.0	12-22-22	0.0	0.0	12-22-22	0.0	0.0
12-23-22			12-23-22	0.0	0.0	12-23-22	0.0	0.0	**	12-23-22	0.0	0.0	12-23-22	0.0	0.0	12-23-22	0.0	0.0	12-23-22	7.0	2.3	12-23-22	1.0	0.4
12-24-22			12-24-22		0.0	12-24-22		0.0		12-24-22		0.0	12-24-22		0.0	12-24-22		0.0	12-24-22		0.0	12-24-22		0.0
12-25-22			12-25-22		0.0	12-25-22		0.0		12-25-22		0.0	12-25-22		0.0	12-25-22		0.0	12-25-22		0.0	12-25-22		0.0
12-26-22			12-26-22		0.0	12-26-22		0.0		12-26-22		0.0	12-26-22		0.0	12-26-22		0.0	12-26-22		0.0	12-26-22		0.0
12-27-22			12-27-22	2.0	1.5	12-27-22	0.0	0.0	**	12-27-22	0.0	0.0	12-27-22	42.0	16.5	12-27-22	1.0	0.4	12-27-22	0.0	0.0	12-27-22	0.0	0.0
12-28-22			12-28-22	4.0	3.0	12-28-22	0.0	0.0	**	12-28-22	2.0	0.9	12-28-22	5.0	2.0	12-28-22	2.0	0.8	12-28-22	0.0	0.0	12-28-22	5.0	2.1
12-29-22			12-29-22	3.0	2.2	12-29-22	0.0	0.0	**	12-29-22	3.0	1.4	12-29-22	2.0	0.8	12-29-22	4.0	1.6	12-29-22	0.0	0.0	12-29-22	2.0	0.8
12-30-22			12-30-22	2.0	1.5	12-30-22	0.0	0.0	**	12-30-22	0.0	0.0	12-30-22	2.0	0.8	12-30-22	1.0	0.4	12-30-22	0.0	0.0	12-30-22	26.0	10.7
12-31-22			12-31-22		0.0	12-31-22		0.0		12-31-22		0.0	12-31-22		0.0	12-31-22		0.0	12-31-22		0.0	12-31-22		0.0
	6725.0			**11400.0**			**6395.0**				**8236**			**1227**			**500.0**			**6946.0**			**31648.0**	

*** denotes system down for repair**

**** denotes line problems and pump problems**

***** denotes pump replaced**

****** denotes piping problem**

APPENDIX H

Third-party Compliance Audit Report

CLEAN HARBORS CANADA INC

2021 Compliance Audit Summary Report – Ryley Hazardous Waste Storage Facility and Landfill, Ryley, Alberta

Alberta Environment and Parks Approval Number 10348-03-00

December 2021 | 21-2502

December 17, 2021

Clean Harbors Canada, Inc.
P.O. Box 390
Ryley, Alberta
T0B 4AO

Attention: Mr. Stan Yuha
Facility Manager

2021 Compliance Audit Summary Report – Ryley Hazardous Waste Storage Facility and Land***fi***ll

Dear Mr. Yuha:

Dillon Consulting Limited is pleased to submit the enclosed Final 2021 Compliance Audit Summary Report for the Ryley Facility (Facility or Site) to Clean Harbors Canada, Inc. This report describes the methodological approach used and highlights key findings resulting from the 2021 Triennial Compliance Audit completed at the Facility through a site visit conducted over September 1 to 2, 2021.

We hope you see this as a valuable tool to gain insight into current operations and Approval requirements, and discover the findings and recommendations described herein useful in informing continued operations at the Facility.

Sincerely,

DILLON CONSULTING LIMITED

Jack Wallace, P. Eng.
Lead Auditor

END:sls

cc: Mr. Mike Parker

Our file: 21-2502

DILLON CONSULTING

334-11th Avenue SE
Suite 200
Calgary, Alberta
Canada
T2G 0Y2
Telephone
403.215.8880
Fax
403.215.8889

Dillon Consulting Limited

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1.0 Introduction

Clean Harbors Canada, Inc. (Clean Harbors) is required to undergo a third-party compliance audit (compliance audit or audit) of construction, operations, and closure/post-closure care of its Ryley Facility (Facility or Site), located in Ryley, Alberta, as a requirement of the Site's Alberta Environment and Parks (AEP) Approval number 10348-03-00 (Approval), at a minimum of once every three years. The audit, as part of section 4.1.7 of the Approval (valid 2017-2027), is required to be performed at least once every three years, commencing on or before October 1, 2018. Dillon Consulting Limited (Dillon) was retained to perform the 2021 Triennial Compliance Audit (2021 Audit), for which the compliance audit kick-off was held on September 1, 2021, representing the commencement of the audit activities, followed by the formal site visit, conducted on September 1 and 2, 2021.

To prepare for this exercise, an audit checklist (Appendix A following this report) was established to account for every actionable item contained within the operating Approval. During the site visit, the auditors reviewed relevant documentation, interviewed facility staff members, and took part in the site visit and associated visual inspection of the facility in order to assess the compliance level of each item contained within the audit checklist. This report summarizes the findings and results of this audit.

1.1 Scope and Objectives

The objective of this audit was to determine if the Facility was in compliance with all requirements included in the Approval from the period of September 20, 2018 (2018 compliance audit completion) to September 1, 2021 (2021 Compliance Audit commenced). This is the second audit completed at the Facility since the new Approval came into effect in 2017.

Each of the 573 line items in the audit checklist were assessed and assigned one of the following statuses:

- Compliant;
- Non-compliant;
- Opportunity for Improvement; and
- Not Applicable/Information.

Each line item consists of a clear statement identifying an obligation of the Facility to the Approval. Line items are phrased in such a way where it is easy to assign one of the above statuses without cause for confusion. Approval requirements, which state numerous conditions under one larger, enveloping condition, have been separated and added as individual line items in the audit checklist to provide further clarity. A "Not Applicable/Information" status was assigned to items which were not applicable at the time of the audit, or were for information purposes only and do not represent compliance requirements. "Opportunity for Improvement" was assigned to items for which the Facility was clearly implementing compliance measures, but where Dillon identified room to improve.

In addition to assessing compliance with each item of the audit checklist, the auditors also recorded the supporting documentation (where available), which the auditors had reviewed prior to assigning a status to each line item. Documentation is generally the strongest evidence to support interviewee statements, and was revisited, as needed, to confirm statements. Documents reviewed included, but were not limited to:

- Site Approval;
- Annual Landfill Operations Report(s);
- Annual Landfill Operations Plan(s);
- Groundwater Monitoring Report(s);
- Calibration records;
- Sample analytical results;
- Regulatory documents and guidelines;
- Regulatory correspondence;
- Design drawings; and
- Emails.

To supplement documentation review, or in cases where documentation was not available or did not exist, a Facility tour was conducted by both auditors and three senior staff members of Clean Harbors. Visual observations and inspections were performed during the tour to verify compliance with certain items in the audit checklist.

Verbal confirmation provided by Clean Harbors' personnel was accepted in cases where assigning a status based on documentation or visual inspection was not feasible. Oftentimes, more than one staff member confirmed claims by the other, increasing the confidence of the auditors in assigning a status.

Clarification from AEP on Approval terms was not sought for this audit. Dillon's Auditors used professional judgement when evaluating the Approval terms and the Facility's compliance to them.

Requirements not explicitly identified in the Approval were outside the scope of this audit.

2.0 Discussion

The completed audit checklist, identifying the status of all Approval clauses, is provided as Appendix A, following the report text.

2.1 Resolution of 2018 Audit Findings

The 2018 audit completed at the Facility has identified two non-conformant items. Specifically, it was discovered that a groundwater monitoring well (MW-10) was found to have been damaged, resulting in well cap exposure, contravening Sections 4.1.4(vi) and Sections 4.9.10 (a) and (b) of the Approval. The 2021 audit observed that the monitoring well MW-10 had been repaired and locked. The second contravention found was relating to Section 4.6.16 (b) of the Approval, which states "All tanks containing hazardous waste and all tanks containing hazardous recyclables in each building shall be equipped, at a minimum, with all of the following: (b) A written operating procedure to prevent tank overfill". Although the "Bulk Flammable Liquid Transfer Safe Operating Procedure (SOP) Document and Checklist" is available, it is not posted next to the tanks in question. During the field observations of the 2021 audit, the Bulk Flammable Liquid Transfer SOP had not been stored next to the flammable tanks. This resulted in the non-compliance of Section 4.6.16(b) of the Approval during the 2021 Audit.

The requirements of Section 7.1 – Landfill Cell Closure and Maintenance of the Approval, which states in Section 7.1.1 "The approval holder shall submit a Landfill Cell Closure Plan for individual landfill cell closure to the Director on or before September 30, 2017, unless otherwise authorized in writing by the Director" and Section 7.1.2 "The Landfill Cell Closure Plan submitted pursuant to 7.1.1 shall be signed and stamped by a professional registered with APEGA" were found to not necessarily portray the operating practices which are actually utilized by the Facility. It was observed in the 2018 audit that Sections 7.1.1 through Sections 7.1.2 required clarification from AEP to ensure compliance to the Approval is maintained. The latest landfill cell closure would be Cell 3B. Based on further discussion with Clean Harbors, the Landfill Cell Closure Plan was formed by the stamped design work completed as part of the issued for construction and final record drawing packages, and associated documents; as such, this item appears to be not applicable to ongoing operations. Further monitoring of this requirement is recommended for future landfill cell closure activities.

2.2 2021 Audit Summary of Findings

Appendix A includes the full checklist used during the audit. Table 1 below summarizes the statuses assigned to each line item in the audit checklist.

Table 1: Statuses Assigned to Line Items in the Audit Checklist

Status	Number Assigned
Compliant	391
Non-Compliant	2
Opportunity for Improvement	17
Not Applicable/Information	163
TOTAL	573

Two line items were assigned the status "non-compliant". They are as follows:

1. Section 4.4.5 of the Approval states "The volume of liquid in the leak detection system, as monitored in Table 4.6-D shall not exceed the action leakage rate in any landfill cell". Action leakage rate exceedances were noted and reported June 9, June 10, July 2, and July 9, 2020, and reported to AEP within acceptable time frames with no adverse impacts from the exceedances. Several action leakage rate exceedances were also determined to have not been reported. Notification to AEP was made as soon as this information was discovered (AEP 376183), with actions taken to ensure this is not repeated. No adverse impacts resulted due to the exceedances.
2. Section 4.6.16 (b) of the Approval states "All tanks containing hazardous waste and all tanks containing hazardous recyclables in each building shall be equipped, at a minimum, with all of the following: (b) A written operating procedure to prevent tank overfill". Although the "Bulk Flammable Liquid Transfer SOP Document and Checklist" is available, it is not posted next to the tanks in question.

Several requirements of the Approval were identified as "informational" or "non-applicable" in nature by audit and the Facility's personnel, and were assigned these identifiers accordingly. For example, Section 4.6.41 of the Approval states "The approval holder shall not dispose of hazardous waste in any Class II landfill cell". No Class II landfill cells exist at the Facility, and no plans or permits are in place to allow a Class II landfill cell to be constructed in the future.

For continued Approval compliance in construction and operations, Dillon recommends that the Facility's staff regularly review the Approval in depth, and engage the AEP Director as needed during approval amendment periods to modify clauses, which may no longer be applicable to site conditions.

3.0 Conclusions

The 2021 Compliance Audit of AEP Approval number 10348-03-00 revealed two non-compliances to Approval terms and conditions between the time of the last audit completion and commencement of this audit. These non-compliances relate to the following Approval clauses and consisted of the following:

- Clause 4.4.5: Action leakage rate exceedances were noted and reported June 9, June 10, July 2, , and July 9, 2020, and reported to AEP within acceptable time frames with no adverse impacts from the exceedances. Several action leakage rate exceedances were also determined to have not been reported. Notification to AEP was made as soon as this information was discovered (AEP 376183), with actions taken to ensure this is not repeated. No adverse impacts resulted due to the exceedances.
- Clause 4.6.16 (b): The SOP for tank filling and responding to overflows was available to staff on-site, but was not posted next to the bulk liquid storage tanks at the time of the audit.

Several opportunities for improvement were identified in the course of the audit, as identified in Appendix A. They include the following:

- Clause 2.3.1 (ii); 2.3.1(iii, A); and 2.3.1(iii, B): Although it appears that the Facility is adhering to the standards referenced for the collection, preservation, storage, and analysis of effluent or runoff water, a written SOP referencing the standards is recommended to be procured and included in the Operations Plan;
- Clause 4.1.4: A 24 hour “Hotline” is maintained at the Facility. Opportunity for improvement would be to post this number at the Facility’s gate and office entrance;
- Clause 4.1.5(ii): Ponding was observed in roadways near potable water tanks, which can be managed on an ongoing basis;
- Clause 4.3.9 and 4.3.13(b): Results for the runoff control system testing of 48 hour static acute lethality test using daphnia magna could be included in the Summary of Batch Analysis presented in the 2020 Annual Landfill Operations Report, along with the lethality of effluents to rainbow trout testing;
- 4.6.29(a)-(e): The Facility is adhering to the information required in the Monthly Waste Management Report, viewed for July 2021. However, the reports are currently referencing the 10348-02-00 Approval. Dillon would recommended that the referenced Approval be updated to 10348-03-00;
- Clauses 4.6.24 (i); 4.6.30 (b); and 4.6.39 (b): Although it appears that the Facility is adhering to the document in question; “Industrial Waste Identification and Management Options, Alberta Environment, May 1996”, it could be explicitly referred to in the Facility’s Operations Plan; and
- Clause 7.1.1 and 7.1.2: It is understood that the Landfill Cell Closure Plan is formed by the stamped design work completed as part of the issued for construction and final record drawing packages, and associated documents. Assess the requirement for future Closure Plan submissions for future landfill cell closure activities.

4.0 Audit Limitations

This limited scope regulatory compliance audit relied upon information provided by representatives of Clean Harbors, and gathered during the site visit and document review conducted by Dillon during the course of the audit works undertaken. All information was verified to the extent possible through independent observations. However, Dillon cannot warrant that all information provided by Clean Harbors or other parties is completely accurate, transparent, or correct.

5.0 Closure

This audit and report have been completed in accordance with industry best practices subject to limitations outlined herein. If you should have any questions or concerns regarding the contents of this report or findings of the audit, please direct them to Jack Wallace at jwallace@dillon.ca or by calling 403.215.8880 ext. 4364.

Appendix A

Ryley Audit Checklist

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Section 2 - General

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 2 - General							
2.1.1	The approval holder must immediately report to the Director by telephone any contravention of the terms and conditions of this approval at 1-780-422-4505.	X				• Notification to AEP regarding odour complaint (ref. #380842), dated July 12, 2021. • Report to AEP regarding landfill fire (ref. #375305), dated January 25, 2021.	• All complaints are called into the AEP number, which then assigns a reference number. The facility aims to call in within the hour. Contraventions are mostly odour complaints, which are called in to site then reported to AEP. • There was a landfill fire early in 2021 due to a non-conforming waste stream, which was reported.
2.1.2	The approval holder shall submit a written report to the Director within 7 days of the reporting pursuant to 2.1.1.	X					Confirmed through review of records and discussion that all odour complaints are investigated and findings are submitted to the AEP within the reports.
2.1.3	The approval holder shall immediately notify the director if any of the following events occurs:				X	Not applicable.	Confirmed through discussion that the facility has not had any of these events occur.
2.1.3 (a)	The approval holder is served with a petition into bankruptcy.				X		
2.1.3 (b)	The approval holder files an assignment in bankruptcy or Notice of Intent to make a proposal.				X		
2.1.3 (c)	A receiver or receiver-manager is appointed.				X		
2.1.3 (d)	An application for protection from creditors is filed for the benefit of the approval holder under any creditor protection legislation.				X		
2.1.3 (e)	Any of the assets which are the subject matter of this approval are seized for any reason.				X		
2.1.4	The approval holder shall report any monitoring of substances or parameters which are the subject of operational limits as set out in the approval if they are monitored more frequently than specified by the approval. The additional results of such monitoring are to be included as an addendum in the reports required by the approval.				X	Not applicable.	Confirmed through discussion that the monitoring frequency as specified in Approval is followed.
2.1.5	The approval holder shall submit all monthly reports required by the approval to be compiled or submitted on or before the end of the month following the month in which the information was collected.	X				• 2020 Annual Landfill Operations Report, dated March 31, 2021. • 2020 Annual Air Monitoring Report, dated March 30, 2021.	• Air monitoring reporting is done monthly by GHD. • Reporting requirements and data were viewed in the 2020 Annual Landfill Operations Report. • No late submissions noted.
2.1.6	The approval holder shall submit all annual reports require by the approval to be compiled or submitted to the Director on or before March 31 of the year following the year in which the information was collected.	X				• 2020 Annual Landfill Operations Report, dated March 31, 2021. • 2020 Annual Air Monitoring Report, dated March 30, 2021.	Confirmed through discussion that all reporting has been on time to date.

Section 2 - General

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 2 - General							
2.2.1 (b)	The approval holder shall record and retain all the following information in respect of any sampling conducted or analyses performed in accordance with this approval for a minimum of 10 years:	X				• Record Retention Schedule dated November 14, 2014. • WIN Web records.	Compliance confirmed through a review of multiple files and windows in the Clean Harbors Facility Compliance View system (WIN Web).
2.2.1 (b, i)	The place, date and time of sampling.	X				• pH at scrubber daily inspection for August 31, 2021. • Leachate level quarterly sampling certificate of analysis dated March 17, 2020.	Facility Compliance View system (WIN Web) is the electronic database and data is accessible for all records of daily scrubber pH data; leachate level log data; and surface water and leachate monitoring results.
2.2.1 (b, ii)	Sample type.	X					
2.2.1 (b, iii)	The dates the analyses were performed.	X					
2.2.1 (b, iv)	The analytical techniques, methods or procedures used in the analysis.	X					
2.2.1 (b, v)	The names of the persons who collected and analysed each sample.	X					
2.2.1 (b, vi)	The number of analyses.	X					
2.2.2	The approval holder shall keep and maintain an Operating Record as per 4.6.34(a) until the end of the landfill post-closure.	X				• Landfill annual operations reports (submissions to AEP). • Landfill Operations Plan and Ryley HWRSP Facility Plan, dated February 2021. (Operations Plan). • HWRSP Standard Operating Procedures.	• Landfill and Facility Operations Plan is updated annually per Approval as required. Latest version is dated February 22, 2021. • Updates for 2021: personnel listing, procedures for sampling of new or changed landfill cells, what cells are capped • Operations Report available publicly or viewing any time on the Clean Harbors website.
2.2.3	The Operating Record shall include, at minimum, all of the following information:				X		
2.2.3 (a)	The information required in section 7.3(c) of the Standards for Landfills in Alberta .	X					
2.2.3 (b)	The name and contact information of all persons who discover any contravention	X					
2.2.3 (c)	The names and contact information of all persons who take any remedial actions arising from the contravention of the Act, the regulations, or the approval.	X					
2.2.3 (d)	A description of remedial measures taken in respect of a contravention of the Act, the regulations, or the Approval.	X					
2.2.4	The approval holder shall submit a copy of the most recent Operating Record to the Director upon written request from the Director within the timeline specified by the Director.	X				2020 Annual Landfill Operations Report, dated March 31, 2021 (2020 Annual Report).	Operating Records are held on site but have not been requested by AEP to date.
2.3.1 (i, A)	Air monitoring analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the “Alberta Stack Sampling Code” (AEP, 1995).	X				GHD 2016 Quality Assurance Plan - Air Monitoring Program.	Exhaust stack sampling done once per week as per Section 4.2.9.
2.3.1 (i, B)	Air monitoring analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the “Methods Manual for Chemical Analysis of Atmospheric Pollutants” (AEP, 1993).	X				GHD 2016 Quality Assurance Plan - Air Monitoring Program.	Referred to in Air Monitoring Program.
2.3.1 (i, C)	Air monitoring analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the “Air Monitoring Directive” (AEP 1989).	X				GHD 2020 AEP annual Ambient Air Monitoring Report, dated March 30, 2021.	Standard referenced in the 2020 Annual Ambient Air Monitoring Report

Section 2 - General

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 2 - General							
2.3.1 (ii)	Industrial Wastewater, Industrial runoff, groundwater and domestic wastewater analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association, American Water Works Association, Water Environment Federation, 1998).			X		Industrial run-off report for July 2020 to AEP.	• Clean Harbors staff collects samples then send them to the lab in Edmonton. • Staff are trained in proper sampling techniques consistent with the methods indicated in the Approval. • There is no formal written SOP for sampling industrial wastewater which makes reference to the Approval line test method.
2.3.1 (iii, A)	Whole effluent toxicity analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the "Biological Test Method: Reference Method for Determining the Acute Lethality of Effluents to Rainbow Trout" (Environment and Climate Change Canada, 2000).			X			
2.3.1 (iii, B)	Whole effluent toxicity analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the "Biological Test Method: Reference Method for Determining the Acute Lethality of Effluents to Daphnia Magna" (Environment and Climate Change Canada, 2000).			X			
2.3.1 (iii, C)	Whole effluent toxicity analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the "Biological Test Method: Growth Inhibition Test Using the Freshwater Alga Selenastrum capricornutum" (Environment and Climate Change Canada, 1992).				X	Review of Approval requirements (Table 4.3-B, 4.3-C, 4.3-D).	Not applicable. Whole effluent control system limits analysed as outlined by the Approval in Sections 4.6.8 are for: pH, COD, TDS, TSS, ammonia, chloride, sodium, sulphate, oil and other substances, 96-hour acute lethality test using rainbow trout, 48-hour acute lethality test using daphnia magna.
2.3.1 (iii, D)	Whole effluent toxicity analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the "Biological Test Method: Test of Reproduction and Survival Using the Cladoceran Ceriodaphnia dubia" (Environment and Climate Change Canada, 1992).				X		
2.3.1 (iii, E)	Whole effluent toxicity analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the "Biological Test Method: Test of Larval Growth and Survival Using Fathead Minnows" (Environment and Climate Change Canada, 1992).				X		
2.3.1 (iii, F)	Whole effluent toxicity analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the "Biological Test Method: Toxicity Test Using Luminescent Bacteria (Photobacterium phosphoreum)" (Environment and Climate Change Canada, 1992).				X		
2.3.1 (iv, A)	Soil analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the Soil Monitoring Directive (AEP, 2009).	X				2019 Soil Monitoring Program Report dated January 31, 2020.	Tetra Tech performs the soil sampling. Confirmed that the Soil Monitoring Directive was followed
2.3.1 (iv, B)	Soil analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: The Soil Quality Criteria Relative to Disturbance and Reclamation (Alberta Agriculture, 1987)				X	2019 Soil Monitoring Program Report dated January 31, 2020.	Not applicable. Information only as this pertains to reclamation. The site is still operating.

Section 2 - General

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 2 - General							
2.3.1 (v, A)	Waste analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (USEPA, 1986).	X				Operations Plan.	All wastes are subject to a pre-acceptance review prior to receipt. Each waste stream will have a waste profile completed prior to the receipt of the waste which incudes a third party Class II Landfill analysis Package - pH, BTEX, metals, delta T and flash point. Sampling of incoming loads is performed to verify characteristics of the shipment.
2.3.1 (v, B)	Waste analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the "Methods Manual for Chemical Analysis of Water and Wastes" (Alberta Environmental Centre, 1996).	X					
2.3.1 (v, C)	Waste analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the "Toxicity Characteristic Leaching Procedure (TCLP)" (USEPA Regulation 40 CFR261, Appendix II, Method No. 1311).	X					
2.3.1 (v, D)	Waste analytical requirements for collection, preservation, storage, handling, and analysis must be in accordance with: the "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association, American Water Works Association, Water Environment Federation, 2010).	X					
2.3.2	Labs retained for analysis of parameters required by the approval are accredited pursuant to ISO/IEC 17025.	X				Certificate of Analysis for Bureau Veritas and ALS Environmental in various reports.	• Bureau Veritas and ALS Environmental are used for all water/leachate parameters (switched to ALS from BV in Q4 2020). • Alberta Innovates is used for all air parameters. • Confirmed accreditations for all labs.
2.3.4	The approval holder shall comply with the terms and conditions of any written authorization issued by the Director under 2.3.2.				X	Not applicable.	Not applicable. Information only.
2.4.1	The terms and conditions of this approval are severable. If any term or condition of this approval or the application of any term or condition is held invalid, the application of such term or condition to other circumstances and the remainder of this approval shall not be affected thereby.				X	Not applicable.	Not applicable. Information only.
2.4.2	Any conflict between the Standards for Landfills in Alberta, as amended, and the terms and conditions of this approval shall be resolved in favour of this approval.				X	Not applicable.	Not applicable. Information only.
2.4.3	Environmental Protection and Enhancement Act Approval No. 10348-02-00, as amended, is cancelled.				X	Not applicable.	Not applicable. Information only.
2.4.4	All tanks shall conform to the "Guidelines for Secondary Containment for Above Ground Storage Tanks" (Alberta Environmental Protection, 1997).	X				Field observations.	• Three get annually inspected by Petroleum Tank Industry (diesel tank and 2 liquid waste tanks). • Safety Codes Council invoice viewed. • PTMAA certificate no longer required after Aug. 31, 2020. Safety Codes Council is now the regulating body. • Secondary containment observed in field. • Waste tanks were connected to the vapour capture and scrubbing system. Leachate tank had a newly installed vapour capture and scrubbing system installed. • Inspected the three waste tanks on site and the leachate tank.
2.4.5	All above ground storage tanks containing liquid hydrocarbons or organic compounds shall conform to the "Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks" (Canadian Council of Ministers of the Environment, 1995).	X				• Safety Codes Council invoice dated June 10, 2021. • Field observations.	

Section 3 - Construction

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 3 - Construction							
3.1.1	The approval holder shall not commence construction of Cell 4 unless and until updated financial security of the facility has been provided to include Cell 4 lateral expansion.	X				• Letter to AEP regarding Cell 4 QA/QC Submission, dated February 19, 2019. • Bond for financial security from Chubb dated August 16 ,2021. • AEP acceptance letter for bond, dated October 22, 2019.	Compliance confirmed through a review of correspondence regarding changes to financial security for this period related to construction. AEP accepted the financial security bond for the construction period.
3.1.2	The approval holder shall construct each new Class I industrial landfill which has the following components, at a minimum:				X	Not applicable.	Not applicable. Information only.
3.1.2 (a)	A minimum of 0.45 metre thick cover of clean sand or soil placed over top of the uppermost drainage layer.	X				Tetra Tech Issued for Construction Drawings, dated March 2018.	Compliance confirmed; minimum of 450 mm is specified in drawing details.
3.1.2 (b, i)	GCL liner placed in direct contact with an underlying 80 mil HDPE geomembrane liner as a primary liner.	X				• Tetra Tech Issued for Construction Drawings. • AEP Letter amending GCL to Geosynthetic.	Compliance confirmed; Detail 3 on Drawing C-04 shows GCL in direct contact with underlying geomembrane.
3.1.2 (b, ii)	GCL liner placed in direct contact with an underlying 80 mil HDPE geomembrane liner as a secondary liner.	X				• Tetra Tech Issued for Construction Drawings. • AEP Letter amending GCL to Geosynthetic.	Compliance confirmed; Detail 3 on Drawing C-04 shows GCL in direct contact with underlying geomembrane as a secondary liner.
3.1.2 (b, iii, A)	GCL liner placed in direct contact with an underlying clay liner that has a minimum thickness of 1.0 metre at all points.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; 1000 mm indicated as a minimum thickness of the underlying clay liner, GCL indicated above in Detail 3 on Drawing C-04.
3.1.2 (b, iii, B)	GCL liner placed in direct contact with an underlying clay liner that has been compacted to achieve an in-place hydraulic conductivity of $1x10^{-9}$ m/s or less.	X				Clean Harbors Cell 4 Request for Quotation.	Compliance confirmed; GCL is required to have a conductivity of 5×10^{-9} cm/s at most (which is lower than the AEP requirements).
3.1.2 (c, i)	Leachate collection system that is placed over the primary liner.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; Detail 11 on Drawing C-06 shows LCS above primary layer.
3.1.2 (c, ii)	Leachate collection system that is capable of maintaining the acceptable leachate head.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; leachate collection system for most cells on timers, one cell has automatic pumping based on leachate level.
3.1.2 (c, iii, a)	Leachate collection system that consists of a geo-composite drainage layer with a transmissivity of at least $1x10^{-4}m^2/s$ placed over top of the primary layer.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; transmissivity is required to be $1x10^{-4}$ m^2/s at a minimum.
3.1.2 (c, iii, b)	Leachate collection system that consists of a network of perforated leachate collection pipes.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; Drawing C-05 shows perforation details for the leachate collection system.
3.1.2 (c, iii, c)	Leachate collection system that consists of a leachate collection sump placed over the primary layer.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; Drawing C-05 shows sump in both primary and secondary layer acting as one.
3.1.2 (d, i)	Leak detection system that is placed over the secondary layer.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; Detail 3 on Drawing C-04 shows leak detection system over the secondary layer.
3.1.2 (d, ii)	Leak detection system that is capable of detecting the leakage through the primary layer.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; Detail 3 on Drawing C-04 shows leak detection system under the primary layer.

Section 3 - Construction

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 3 - Construction							
3.1.2 (d, iii, a)	Leak detection system that consists of a geo-composite drainage layer with a transmissivity of at least $1x10^{-4}m^2/s$ placed over the top of the secondary layer.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; Detail 3 on Drawing C-04 shows geocomposite leak detection system over the secondary layer. Transmissivity of geocomposite satisfies requirements.
3.1.2 (d, iii, b)	Leak detection system that consists of a network of perforated leak detection liquid collection pipes.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; Detail 10 on Drawing C-05 shows perforated leachate monitoring pipes.
3.1.2 (d, iii, c)	Leak collection system that consists of a leak detection liquid collection sump placed over the secondary layer.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; Drawing C-05 shows sump in both primary and secondary layer acting as one.
3.1.2 (e, i)	A final cover that meets the requirements in Section 6.1(c) of the "Standards for Landfills in Alberta" or as specified in the Landfill Cell Closure Plan submitted by the approval holder and authorized by the Director pursuant to 7.1.1 and 7.1.4 of the approval.	X				Dillon Annual Landfill Cell Closure Report (Cell 3B), dated March 2021.	Compliance confirmed; design and installation of the Cell 3B final cover system was completed in 2020.
3.1.2 (f)	A run-on control system capable of preventing flow onto the active landfill area from at least the peak discharge from a 1 in 25 year, 24 hour duration storm event at the facility.	X				Tetra Tech Issued for Construction Drawings.	Compliance confirmed; perimeter berm is evident in Drawing C-03.
3.1.2 (g)	A runoff control system capable of collecting and controlling at least the runoff volume resulting from a 1 in 25 year, 24 hour duration storm event at the facility.	X				Tetra Tech Issued for Construction Drawings.	Leachate collections system will handle all stormwater that falls in the landfill footprint.
3.1.3	The composite liner is constructed on a foundation or base that prevents failure of the liners due to settlement, compression or uplift.	X				Tetra Tech Issued for Construction Drawings.	1000 mm minimum of compacted clay liner specified on top of compacted backfill of an unknown thickness.
3.1.4	The approval holder shall submit to the Director the following plans and specifications for the proposed construction of each of the items listed in 3.1.2, signed and stamped by a professional registered with APEGA at least 3 months prior to construction:				X	Not applicable.	Not applicable. Information only.
3.1.4 (a)	Detailed Construction Plan and Specifications	X				Tetra Tech Construction Quality Assurance Report - Cell 4 and Laydown Pond - Earthworks, dated February 2019.	Construction started 3 months after submission of the referenced plans per the Approval.
3.1.4 (b)	Construction Quality Assurance Plan	X					
3.1.4 (c)	Construction Quality Control Plan	X					
3.1.5	The approval holder shall correct all deficiencies as outlined in the Detailed Construction Plan and Specifications outlined by the Director in the timeline specified by the Director.	X				Letter from AEP: Authorization of Cell 4 Construction, dated August 21, 2018.	Deficiencies were corrected on a per item basis until final issuance of approval to proceed on August 21, 2018.
3.1.6	The approval holder shall implement the Detailed Construction Plan and Specifications in 3.1.4 as authorized in writing by the Director.	X				Tetra Tech Construction Quality Assurance Report - Cell 4 and Laydown Pond - Earthworks, dated February 2019.	Report details the construction activities and identifies compliance with the Detailed Construction Plan.
3.1.7	During construction of any of the items listed in 3.1.2, the approval holder shall not deviate from the Detailed Construction Plan and Specifications unless the following conditions are met:				X	Not applicable.	Not applicable. Information only.

Section 3 - Construction

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 3 - Construction							
3.1.7 (a)	The deviation results in a minor adjustment in order to suite field conditions encountered.	X				Dillon Annual Landfill Cell Closure Report (Cell 3B), dated March 2021.	Deviation results to be communicated to AEP following construction in the summary report, per Line Item 3.1.9.
3.1.7 (b)	The deviation will result in an equivalent or better design performance of the landfill.	X				Dillon Annual Landfill Cell Closure Report (Cell 3B), dated March 2021.	Deviation results to be communicated to AEP following construction in the summary report, per Line Item 3.1.9.
3.1.8	The approval holder shall submit to the Director a summary report of the Construction Quality Assurance and Construction Quality Control results signed and stamped by a professional registered with APEGA.	X				• Tetra Tech Construction Quality Assurance Report - Cell 4 and Laydown Pond - Earthworks, dated February 2019. • Tetra Tech Construction Quality Assurance Report - Cell 4 and Laydown Pond Geosynthetics Installation, dated February 2019. • Dillon Annual Landfill Cell Closure Report (Cell 3B), dated March 2021.	Confirmed through a review of the reports indicated.
3.1.9	The summary report in 3.1.9 shall contain the following information, at minimum:				X		Not applicable. Information only.
3.1.9 (a)	Confirmation that the landfill has been constructed according to the Construction Quality Assurance Plan, Construction Quality Control Plan, and the Detailed Construction Plan and Specifications.	X					Confirmed through a review of the reports indicated.
3.1.9 (b)	Description of any minor deviations as per 3.1.7	X					Confirmed that no deviations occurred.
3.1.9 (c)	Confirmation by the professional registered with APEGA, that deviations as per 3.1.7 will result in an equivalent or better design performance of the landfill.	X					Confirmed that no deviations occurred and that that design met or exceeded specifications.
3.1.9 (d)	“As-built” plans.	X					Confirmed, dated February 2019.
3.1.9 (e)	Photo-documentation of important stages of construction including any repair work or remediation activities to establish or maintain liner integrity.	X					Confirmed through a review of the reports indicated.
3.1.9 (f)	Any other information not listed or implied in 3.1.9 as required in writing by the Director.	X					Confirmed through a review of the reports indicated.
3.1.10	The approval holder shall notify the Director in writing at least fourteen days prior to construction of commencing operations of any new landfill cell.	X				Letter to AEP, dated February 19, 2021.	Notifying that construction approval requirements fulfilled and that operations will commence in 14 days.
3.1.11	The approval holder shall construct the off-loading area as described in the application.				X	Not applicable.	Construction hasn't started on the off-loading area.
3.1.12	The approval holder shall manage landfill progression in a manner that has limited off-site visual impacts of the landfill, as described in the Landfill Cell Closure Plan.	X				• Dillon Annual Landfill Cell Closure Report (Cell 3B), dated March 2021. • Clean Harbors Closure and Post Closure Plan.	Report details the construction activities and identifies compliance with the Closure and Post Closure Plan.
3.2.1 (a)	The waste stabilization area has been constructed in accordance with application No. 008-10348.	X				Correspondence between AEP and Clean Harbors.	• This has been completed within the constructed portions of Cell 3D to avoid tracking waste off-site. • Clean Harbors submitted specifications for stabilization area and did not receive any amendment requests from AEP.
3.2.1 (b)	The waste stabilization area has been constructed in accordance within a Class I landfill cell.	X					

Section 3 - Construction

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 3 - Construction							
3.3.1	The approval holder shall salvage and conserve all topsoil for land reclamation of the landfill.	X				• Field Observations • Operations Plan. • Annual Landfill Cell Closure Reports.	• Vegetated mounds for final Cell 3 closure at southern edge. • Non-vegetated active stockpiles for Cell 4 construction at north end.
3.3.2	The approval holder shall salvage and conserve all upper subsoil for land reclamation of the landfill.	X					
3.3.3	The approval holder shall conserve and stockpile all topsoil separately from the upper subsoil.	X					Stockpiles are separated for topsoil and upper subsoil.
3.3.4 (a)	The approval holder shall place all top soil stockpiles at the landfill.	X					Stockpiles placed within the landfill boundary.
3.3.4 (b)	The approval holder shall place all upper subsoil stockpiles at the landfill.	X					
3.3.5 (a)	The approval holder shall stockpile all topsoil on stable foundations.	X					Topsoil stockpiles are placed on undisturbed topsoil and stable ground.
3.3.5 (b)	The approval holder shall stockpile all topsoil on undisturbed topsoil.	X					
3.3.6 (a)	The approval holder shall stockpile all upper subsoil on stable foundations.	X					Upper subsoil stockpiles are placed on areas with topsoil removed and stable ground.
3.3.6 (b)	The approval holder shall stockpile all upper subsoil on areas where the topsoil has been removed.	X					
3.3.7	The approval holder shall take all steps necessary to prevent any erosion due to wind or water.	X					Vegetation for closed stockpiles used for final closure of Cell 3. No other erosion measures required from AEP.
3.3.7 (a)	The approval holder shall revegetate stockpiles in order to prevent erosion.	X					Stockpiles appear to be vegetated from field observation.
3.3.7 (b)	The approval holder shall take all steps authorized in writing by the director in order to prevent erosion.	X					Erosion controls observed in place.
3.3.8 (a, i)	The approval holder shall suspend conservation of topsoil when wet or frozen condition would result in mixing, loss, degradation or compaction of topsoil.	X					Stockpiling of topsoil and upper subsoil is suspended during periods of adverse weather conditions, in accordance with facility operational practices.
3.3.8 (a, ii)	The approval holder shall suspend conservation of topsoil when high wind velocities or other field conditions would result in mixing, loss, or degradation of topsoil.	X					
3.3.8 (b, i)	The approval holder shall suspend conservation of upper subsoil when wet or frozen condition would result in mixing, loss, degradation or compaction of upper subsoil.	X					
3.3.8 (b, ii)	The approval holder shall suspend conservation of upper subsoil when wet or frozen condition would result in mixing, loss, degradation or compaction of upper subsoil.	X					

Section 3 - Construction

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 3 - Construction							
3.3.9 (a)	The approval holder shall recommend conservation of topsoil when conditions in 3.3.8 no longer existed.				X	Not applicable.	Not applicable. Information only.
3.3.9 (b)	The approval holder shall recommend conservation of upper subsoil when conditions in 3.3.8 no longer existed.				X	Not applicable.	Not applicable. Information only.

Section 4 - Operations

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.1.1	The geographic boundaries of the landfill has been maintained to that located within SE ¼ of Section 9, Township 50, Range 17, West of the 4th Meridian.	X				• 2020 Annual Report • Field observations.	Confirmed that landfill is within the approved boundary.
4.1.2	The waste elevation of the landfill has not exceeded the maximum designated waste elevation.	X				Cell 3B Landfill Capping Top of Final Cover Elevations, Figure No. 3 in Dillon Annual Landfill Cell Closure Report (Cell 3B), dated March 2021.	• Maximum elevation, per Part 1 (ggg) (definitions) is 714 masl. • Most recent closure was Cell 3B, which is also the highest. • Maximum elevation observed in final cover was 713.15 masl.
4.1.3	Access to the facility has been restricted to only authorized personnel.	X				Field observations.	• Visitor sign in sheet at front desk. • Scale house reporting for all vehicles. • Security cameras on-site. • Gated access.
4.1.4	A 24 hour "HOTLINE" number has been maintained for prompt response during an emergency.			X		Field observations.	A hotline is maintained but not posted at gate or office entrance. Hotline is 780-690-0614.
4.1.5	The approval owner shall operate and maintain the integrity of the following waste management facilities at the facility:				X		Not applicable. Information only.
4.1.5 (i)	HWRSP Facility	X					Confirmed during field inspection.
4.1.5 (ii)	Class I and II landfill, including Class I and II cells and waste stabilization areas.			X			Observed ponding in roadways near potable water tanks, which can be managed on an ongoing basis.
4.1.5 (iii)	Waste storage areas.	X					Confirmed during field inspection.
4.1.6	The approval holder shall operate and maintain the integrity of the following infrastructure components at the facility:				X		Not applicable. Information only.
4.1.6 (i)	Composite liner	X				• 2020 Annual Report. • Field observations.	Confirmed during field inspection.
4.1.6 (ii)	Leachate collection system	X					Confirmed during field inspection.
4.1.6 (iii)	Leak detection system	X					Confirmed during field inspection.
4.1.6 (iv)	Run-on control system	X					Confirmed during field inspection.
4.1.6 (v)	Run-off control system	X					Confirmed during field inspection.
4.1.6 (vi)	Groundwater monitoring wells	X					• Confirmed well MW-10 (near waste storage and HWRSP Facility) has been repaired and locked. • All other wells were observed to be protected and locked.
4.1.6 (vii)	Weigh scale	X					Weigh scale is operational.
4.1.6 (viii)	Site access control	X				Field observations.	Confirmed that sign-in procedures in place, doors locked, etc.
Facility Audit							
4.1.7	The approval holder shall cause the facility to be audited by an independent third-party environmental consultant to assess compliance with the terms and conditions of this approval, commencing on or before October 1, 2018.	X				• 2018 Compliance Audit Report. • 2021 Compliance Audit Report.	Compliance confirmed.
4.1.8	The approval holder shall submit the audit report required in 4.1.7 in the Annual Landfill Operations Report.	X				2020 Annual Report.	Reviewed the 2020 Annual Landfill Operations Report and confirmed previous Audit was included.
4.1.9	The requirements in 4.1.7 and 4.1.8 do not relieve the approval holder of any duty under the Act, or its associated regulations, or this approval.				X	Not applicable.	Not applicable. Information only.

Section 4 - Operations

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Operations							
4.2.1	The approval holder shall not release any air effluent streams to the atmosphere except as authorized by this approval.				X	Not applicable.	Not applicable. Information only.
4.2.2	The approval holder shall only release air effluent streams to the atmosphere from the following sources: - Scrubber exhaust stack - Drum Processing Building exhaust vent - Staging Building exhaust vent - Administrative Building exhaust vents - Laboratory fume hood and exhaust vents - Maintenance Shop equipment and exhaust vents - Leachate Collection Tanks exhaust vents - Leachate transfer lines passive gas vents - Any other source authorized in writing by the Director	X				Field observations.	• No other sources not listed in the approval. • Requested in Approval Amendment (pending) to do quenching emulsions, only if non-toxic gases are emitted.
4.2.3	The approval holder shall not operate any process equipment unless and until the pollution abatement equipment associated with the corresponding process equipment is operational and operating.	X				• Field observations. • Verbal confirmation. • Sept. 1, 2021 Transfer Station Daily Inspection (including scrubber inspection).	All pollution abatement equipment is continuously operated.
4.2.4	The approval holder shall treat all air effluent streams from the exhaust vents of the Drum Processing or Staging or both Buildings with a caustic scrubber and an activated carbon filter before directing the air effluent streams to the scrubber exhaust stack for release to the atmosphere while: - Hazardous wastes/recyclables are being processed. - Hazardous wastes/recyclables are being transferred. - Containers of hazardous wastes/recyclables are open in the Drum Processing and/or Staging Buildings.	X				• Field observations. • Discussion with site staff.	Monitored weekly and documented as per section below. All building air is treated through the pollution abatement equipment (scrubber and filter), including drum and tank vents.
4.2.5	The approval holder shall control fugitive emissions and any source not specified in 4.2.2 in accordance with 4.2.6 of this approval.	X				Field observations.	A carbon filter was added to the leachate tank.
4.2.6	With respect to fugitive emissions and any source not specified in 4.2.2, the approval holder shall not release a substance or cause to be released a substance that causes or may cause any of the following:				X	• Operations Plan, Appendix C (Fugitive Dust and Odour Best Management Plan). • Odour Complaint notification to Village and County, dated July 30, 2021.	• No fugitive emissions outside of what's permitted. • Odour complaints are received and managed per BMPs (report reviewed and contained in Operations Plan). • As part of the Amendment Application, AEP identified concerns regarding communications to the Village of Ryley and Beaver County. Clean Harbors now notifies the Village and County of all complaints and contraventions submitted to AEP.
4.2.6 (a)	Impairment, degradation or alteration of the quality of natural resources.	X					
4.2.6 (b)	Material discomfort, harm or adverse effect to the well being or health of a person.	X					
4.2.6 (c)	Harm to property or to vegetative or animal life.	X					
4.2.7	The approval holder shall not burn any debris by means of an open fire unless authorized in writing by the Director.	X				Correspondence with AEP	A fire occurred on property in January 2021, for which AEP was notified. No burning is conducted on site.
4.2.8	If the approval holder receives complaints of offensive odours, or fugitive dust, or both, beyond the facility boundaries, the approval holder shall:				X	• Operations Plan, Appendix C (Fugitive Dust and Odour Best Management Plan). • Environmental Management Program SOP #90RY-410-00. • Field observations. • Discussion with site staff.	• Response is based on the type of complaint. • Recently added a carbon filter on the leachate tank vent. • Material receipt may be suspended during high wind days. • Cover can be immediately placed for dust suppression and dispersion prevention. • Receive typically 2-3 odour complaints per year.
4.2.8 (a)	Conduct the following to reduce the release of those odours, or fugitive dust, or both by:	X					
4.2.8 (a, i)	Placing restrictions on types, or volumes, or both, of the wastes being handled or processed or deposited that are causing those odours, or fugitive dust, or both.	X					
4.2.8 (a, ii)	Increasing the frequency of cover placement, or modifying waste handling activities, or performing both, at the landfill.	X					
4.2.8 (a, iii)	Modifying waste handling activities at the HWRSP Facility.	X					
4.2.8 (a, iv)	Performing any combination of the above.	X					
4.2.8 (b)	Activate the Odour and Fugitive Dust Response Program as specified in the Landfill Operations Plan 4.6.34U).	X					

Section 4 - Operations

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Limits							
4.2.9	The approval holder shall maintain the pH of the scrubbing liquid of the caustic scrubber referred to in 4.2.4 at 8.0 or higher.	X				• Field observations. • Recorded daily (viewed Aug. 22, 2021 and Nov. 5, 2020 examples) and maintained in the WIN Web system.	• pH data logger contains daily readings. • Available to AEP upon request, confirmed in report that recordings are compliant. • "Keep pH above 8.0" sign posted.
4.2.10	The approval holder shall replace activated carbon in the activated carbon filter referred to in 4.2.4 immediately when the concentration of total petroleum hydrocarbons in the air effluent streams released from the scrubber exhaust stack to the atmosphere exceeds 25 ppm.	X				• Field observations. • WIN Web records.	• Weekly total petroleum hydrocarbon readings are taken and recorded in log book next to the scrubber and in WINWEB. • Carbon is typically replaced every 4-5 years or less frequent. • Last replacement occurred July 2015. • No exceedances or replacement of media in the last three year period (2019-2021).
Monitoring and Reporting							
4.2.11	The approval holder shall monitor, daily at a minimum, the pH of the scrubbing liquid of the caustic scrubber referred to in 4.2.4.	X				• Monitoring records for Aug. 22, 2021 and Nov. 5, 2020 in WIN Web. • Field observations.	• Data logger contains daily readings. • Available to AEP upon request, confirmed in report that recordings are compliant. • If pH readings are close to 8.0 limit, a secondary laboratory reading is performed to verify in-line pH meter accuracy. • Aug. 22, 2021 and Nov. 5, 2020 dates sampled.
4.2.12	The approval holder shall monitor, weekly at a minimum, the air effluent streams released from the scrubber exhaust stack, using a portable total petroleum hydrocarbon analyzer while: - Hazardous wastes/recyclables are being processed. - Hazardous wastes/recyclables are being transferred. - Containers of hazardous wastes/recyclables are open in the Drum Processing and/or Staging Buildings.	X				• Field observations. • WIN Web records.	• Weekly readings are taken and recorded in log book next to the scrubber. • Carbon is replaced every 4-5 years or less frequency.
4.2.13	The portable total petroleum hydrocarbon analyzer referred to in 4.2.12 shall:				X	Not applicable.	Not applicable. Information only.
4.2.13 (a)	Have a detection limit of 1 ppm or lower for total petroleum hydrocarbons.	X				Field observations.	Confirmed that accuracy is to 0.1 ppm, as observed on calibration certificate.
4.2.13 (b)	Be located in a straight section of the scrubber exhaust stack, a minimum of one (1) metre downstream from the last flow disturbance.	X				Field observations.	Sampling location is on second story scaffolding within building, 1 m downstream from the last flow disturbance.
4.2.13 (c)	Be calibrated regularly in accordance with the analyzer manufacturer's specifications.	X				Calibration certificate from 2020.	Confirmed calibrated in 2020; expires in 2022.
4.2.14	The approval holder shall continue to implement the Ambient Air Monitoring Program as authorized in writing by the Director on June 24, 2009, unless and until otherwise authorized in writing by the Director pursuant to 4.2.18.	X				• 2020 Operations Report. • GHD Quality Assurance Plan - Air Monitoring Program Report, dated Dec. 31, 2016. • "Ambient Air Monitoring Station Audit" letter from AEP, dated August 31, 2016. • "Ambient Air Monitoring Station Audit" letter from AEP, dated Jan. 13, 2017 (closing out the audit findings).	• Clean Harbors was audited by AEP for adherence to the new Air Monitoring Directive released in 2016. • Clean Harbors proposed dates and actions to address findings of the audit, which were accepted by AEP in letter December 2, 2016. • Dec. 31, 2016 GHD report contains new Air Monitoring Program. • AEP letter closing out the audit indicates that all findings addressed.
4.2.15	The approval holder shall submit to the Director the results of the Ambient Air Monitoring Program in 4.2.14 with the following reports: - Monthly Ambient Air Monitoring Report - Annual Ambient Air Monitoring Report In accordance with the written authorization by the Director on June 24, 2009, unless and until otherwise authorized in writing by the Director pursuant to 4.2.18.	X					
4.2.16	The approval holder shall submit a revised Ambient Air Monitoring Program, revised reporting requirements, or both, to the Director upon written request from the Director within the timeline specified in writing by the Director.	X					
4.2.17	If the revised Ambient Air Monitoring Program, reporting requirements, or both, submitted pursuant to 4.2.16 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.	X					

Section 4 - Operations

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.2.18	The approval holder shall implement the revised Ambient Air Monitoring Program, reporting requirements, or both, submitted pursuant to 4.2.16 as authorized in writing by the Director within the timeline specified in writing by the Director.	X					
Operations							
4.3.1	The approval holder shall not release any substances from the facility to the surrounding watershed except as authorized by this approval.	X				Field observations.	Compliance confirmed. 100% of the leachate is disposed of via deep well injection. Runon/runoff control systems in place and inspected during field observations.
4.3.2	The approval holder shall operate and maintain the integrity of:				X	Not applicable.	Not applicable. Information only.
4.3.2 (a)	The run-on control system to prevent flow onto the active landfill area from at least the peak discharge from a 1 in 25 year, 24 hour duration storm event a the facility.	X				Field observations.	Compliance confirmed. Run on/run off control systems were completed during Cell 4 construction. As built drawings reviewed.
4.3.2 (b)	The runoff control system for the facility to collect and control at least the runoff volume resulting from a 1 in 25 year, 24 hour duration storm event at the facility.	X				Field observations.	Compliance confirmed. Run on/run off control systems were completed during Cell 4 construction. As built drawings reviewed.
4.3.3	All runoff from the facility developed area shall be directed to the runoff control system as described in:				X	Not applicable.	Not applicable. Information only.
4.3.3 (a)	Application No. 012-10348, prior to decommissioning and reclamation of the old surface water detention pond.	X				Not applicable.	Confirmed. The old surface water detention pond was decommissioned in August 2018 prior to this audit.
4.3.3 (b)	The application, after decommissioning and reclamation of the old surface water detention pond.	X					
4.3.4	Prior to decommissioning and reclamation of the old surface water detention pond and subject to 4.3.7, the approval holder shall only make or permit a release from the old surface water detention pond:				X	Not applicable.	Not applicable. Information only.
4.3.4 (a)	At the release point as designated in application No. 012-10348, which is: • Located in the south east corner of the old surface water detention pond. • Referred to as sampling location A 1 in 4.3.11.	X				• 2020 Annual Report. • Field observations. • Operations Plan. • Discussions with site staff.	Decommissioning of the old surface water detention pond was completed in August 2018. Observations were made of the new surface water detention pond, drainage ditch, and discharge point.
4.3.4 (b)	Through a pump and a release hose over the south berm into the drainage control ditch, east of the landfill access road, to the new surface water detention pond, under normal operating conditions.	X					
4.3.4 (c)	Through a pump and a release hose over the south berm directly to the culvert under Highway 854, during periods of high runoff exceeding the holding capacity of the old surface water detention pond.	X					
4.3.5	Subject to 4.3.7, the approval holder shall only make or permit a release from the new surface water detention pond:	X					• Observed the discharge point at the new surface water detention pond. • Composite sampling is performed prior to any discharge consistent with the approval.
4.3.5 (a)	At the release point as designated in application No. 012-10348, which is: • Located in the north east corner of the new surface water detention pond. • Referred to as sampling location 81 in 4.3.11.	X					
4.3.5 (b)	Through a pump and a release hose over the east berm into the culvert under Highway 854.	X					
4.3.6	The approval holder shall only dispose of industrial wastewaters, or specified runoff in Table 4.3-A, or both, by one or more of the following methods:				X	• 2020 Annual Report. • Field observations. • Operations Plan. • Discussions with site staff.	• All stormwaters are discharged through pond with testing prior to discharge. • No non-compliant discharges have occurred. • When TSS exceeds limits, further settling time is done prior to re-testing and discharge, or flocculant is added. • No change to discharge.
4.3.6 (a)	To facilities holding a current Act authorization to accept such waste.	X					
4.3.6 (b)	To facilities approved by a local environmental authority outside of Alberta to accept such waste.	X					
4.3.6 (c)	To a disposal well approved by AER.	X					
4.3.6 (d)	As per 4.6.51.	X					
4.3.6 (e)	As otherwise authorized in writing by the Director.	X					

Section 4 - Operations

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Limits							
4.3.7	Releases of runoff from the following to the surrounding watershed shall comply with the limits specified in Table 4.3-B: - The old surface water detention pond. - The new surface water detention pond. - Or, both ponds.	X				• 2020 Annual Report. • Operations Plan.	Compliance confirmed through a review of release analytical records.
4.3.8	Releases of runoff from within the tank farm bermed area to the old or new or both surface water detention ponds shall comply with the limits specified in Table 4.3-C.				X	Not applicable.	Not applicable: • Tank farm bermed area water goes into landfill. • This volume is pumped and solidified for disposal in the landfill.
Monitoring and Reporting							
4.3.9	The approval holder shall monitor the runoff control system as required in Table 4.3-D, subject to 4.3.12.			X		Surface Water Detention Pond B Summary of Batch Analysis, 2020 Annual Report.	Results for the runoff control system testing of 48 hour static acute lethality test using daphnia magna could be included in the Summary of Batch Analysis presented in the 2020 Annual Landfill Operations Report; along with the lethality of effluents to rainbow trout testing.
4.3.10	The approval holder shall report to the Director the results of the runoff control system monitoring as required in Table 4.3-D, subject to 4.3.12.	X				2020 Annual Report.	Monitoring findings reported to AEP.
4.3.11	For the purpose of Table 4.3-D:				X	Not applicable	Not applicable. Information only.
4.3.11 (a)	Sampling location A 1 is defined as the old surface water detention pond release point.				X	Field observations.	Not applicable. Old surface water detention pond has been decommissioned.
4.3.11 (b)	Sampling location A2 is defined as the old surface water detention pond.				X		
4.3.11 (c)	Sampling location B1 is defined as the new surface water detention pond release point.	X				Field observations.	Facility actively monitors releases.
4.3.11 (d)	Sampling location B2 is defined as the new surface water detention pond.	X				Field observations.	Facility actively monitors detention pond.
4.3.11 (e)	Sampling location C is defined as the tank farm bermed area.	X				Field observations.	Water collected in bermed area of tank farm is solidified for disposal in landfill as per 4.3.8
4.3.12	The monitoring and reporting requirements in 4.3.9 and 4.3.10 for the old surface water detention pond (sampling locations A1 and A2) shall not apply after decommissioning and reclamation of the old surface water detention pond.				X	Not applicable.	Not applicable. The old surface water detention pond was decommissioned in August, 2018 prior to this audit.
4.3.13	The monitoring and reporting required in Table 4.3-D for the acute lethality tests shall comply with:				X	Not applicable.	Not applicable. Information only.
4.3.13 (a)	The Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, Environment Canada, Environment Protection Series 1/RM/13, December2000, as amended.	X				Surface Water Detention Pond B Summary of Batch Analysis - 2020 Annual Landfill Operations Report	Summary of results all pass for the Surface Water Detention Pond B Summary of Batch Analyses.
4.3.13 (b)	The Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia Magna, Environment Canada, Environmental Protection Series 1/RM/14, December 2000, as amended.			X		• Monthly Runoff and Industrial Wastewater Report. • Surface Water Detention Pond B Summary of Batch Analysis - 2020 Annual Report.	Results for the runoff control system testing of 48 hour static acute lethality test using daphnia magna could be included in the Summary of Batch Analysis presented in the 2020 Annual Landfill Operations Report; along with the lethality of effluents to rainbow trout testing.
4.3.14	The approval holder shall: - Treat any acute lethality test that deviates from the corresponding test method referred to in 4.3.13 as invalid. - Repeat the test as soon as logistically possible.				X	Not applicable.	Not applicable. No deviation from corresponding test method has occurred.
4.3.15	In the event that less than 50% of the rainbow trout survived in the 100% concentration sample, the approval holder shall: - Implement a program immediately to identify the source of the toxicity. - Submit to the Director within 90 days after the test result is available, a proposed program to reduce the toxicity of the runoff.				X	Not applicable.	Not applicable. All testing passed the criteria.
4.3.16	The approval holder shall submit the Monthly Runoff and Industrial Wastewater Report in Table 4.3-D to the Director.	X				Monthly Runoff and Industrial Wastewater Report.	Verbal confirmation from multiple parties confirming the reports are forwarded to AEP.
4.3.17	The Monthly Runoff and Industrial Wastewater Report shall include, at a minimum, all of the following information:				X	Not applicable.	Not applicable. Monthly reports contained in annual report, but only need to be submitted with discharges.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.3.17 (a)	A monthly assessment of the monitoring results relative to the limits in Table 4.3-B.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (b)	A monthly assessment of the monitoring results relative to the limits in Table 4.3-C.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (c)	A monthly assessment of the performance of the: - Runoff control system. - Pollution abatement equipment. - Monitoring equipment.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (d)	A monthly summary of management and disposal of the industrial wastewaters and specified runoff, as per 4.3.6.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (e)	A monthly summary of management and disposal of runoff in general.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (f)	A monthly summary of runoff contraventions reported pursuant to 2. 1. 1.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (g)	Any other information as required in writing by the Director.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.18	The approval holder shall submit the Annual Runoff and Industrial Wastewater Report in Table 4.3-D to the Director.	X				Annual Runoff and Industrial Wastewater Report.	Verbal confirmation and included with annual report.
4.3.19	The Annual Runoff and Industrial Wastewater Report shall include, at a minimum, all of the following information:				X	Not applicable.	Not applicable. Information only.
4.3.19 (a)	An annual summary assessment of the monitoring results relative to the limits in Table 4.3-B.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (b)	An annual summary assessment of the monitoring results relative to the limits in Table 4.3-C.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (c)	An annual summary assessment of the performance of the: - Runoff control system. - Pollution abatement equipment. - Monitoring equipment.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (d)	An annual summary of management and disposal of the industrial wastewaters and specified runoff, as per 4.3.6.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (e)	An annual summary and evaluation of management and disposal of runoff in general.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (f)	An annual summary of the results pursuant to 4.3.21.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.3.19 (g)	An annual summary of runoff contraventions reported pursuant to 2. 1. 1.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (h)	Any other information as required in writing by the Director.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.20	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.3.20 (a)	Collect a representative grab sample from the old surface water detention pond at least once per year, prior to decommissioning and reclamation of the pond.				X	Not applicable.	Not applicable. Old surface water detention pond has been decommissioned.
4.3.20 (b)	Collect a representative grab sample from the new surface water detention pond at least once per year.	X				Annual Runoff and Industrial Wastewater Report	Details included in Report.
4.3.20 (c)	Analyze the sample(s) for all of the parameters specified in Table 4.3-E.	X				Annual Runoff and Industrial Wastewater Report	Details included in Report.
4.3.21	The approval holder shall submit the results of the analyses in 4.3.20 to the Director in the Annual Runoff and Industrial Wastewater Report.	X				Annual Runoff and Industrial Wastewater Report	Details included in Report.
Operations							
4.4.1	The approval holder shall only dispose of leachate removed from the leachate collection system by one or more of the following methods:				X	Not applicable.	Not applicable. Information only.
4.4.1 (a)	To facilities holding a current Act authorization to accept such waste.				X	Not applicable.	Not applicable. Option not used by the facility.
4.4.1 (b)	To facilities approved by a local environmental authority outside of Alberta to accept such waste.				X	Not applicable.	Not applicable. Option not used by the facility.
4.4.1 (c)	To a disposal well approved by AER.	X				• Alberta Energy Regulator (AER) approval for deep well. • Appendix E of 2020 Annual Report.	Leachate is hauled to Class I deep well in Calmar. Volume summary included in annual report.
4.4.1 (d)	As per 4.6.51.				X	Not applicable.	Not applicable. Information only.
4.4.2	The approval holder shall only dispose of liquid removed from the leak detection system by one or more of the following methods:				X	Not applicable.	Not applicable. Information only.
4.4.2 (a)	To facilities holding a current Act authorization to accept such waste.				X	Not applicable.	Not applicable. Option not used by the facility.
4.4.2 (b)	To facilities approved by a local environmental authority outside of Alberta to accept such waste.				X	Not applicable.	Not applicable. Option not used by the facility.
4.4.2 (c)	To a disposal well approved by AER.	X				• AER approval for deep well. • Appendix E of 2020 Annual Landfill Operations Report.	Leachate is hauled to Class I deep well in Calmar. Volume summary included in annual report.
4.4.2 (d)	As per 4.6.51.				X	Not applicable.	Option not used by the facility.
Limits							
4.4.3	Subject to 4.4.4, the approval holder shall not exceed the maximum acceptable leachate head in any landfill cell.	X				Leachate Head Level Table.	Leachate levels recorded daily. Field logs for 2020 observed, contain following parameters: - Date, time, condition, level status, personnel initial
4.4.4	Subsequent to a storm event, the leachate head in any landfill cell shall not exceed the maximum acceptable leachate head for more than fourteen (14) days, unless otherwise authorized in writing by the Director.	X				Leachate Head Level Table.	Leachate pumping infrastructure on timers in most cells, (all but Cell 1). A fire January 12, 2020 caused a fire (AEP Reference No. 362650) which destroyed the Cell 2 Leachate building until pumping capacity was resotred June 30, 2020. Infrastructure is capable of removing leachate generated from a storm event in fewer than 14 days.
4.4.5	The volume of liquid in the leak detection system, as monitored in Table 4.6-D, shall not exceed the action leakage rate in any landfill cell.		X			2020 Annual Report.	Action Leakage Rate (ALR) Exceedances were noted June 9, 2020, June 10, 2020, July 2, 2020, July 9, 2020. Section 14.6 of the Annual Landfill Operations Report detail several ALR exceedances that were not reported. No negative impacts were observed and clarification of the reporting requirements were made with the Facility Manager to ensure this is not repeated in the future. (AEP 376183)

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Monitoring and Reporting							
4.4.6	The approval holder shall monitor the leachate collection and leak detection systems as required in Table 4.6-D and for all parameters specified in Table 4.4-A, subject to 4.4.8 and 4.4.9.	X				Primary Leachate Analysis Results Appendix D of 2020 Annual Report.	Leachate levels recorded daily. Field logs for 2020 observed, contain following parameters: • Date, time, condition, level status, personnel initial.
4.4. 7	The approval holder shall report to the Director the results of the leachate collection and leak detection systems monitoring as required in Table 4.6-D, including the results of the analyses for all parameters specified in Table 4.4-A, subject to 4.4.8 and 4.4.9.	X				Primary Leachate Analysis Results Appendix D of 2020 Annual Report.	Submitted to AEP.
4.4.8	The requirements in 4.4.6 and 4.4. 7 for monitoring and reporting the parameters in Table 4.4-A for leachate shall not apply if insufficient leachate is available for conducting the analyses.				X	Not applicable.	Not applicable. Information only.
4.4.9	The requirements in 4.4.6 and 4.4. 7 for monitoring and reporting the parameters in Table 4.4-A for leak detection liquid shall not apply if insufficient leak detection liquid is available for conducting the analyses.				X	Not applicable.	Not applicable. Information only.
4.4.10	If the volume of liquid removed from the leak detection system exceeds the action leakage rate, in addition to reporting pursuant to 2.1.1, the approval holder shall submit a Response Action Plan to the Director within 30 days of the exceedance.	X				2020 Annual Report.	(AEP 376183) links exceedances to excessive rainfall and details steps taken to solve infiltration.
Monitoring and Reporting							
4.5.1	The approval holder shall, unless the approval holder is not granted access by the landowner:				X	Not applicable.	Not applicable. Information only.
4.5.1 (a)	Collect a representative sample from each of the dugouts and each of the water wells, within an approximate 1.6 kilometre radius around the facility.	X				Tetra Tech 2020 Dugout Sampling Program Report, dated March 2, 2021.	Details included in Report.
4.5.1 (b)	Analyze the sample for the parameters listed in Table 4.5-A.	X					Details included in Report.
4.5.2	The monitoring required in 4.5.1 shall be conducted once each year in October unless otherwise authorized in writing by the Director.	X					Details included in Report.
4.5.3	The approval holder shall record the analytical results of the sampling information required in 4.5.1 in an Annual Dugout and Water Well Sampling Program Report.	X					Details included in Report.
4.5.4	The approval holder shall submit the Annual Dugout and Water Well Sampling Program Report to the Director pursuant to 4.6.58(i).	X					Details included in Report.
General							
4.6.1	The approval holder shall not receive, process, dispose of, or perform any combination of the above for any of the following wastes, individually or in any combination, at the places specified below respectively: - Explosives (Class 1 TDGR wastes), at the facility. - Radioactive wastes (Class 7 TDGR wastes), at the facility. - Radioactive wastes regulated under the Nuclear Safety and Control Act (Canada), at the facility. - Biomedical waste, at the facility. - Waste containing free liquids, at the landfill, excluding the waste stabilization area. - Material containing ozone depleting substances, at the landfill. - Municipal solid waste, at the facility. - NORM waste, at the facility.	X				• Field observations. • Discussions with site staff.	Site field observations and verbal confirmation were received regarding materials receipt. Cross checked against Facility Operations Plan and SOPs for individual waste materials. WINWEB system also performs checks on waste compatibility and will issue warnings of any non-conforming waste
4.6.2	Incompatible wastes and incompatible hazardous recyclables shall be prevented from mixing.	X				• Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Landfill Operations (SOPL001). • WIN Web (compatibility workbench).	Relevant Facility SOPs confirm procedures are appropriate to prevent incompatible wastes and recyclables from mixing.
4.6.3	The approval holder shall dispose of wastes generated at the facility only:				X	Not applicable	Information only.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.3 (a)	To facilities holding a current Act authorization.	X				Discussions with site staff.	Confirmed that regulations are being followed.
4.6.3 (b)	To facilities approved by a local environmental authority outside of Alberta.	X				Discussions with site staff.	Confirmed that regulations are being followed.
4.6.3 (c)	As otherwise authorized in writing by the Director.	X				Discussions with site staff.	Confirmed that regulations are being followed.
HWRSP Facility							
Operations Plan							
4.6.4	The approval holder shall develop, keep up-to-date, and implement an HWRSP Facility Operations Plan.	X				• Facility Standard Operating Procedures (SOPs) • Operations Plan.	Most recently dated as February 2021, with annual updates required. In 2020, procedures for Cell 4 added.
4.6.5	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.6.5 (a)	Review the HWRSP Facility Operations Plan annually, at a minimum.	X				• 2020 Annual Report. • Operations Plan.	This is performed in line with the annual reporting required under the Approval.
4.6.5 (b)	Update the HWRSP Facility Operations Plan if any of the following circumstances apply: - There are facility expansions or changes in site operations or equipment. - There is an applicable change to an applicable regulation. - An update is required in writing by the Director.	X				• 2020 Annual Report. • Operations Plan.	Section 14 added to 2017 Annual Report, addressing HWRSP facility operations.
4.6.6	The approval holder shall retain a copy of the most recent HWRSP Facility Operations Plan at the facility.	X				• 2020 Annual Report. • Operations Plan.	Held on-site electronically and in hard copy.
4.6. 7	The approval holder shall submit a copy of the most recent HWRSP Facility Operations Plan to the Director upon written request from the Director within the timeline specified in writing by the Director.	X				• 2020 Annual Report. • Operations Plan.	Submitted in the 2020 Annual Report.
4.6.8	If the HWRSP Facility Operations Plan submitted pursuant to 4.6. 7 is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.				X	Not applicable.	Not applicable. No response received from AEP on 2020 Annual Report.
4.6.9	The approval holder shall implement the latest HWRSP Facility Operations Plan, unless otherwise authorized in writing by the Director.	X				Operations Plan.	Up to date plan available and utilized.
Operations							
4.6.10	The approval holder shall only transfer wastes and hazardous recyclables at designated transfer areas designed to contain spills and leaks.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Relevant Facility SOPs confirm procedures for transferring wastes in the HWRSP.
4.6.11	The approval holder shall use the following when transferring substances to, from, and between containers, tanks, and trucks:				X	Not applicable.	Not applicable. Information only.
4.6.11 (a)	Couplings equipped with seals that are compatible with the substance transferred.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.11 (b)	The necessary precautions to prevent spills when the couplings are disconnected.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.11 (c)	Emergency shut-off valves.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.11 (d)	Established transfer areas and associated curbing, paving and catchment areas.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.11 (e)	Drip trays to capture potential losses under coupling devices and other connections.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.11 (f)	Manual inspections of the transfer area for leaks and spills during and after waste transfer.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.12	All wastes and all hazardous recyclables that are unloaded shall be immediately transferred to the waste storage area.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.13	All containers and unrinsed empty containers shall be stored in the waste storage area.	X				Field observations.	Confirmed during Site visit.
4.6.14	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.6.14 (a)	Provide and maintain an adequate aisle space between containers in the waste storage area to allow inspection and unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of the waste storage area.	X				Field observations.	Site field operations consistent with fire code for spacing between containers.
4.6.14 (b)	Arrange inspection aisles in the waste storage area such that the identification label on each container is readable.	X				Field observations.	Identification labels clear for all containers.
4.6.15	All tanks within the tank farm area shall be equipped, at a minimum, with all of the following:				X	Not applicable.	Not applicable. Information only.
4.6.15 (a)	Sensors for detecting the level in each tank.	X				Field observations.	Sensors, alarms, and shut-off devices observed and active for each tank. The aqueous tank within the building does not contain a high level alarm but is not considered part of the tank farm.
4.6.15 (b)	High level alarms that activate when a tank overfill is imminent.	X					
4.6.15 (c)	Automatic shut-off devices or sufficient free board space above the high level sensor to allow operators time to prevent overfill from occurring.	X					
4.6.15 (d)	Earthen dikes or equivalent secondary containment structures capable of containing 110% of the volume of the largest tank within the bermed area plus 10% of the aggregate capacity of all other tanks in the bermed area.	X				Field observations.	Entire waste storage area is the building floor, which is drained to holding tank in central manhole and can be pumped.
4.6.16	All tanks containing hazardous waste and all tanks containing hazardous recyclables in each building shall be equipped, at a minimum, with all of the following:				X	Not applicable.	Not applicable. Information only.
4.6.16 (a)	Sensors or gauges for detecting the level in each tank.	X				Field observations.	Sensors observed and active for tanks.
4.6.16 (b)	A written operating procedure to prevent tank overfill.		X			• Field observation • Bulk Flammable Liquid Transfer SOP	Bulk Flammable Liquid Transfer SOP Document and Checklist is available (part of Facility SOPs) in office area but is not stored next to tanks.
4.6.16 (c)	Secondary containment structures capable of containing 110% of the volume of the largest tank within the building plus 10% of the aggregate capacity of all other tanks containing hazardous waste and hazardous recyclables in the same building.	X				Field observations.	Secondary containment structures observed in the field.
4.6.17	Hazardous waste and hazardous recyclables stored in containers and tanks shall be stored in accordance with the Hazardous Waste Storage Guidelines, June 1988, Alberta Environment, as amended.	X				• Field observations. • Bulk Flammable Liquid Transfer SOP.	Facility observed to be following governing regulations.
4.6.18	The approval holder shall only carry out the following activities, individually or in any combination, at the HWRSP Facility in relation to hazardous waste or hazardous recyclables or both:	X				• Field observations.	Field observations reviewed the activities that occur on site; which was confirmed through review of the Facility and Landfill
4.6.18 (a)	Commingling of hazardous waste or hazardous recyclables to make maximum use of available container or tank capacity, only if the resultant mixture has the same TDGR hazard classification as any one of the individual components.	X					
4.6.18 (b)	Phase separation by gravity settling, only without the addition of any chemicals designed to accelerate settling.	X					
4.6.18 (c)	Dispersion of solids into liquids by natural or mechanical means, only if the resultant mixture has the same TDGR hazard classification as the original waste.	X					

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.18 (d)	Physical segregation of hazardous from non-hazardous articles or components from the same container, only if no process equipment is used.	X				• Operations Plan. • Facility SOPs.	Operations Plan and Facility SOPs.
4.6.18 (e)	Washing of drums or other objects, only for the purpose of removing hazardous residue.	X					
4.6.18 (f)	Crushing or shredding of used filters, rags, absorbent materials, or empty containers, only for the purpose of volume reduction or liquid recovery, unless otherwise authorized in writing by the Director.	X					
4.6.18 (g)	Treatment of hazardous waste, only as authorized in writing by the Director.	X					
4.6.19	Notwithstanding 4.6.1 B(g), the approval holder shall not incinerate waste at the facility.	X					No waste incineration equipment exists at the facility.
Limits							
4.6.20	The approval holder shall not store a total of more than 752,500 litres of hazardous waste or hazardous recyclables or both at the HWRSP Facility at any time.	X				WIN Web inventory management software.	Maximum capacity not exceeded as of September 2, 2021, per the below volumes.
4.6.21	In addition to the storage limits in 4.6.20, the approval holder shall not exceed the waste storage limits as specified in TABLE 4.6-A.	X				WIN Web inventory management software.	Observations of inventory software made on September 2, 2021: • 254,681 L of all wastes (hazardous and non-hazardous) • 64,856 L of hazardous waste in containers (drums) • 15,340 L of bulk liquids
4.6.22	Containers other than 205 litre drums shall be prorated to 205 litre drum equivalents based on their nominal volumes, e.g., 10 X 20 litre pails= 1 X 205 litre drum.	X				WIN Web inventory management software.	Software automatically calculates drum equivalents.
4.6.23	The limits referred to in 4.6.20 and 4.6.21 shall be calculated based on the:				X	Not applicable.	Not applicable. Information only.
4.6.23 (a)	Total nominal volumes of all containers, treating all partially filled containers as if they were full.				X	Not applicable.	Not applicable. Information only.
4.6.23 (b)	Total filled capacities of all tanks.				X	Not applicable.	Not applicable. Information only.
Monitoring and Reporting							
4.6.24	The approval holder shall identify, characterize, and classify all waste streams and all hazardous recyclables, generated or received at the HWRSP Facility, not including runoff, industrial wastewater streams and air effluent streams in accordance with the:				X	Not applicable.	Not applicable. Information only.
4.6.24 (i)	Industrial Waste Identification and Management Options, Alberta Environment, May 1996, as amended.			X		Facility and Landfill Operations Report, Section B	The document is not referenced specifically in Landfill Operations Plan, although review of documentation indicates adherence to this standard. Recommended that this be included in the Operations Plan as a specific reference.
4.6.24 (ii)	Alberta User Guide for Waste Managers, Alberta Environment, August 1996, as amended.	X				Facility and Landfill Operations Report, Section B	Referenced in Landfill Operations Plan.
4.6.25	The approval holder shall measure or, when not feasible to measure, estimate, the quantity of each waste and hazardous recyclable identified in 4.6.24 each year.	X				Facility and Landfill Operations Report	Addressed in Appendix A of Operations Report.
4.6.26	The approval holder shall keep a daily total and inventory of all materials being stored at the HWRSP Facility.	X				• Field observations. • Various inventory logs (WIN Web).	Observed documentation in the field.
4.6.27	The daily total and inventory records in 4.6.26 shall be available at the facility at all times for inspection by the Director or an inspector.	X				• Field observations. • Various inventory logs (WIN Web).	Available at the time of the audit.
4.6.28	The approval holder shall submit a Monthly Waste Management Report to the Director.	X				• July 2021 Waste Inventory Report. • Discussion with site staff.	Verbal confirmation that the monthly reports are submitted to AEP. Different documents for internal use and submission confirms submission.
4.6.29	The approval holder shall compile all of the information indicated in Table 4.6-B in the Monthly Waste Management Report which shall contain, at minimum, all of the following information:				X	Not applicable.	Not applicable. Information only.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.29 (a)	An opening waste and hazardous recyclables inventory balance in kilograms or litres by waste class or material type.			X		• July 2021 Waste Inventory Report. • Discussion with site staff.	Compliance confirmed; included in report. The Facility is adhering to the information required in the Monthly Waste Management Report, viewed for July 2021. However the reports are currently referencing the 10348-02-00 Approval. Dillon would recommended that the referenced Approval be updated to 10348-03-00.
4.6.29 (b)	The amount and type of waste and hazardous recyclables received: - Within the province. - From outside of the province.			X			
4.6.29 (c)	The amount and type of waste and hazardous recyclables: - Shipped for recycling or product. - Shipped off-site for disposal. - Disposed on-site.			X			
4.6.29 (d)	Any adjustments, including but not limited to, consolidation, reclassification, losses to processing, spills, volume miscalculations, or any other circumstances, which would affect the mass balance of the monthly inventory report.			X			
4.6.29 (e)	Closing balance in kilograms or litres.			X			
4.6.29 (f)	A summary of contraventions reported pursuant to 2. 1. 1 related to waste and hazardous recyclables.	X				• July 2021 Waste Inventory Report. • Discussion with site staff.	No contraventions identified in monthly report.
4.6.29 (g)	Any other information as required in writing by the Director.	X				• July 2021 Waste Inventory Report. • Discussion with site staff.	No additional requirements by AEP.
4.6.30	The approval holder shall compile all the information required by 4.6.24 and 4.6.25 in an Annual Waste Management Summary Report:				X	Not applicable.	Not applicable. Information only.
4.6.30 (a)	As specified in Table 4.6-C.	X				2020 Annual Waste Management Summary - Table 4.6-D, Hazardous Waste Landfilled, included in the 2020 Annual Report.	In Appendix A of Operations Report.
4.6.30 (b)	In accordance with the: - Industrial Waste Identification and Management Options, Alberta Environment, May 1996, as amended. - Alberta User Guide for Waste Managers, Alberta Environment, August 1996, as amended.			X		2020 Annual Waste Management Summary - Table 4.6-D, Hazardous Waste Landfilled, included in the 2020 Annual Report.	The first document is not referenced specifically in Landfill Operations Plan, although review of documentation indicates adherence to this standard. Recommended that this be included in the Operations Plan as a specific reference.
4.6.31	The approval holder shall submit the Annual Waste Management Summary Report to the Director.	X				2020 Annual Waste Management Summary - Table 4.6-D, Hazardous Waste Landfilled, included in the 2020 Annual Report.	Submitted as part of the Annual Report for the Facility.
Landfill							
Operations Plan							
4.6.32	The approval holder shall develop, keep up-to-date, and implement a Landfill Operations Plan that does not contravene with the requirements of this approval.	X				Operations Plan.	Approval requirements are being examined in this checklist.
4.6.33	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.6.33 (a)	Review the Landfill Operations Plan annually, at a minimum.	X				Operations Plan.	Revision date on the 2021 Facility and Landfill Operations Plan is February, 2021.
4.6.33 (b)	Update the Landfill Operations Plan if any of the following circumstances apply: - There are facility expansions or changes in site operations or equipment. - There is an applicable change to the Standards for Landfills in Alberta, as amended. - An update is required in writing by the Director. - There is an update to an applicable regulation.	X				Operations Plan.	Updates to the operations plan reflect Cell 4 and Cell 3B changes.
4.6.34	The Landfill Operations Plan shall include, at a minimum, all of the following:				X	Not applicable.	Not applicable. Information only.
4.6.34 (a)	SOP for keeping and maintaining an Operating Record.	X				Operations Plan.	Addressed in section A of Operations Plan.
4.6.34 (b)	SOP for waste control, run-on and runoff controls, and nuisance controls.	X				Operations Plan.	Addressed in section B of Operations Plan.
4.6.34 (c)	SOP for the waste stabilization area operations.	X				Operations Plan.	Addressed in section C of Operations Plan.

Section 4 - Operations

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.34 (d)	SOP for the acceptance, handling and disposal of wastes, including: - Waste characterization and classification at source. - Waste manifesting and tracking. - QA/QC waste acceptance procedures. - Waste sampling.	X				Operations Plan.	Addressed in Sections D of Operations Plan.
4.6.34 (e)	SOP for detecting, preventing and disposal of unauthorized wastes.	X				Operations Plan.	Addressed in Sections E of Operations Plan.
4.6.34 (f)	SOP for placing waste in a landfill cell including: - Working face width. - Lift depth. - Compaction. - Waste placement location using a grid system	X				Operations Plan.	Addressed in Sections F of Operations Plan.
4.6.34 (g)	SOP for managing contaminated sulphur and sulphur containing wastes.	X				Operations Plan.	Addressed in Sections G of Operations Plan.
4.6.34 (h)	SOP for managing asbestos wastes.	X				Operations Plan.	Addressed in Sections H of Operations Plan.
4.6.34 (i)	SOP for placing leachate, leak detection liquid, or other authorized wastes and liquids over the surface of the active landfill area for the purpose of evaporation or dust suppression.	X				Operations Plan.	Addressed in Sections I of Operations Plan.
4.6.34 (j)	An Odour and Fugitive Dust Response Program.	X				Operations Plan.	Addressed in Sections J of Operations Plan, referencing the Fugitive Dust and Odour Best Management Plan in Appendix C.
4.6.34 (k)	A Fugitive Dust and Odour Best Management Plan.	X				Operations Plan.	Addressed in Sections K of Operations Plan, referencing the Fugitive Dust and Odour Best Management Plan in Appendix C.
4.6.34 (l)	A runoff and industrial wastewater monitoring and management program.	X				Operations Plan.	Addressed in Sections L of Operations Plan.
4.6.34 (m)	A leachate monitoring and management program.	X				• Operations Plan. • SOPL002-003 Landfill Leachate System.	Addressed in Sections M of Operations Plan.
4.6.34 (n)	A leak detection liquid monitoring and management program.	X				• Operations Plan. • SOPL002-003 Landfill Leachate System.	Addressed in Sections M/N of Operations Plan.
4.6.34 (o)	A groundwater monitoring program.	X				Operations Plan.	Addressed in Sections O of Operations Plan.
4.6.34 (p)	A Remediation Plan to deal with groundwater quality deterioration.	X				Groundwater Remediation Plan.	Addressed in Sections P of Operations Plan.
4.6.34 (q)	A soil monitoring program.	X				Operations Plan.	Addressed in Sections Q of Operations Plan. Submitted in late 2019 and the first soil monitoring program report was submitted to AEP on January 31, 2020.
4.6.34 (r)	A soil management program.	X				Operations Plan.	Addressed in Sections R of Operations Plan. Confirmation of acceptance from AEP September 18, 2020.
4.6.34 (s)	A landfill cell cover system.	X				Operations Plan.	Addressed in Sections S of Operations Plan. Cell cover system is prepared by consultants and conforms to provincial regulations.
4.6.34 (t)	A monitoring and maintenance program for the scale house and heavy operational equipment.	X				• Operations Plan. • Maintenance Dashboard. • Scale maintenance records	Addressed in Sections T of Operations Plan. Scales calibrated twice per year, maintenance program in place.
4.6.34 (u)	A health and safety program.	X				Health and Safety Program.	Addressed in Sections U of Operations Plan. Health and Safety program in place, training records are kept accounted for, and notifications when training comes due. Employees sign-off on Health and Safety program.
4.6.34 (v)	An emergency response program, including SOP for handling fires, substance releases to the environment, and health concerns.	X				Contingency Plan in Appendix A of the Operations Plan.	Addressed in Sections V of Operations Plan, referencing the facility's Contingency Plan in Appendix A. A system exists to track each employees training and provides management with information such as: training expiring, which training each employee requires, etc.
4.6.34 (w)	An up-to-date plan of the landfill layout with survey records showing the location of all infrastructure components of the landfill including final cover elevations and contours.	X				Operations Plan.	Addressed in Section W of Operations Plan, referencing Appendix D.
4.6.35	The approval holder shall retain a copy of the most recent Landfill Operations Plan at the facility.	X				Operations Plan.	Hard copy of 2021 Operations Plan viewed
4.6.36	The approval holder shall submit to the Director the most recent Landfill Operations Plan when requested in writing by the Director within the timeline specified in writing by the Director.	X				Discussions with site staff.	Compliance confirmed; submitted annually.
4.6.37	The approval holder shall correct all deficiencies in the Landfill Operations Plan submitted pursuant to 4.6.36, as outlined in writing by the Director, within the timeline specified in writing by the Director.				X	Not applicable.	Not applicable. Information only.
4.6.38	The approval holder shall implement the latest Landfill Operations Plan, unless otherwise authorized in writing by the Director.	X				Operations Plan.	2021 Operations Plan observed.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Operations							
4.6.39	The approval holder shall classify all materials entering the landfill in accordance with the:				X	Not applicable.	Not applicable. Information only.
4.6.39 (a)	Waste Control Regulation (AR 192196).	X				Operations Plan, Section B.	Referenced in Landfill Operations Plan.
4.6.39 (b)	Industrial Waste Identification and Management Options, Alberta Environment, May 1996, as amended.			X		Operations Plan.	The document is not referenced specifically in Landfill Operations Plan, although review of documentation indicates adherence to this standard. Recommended that this be included in the Operations Plan as a specific reference.
4.6.39 (c)	Alberta User Guide for Waste Managers, May 1995, as amended.	X				Operations Plan, Section B.	Referenced in Landfill Operations Plan.
4.6.40	The approval holder shall obtain a detailed representative physical and chemical analysis of a waste prior to disposal of the waste into the landfill at the following times, at a minimum:				X	Not applicable.	Not applicable. Information only.
4.6.40 (a)	The first time a waste is received from a new generator.	X				• Operations Plan, Sections B-D • Waste Profile from WIN Web viewed.	Compliance confirmed: • Procedures and acceptance criteria in the Landfill Operations Plan are compliant with Approval. • All waste profiles renewed annually, either by customers or Clean Harbors on-site.
4.6.40 (b)	The first time a delivery is received from a different process associated with a known waste generator.	X					
4.6.40 (c)	The first time a waste is received from a different location associated with a known waste generator.	X					
4.6.40 (d)	When the nature or composition of the waste that was previously characterized by the generator changes.	X					
4.6.41	The approval holder shall not dispose of hazardous waste in any Class II landfill cell.				X	Not applicable.	Not applicable. The site is not a Class II landfill.
4.6.42	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.6.42 (a)	Only carry out waste stabilization or solidification or both within the waste stabilization area.	X				Site field observations.	Solidification and waste stabilization activities consistent with Approval requirements during field observations.
4.6.42 (b)	Not transfer waste from the waste stabilization area to the Class I landfill cell before the waste stabilization or solidification or both have completed.	X					
4.6.43	The approval holder shall only dispose of any liquid collected within the waste stabilization area by one or more of the following methods:				X	Not applicable.	Not applicable. Information only.
4.6.43 (a)	To facilities holding a current Act authorization to accept such waste.				X	Not applicable.	Not applicable. This option not used by the facility.
4.6.43 (b)	To facilities approved by a local environmental authority outside of Alberta to accept such waste.				X	Not applicable.	Not applicable. This option not used by the facility.
4.6.43 (c)	To a disposal well approved by AER.or	X				AER approval for deep well.	• Liquid waste is hauled to Class I deep well in Calmar. • AER approval for deep well (leased from Seller's Oilfield Services to CH) observed. Approval No. WM 077 A, dated July 25, 2011.
4.6.43 (d)	As otherwise authorized in writing by the Director.				X	Not applicable.	Option not used by the Facility.
4.6.44	The approval holder shall conduct:				X	Not applicable.	Not applicable. Information only.
4.6.44 (a)	Annually, in-house visual inspections for corrosion.	X				Discussion with site staff.	Confirmed that annual visual inspections performed.
4.6.44 (b)	Biennially, ultrasonic testing to monitor thickness of the steel plate liner of the stabilization pits in the waste stabilization area, unless otherwise authorized in writing by the Director.	X				Inspection report from Integrity Testing Services Inc., dated August 2021.	Performed yearly, tracked by compliance calendar.
4.6.45	The approval holder shall dispose of asbestos wastes in accordance with "Guidelines for the Disposal of Asbestos Waste': Environmental Protection Services, Alberta Environment, 1989, as amended.	X				Operations Plan, Section H.	Referenced in Landfill Operations Plan.
4.6.46	The approval holder shall dispose of sulphur waste in accordance with "Guidelines for Landfill Disposal of Sulphur Wastes and Remediation of Sulphur Containing Soils", Alberta Environment, 2011, as amended.	X				Operations Plan, Section G.	Referenced in Landfill Operations Plan.
4.6.47	The approval holder shall only dispose of wastes that the landfill is not authorized to dispose of:				X	Not applicable.	Not applicable. Information only.
4.6.47 (a)	To facilities holding a current Act authorization.	X				Discussion with site staff.	Compliance confirmed. All waste receipts are screened at the site entry scale and any non-authorized loads, as determined through manifest, are rejected.
4.6.47 (b)	To facilities approved by a local environmental authority outside of Alberta. Or:	X					
4.6.47 (c)	As otherwise authorized in writing by the Director.	X					
4.6.48	If an unauthorized waste is received at the landfill, the approval holder shall remove the waste from the landfill within seven (7) days of the receipt, unless otherwise authorized in writing by the Director.				X	Not applicable.	Not applicable. Not observed during the audit. Non authorized waste not received in the landfill.
4.6.49	The approval holder shall restrict the working face of each landfill cell to the smallest practical area.				X		
4.6.50	For any waste disposed of at the landfill that is subject to wind dispersal, the approval holder shall:				X		
4.6.50 (a)	Wet the waste to prevent dispersal of particulate matter.or	X				Operations Plan, Appendix C (Fugitive Dust and Odour Best Management Plan).	Documents reviewed have procedures for managing dust and particulate matter through waste placement in landfill and in waste stabilization.
4.6.50 (b)	Immediately apply cover on top of the waste to minimize entrainment of particulate matter.	X					

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.51	Notwithstanding 4.6.1 (v), the approval holder may place any of the following wastes over the surface of the active landfill area for the purpose of dust suppression, provided that placement of such wastes will not cause offensive odours:	X				Discussion with site staff.	Compliance confirmed. Pond water for dust suppression. Leachate is never used due to odour.
4.6.51 (a)	Specified runoff.				X	Not applicable.	Not applicable. Pond water is used for dust suppression only.
4.6.51 (b)	Leachate.				X		
4.6.51 (c)	Leak detection liquid.				X		
4.6.51 (d)	Sump waste of car wash bays or similar operations.				X		
4.6.51 (e)	Waste from hydrovac excavation operations.				X		
4.6.51 (f)	Any other waste authorized by the Alberta User Guide for Waste Managers, May 1995, as amended.				X		
4.6.52	The approval holder shall inspect the landfill, at a minimum:				X	Not applicable.	Not applicable. Information only.
4.6.52 (a)	Weekly.	X				• Discussion with site staff. • September 1, 2021 daily inspection record.	Compliance confirmed through review of inspection record.
4.6.52 (b)	Immediately after each storm event to: - Detect evidence of deterioration of any infrastructure components, including the composite liner. - Detect any malfunction or improper operation of the run-on and runoff control systems, leachate collection system, or leak detection system. - Take corrective measures to repair any damage to infrastructure components, including the composite liner.	X					
4.6.53	The approval holder shall do the following, the Director in writing along with any corrective measures taken or proposed:				X	Not applicable.	Not applicable. Information only.
4.6.53 (a)	Keep a record of inspections conducted pursuant to 4.6.52.	X				Landfill inspection records.	Compliance confirmed through review of electronic records.
4.6.53 (b)	Have the record of inspections available for review upon written request from the Director.	X					
4.6.53 (c)	Immediately report any deficiencies detected by the inspection in 4.6.52 to the Director in writing along with any corrective measures taken or proposed	X				Landfill inspection records.	Reported if there is a contravention. If not, a work ticket is created and the issue is fixed.
4.6.54	The approval holder shall not stockpile waste exceeding the maximum designated waste elevation of the landfill for a period of more than two (2) weeks, unless otherwise authorized in writing by the Director.	X				Site survey, dated January 4, 2021.	The site is surveyed twice per year, and no contours exceed the maximum designated waste elevation.
4.6.55	The approval holder shall take all practical measures to prevent off-site tracking of waste from vehicles and equipment leaving the facility.	X				Discussion with site staff.	Mud and waste tracking from the haul trucks is addressed as needed.
Monitoring and Reporting							
4.6.56	The approval holder shall monitor the landfill operations as required in Table 4.6-D.	X				2020 Annual Report.	All criteria in Table 4.6-D is included.
4.6.57	The approval holder shall report to the Director the results of the landfill operations monitoring as required in Table 4.6-D.	X				2020 Annual Report.	Submitted to AEP.
4.6.58	The Annual Landfill Operations Report required in Table 4.6-D shall include, at a minimum, all of the following:				X	Not applicable.	Not applicable. Information only.
4.6.58 (a)	the name and contact information of the person responsible for the facility.	X				2020 Annual Report.	Addressed in Section 2.0 of Annual Report.
4.6.58 (b)	A summary of all information collected as required in Table 4.6-D.	X				2020 Annual Report.	Addressed in Section 3.0 of Annual Report.
4.6.58 (c)	A summary of the results of any audit conducted in accordance with 4.1.7.	X				2020 Annual Report.	2018 Triennial Compliance Audit included in Appendix D of Annual Report.
4.6.58 (d)	A summary of the operations of the waste stabilization area.	X				2020 Annual Report.	Addressed in Section 5.0 and Appendix I of Annual Report.
4.6.58 (e)	A summary of the performance of the run-on and runoff control systems, including a comparison to the limits in Tables 4.3-8 and 4.3-C.	X				2020 Annual Report.	Addressed in Section 6.0 of Annual Report.
4.6.58 (f)	A summary of the performance of the leachate collection system, including a comparison to the maximum acceptable leachate head.	X				2020 Annual Report.	Addressed in Section 7.0 of Annual Report.
4.6.58 (g)	A summary of the performance of the leak detection system, including a comparison to the action leakage rate limit.	X				2020 Annual Report.	Addressed in Section 8.0 of Annual Report.
4.6.58 (h)	The Response Action Plan for the leak detection system pursuant to 4.4.1 O.	X				2020 Annual Report.	Addressed in Section 9.0 and Appendix J of Annual Report.
4.6.58 (i)	The Annual Dugout and Water Well Sampling Program Report pursuant to 4.5.4.	X				2020 Annual Report.	Addressed in Section 10.0 Appendix K of Annual Report.
4.6.58 (j)	A summary of all revisions to the Landfill Operations Plan pursuant to 4.6.33(b).	X				2020 Annual Report.	Addressed in Section 11.0 and Appendix L of Annual Report.
4.6.58 (k)	Any groundwater remedial action taken pursuant to 4.6.34(p).	X				2020 Annual Report.	Addressed in Section 12.0 of Annual Report.
4.6.58 (l)	A summary of records of landfill inspections pursuant to 4.6.53.	X				2020 Annual Report.	Addressed in Section 13.0 and Appendix M of Annual Report.
4.6.58 (m)	A summary of: - Operational issues encountered. - Emergencies occurred. - Measures or actions taken.	X				2020 Annual Report.	Addressed in Section 14.0 of Annual Report.
4.6.58 (n)	A summary of records of: - Public complaints. - The approval holder's responses	X				2020 Annual Report.	Addressed in Section 15.0 and Appendix Q of Annual Report.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.58 (o)	An up-to-date financial security estimate pursuant to 5.1.2.	X				2020 Annual Report.	Addressed in Section 16.0 and Appendix N of Annual Report.
4.6.58 (p)	An updated site development plan showing the status of the landfill progression at the end of the operating year, including but not limited to: - Contour mapping. - The location of active and inactive disposal areas. - Areas where a final cover has been placed. - The location of new landfill cell(s) constructed.	X				2020 Annual Report.	Addressed in Section 17.0 and Appendix O of Annual Report.
4.6.58 (q)	The Annual Landfill Cell Closure Report pursuant to 7.1.7.	X				2020 Annual Report.	Addressed in Section 18.0 Appendix P of Annual Report.
4.6.58 (r)	A summary of contraventions reported pursuant to 2.1.1 related to landfill operations.	X				2020 Annual Report.	Addressed in Section 19.0 Appendix Q of Annual Report.
4.6.58 (s)	Any other information as required in writing by the Director.	X				2020 Annual Report.	Addressed in Section 20 of Annual Report. No additional information was required by the Director.
4.6.59	The approval holder shall submit the Annual Landfill Operations Report to the Director.	X				Discussion with site staff.	Confirmation of submission prior to deadline (March 24, 2021 for last items).
Operations							
4.7.1	The approval holder shall not release any substances from the domestic wastewater system to the surrounding watershed except as authorized by this approval.	X				Discussion with site staff.	Wastewater is directed to an isolated holding tank.
4.7.2	The approval holder shall direct all domestic wastewater to the domestic wastewater system.	X					
4.7.3	The approval holder shall only dispose of substances from the domestic wastewater system:				X	Not applicable.	Not applicable. Information only.
4.7.3 (a)	To facilities holding a current Act authorization.	X				Discussion with site staff.	Wastewater from holding tank taken across the street to authorized treatment lagoon (Contractor).
4.7.3 (b)	To facilities approved by a local environmental authority outside of Alberta.or	X					
4.7.3 (c)	As otherwise authorized in writing by the Director.	X					
Not used at this time.							
Monitoring							
4.9.1	The approval holder shall continue to implement the existing Groundwater Monitoring Program as authorized in writing by the Director, unless and until otherwise authorized in writing by the Director pursuant to 4.9.4.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Groundwater reporting is being conducted in conformance with the Groundwater Monitoring Program.
4.9.2	The approval holder shall submit a revised Groundwater Monitoring Program to the Director on or before September 30, 2017, unless otherwise authorized in writing by the Director.	X				Discussion with site staff.	Submitted before the September 30th, 2017 deadline.
4.9.3	If the revised Groundwater Monitoring Program submitted pursuant to 4.9.2 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.	X				Discussion with site staff.	AEP did not identify any deficiencies with the program.
4.9.4	The approval holder shall implement the revised Groundwater Monitoring Program submitted pursuant to 4.9.2 as authorized in writing by the Director within the timeline specified in writing by the Director.	X				Discussion with site staff.	Implemented after submittal.
4.9.5	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.9.5 (a)	Collect a representative groundwater sample from each of the groundwater monitor wells specified in the Groundwater Monitoring Program, including the groundwater monitoring wells designated as points of compliance.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Compliance confirmed; all wells in monitoring program are sampled.
4.9.5 (b)	Analyze each sample for the parameters listed in Table 4.9-A.	X					Compliance confirmed; all parameters are sampled for.
4.9.6	The monitoring required in 4.9.5 shall be conducted at the following frequencies, unless otherwise authorized in writing by the Director:				X	Not applicable.	Not applicable. Information only.
4.9.6 (a)	A minimum of once per year during each of the active landfill life, landfill cell closure, final landfill closure, and post-closure periods.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Compliance confirmed; groundwater is monitored once per year.
4.9.6 (b)	A minimum of four times per year following detection of leachate constituents in groundwater at levels above those specified in 4.9.7, and until the levels specified in 4.9. 7 have been met.	X				Discussion with site staff.	Compliance confirmed; no leachate constituents have ever been found.
4.9.7	The groundwater quality in the monitoring wells, designated as points of compliance in the Groundwater Monitoring Program, shall not exceed the higher of:				X	Not applicable.	Not applicable. Information only.

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		Compliant	Non-Compliant	OFI	Info, N/A		
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4.9.7 (a)	The objectives established in the water quality objectives in the Canadian Environmental Quality Guidelines (CEQG) for drinking water published by the Canadian Council of Ministers of the Environment (CCME), as amended.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Several exceedances noted in GW report, however these are due to the natural composition of the groundwater in the area.
4.9.7 (b)	Background groundwater chemistry as determined through a statistical analysis, as a derived alternate groundwater performance standard.	X					
4.9.8	The approval holder shall implement the Remediation Plan as specified in the Landfill Operations Plan, when groundwater quality exceeds the groundwater performance criteria in 4.9.7.				X		Remediation Plan has not been required to be implemented. Exceedances are normal for the groundwater in the area.
4.9.9	The samples extracted from the groundwater monitor wells shall be collected using scientifically acceptable purging, sampling and preservation procedures so that a representative groundwater sample is obtained.	X				2020 GW Monitoring Report, dated March 2, 2021 from Tetra Tech	Compliance confirmed; acceptable procedures are being followed.
4.9.10	The approval holder shall for all groundwater monitoring wells:				X	Not applicable.	Not applicable. Information only.
4.9.10 (a)	Protect from damage.	X				Field observations.	Compliance confirmed; all wells were observed to be protected and locked.
4.9.10 (b)	Keep locked except when being sampled.	X					
4.9.11	If a representative groundwater sample cannot be collected because the groundwater monitoring well is damaged or is no longer capable of producing a representative groundwater sample, the approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.9.11 (a)	Clean, repair or replace the groundwater monitoring well.				X	Not applicable.	Not applicable. No damaged or non-functional wells.
4.9.11 (b)	Collect and analyse a representative groundwater sample prior to the next scheduled sampling event.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Compliance confirmed; groundwater monitoring consistent with schedule.
4.9.12	In addition to the sampling information recorded in 2.2.1, the approval holder shall record the following sampling information for all groundwater samples collected:				X	Not applicable.	Not applicable. Information only.
4.9.12 (a)	A description of purging and sampling procedures.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Refer to Section 5.2.
4.9.12 (b)	The static elevations above sea level, and depth below ground surface of fluid phases in the groundwater monitoring well prior to purging.	X					Compliance confirmed; groundwater levels were recorded.
4.9.12 (c)	The temperature of each sample at the time of sampling.	X					Compliance confirmed; temperature was recorded at the time of sampling.
4.9.12 (d)	The pH of each sample at the time of sampling.	X					Compliance confirmed; pH was recorded at the time of sampling.
4.9.12 (e)	The specific conductance of each sample at the time of sampling.	X					Compliance confirmed; recorded as mS at the time of sampling.
4.9.13	The approval holder shall carry out remediation of the groundwater in accordance with the following:				X	Not applicable.	Not applicable. Information only.
4.9.13 (a)	Alberta Tier 1 Soil and Groundwater Remediation Guidelines, Alberta Environment, February 2009, as amended.				X		Not applicable. Groundwater remediation has not been deemed necessary.
4.9.13 (b)	Alberta Tier 2 Soil and Groundwater Remediation Guidelines, Alberta Environment, February 2009, as amended.				X		
Reporting							
4.9.14	The approval holder shall compile an Annual Groundwater Monitoring Program Report which shall include, at a minimum, all of the following information:				X	Not applicable.	Not applicable. Information only.

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		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.9.14 (a)	A completed Record of Site Condition Form, Alberta Environment, 2009, as amended.	X				• Tetra Tech 2019 Groundwater Monitoring Program, dated March 10, 2020. • Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Compliance confirmed through a review of the report. Submission to AEP confirmed through review of correspondence.
4.9.14 (b)	A legal land description of the facility and a map illustrating the facility boundaries.	X					
4.9.14 (c)	A topographic map of the facility.	X					
4.9.14 (d)	A description of the industrial activity and processes.	X					
4.9.14 (e)	A map showing the location of all surface and groundwater users, and a listing describing surface water and water well use details, within at least a 1.6 kilometre radius of the facility.	X					
4.9.14 (f)	A general hydrogeological characterization of the region within a five kilometre radius of the facility.	X					
4.9.14 (g)	A detailed hydrogeological characterization of the facility, including an interpretation of groundwater flow patterns.	X					
4.9.14 (h)	Cross-sections showing depth to water table, patterns of groundwater movement and hydraulic gradients at the facility.	X					
4.9.14 (i)	Borehole logs and completion details for groundwater monitoring wells.	X					
4.9.14 (j)	A map showing locations of all known buried channels within at least five kilometre of the facility.	X					
4.9.14 (k)	A map of surface drainage within the facility and surrounding area to include nearby water bodies.	X					
4.9.14 (l)	A map of groundwater monitoring well locations and a table summarizing the existing groundwater monitoring program for the facility.	X					
4.9.14 (m)	A summary of any changes to the groundwater monitoring program made since the last groundwater monitoring report.	X					
4.9.14 (n)	Analytical data recorded as required in 4.9.5 and 4.9.11(b).	X					
4.9.14 (o)	A summary of fluid elevations recorded as required in 4.9.12(b) and an interpretation of changes in fluid elevations.	X					
4.9.14 (p)	An interpretation of QA/QC program results.	X					
4.9.14 (q)	An interpretation of all the data in this report, including the following: - Diagrams indicating the location and extent of any contamination. - A description of probable sources of contamination. - A site map showing the location and type of current and historical potential sources of groundwater contamination	X					
4.9.14 (v)	Recommendations for: - Changes to the groundwater monitoring program to make it more effective. - Remediation, risk assessment or risk management of contamination identified.	X					
4.9.15	The approval holder shall submit the Annual Groundwater Monitoring Program Report to the Director.	X					
4.9.16	If the Annual Groundwater Monitoring Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, within the timeline specified in writing by the Director.				X	Not applicable.	Not applicable. AEP did not identify any deficiencies.
4.10.1	In addition to any other requirements specified in this approval, the approval holder shall conduct all of the following activities related to soil monitoring and soil management required by this approval in accordance with the Soil Monitoring Directive, Alberta Environment, 2009, as amended:	X				Tetra Tech 2017 Soil Management Program Proposal, including Soil Monitoring Program.	Compliance confirmed: • March 21, 2017 - Soil Management Program Proposal (incl. monitoring program submitted to AEP. • September 11, 2017 - Supplemental Information to Soil Management Program Proposal (revisions), submitted to AEP. • September 13, 2017 - Approval letter from AEP regarding Soil Management Program Proposal.
4.10.1 (a)	Designing and developing proposals for the Soil Monitoring Program.	X					
4.10.1 (b)	Designing and developing proposals for the Soil Management Program.	X					
4.10.1 (c)	All other actions, including sampling, analysing, and reporting, associated with the Soil Monitoring Program.	X				Tetra Tech 2019 Soil Monitoring Program Report, dated January 31, 2020.	Actions in program reflect the 2019 Soil Monitoring Program Proposal and Deficiency Response Letter.
4.10.1 (d)	All other actions, including sampling, analysing and reporting, associated with the Soil Management Program.	X				Tetra Tech 2019 Soil Monitoring Program Report, dated January 31, 2020.	Actions in program reflect the 2019 Soil Monitoring Program Proposal and Deficiency Response Letter.

Section 4 - Operations

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Soil Monitoring and Reporting							
4.10.2	The approval holder shall submit the Soil Monitoring Program proposal to the Director according to the following schedule: - For the first soil monitoring event on or before January 31, 2019. - For the second soil monitoring event on or before January 31, 2024.	X				Tetra Tech 2017 Soil Management Program Proposal, including Soil Monitoring Program.	Compliance confirmed: • March 21, 2017 - Soil Management Program Proposal (incl. monitoring program submitted to AEP. • September 11, 2017 - Supplemental Information to Soil Management Program Proposal (revisions), submitted to AEP. • September 13, 2017 - Approval letter from AEP regarding Soil Management Program Proposal.
4.10.3	If any Soil Monitoring Program proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.	X					
4.10.4	Subject to 4.10.3, the approval holder shall implement the Soil Monitoring Program as authorized in writing by the Director.	X				Tetra Tech 2019 Soil Monitoring Program.	Confirmed that this was completed in Fall 2019.
4.10.5	If an authorization or a deficiency letter is not issued within 120 days of the applicable date required by 4.10.2, the approval holder shall implement the Soil Monitoring Program in accordance with the program as set out in the proposal submitted by the approval holder and within 270 days after the applicable date required by 4.10.2	X				Tetra Tech 2019 Soil Monitoring Program.	Confirmed that this was completed in Fall 2019.
4.10.6	The approval holder shall submit to the Director each Soil Monitoring Program Report obtained from the soil monitoring referred to in 4.10.4 and 4.10.5 according to the following schedule:	X				Tetra Tech 2019 Soil Monitoring Program.	Confirmed that this was completed in Fall 2019.
4.10.6 (a)	For the first Soil Monitoring Program Report on or before January 31, 2020.	X				Tetra Tech 2019 Soil Monitoring Program Report, dated January 31, 2020.	Submit to the AEP on time, January 31, 2020
4.10.6 (b)	For the second Soil Monitoring Program Report on or before January 31, 2025.				X	Not applicable.	Not applicable. To be completed in the summer of 2024.
4.10.7	If any Soil Monitoring Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.	X				Tetra Tech 2019 Soil Monitoring Program Report, dated January 31, 2020.	Actions in program reflect the 2019 Soil Monitoring Program Proposal and Deficiency Response Letter.
Soil Management Program							
4.10.8	If the Soil Monitoring Program, or any other soil monitoring, reveals that there are substances present in the soil at concentrations greater than any of the applicable concentrations set out in the standards in the Soil Monitoring Directive, Alberta Environment, 2009, as amended, the approval holder shall develop a Soil Management Program Proposal.	X				• Tetra Tech 2017 Soil Management Program Proposal, including Soil Monitoring Program. • Tetra Tech Soil Management Program 2017 Cell 4 Soil Sampling, dated March 12, 2018.	Soil Management Program Proposal was developed and compliance was confirmed through a review.
4.10.9	If a Soil Management Program Proposal is required pursuant to 4.10.8, the approval holder shall submit a Soil Management Program Proposal to the Director according to the following schedule:				X	Not applicable.	Not applicable. Information only
4.10.9 (a)	For Soil Management Program Proposal that is triggered by the findings from the first soil monitoring event on or before the date in 4.10.6(a).	X				Soil Management Program - 2017 Cell 4 Soil Sampling	Updated Soil Management Plan and recommendations are being followed by consultant.
4.10.9 (b)	For Soil Management Program Proposal that is triggered by the findings from a second soil monitoring event on or before the date in 4.10.6(b).	X				Soil Management Program - 2017 Cell 4 Soil Sampling	Updated Soil Management Plan and recommendations are being followed by consultant.
4.10.9 (c)	For any other soil monitoring event not specified in this approval within six months of completion of the soil monitoring event.				X	Not applicable.	Not applicable. Information only
4.10.10	If any Soil Management Program Proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.	X				Soil Management Program - 2017 Cell 4 Soil Sampling	Updated Soil Management Plan and recommendations are being followed by consultant.
4.10.11	The approval holder shall implement the Soil Management Program as authorized in writing by the Director.	X				Soil Management Program - 2017 Cell 4 Soil Sampling	Updated Soil Management Plan and recommendations are being followed by consultant.
4. 10.12	If the approval holder is required to implement a Soil Management Program pursuant to 4.10.11, the approval holder shall submit a written Soil Management Program Report to the Director on or before March 31 of each year following the year in which the information was collected.	X				Soil Management Program - 2017 Cell 4 Soil Sampling	Updated Soil Management Plan and recommendations are being followed by consultant.
4.10.13	If any Soil Management Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified by the Director by the date specified in writing by the Director.				X	Not applicable.	Not applicable. No deficiencies identified by the Director.

Section 4 - Operations

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.1.1	The geographic boundaries of the landfill has been maintained to that located within SE ¼ of Section 9, Township 50, Range 17, West of the 4th Meridian.	X				• 2020 Annual Report • Field observations.	Confirmed that landfill is within the approved boundary.
4.1.2	The waste elevation of the landfill has not exceeded the maximum designated waste elevation.	X				Cell 3B Landfill Capping Top of Final Cover Elevations, Figure No. 3 in Dillon Annual Landfill Cell Closure Report (Cell 3B), dated March 2021.	• Maximum elevation, per Part 1 (ggg) (definitions) is 714 masl. • Most recent closure was Cell 3B, which is also the highest. • Maximum elevation observed in final cover was 713.15 masl.
4.1.3	Access to the facility has been restricted to only authorized personnel.	X				Field observations.	• Visitor sign in sheet at front desk. • Scale house reporting for all vehicles. • Security cameras on-site. • Gated access.
4.1.4	A 24 hour "HOTLINE" number has been maintained for prompt response during an emergency.			X		Field observations.	A hotline is maintained but not posted at gate or office entrance. Hotline is 780-690-0614.
4.1.5	The approval owner shall operate and maintain the integrity of the following waste management facilities at the facility:				X		Not applicable. Information only.
4.1.5 (i)	HWRSP Facility	X					Confirmed during field inspection.
4.1.5 (ii)	Class I and II landfill, including Class I and II cells and waste stabilization areas.			X			Observed ponding in roadways near potable water tanks, which can be managed on an ongoing basis.
4.1.5 (iii)	Waste storage areas.	X					Confirmed during field inspection.
4.1.6	The approval holder shall operate and maintain the integrity of the following infrastructure components at the facility:				X		Not applicable. Information only.
4.1.6 (i)	Composite liner	X				• 2020 Annual Report. • Field observations.	Confirmed during field inspection.
4.1.6 (ii)	Leachate collection system	X					Confirmed during field inspection.
4.1.6 (iii)	Leak detection system	X					Confirmed during field inspection.
4.1.6 (iv)	Run-on control system	X					Confirmed during field inspection.
4.1.6 (v)	Run-off control system	X					Confirmed during field inspection.
4.1.6 (vi)	Groundwater monitoring wells	X					• Confirmed well MW-10 (near waste storage and HWRSP Facility) has been repaired and locked. • All other wells were observed to be protected and locked.
4.1.6 (vii)	Weigh scale	X					Weigh scale is operational.
4.1.6 (viii)	Site access control	X				Field observations.	Confirmed that sign-in procedures in place, doors locked, etc.
Facility Audit							
4.1.7	The approval holder shall cause the facility to be audited by an independent third-party environmental consultant to assess compliance with the terms and conditions of this approval, commencing on or before October 1, 2018.	X				• 2018 Compliance Audit Report. • 2021 Compliance Audit Report.	Compliance confirmed.
4.1.8	The approval holder shall submit the audit report required in 4.1.7 in the Annual Landfill Operations Report.	X				2020 Annual Report.	Reviewed the 2020 Annual Landfill Operations Report and confirmed previous Audit was included.
4.1.9	The requirements in 4.1.7 and 4.1.8 do not relieve the approval holder of any duty under the Act, or its associated regulations, or this approval.				X	Not applicable.	Not applicable. Information only.

Section 4 - Operations

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Operations							
4.2.1	The approval holder shall not release any air effluent streams to the atmosphere except as authorized by this approval.				X	Not applicable.	Not applicable. Information only.
4.2.2	The approval holder shall only release air effluent streams to the atmosphere from the following sources: - Scrubber exhaust stack - Drum Processing Building exhaust vent - Staging Building exhaust vent - Administrative Building exhaust vents - Laboratory fume hood and exhaust vents - Maintenance Shop equipment and exhaust vents - Leachate Collection Tanks exhaust vents - Leachate transfer lines passive gas vents - Any other source authorized in writing by the Director	X				Field observations.	• No other sources not listed in the approval. • Requested in Approval Amendment (pending) to do quenching emulsions, only if non-toxic gases are emitted.
4.2.3	The approval holder shall not operate any process equipment unless and until the pollution abatement equipment associated with the corresponding process equipment is operational and operating.	X				• Field observations. • Verbal confirmation. • Sept. 1, 2021 Transfer Station Daily Inspection (including scrubber inspection).	All pollution abatement equipment is continuously operated.
4.2.4	The approval holder shall treat all air effluent streams from the exhaust vents of the Drum Processing or Staging or both Buildings with a caustic scrubber and an activated carbon filter before directing the air effluent streams to the scrubber exhaust stack for release to the atmosphere while: - Hazardous wastes/recyclables are being processed. - Hazardous wastes/recyclables are being transferred. - Containers of hazardous wastes/recyclables are open in the Drum Processing and/or Staging Buildings.	X				• Field observations. • Discussion with site staff.	Monitored weekly and documented as per section below. All building air is treated through the pollution abatement equipment (scrubber and filter), including drum and tank vents.
4.2.5	The approval holder shall control fugitive emissions and any source not specified in 4.2.2 in accordance with 4.2.6 of this approval.	X				Field observations.	A carbon filter was added to the leachate tank.
4.2.6	With respect to fugitive emissions and any source not specified in 4.2.2, the approval holder shall not release a substance or cause to be released a substance that causes or may cause any of the following:				X	• Operations Plan, Appendix C (Fugitive Dust and Odour Best Management Plan). • Odour Complaint notification to Village and County, dated July 30, 2021.	• No fugitive emissions outside of what's permitted. • Odour complaints are received and managed per BMPs (report reviewed and contained in Operations Plan). • As part of the Amendment Application, AEP identified concerns regarding communications to the Village of Ryley and Beaver County. Clean Harbors now notifies the Village and County of all complaints and contraventions submitted to AEP.
4.2.6 (a)	Impairment, degradation or alteration of the quality of natural resources.	X					
4.2.6 (b)	Material discomfort, harm or adverse effect to the well being or health of a person.	X					
4.2.6 (c)	Harm to property or to vegetative or animal life.	X					
4.2.7	The approval holder shall not burn any debris by means of an open fire unless authorized in writing by the Director.	X				Correspondence with AEP	A fire occurred on property in January 2021, for which AEP was notified. No burning is conducted on site.
4.2.8	If the approval holder receives complaints of offensive odours, or fugitive dust, or both, beyond the facility boundaries, the approval holder shall:				X	• Operations Plan, Appendix C (Fugitive Dust and Odour Best Management Plan). • Environmental Management Program SOP #90RY-410-00. • Field observations. • Discussion with site staff.	• Response is based on the type of complaint. • Recently added a carbon filter on the leachate tank vent. • Material receipt may be suspended during high wind days. • Cover can be immediately placed for dust suppression and dispersion prevention. • Receive typically 2-3 odour complaints per year.
4.2.8 (a)	Conduct the following to reduce the release of those odours, or fugitive dust, or both by:	X					
4.2.8 (a, i)	Placing restrictions on types, or volumes, or both, of the wastes being handled or processed or deposited that are causing those odours, or fugitive dust, or both.	X					
4.2.8 (a, ii)	Increasing the frequency of cover placement, or modifying waste handling activities, or performing both, at the landfill.	X					
4.2.8 (a, iii)	Modifying waste handling activities at the HWRSP Facility.	X					
4.2.8 (a, iv)	Performing any combination of the above.	X					
4.2.8 (b)	Activate the Odour and Fugitive Dust Response Program as specified in the Landfill Operations Plan 4.6.34U).	X					

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Limits							
4.2.9	The approval holder shall maintain the pH of the scrubbing liquid of the caustic scrubber referred to in 4.2.4 at 8.0 or higher.	X				• Field observations. • Recorded daily (viewed Aug. 22, 2021 and Nov. 5, 2020 examples) and maintained in the WIN Web system.	• pH data logger contains daily readings. • Available to AEP upon request, confirmed in report that recordings are compliant. • "Keep pH above 8.0" sign posted.
4.2.10	The approval holder shall replace activated carbon in the activated carbon filter referred to in 4.2.4 immediately when the concentration of total petroleum hydrocarbons in the air effluent streams released from the scrubber exhaust stack to the atmosphere exceeds 25 ppm.	X				• Field observations. • WIN Web records.	• Weekly total petroleum hydrocarbon readings are taken and recorded in log book next to the scrubber and in WINWEB. • Carbon is typically replaced every 4-5 years or less frequent. • Last replacement occurred July 2015. • No exceedances or replacement of media in the last three year period (2019-2021).
Monitoring and Reporting							
4.2.11	The approval holder shall monitor, daily at a minimum, the pH of the scrubbing liquid of the caustic scrubber referred to in 4.2.4.	X				• Monitoring records for Aug. 22, 2021 and Nov. 5, 2020 in WIN Web. • Field observations.	• Data logger contains daily readings. • Available to AEP upon request, confirmed in report that recordings are compliant. • If pH readings are close to 8.0 limit, a secondary laboratory reading is performed to verify in-line pH meter accuracy. • Aug. 22, 2021 and Nov. 5, 2020 dates sampled.
4.2.12	The approval holder shall monitor, weekly at a minimum, the air effluent streams released from the scrubber exhaust stack, using a portable total petroleum hydrocarbon analyzer while: - Hazardous wastes/recyclables are being processed. - Hazardous wastes/recyclables are being transferred. - Containers of hazardous wastes/recyclables are open in the Drum Processing and/or Staging Buildings.	X				• Field observations. • WIN Web records.	• Weekly readings are taken and recorded in log book next to the scrubber. • Carbon is replaced every 4-5 years or less frequency.
4.2.13	The portable total petroleum hydrocarbon analyzer referred to in 4.2.12 shall:				X	Not applicable.	Not applicable. Information only.
4.2.13 (a)	Have a detection limit of 1 ppm or lower for total petroleum hydrocarbons.	X				Field observations.	Confirmed that accuracy is to 0.1 ppm, as observed on calibration certificate.
4.2.13 (b)	Be located in a straight section of the scrubber exhaust stack, a minimum of one (1) metre downstream from the last flow disturbance.	X				Field observations.	Sampling location is on second story scaffolding within building, 1 m downstream from the last flow disturbance.
4.2.13 (c)	Be calibrated regularly in accordance with the analyzer manufacturer's specifications.	X				Calibration certificate from 2020.	Confirmed calibrated in 2020; expires in 2022.
4.2.14	The approval holder shall continue to implement the Ambient Air Monitoring Program as authorized in writing by the Director on June 24, 2009, unless and until otherwise authorized in writing by the Director pursuant to 4.2.18.	X				• 2020 Operations Report. • GHD Quality Assurance Plan - Air Monitoring Program Report, dated Dec. 31, 2016. • "Ambient Air Monitoring Station Audit" letter from AEP, dated August 31, 2016. • "Ambient Air Monitoring Station Audit" letter from AEP, dated Jan. 13, 2017 (closing out the audit findings).	• Clean Harbors was audited by AEP for adherence to the new Air Monitoring Directive released in 2016. • Clean Harbors proposed dates and actions to address findings of the audit, which were accepted by AEP in letter December 2, 2016. • Dec. 31, 2016 GHD report contains new Air Monitoring Program. • AEP letter closing out the audit indicates that all findings addressed.
4.2.15	The approval holder shall submit to the Director the results of the Ambient Air Monitoring Program in 4.2.14 with the following reports: - Monthly Ambient Air Monitoring Report - Annual Ambient Air Monitoring Report In accordance with the written authorization by the Director on June 24, 2009, unless and until otherwise authorized in writing by the Director pursuant to 4.2.18.	X					
4.2.16	The approval holder shall submit a revised Ambient Air Monitoring Program, revised reporting requirements, or both, to the Director upon written request from the Director within the timeline specified in writing by the Director.	X					
4.2.17	If the revised Ambient Air Monitoring Program, reporting requirements, or both, submitted pursuant to 4.2.16 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.	X					

Section 4 - Operations

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.2.18	The approval holder shall implement the revised Ambient Air Monitoring Program, reporting requirements, or both, submitted pursuant to 4.2.16 as authorized in writing by the Director within the timeline specified in writing by the Director.	X					
Operations							
4.3.1	The approval holder shall not release any substances from the facility to the surrounding watershed except as authorized by this approval.	X				Field observations.	Compliance confirmed. 100% of the leachate is disposed of via deep well injection. Runon/runoff control systems in place and inspected during field observations.
4.3.2	The approval holder shall operate and maintain the integrity of:				X	Not applicable.	Not applicable. Information only.
4.3.2 (a)	The run-on control system to prevent flow onto the active landfill area from at least the peak discharge from a 1 in 25 year, 24 hour duration storm event a the facility.	X				Field observations.	Compliance confirmed. Run on/run off control systems were completed during Cell 4 construction. As built drawings reviewed.
4.3.2 (b)	The runoff control system for the facility to collect and control at least the runoff volume resulting from a 1 in 25 year, 24 hour duration storm event at the facility.	X				Field observations.	Compliance confirmed. Run on/run off control systems were completed during Cell 4 construction. As built drawings reviewed.
4.3.3	All runoff from the facility developed area shall be directed to the runoff control system as described in:				X	Not applicable.	Not applicable. Information only.
4.3.3 (a)	Application No. 012-10348, prior to decommissioning and reclamation of the old surface water detention pond.	X				Not applicable.	Confirmed. The old surface water detention pond was decommissioned in August 2018 prior to this audit.
4.3.3 (b)	The application, after decommissioning and reclamation of the old surface water detention pond.	X					
4.3.4	Prior to decommissioning and reclamation of the old surface water detention pond and subject to 4.3.7, the approval holder shall only make or permit a release from the old surface water detention pond:				X	Not applicable.	Not applicable. Information only.
4.3.4 (a)	At the release point as designated in application No. 012-10348, which is: • Located in the south east corner of the old surface water detention pond. • Referred to as sampling location A 1 in 4.3.11.	X				• 2020 Annual Report. • Field observations. • Operations Plan. • Discussions with site staff.	Decommissioning of the old surface water detention pond was completed in August 2018. Observations were made of the new surface water detention pond, drainage ditch, and discharge point.
4.3.4 (b)	Through a pump and a release hose over the south berm into the drainage control ditch, east of the landfill access road, to the new surface water detention pond, under normal operating conditions.	X					
4.3.4 (c)	Through a pump and a release hose over the south berm directly to the culvert under Highway 854, during periods of high runoff exceeding the holding capacity of the old surface water detention pond.	X					
4.3.5	Subject to 4.3.7, the approval holder shall only make or permit a release from the new surface water detention pond:	X					• Observed the discharge point at the new surface water detention pond. • Composite sampling is performed prior to any discharge consistent with the approval.
4.3.5 (a)	At the release point as designated in application No. 012-10348, which is: • Located in the north east corner of the new surface water detention pond. • Referred to as sampling location 81 in 4.3.11.	X					
4.3.5 (b)	Through a pump and a release hose over the east berm into the culvert under Highway 854.	X					
4.3.6	The approval holder shall only dispose of industrial wastewaters, or specified runoff in Table 4.3-A, or both, by one or more of the following methods:				X	• 2020 Annual Report. • Field observations. • Operations Plan. • Discussions with site staff.	• All stormwaters are discharged through pond with testing prior to discharge. • No non-compliant discharges have occurred. • When TSS exceeds limits, further settling time is done prior to re-testing and discharge, or flocculant is added. • No change to discharge.
4.3.6 (a)	To facilities holding a current Act authorization to accept such waste.	X					
4.3.6 (b)	To facilities approved by a local environmental authority outside of Alberta to accept such waste.	X					
4.3.6 (c)	To a disposal well approved by AER.	X					
4.3.6 (d)	As per 4.6.51.	X					
4.3.6 (e)	As otherwise authorized in writing by the Director.	X					

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Limits							
4.3.7	Releases of runoff from the following to the surrounding watershed shall comply with the limits specified in Table 4.3-B: - The old surface water detention pond. - The new surface water detention pond. - Or, both ponds.	X				• 2020 Annual Report. • Operations Plan.	Compliance confirmed through a review of release analytical records.
4.3.8	Releases of runoff from within the tank farm bermed area to the old or new or both surface water detention ponds shall comply with the limits specified in Table 4.3-C.				X	Not applicable.	Not applicable: • Tank farm bermed area water goes into landfill. • This volume is pumped and solidified for disposal in the landfill.
Monitoring and Reporting							
4.3.9	The approval holder shall monitor the runoff control system as required in Table 4.3-D, subject to 4.3.12.			X		Surface Water Detention Pond B Summary of Batch Analysis, 2020 Annual Report.	Results for the runoff control system testing of 48 hour static acute lethality test using daphnia magna could be included in the Summary of Batch Analysis presented in the 2020 Annual Landfill Operations Report; along with the lethality of effluents to rainbow trout testing.
4.3.10	The approval holder shall report to the Director the results of the runoff control system monitoring as required in Table 4.3-D, subject to 4.3.12.	X				2020 Annual Report.	Monitoring findings reported to AEP.
4.3.11	For the purpose of Table 4.3-D:				X	Not applicable	Not applicable. Information only.
4.3.11 (a)	Sampling location A 1 is defined as the old surface water detention pond release point.				X	Field observations.	Not applicable. Old surface water detention pond has been decommissioned.
4.3.11 (b)	Sampling location A2 is defined as the old surface water detention pond.				X		
4.3.11 (c)	Sampling location B1 is defined as the new surface water detention pond release point.	X				Field observations.	Facility actively monitors releases.
4.3.11 (d)	Sampling location B2 is defined as the new surface water detention pond.	X				Field observations.	Facility actively monitors detention pond.
4.3.11 (e)	Sampling location C is defined as the tank farm bermed area.	X				Field observations.	Water collected in bermed area of tank farm is solidified for disposal in landfill as per 4.3.8
4.3.12	The monitoring and reporting requirements in 4.3.9 and 4.3.10 for the old surface water detention pond (sampling locations A1 and A2) shall not apply after decommissioning and reclamation of the old surface water detention pond.				X	Not applicable.	Not applicable. The old surface water detention pond was decommissioned in August, 2018 prior to this audit.
4.3.13	The monitoring and reporting required in Table 4.3-D for the acute lethality tests shall comply with:				X	Not applicable.	Not applicable. Information only.
4.3.13 (a)	The Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, Environment Canada, Environment Protection Series 1/RM/13, December2000, as amended.	X				Surface Water Detention Pond B Summary of Batch Analysis - 2020 Annual Landfill Operations Report	Summary of results all pass for the Surface Water Detention Pond B Summary of Batch Analyses.
4.3.13 (b)	The Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia Magna, Environment Canada, Environmental Protection Series 1/RM/14, December 2000, as amended.			X		• Monthly Runoff and Industrial Wastewater Report. • Surface Water Detention Pond B Summary of Batch Analysis - 2020 Annual Report.	Results for the runoff control system testing of 48 hour static acute lethality test using daphnia magna could be included in the Summary of Batch Analysis presented in the 2020 Annual Landfill Operations Report; along with the lethality of effluents to rainbow trout testing.
4.3.14	The approval holder shall: - Treat any acute lethality test that deviates from the corresponding test method referred to in 4.3.13 as invalid. - Repeat the test as soon as logistically possible.				X	Not applicable.	Not applicable. No deviation from corresponding test method has occurred.
4.3.15	In the event that less than 50% of the rainbow trout survived in the 100% concentration sample, the approval holder shall: - Implement a program immediately to identify the source of the toxicity. - Submit to the Director within 90 days after the test result is available, a proposed program to reduce the toxicity of the runoff.				X	Not applicable.	Not applicable. All testing passed the criteria.
4.3.16	The approval holder shall submit the Monthly Runoff and Industrial Wastewater Report in Table 4.3-D to the Director.	X				Monthly Runoff and Industrial Wastewater Report.	Verbal confirmation from multiple parties confirming the reports are forwarded to AEP.
4.3.17	The Monthly Runoff and Industrial Wastewater Report shall include, at a minimum, all of the following information:				X	Not applicable.	Not applicable. Monthly reports contained in annual report, but only need to be submitted with discharges.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.3.17 (a)	A monthly assessment of the monitoring results relative to the limits in Table 4.3-B.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (b)	A monthly assessment of the monitoring results relative to the limits in Table 4.3-C.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (c)	A monthly assessment of the performance of the: - Runoff control system. - Pollution abatement equipment. - Monitoring equipment.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (d)	A monthly summary of management and disposal of the industrial wastewaters and specified runoff, as per 4.3.6.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (e)	A monthly summary of management and disposal of runoff in general.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (f)	A monthly summary of runoff contraventions reported pursuant to 2. 1. 1.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.17 (g)	Any other information as required in writing by the Director.	X				Monthly Runoff and Industrial Wastewater Report.	Included in Report.
4.3.18	The approval holder shall submit the Annual Runoff and Industrial Wastewater Report in Table 4.3-D to the Director.	X				Annual Runoff and Industrial Wastewater Report.	Verbal confirmation and included with annual report.
4.3.19	The Annual Runoff and Industrial Wastewater Report shall include, at a minimum, all of the following information:				X	Not applicable.	Not applicable. Information only.
4.3.19 (a)	An annual summary assessment of the monitoring results relative to the limits in Table 4.3-B.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (b)	An annual summary assessment of the monitoring results relative to the limits in Table 4.3-C.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (c)	An annual summary assessment of the performance of the: - Runoff control system. - Pollution abatement equipment. - Monitoring equipment.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (d)	An annual summary of management and disposal of the industrial wastewaters and specified runoff, as per 4.3.6.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (e)	An annual summary and evaluation of management and disposal of runoff in general.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (f)	An annual summary of the results pursuant to 4.3.21.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.3.19 (g)	An annual summary of runoff contraventions reported pursuant to 2. 1. 1.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.19 (h)	Any other information as required in writing by the Director.	X				Annual Runoff and Industrial Wastewater Report.	Included in Report.
4.3.20	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.3.20 (a)	Collect a representative grab sample from the old surface water detention pond at least once per year, prior to decommissioning and reclamation of the pond.				X	Not applicable.	Not applicable. Old surface water detention pond has been decommissioned.
4.3.20 (b)	Collect a representative grab sample from the new surface water detention pond at least once per year.	X				Annual Runoff and Industrial Wastewater Report	Details included in Report.
4.3.20 (c)	Analyze the sample(s) for all of the parameters specified in Table 4.3-E.	X				Annual Runoff and Industrial Wastewater Report	Details included in Report.
4.3.21	The approval holder shall submit the results of the analyses in 4.3.20 to the Director in the Annual Runoff and Industrial Wastewater Report.	X				Annual Runoff and Industrial Wastewater Report	Details included in Report.
Operations							
4.4.1	The approval holder shall only dispose of leachate removed from the leachate collection system by one or more of the following methods:				X	Not applicable.	Not applicable. Information only.
4.4.1 (a)	To facilities holding a current Act authorization to accept such waste.				X	Not applicable.	Not applicable. Option not used by the facility.
4.4.1 (b)	To facilities approved by a local environmental authority outside of Alberta to accept such waste.				X	Not applicable.	Not applicable. Option not used by the facility.
4.4.1 (c)	To a disposal well approved by AER.	X				• Alberta Energy Regulator (AER) approval for deep well. • Appendix E of 2020 Annual Report.	Leachate is hauled to Class I deep well in Calmar. Volume summary included in annual report.
4.4.1 (d)	As per 4.6.51.				X	Not applicable.	Not applicable. Information only.
4.4.2	The approval holder shall only dispose of liquid removed from the leak detection system by one or more of the following methods:				X	Not applicable.	Not applicable. Information only.
4.4.2 (a)	To facilities holding a current Act authorization to accept such waste.				X	Not applicable.	Not applicable. Option not used by the facility.
4.4.2 (b)	To facilities approved by a local environmental authority outside of Alberta to accept such waste.				X	Not applicable.	Not applicable. Option not used by the facility.
4.4.2 (c)	To a disposal well approved by AER.	X				• AER approval for deep well. • Appendix E of 2020 Annual Landfill Operations Report.	Leachate is hauled to Class I deep well in Calmar. Volume summary included in annual report.
4.4.2 (d)	As per 4.6.51.				X	Not applicable.	Option not used by the facility.
Limits							
4.4.3	Subject to 4.4.4, the approval holder shall not exceed the maximum acceptable leachate head in any landfill cell.	X				Leachate Head Level Table.	Leachate levels recorded daily. Field logs for 2020 observed, contain following parameters: - Date, time, condition, level status, personnel initial
4.4.4	Subsequent to a storm event, the leachate head in any landfill cell shall not exceed the maximum acceptable leachate head for more than fourteen (14) days, unless otherwise authorized in writing by the Director.	X				Leachate Head Level Table.	Leachate pumping infrastructure on timers in most cells, (all but Cell 1). A fire January 12, 2020 caused a fire (AEP Reference No. 362650) which destroyed the Cell 2 Leachate building until pumping capacity was resotred June 30, 2020. Infrastructure is capable of removing leachate generated from a storm event in fewer than 14 days.
4.4.5	The volume of liquid in the leak detection system, as monitored in Table 4.6-D, shall not exceed the action leakage rate in any landfill cell.		X			2020 Annual Report.	Action Leakage Rate (ALR) Exceedances were noted June 9, 2020, June 10, 2020, July 2, 2020, July 9, 2020. Section 14.6 of the Annual Landfill Operations Report detail several ALR exceedances that were not reported. No negative impacts were observed and clarification of the reporting requirements were made with the Facility Manager to ensure this is not repeated in the future. (AEP 376183)

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Monitoring and Reporting							
4.4.6	The approval holder shall monitor the leachate collection and leak detection systems as required in Table 4.6-D and for all parameters specified in Table 4.4-A, subject to 4.4.8 and 4.4.9.	X				Primary Leachate Analysis Results Appendix D of 2020 Annual Report.	Leachate levels recorded daily. Field logs for 2020 observed, contain following parameters: • Date, time, condition, level status, personnel initial.
4.4. 7	The approval holder shall report to the Director the results of the leachate collection and leak detection systems monitoring as required in Table 4.6-D, including the results of the analyses for all parameters specified in Table 4.4-A, subject to 4.4.8 and 4.4.9.	X				Primary Leachate Analysis Results Appendix D of 2020 Annual Report.	Submitted to AEP.
4.4.8	The requirements in 4.4.6 and 4.4. 7 for monitoring and reporting the parameters in Table 4.4-A for leachate shall not apply if insufficient leachate is available for conducting the analyses.				X	Not applicable.	Not applicable. Information only.
4.4.9	The requirements in 4.4.6 and 4.4. 7 for monitoring and reporting the parameters in Table 4.4-A for leak detection liquid shall not apply if insufficient leak detection liquid is available for conducting the analyses.				X	Not applicable.	Not applicable. Information only.
4.4.10	If the volume of liquid removed from the leak detection system exceeds the action leakage rate, in addition to reporting pursuant to 2.1.1, the approval holder shall submit a Response Action Plan to the Director within 30 days of the exceedance.	X				2020 Annual Report.	(AEP 376183) links exceedances to excessive rainfall and details steps taken to solve infiltration.
Monitoring and Reporting							
4.5.1	The approval holder shall, unless the approval holder is not granted access by the landowner:				X	Not applicable.	Not applicable. Information only.
4.5.1 (a)	Collect a representative sample from each of the dugouts and each of the water wells, within an approximate 1.6 kilometre radius around the facility.	X				Tetra Tech 2020 Dugout Sampling Program Report, dated March 2, 2021.	Details included in Report.
4.5.1 (b)	Analyze the sample for the parameters listed in Table 4.5-A.	X					Details included in Report.
4.5.2	The monitoring required in 4.5.1 shall be conducted once each year in October unless otherwise authorized in writing by the Director.	X					Details included in Report.
4.5.3	The approval holder shall record the analytical results of the sampling information required in 4.5.1 in an Annual Dugout and Water Well Sampling Program Report.	X					Details included in Report.
4.5.4	The approval holder shall submit the Annual Dugout and Water Well Sampling Program Report to the Director pursuant to 4.6.58(i).	X					Details included in Report.
General							
4.6.1	The approval holder shall not receive, process, dispose of, or perform any combination of the above for any of the following wastes, individually or in any combination, at the places specified below respectively: - Explosives (Class 1 TDGR wastes), at the facility. - Radioactive wastes (Class 7 TDGR wastes), at the facility. - Radioactive wastes regulated under the Nuclear Safety and Control Act (Canada), at the facility. - Biomedical waste, at the facility. - Waste containing free liquids, at the landfill, excluding the waste stabilization area. - Material containing ozone depleting substances, at the landfill. - Municipal solid waste, at the facility. - NORM waste, at the facility.	X				• Field observations. • Discussions with site staff.	Site field observations and verbal confirmation were received regarding materials receipt. Cross checked against Facility Operations Plan and SOPs for individual waste materials. WINWEB system also performs checks on waste compatibility and will issue warnings of any non-conforming waste
4.6.2	Incompatible wastes and incompatible hazardous recyclables shall be prevented from mixing.	X				• Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Landfill Operations (SOPL001). • WIN Web (compatibility workbench).	Relevant Facility SOPs confirm procedures are appropriate to prevent incompatible wastes and recyclables from mixing.
4.6.3	The approval holder shall dispose of wastes generated at the facility only:				X	Not applicable	Information only.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.3 (a)	To facilities holding a current Act authorization.	X				Discussions with site staff.	Confirmed that regulations are being followed.
4.6.3 (b)	To facilities approved by a local environmental authority outside of Alberta.	X				Discussions with site staff.	Confirmed that regulations are being followed.
4.6.3 (c)	As otherwise authorized in writing by the Director.	X				Discussions with site staff.	Confirmed that regulations are being followed.
HWRSP Facility							
Operations Plan							
4.6.4	The approval holder shall develop, keep up-to-date, and implement an HWRSP Facility Operations Plan.	X				• Facility Standard Operating Procedures (SOPs) • Operations Plan.	Most recently dated as February 2021, with annual updates required. In 2020, procedures for Cell 4 added.
4.6.5	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.6.5 (a)	Review the HWRSP Facility Operations Plan annually, at a minimum.	X				• 2020 Annual Report. • Operations Plan.	This is performed in line with the annual reporting required under the Approval.
4.6.5 (b)	Update the HWRSP Facility Operations Plan if any of the following circumstances apply: - There are facility expansions or changes in site operations or equipment. - There is an applicable change to an applicable regulation. - An update is required in writing by the Director.	X				• 2020 Annual Report. • Operations Plan.	Section 14 added to 2017 Annual Report, addressing HWRSP facility operations.
4.6.6	The approval holder shall retain a copy of the most recent HWRSP Facility Operations Plan at the facility.	X				• 2020 Annual Report. • Operations Plan.	Held on-site electronically and in hard copy.
4.6. 7	The approval holder shall submit a copy of the most recent HWRSP Facility Operations Plan to the Director upon written request from the Director within the timeline specified in writing by the Director.	X				• 2020 Annual Report. • Operations Plan.	Submitted in the 2020 Annual Report.
4.6.8	If the HWRSP Facility Operations Plan submitted pursuant to 4.6. 7 is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.				X	Not applicable.	Not applicable. No response received from AEP on 2020 Annual Report.
4.6.9	The approval holder shall implement the latest HWRSP Facility Operations Plan, unless otherwise authorized in writing by the Director.	X				Operations Plan.	Up to date plan available and utilized.
Operations							
4.6.10	The approval holder shall only transfer wastes and hazardous recyclables at designated transfer areas designed to contain spills and leaks.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Relevant Facility SOPs confirm procedures for transferring wastes in the HWRSP.
4.6.11	The approval holder shall use the following when transferring substances to, from, and between containers, tanks, and trucks:				X	Not applicable.	Not applicable. Information only.
4.6.11 (a)	Couplings equipped with seals that are compatible with the substance transferred.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.11 (b)	The necessary precautions to prevent spills when the couplings are disconnected.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.11 (c)	Emergency shut-off valves.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.11 (d)	Established transfer areas and associated curbing, paving and catchment areas.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.11 (e)	Drip trays to capture potential losses under coupling devices and other connections.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.11 (f)	Manual inspections of the transfer area for leaks and spills during and after waste transfer.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.12	All wastes and all hazardous recyclables that are unloaded shall be immediately transferred to the waste storage area.	X				Facility SOPs: Drum Staging and Storage (SOPOP002), Drum Sampling (SOPOP003), Container Management (SOPOP004), Spills on Site (SOPOP008).	Reviewed and compliance confirmed during site visit.
4.6.13	All containers and unrinsed empty containers shall be stored in the waste storage area.	X				Field observations.	Confirmed during Site visit.
4.6.14	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.6.14 (a)	Provide and maintain an adequate aisle space between containers in the waste storage area to allow inspection and unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of the waste storage area.	X				Field observations.	Site field operations consistent with fire code for spacing between containers.
4.6.14 (b)	Arrange inspection aisles in the waste storage area such that the identification label on each container is readable.	X				Field observations.	Identification labels clear for all containers.
4.6.15	All tanks within the tank farm area shall be equipped, at a minimum, with all of the following:				X	Not applicable.	Not applicable. Information only.
4.6.15 (a)	Sensors for detecting the level in each tank.	X				Field observations.	Sensors, alarms, and shut-off devices observed and active for each tank. The aqueous tank within the building does not contain a high level alarm but is not considered part of the tank farm.
4.6.15 (b)	High level alarms that activate when a tank overfill is imminent.	X					
4.6.15 (c)	Automatic shut-off devices or sufficient free board space above the high level sensor to allow operators time to prevent overfill from occurring.	X					
4.6.15 (d)	Earthen dikes or equivalent secondary containment structures capable of containing 110% of the volume of the largest tank within the bermed area plus 10% of the aggregate capacity of all other tanks in the bermed area.	X				Field observations.	Entire waste storage area is the building floor, which is drained to holding tank in central manhole and can be pumped.
4.6.16	All tanks containing hazardous waste and all tanks containing hazardous recyclables in each building shall be equipped, at a minimum, with all of the following:				X	Not applicable.	Not applicable. Information only.
4.6.16 (a)	Sensors or gauges for detecting the level in each tank.	X				Field observations.	Sensors observed and active for tanks.
4.6.16 (b)	A written operating procedure to prevent tank overfill.		X			• Field observation • Bulk Flammable Liquid Transfer SOP	Bulk Flammable Liquid Transfer SOP Document and Checklist is available (part of Facility SOPs) in office area but is not stored next to tanks.
4.6.16 (c)	Secondary containment structures capable of containing 110% of the volume of the largest tank within the building plus 10% of the aggregate capacity of all other tanks containing hazardous waste and hazardous recyclables in the same building.	X				Field observations.	Secondary containment structures observed in the field.
4.6.17	Hazardous waste and hazardous recyclables stored in containers and tanks shall be stored in accordance with the Hazardous Waste Storage Guidelines, June 1988, Alberta Environment, as amended.	X				• Field observations. • Bulk Flammable Liquid Transfer SOP.	Facility observed to be following governing regulations.
4.6.18	The approval holder shall only carry out the following activities, individually or in any combination, at the HWRSP Facility in relation to hazardous waste or hazardous recyclables or both:	X				• Field observations.	Field observations reviewed the activities that occur on site; which was confirmed through review of the Facility and Landfill
4.6.18 (a)	Commingling of hazardous waste or hazardous recyclables to make maximum use of available container or tank capacity, only if the resultant mixture has the same TDGR hazard classification as any one of the individual components.	X					
4.6.18 (b)	Phase separation by gravity settling, only without the addition of any chemicals designed to accelerate settling.	X					
4.6.18 (c)	Dispersion of solids into liquids by natural or mechanical means, only if the resultant mixture has the same TDGR hazard classification as the original waste.	X					

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		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.18 (d)	Physical segregation of hazardous from non-hazardous articles or components from the same container, only if no process equipment is used.	X				• Operations Plan. • Facility SOPs.	Operations Plan and Facility SOPs.
4.6.18 (e)	Washing of drums or other objects, only for the purpose of removing hazardous residue.	X					
4.6.18 (f)	Crushing or shredding of used filters, rags, absorbent materials, or empty containers, only for the purpose of volume reduction or liquid recovery, unless otherwise authorized in writing by the Director.	X					
4.6.18 (g)	Treatment of hazardous waste, only as authorized in writing by the Director.	X					
4.6.19	Notwithstanding 4.6.1 B(g), the approval holder shall not incinerate waste at the facility.	X					No waste incineration equipment exists at the facility.
Limits							
4.6.20	The approval holder shall not store a total of more than 752,500 litres of hazardous waste or hazardous recyclables or both at the HWRSP Facility at any time.	X				WIN Web inventory management software.	Maximum capacity not exceeded as of September 2, 2021, per the below volumes.
4.6.21	In addition to the storage limits in 4.6.20, the approval holder shall not exceed the waste storage limits as specified in TABLE 4.6-A.	X				WIN Web inventory management software.	Observations of inventory software made on September 2, 2021: • 254,681 L of all wastes (hazardous and non-hazardous) • 64,856 L of hazardous waste in containers (drums) • 15,340 L of bulk liquids
4.6.22	Containers other than 205 litre drums shall be prorated to 205 litre drum equivalents based on their nominal volumes, e.g., 10 X 20 litre pails= 1 X 205 litre drum.	X				WIN Web inventory management software.	Software automatically calculates drum equivalents.
4.6.23	The limits referred to in 4.6.20 and 4.6.21 shall be calculated based on the:				X	Not applicable.	Not applicable. Information only.
4.6.23 (a)	Total nominal volumes of all containers, treating all partially filled containers as if they were full.				X	Not applicable.	Not applicable. Information only.
4.6.23 (b)	Total filled capacities of all tanks.				X	Not applicable.	Not applicable. Information only.
Monitoring and Reporting							
4.6.24	The approval holder shall identify, characterize, and classify all waste streams and all hazardous recyclables, generated or received at the HWRSP Facility, not including runoff, industrial wastewater streams and air effluent streams in accordance with the:				X	Not applicable.	Not applicable. Information only.
4.6.24 (i)	Industrial Waste Identification and Management Options, Alberta Environment, May 1996, as amended.			X		Facility and Landfill Operations Report, Section B	The document is not referenced specifically in Landfill Operations Plan, although review of documentation indicates adherence to this standard. Recommended that this be included in the Operations Plan as a specific reference.
4.6.24 (ii)	Alberta User Guide for Waste Managers, Alberta Environment, August 1996, as amended.	X				Facility and Landfill Operations Report, Section B	Referenced in Landfill Operations Plan.
4.6.25	The approval holder shall measure or, when not feasible to measure, estimate, the quantity of each waste and hazardous recyclable identified in 4.6.24 each year.	X				Facility and Landfill Operations Report	Addressed in Appendix A of Operations Report.
4.6.26	The approval holder shall keep a daily total and inventory of all materials being stored at the HWRSP Facility.	X				• Field observations. • Various inventory logs (WIN Web).	Observed documentation in the field.
4.6.27	The daily total and inventory records in 4.6.26 shall be available at the facility at all times for inspection by the Director or an inspector.	X				• Field observations. • Various inventory logs (WIN Web).	Available at the time of the audit.
4.6.28	The approval holder shall submit a Monthly Waste Management Report to the Director.	X				• July 2021 Waste Inventory Report. • Discussion with site staff.	Verbal confirmation that the monthly reports are submitted to AEP. Different documents for internal use and submission confirms submission.
4.6.29	The approval holder shall compile all of the information indicated in Table 4.6-B in the Monthly Waste Management Report which shall contain, at minimum, all of the following information:				X	Not applicable.	Not applicable. Information only.

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		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.29 (a)	An opening waste and hazardous recyclables inventory balance in kilograms or litres by waste class or material type.			X		• July 2021 Waste Inventory Report. • Discussion with site staff.	Compliance confirmed; included in report. The Facility is adhering to the information required in the Monthly Waste Management Report, viewed for July 2021. However the reports are currently referencing the 10348-02-00 Approval. Dillon would recommended that the referenced Approval be updated to 10348-03-00.
4.6.29 (b)	The amount and type of waste and hazardous recyclables received: - Within the province. - From outside of the province.			X			
4.6.29 (c)	The amount and type of waste and hazardous recyclables: - Shipped for recycling or product. - Shipped off-site for disposal. - Disposed on-site.			X			
4.6.29 (d)	Any adjustments, including but not limited to, consolidation, reclassification, losses to processing, spills, volume miscalculations, or any other circumstances, which would affect the mass balance of the monthly inventory report.			X			
4.6.29 (e)	Closing balance in kilograms or litres.			X			
4.6.29 (f)	A summary of contraventions reported pursuant to 2. 1. 1 related to waste and hazardous recyclables.	X				• July 2021 Waste Inventory Report. • Discussion with site staff.	No contraventions identified in monthly report.
4.6.29 (g)	Any other information as required in writing by the Director.	X				• July 2021 Waste Inventory Report. • Discussion with site staff.	No additional requirements by AEP.
4.6.30	The approval holder shall compile all the information required by 4.6.24 and 4.6.25 in an Annual Waste Management Summary Report:				X	Not applicable.	Not applicable. Information only.
4.6.30 (a)	As specified in Table 4.6-C.	X				2020 Annual Waste Management Summary - Table 4.6-D, Hazardous Waste Landfilled, included in the 2020 Annual Report.	In Appendix A of Operations Report.
4.6.30 (b)	In accordance with the: - Industrial Waste Identification and Management Options, Alberta Environment, May 1996, as amended. - Alberta User Guide for Waste Managers, Alberta Environment, August 1996, as amended.			X		2020 Annual Waste Management Summary - Table 4.6-D, Hazardous Waste Landfilled, included in the 2020 Annual Report.	The first document is not referenced specifically in Landfill Operations Plan, although review of documentation indicates adherence to this standard. Recommended that this be included in the Operations Plan as a specific reference.
4.6.31	The approval holder shall submit the Annual Waste Management Summary Report to the Director.	X				2020 Annual Waste Management Summary - Table 4.6-D, Hazardous Waste Landfilled, included in the 2020 Annual Report.	Submitted as part of the Annual Report for the Facility.
Landfill							
Operations Plan							
4.6.32	The approval holder shall develop, keep up-to-date, and implement a Landfill Operations Plan that does not contravene with the requirements of this approval.	X				Operations Plan.	Approval requirements are being examined in this checklist.
4.6.33	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.6.33 (a)	Review the Landfill Operations Plan annually, at a minimum.	X				Operations Plan.	Revision date on the 2021 Facility and Landfill Operations Plan is February, 2021.
4.6.33 (b)	Update the Landfill Operations Plan if any of the following circumstances apply: - There are facility expansions or changes in site operations or equipment. - There is an applicable change to the Standards for Landfills in Alberta, as amended. - An update is required in writing by the Director. - There is an update to an applicable regulation.	X				Operations Plan.	Updates to the operations plan reflect Cell 4 and Cell 3B changes.
4.6.34	The Landfill Operations Plan shall include, at a minimum, all of the following:				X	Not applicable.	Not applicable. Information only.
4.6.34 (a)	SOP for keeping and maintaining an Operating Record.	X				Operations Plan.	Addressed in section A of Operations Plan.
4.6.34 (b)	SOP for waste control, run-on and runoff controls, and nuisance controls.	X				Operations Plan.	Addressed in section B of Operations Plan.
4.6.34 (c)	SOP for the waste stabilization area operations.	X				Operations Plan.	Addressed in section C of Operations Plan.

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		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.34 (d)	SOP for the acceptance, handling and disposal of wastes, including: - Waste characterization and classification at source. - Waste manifesting and tracking. - QA/QC waste acceptance procedures. - Waste sampling.	X				Operations Plan.	Addressed in Sections D of Operations Plan.
4.6.34 (e)	SOP for detecting, preventing and disposal of unauthorized wastes.	X				Operations Plan.	Addressed in Sections E of Operations Plan.
4.6.34 (f)	SOP for placing waste in a landfill cell including: - Working face width. - Lift depth. - Compaction. - Waste placement location using a grid system	X				Operations Plan.	Addressed in Sections F of Operations Plan.
4.6.34 (g)	SOP for managing contaminated sulphur and sulphur containing wastes.	X				Operations Plan.	Addressed in Sections G of Operations Plan.
4.6.34 (h)	SOP for managing asbestos wastes.	X				Operations Plan.	Addressed in Sections H of Operations Plan.
4.6.34 (i)	SOP for placing leachate, leak detection liquid, or other authorized wastes and liquids over the surface of the active landfill area for the purpose of evaporation or dust suppression.	X				Operations Plan.	Addressed in Sections I of Operations Plan.
4.6.34 (j)	An Odour and Fugitive Dust Response Program.	X				Operations Plan.	Addressed in Sections J of Operations Plan, referencing the Fugitive Dust and Odour Best Management Plan in Appendix C.
4.6.34 (k)	A Fugitive Dust and Odour Best Management Plan.	X				Operations Plan.	Addressed in Sections K of Operations Plan, referencing the Fugitive Dust and Odour Best Management Plan in Appendix C.
4.6.34 (l)	A runoff and industrial wastewater monitoring and management program.	X				Operations Plan.	Addressed in Sections L of Operations Plan.
4.6.34 (m)	A leachate monitoring and management program.	X				• Operations Plan. • SOPL002-003 Landfill Leachate System.	Addressed in Sections M of Operations Plan.
4.6.34 (n)	A leak detection liquid monitoring and management program.	X				• Operations Plan. • SOPL002-003 Landfill Leachate System.	Addressed in Sections M/N of Operations Plan.
4.6.34 (o)	A groundwater monitoring program.	X				Operations Plan.	Addressed in Sections O of Operations Plan.
4.6.34 (p)	A Remediation Plan to deal with groundwater quality deterioration.	X				Groundwater Remediation Plan.	Addressed in Sections P of Operations Plan.
4.6.34 (q)	A soil monitoring program.	X				Operations Plan.	Addressed in Sections Q of Operations Plan. Submitted in late 2019 and the first soil monitoring program report was submitted to AEP on January 31, 2020.
4.6.34 (r)	A soil management program.	X				Operations Plan.	Addressed in Sections R of Operations Plan. Confirmation of acceptance from AEP September 18, 2020.
4.6.34 (s)	A landfill cell cover system.	X				Operations Plan.	Addressed in Sections S of Operations Plan. Cell cover system is prepared by consultants and conforms to provincial regulations.
4.6.34 (t)	A monitoring and maintenance program for the scale house and heavy operational equipment.	X				• Operations Plan. • Maintenance Dashboard. • Scale maintenance records	Addressed in Sections T of Operations Plan. Scales calibrated twice per year, maintenance program in place.
4.6.34 (u)	A health and safety program.	X				Health and Safety Program.	Addressed in Sections U of Operations Plan. Health and Safety program in place, training records are kept accounted for, and notifications when training comes due. Employees sign-off on Health and Safety program.
4.6.34 (v)	An emergency response program, including SOP for handling fires, substance releases to the environment, and health concerns.	X				Contingency Plan in Appendix A of the Operations Plan.	Addressed in Sections V of Operations Plan, referencing the facility's Contingency Plan in Appendix A. A system exists to track each employees training and provides management with information such as: training expiring, which training each employee requires, etc.
4.6.34 (w)	An up-to-date plan of the landfill layout with survey records showing the location of all infrastructure components of the landfill including final cover elevations and contours.	X				Operations Plan.	Addressed in Section W of Operations Plan, referencing Appendix D.
4.6.35	The approval holder shall retain a copy of the most recent Landfill Operations Plan at the facility.	X				Operations Plan.	Hard copy of 2021 Operations Plan viewed
4.6.36	The approval holder shall submit to the Director the most recent Landfill Operations Plan when requested in writing by the Director within the timeline specified in writing by the Director.	X				Discussions with site staff.	Compliance confirmed; submitted annually.
4.6.37	The approval holder shall correct all deficiencies in the Landfill Operations Plan submitted pursuant to 4.6.36, as outlined in writing by the Director, within the timeline specified in writing by the Director.				X	Not applicable.	Not applicable. Information only.
4.6.38	The approval holder shall implement the latest Landfill Operations Plan, unless otherwise authorized in writing by the Director.	X				Operations Plan.	2021 Operations Plan observed.

Section 4 - Operations

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Operations							
4.6.39	The approval holder shall classify all materials entering the landfill in accordance with the:				X	Not applicable.	Not applicable. Information only.
4.6.39 (a)	Waste Control Regulation (AR 192196).	X				Operations Plan, Section B.	Referenced in Landfill Operations Plan.
4.6.39 (b)	Industrial Waste Identification and Management Options, Alberta Environment, May 1996, as amended.			X		Operations Plan.	The document is not referenced specifically in Landfill Operations Plan, although review of documentation indicates adherence to this standard. Recommended that this be included in the Operations Plan as a specific reference.
4.6.39 (c)	Alberta User Guide for Waste Managers, May 1995, as amended.	X				Operations Plan, Section B.	Referenced in Landfill Operations Plan.
4.6.40	The approval holder shall obtain a detailed representative physical and chemical analysis of a waste prior to disposal of the waste into the landfill at the following times, at a minimum:				X	Not applicable.	Not applicable. Information only.
4.6.40 (a)	The first time a waste is received from a new generator.	X				• Operations Plan, Sections B-D • Waste Profile from WIN Web viewed.	Compliance confirmed: • Procedures and acceptance criteria in the Landfill Operations Plan are compliant with Approval. • All waste profiles renewed annually, either by customers or Clean Harbors on-site.
4.6.40 (b)	The first time a delivery is received from a different process associated with a known waste generator.	X					
4.6.40 (c)	The first time a waste is received from a different location associated with a known waste generator.	X					
4.6.40 (d)	When the nature or composition of the waste that was previously characterized by the generator changes.	X					
4.6.41	The approval holder shall not dispose of hazardous waste in any Class II landfill cell.				X	Not applicable.	Not applicable. The site is not a Class II landfill.
4.6.42	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.6.42 (a)	Only carry out waste stabilization or solidification or both within the waste stabilization area.	X				Site field observations.	Solidification and waste stabilization activities consistent with Approval requirements during field observations.
4.6.42 (b)	Not transfer waste from the waste stabilization area to the Class I landfill cell before the waste stabilization or solidification or both have completed.	X					
4.6.43	The approval holder shall only dispose of any liquid collected within the waste stabilization area by one or more of the following methods:				X	Not applicable.	Not applicable. Information only.
4.6.43 (a)	To facilities holding a current Act authorization to accept such waste.				X	Not applicable.	Not applicable. This option not used by the facility.
4.6.43 (b)	To facilities approved by a local environmental authority outside of Alberta to accept such waste.				X	Not applicable.	Not applicable. This option not used by the facility.
4.6.43 (c)	To a disposal well approved by AER.or	X				AER approval for deep well.	• Liquid waste is hauled to Class I deep well in Calmar. • AER approval for deep well (leased from Seller's Oilfield Services to CH) observed. Approval No. WM 077 A, dated July 25, 2011.
4.6.43 (d)	As otherwise authorized in writing by the Director.				X	Not applicable.	Option not used by the Facility.
4.6.44	The approval holder shall conduct:				X	Not applicable.	Not applicable. Information only.
4.6.44 (a)	Annually, in-house visual inspections for corrosion.	X				Discussion with site staff.	Confirmed that annual visual inspections performed.
4.6.44 (b)	Biennially, ultrasonic testing to monitor thickness of the steel plate liner of the stabilization pits in the waste stabilization area, unless otherwise authorized in writing by the Director.	X				Inspection report from Integrity Testing Services Inc., dated August 2021.	Performed yearly, tracked by compliance calendar.
4.6.45	The approval holder shall dispose of asbestos wastes in accordance with "Guidelines for the Disposal of Asbestos Waste': Environmental Protection Services, Alberta Environment, 1989, as amended.	X				Operations Plan, Section H.	Referenced in Landfill Operations Plan.
4.6.46	The approval holder shall dispose of sulphur waste in accordance with "Guidelines for Landfill Disposal of Sulphur Wastes and Remediation of Sulphur Containing Soils", Alberta Environment, 2011, as amended.	X				Operations Plan, Section G.	Referenced in Landfill Operations Plan.
4.6.47	The approval holder shall only dispose of wastes that the landfill is not authorized to dispose of:				X	Not applicable.	Not applicable. Information only.
4.6.47 (a)	To facilities holding a current Act authorization.	X				Discussion with site staff.	Compliance confirmed. All waste receipts are screened at the site entry scale and any non-authorized loads, as determined through manifest, are rejected.
4.6.47 (b)	To facilities approved by a local environmental authority outside of Alberta. Or:	X					
4.6.47 (c)	As otherwise authorized in writing by the Director.	X					
4.6.48	If an unauthorized waste is received at the landfill, the approval holder shall remove the waste from the landfill within seven (7) days of the receipt, unless otherwise authorized in writing by the Director.				X	Not applicable.	Not applicable. Not observed during the audit. Non authorized waste not received in the landfill.
4.6.49	The approval holder shall restrict the working face of each landfill cell to the smallest practical area.				X		
4.6.50	For any waste disposed of at the landfill that is subject to wind dispersal, the approval holder shall:				X		
4.6.50 (a)	Wet the waste to prevent dispersal of particulate matter.or	X				Operations Plan, Appendix C (Fugitive Dust and Odour Best Management Plan).	Documents reviewed have procedures for managing dust and particulate matter through waste placement in landfill and in waste stabilization.
4.6.50 (b)	Immediately apply cover on top of the waste to minimize entrainment of particulate matter.	X					

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.51	Notwithstanding 4.6.1 (v), the approval holder may place any of the following wastes over the surface of the active landfill area for the purpose of dust suppression, provided that placement of such wastes will not cause offensive odours:	X				Discussion with site staff.	Compliance confirmed. Pond water for dust suppression. Leachate is never used due to odour.
4.6.51 (a)	Specified runoff.				X	Not applicable.	Not applicable. Pond water is used for dust suppression only.
4.6.51 (b)	Leachate.				X		
4.6.51 (c)	Leak detection liquid.				X		
4.6.51 (d)	Sump waste of car wash bays or similar operations.				X		
4.6.51 (e)	Waste from hydrovac excavation operations.				X		
4.6.51 (f)	Any other waste authorized by the Alberta User Guide for Waste Managers, May 1995, as amended.				X		
4.6.52	The approval holder shall inspect the landfill, at a minimum:				X	Not applicable.	Not applicable. Information only.
4.6.52 (a)	Weekly.	X				• Discussion with site staff. • September 1, 2021 daily inspection record.	Compliance confirmed through review of inspection record.
4.6.52 (b)	Immediately after each storm event to: - Detect evidence of deterioration of any infrastructure components, including the composite liner. - Detect any malfunction or improper operation of the run-on and runoff control systems, leachate collection system, or leak detection system. - Take corrective measures to repair any damage to infrastructure components, including the composite liner.	X					
4.6.53	The approval holder shall do the following, the Director in writing along with any corrective measures taken or proposed:				X	Not applicable.	Not applicable. Information only.
4.6.53 (a)	Keep a record of inspections conducted pursuant to 4.6.52.	X				Landfill inspection records.	Compliance confirmed through review of electronic records.
4.6.53 (b)	Have the record of inspections available for review upon written request from the Director.	X					
4.6.53 (c)	Immediately report any deficiencies detected by the inspection in 4.6.52 to the Director in writing along with any corrective measures taken or proposed	X				Landfill inspection records.	Reported if there is a contravention. If not, a work ticket is created and the issue is fixed.
4.6.54	The approval holder shall not stockpile waste exceeding the maximum designated waste elevation of the landfill for a period of more than two (2) weeks, unless otherwise authorized in writing by the Director.	X				Site survey, dated January 4, 2021.	The site is surveyed twice per year, and no contours exceed the maximum designated waste elevation.
4.6.55	The approval holder shall take all practical measures to prevent off-site tracking of waste from vehicles and equipment leaving the facility.	X				Discussion with site staff.	Mud and waste tracking from the haul trucks is addressed as needed.
Monitoring and Reporting							
4.6.56	The approval holder shall monitor the landfill operations as required in Table 4.6-D.	X				2020 Annual Report.	All criteria in Table 4.6-D is included.
4.6.57	The approval holder shall report to the Director the results of the landfill operations monitoring as required in Table 4.6-D.	X				2020 Annual Report.	Submitted to AEP.
4.6.58	The Annual Landfill Operations Report required in Table 4.6-D shall include, at a minimum, all of the following:				X	Not applicable.	Not applicable. Information only.
4.6.58 (a)	the name and contact information of the person responsible for the facility.	X				2020 Annual Report.	Addressed in Section 2.0 of Annual Report.
4.6.58 (b)	A summary of all information collected as required in Table 4.6-D.	X				2020 Annual Report.	Addressed in Section 3.0 of Annual Report.
4.6.58 (c)	A summary of the results of any audit conducted in accordance with 4.1.7.	X				2020 Annual Report.	2018 Triennial Compliance Audit included in Appendix D of Annual Report.
4.6.58 (d)	A summary of the operations of the waste stabilization area.	X				2020 Annual Report.	Addressed in Section 5.0 and Appendix I of Annual Report.
4.6.58 (e)	A summary of the performance of the run-on and runoff control systems, including a comparison to the limits in Tables 4.3-8 and 4.3-C.	X				2020 Annual Report.	Addressed in Section 6.0 of Annual Report.
4.6.58 (f)	A summary of the performance of the leachate collection system, including a comparison to the maximum acceptable leachate head.	X				2020 Annual Report.	Addressed in Section 7.0 of Annual Report.
4.6.58 (g)	A summary of the performance of the leak detection system, including a comparison to the action leakage rate limit.	X				2020 Annual Report.	Addressed in Section 8.0 of Annual Report.
4.6.58 (h)	The Response Action Plan for the leak detection system pursuant to 4.4.1 O.	X				2020 Annual Report.	Addressed in Section 9.0 and Appendix J of Annual Report.
4.6.58 (i)	The Annual Dugout and Water Well Sampling Program Report pursuant to 4.5.4.	X				2020 Annual Report.	Addressed in Section 10.0 Appendix K of Annual Report.
4.6.58 (j)	A summary of all revisions to the Landfill Operations Plan pursuant to 4.6.33(b).	X				2020 Annual Report.	Addressed in Section 11.0 and Appendix L of Annual Report.
4.6.58 (k)	Any groundwater remedial action taken pursuant to 4.6.34(p).	X				2020 Annual Report.	Addressed in Section 12.0 of Annual Report.
4.6.58 (l)	A summary of records of landfill inspections pursuant to 4.6.53.	X				2020 Annual Report.	Addressed in Section 13.0 and Appendix M of Annual Report.
4.6.58 (m)	A summary of: - Operational issues encountered. - Emergencies occurred. - Measures or actions taken.	X				2020 Annual Report.	Addressed in Section 14.0 of Annual Report.
4.6.58 (n)	A summary of records of: - Public complaints. - The approval holder's responses	X				2020 Annual Report.	Addressed in Section 15.0 and Appendix Q of Annual Report.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.6.58 (o)	An up-to-date financial security estimate pursuant to 5.1.2.	X				2020 Annual Report.	Addressed in Section 16.0 and Appendix N of Annual Report.
4.6.58 (p)	An updated site development plan showing the status of the landfill progression at the end of the operating year, including but not limited to: - Contour mapping. - The location of active and inactive disposal areas. - Areas where a final cover has been placed. - The location of new landfill cell(s) constructed.	X				2020 Annual Report.	Addressed in Section 17.0 and Appendix O of Annual Report.
4.6.58 (q)	The Annual Landfill Cell Closure Report pursuant to 7.1.7.	X				2020 Annual Report.	Addressed in Section 18.0 Appendix P of Annual Report.
4.6.58 (r)	A summary of contraventions reported pursuant to 2.1.1 related to landfill operations.	X				2020 Annual Report.	Addressed in Section 19.0 Appendix Q of Annual Report.
4.6.58 (s)	Any other information as required in writing by the Director.	X				2020 Annual Report.	Addressed in Section 20 of Annual Report. No additional information was required by the Director.
4.6.59	The approval holder shall submit the Annual Landfill Operations Report to the Director.	X				Discussion with site staff.	Confirmation of submission prior to deadline (March 24, 2021 for last items).
Operations							
4.7.1	The approval holder shall not release any substances from the domestic wastewater system to the surrounding watershed except as authorized by this approval.	X				Discussion with site staff.	Wastewater is directed to an isolated holding tank.
4.7.2	The approval holder shall direct all domestic wastewater to the domestic wastewater system.	X					
4.7.3	The approval holder shall only dispose of substances from the domestic wastewater system:				X	Not applicable.	Not applicable. Information only.
4.7.3 (a)	To facilities holding a current Act authorization.	X				Discussion with site staff.	Wastewater from holding tank taken across the street to authorized treatment lagoon (Contractor).
4.7.3 (b)	To facilities approved by a local environmental authority outside of Alberta.or	X					
4.7.3 (c)	As otherwise authorized in writing by the Director.	X					
Not used at this time.							
Monitoring							
4.9.1	The approval holder shall continue to implement the existing Groundwater Monitoring Program as authorized in writing by the Director, unless and until otherwise authorized in writing by the Director pursuant to 4.9.4.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Groundwater reporting is being conducted in conformance with the Groundwater Monitoring Program.
4.9.2	The approval holder shall submit a revised Groundwater Monitoring Program to the Director on or before September 30, 2017, unless otherwise authorized in writing by the Director.	X				Discussion with site staff.	Submitted before the September 30th, 2017 deadline.
4.9.3	If the revised Groundwater Monitoring Program submitted pursuant to 4.9.2 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.	X				Discussion with site staff.	AEP did not identify any deficiencies with the program.
4.9.4	The approval holder shall implement the revised Groundwater Monitoring Program submitted pursuant to 4.9.2 as authorized in writing by the Director within the timeline specified in writing by the Director.	X				Discussion with site staff.	Implemented after submittal.
4.9.5	The approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.9.5 (a)	Collect a representative groundwater sample from each of the groundwater monitor wells specified in the Groundwater Monitoring Program, including the groundwater monitoring wells designated as points of compliance.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Compliance confirmed; all wells in monitoring program are sampled.
4.9.5 (b)	Analyze each sample for the parameters listed in Table 4.9-A.	X					Compliance confirmed; all parameters are sampled for.
4.9.6	The monitoring required in 4.9.5 shall be conducted at the following frequencies, unless otherwise authorized in writing by the Director:				X	Not applicable.	Not applicable. Information only.
4.9.6 (a)	A minimum of once per year during each of the active landfill life, landfill cell closure, final landfill closure, and post-closure periods.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Compliance confirmed; groundwater is monitored once per year.
4.9.6 (b)	A minimum of four times per year following detection of leachate constituents in groundwater at levels above those specified in 4.9.7, and until the levels specified in 4.9. 7 have been met.	X				Discussion with site staff.	Compliance confirmed; no leachate constituents have ever been found.
4.9.7	The groundwater quality in the monitoring wells, designated as points of compliance in the Groundwater Monitoring Program, shall not exceed the higher of:				X	Not applicable.	Not applicable. Information only.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.9.7 (a)	The objectives established in the water quality objectives in the Canadian Environmental Quality Guidelines (CEQG) for drinking water published by the Canadian Council of Ministers of the Environment (CCME), as amended.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Several exceedances noted in GW report, however these are due to the natural composition of the groundwater in the area.
4.9.7 (b)	Background groundwater chemistry as determined through a statistical analysis, as a derived alternate groundwater performance standard.	X					
4.9.8	The approval holder shall implement the Remediation Plan as specified in the Landfill Operations Plan, when groundwater quality exceeds the groundwater performance criteria in 4.9.7.				X		Remediation Plan has not been required to be implemented. Exceedances are normal for the groundwater in the area.
4.9.9	The samples extracted from the groundwater monitor wells shall be collected using scientifically acceptable purging, sampling and preservation procedures so that a representative groundwater sample is obtained.	X				2020 GW Monitoring Report, dated March 2, 2021 from Tetra Tech	Compliance confirmed; acceptable procedures are being followed.
4.9.10	The approval holder shall for all groundwater monitoring wells:				X	Not applicable.	Not applicable. Information only.
4.9.10 (a)	Protect from damage.	X				Field observations.	Compliance confirmed; all wells were observed to be protected and locked.
4.9.10 (b)	Keep locked except when being sampled.	X					
4.9.11	If a representative groundwater sample cannot be collected because the groundwater monitoring well is damaged or is no longer capable of producing a representative groundwater sample, the approval holder shall:				X	Not applicable.	Not applicable. Information only.
4.9.11 (a)	Clean, repair or replace the groundwater monitoring well.				X	Not applicable.	Not applicable. No damaged or non-functional wells.
4.9.11 (b)	Collect and analyse a representative groundwater sample prior to the next scheduled sampling event.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Compliance confirmed; groundwater monitoring consistent with schedule.
4.9.12	In addition to the sampling information recorded in 2.2.1, the approval holder shall record the following sampling information for all groundwater samples collected:				X	Not applicable.	Not applicable. Information only.
4.9.12 (a)	A description of purging and sampling procedures.	X				Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Refer to Section 5.2.
4.9.12 (b)	The static elevations above sea level, and depth below ground surface of fluid phases in the groundwater monitoring well prior to purging.	X					Compliance confirmed; groundwater levels were recorded.
4.9.12 (c)	The temperature of each sample at the time of sampling.	X					Compliance confirmed; temperature was recorded at the time of sampling.
4.9.12 (d)	The pH of each sample at the time of sampling.	X					Compliance confirmed; pH was recorded at the time of sampling.
4.9.12 (e)	The specific conductance of each sample at the time of sampling.	X					Compliance confirmed; recorded as mS at the time of sampling.
4.9.13	The approval holder shall carry out remediation of the groundwater in accordance with the following:				X	Not applicable.	Not applicable. Information only.
4.9.13 (a)	Alberta Tier 1 Soil and Groundwater Remediation Guidelines, Alberta Environment, February 2009, as amended.				X		Not applicable. Groundwater remediation has not been deemed necessary.
4.9.13 (b)	Alberta Tier 2 Soil and Groundwater Remediation Guidelines, Alberta Environment, February 2009, as amended.				X		
Reporting							
4.9.14	The approval holder shall compile an Annual Groundwater Monitoring Program Report which shall include, at a minimum, all of the following information:				X	Not applicable.	Not applicable. Information only.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
4.9.14 (a)	A completed Record of Site Condition Form, Alberta Environment, 2009, as amended.	X				• Tetra Tech 2019 Groundwater Monitoring Program, dated March 10, 2020. • Tetra Tech 2020 Groundwater Monitoring Program, dated March 2, 2020.	Compliance confirmed through a review of the report. Submission to AEP confirmed through review of correspondence.
4.9.14 (b)	A legal land description of the facility and a map illustrating the facility boundaries.	X					
4.9.14 (c)	A topographic map of the facility.	X					
4.9.14 (d)	A description of the industrial activity and processes.	X					
4.9.14 (e)	A map showing the location of all surface and groundwater users, and a listing describing surface water and water well use details, within at least a 1.6 kilometre radius of the facility.	X					
4.9.14 (f)	A general hydrogeological characterization of the region within a five kilometre radius of the facility.	X					
4.9.14 (g)	A detailed hydrogeological characterization of the facility, including an interpretation of groundwater flow patterns.	X					
4.9.14 (h)	Cross-sections showing depth to water table, patterns of groundwater movement and hydraulic gradients at the facility.	X					
4.9.14 (i)	Borehole logs and completion details for groundwater monitoring wells.	X					
4.9.14 (j)	A map showing locations of all known buried channels within at least five kilometre of the facility.	X					
4.9.14 (k)	A map of surface drainage within the facility and surrounding area to include nearby water bodies.	X					
4.9.14 (l)	A map of groundwater monitoring well locations and a table summarizing the existing groundwater monitoring program for the facility.	X					
4.9.14 (m)	A summary of any changes to the groundwater monitoring program made since the last groundwater monitoring report.	X					
4.9.14 (n)	Analytical data recorded as required in 4.9.5 and 4.9.11(b).	X					
4.9.14 (o)	A summary of fluid elevations recorded as required in 4.9.12(b) and an interpretation of changes in fluid elevations.	X					
4.9.14 (p)	An interpretation of QA/QC program results.	X					
4.9.14 (q)	An interpretation of all the data in this report, including the following: - Diagrams indicating the location and extent of any contamination. - A description of probable sources of contamination. - A site map showing the location and type of current and historical potential sources of groundwater contamination	X					
4.9.14 (v)	Recommendations for: - Changes to the groundwater monitoring program to make it more effective. - Remediation, risk assessment or risk management of contamination identified.	X					
4.9.15	The approval holder shall submit the Annual Groundwater Monitoring Program Report to the Director.	X					
4.9.16	If the Annual Groundwater Monitoring Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, within the timeline specified in writing by the Director.				X	Not applicable.	Not applicable. AEP did not identify any deficiencies.
4.10.1	In addition to any other requirements specified in this approval, the approval holder shall conduct all of the following activities related to soil monitoring and soil management required by this approval in accordance with the Soil Monitoring Directive, Alberta Environment, 2009, as amended:	X				Tetra Tech 2017 Soil Management Program Proposal, including Soil Monitoring Program.	Compliance confirmed: • March 21, 2017 - Soil Management Program Proposal (incl. monitoring program submitted to AEP. • September 11, 2017 - Supplemental Information to Soil Management Program Proposal (revisions), submitted to AEP. • September 13, 2017 - Approval letter from AEP regarding Soil Management Program Proposal.
4.10.1 (a)	Designing and developing proposals for the Soil Monitoring Program.	X					
4.10.1 (b)	Designing and developing proposals for the Soil Management Program.	X					
4.10.1 (c)	All other actions, including sampling, analysing, and reporting, associated with the Soil Monitoring Program.	X				Tetra Tech 2019 Soil Monitoring Program Report, dated January 31, 2020.	Actions in program reflect the 2019 Soil Monitoring Program Proposal and Deficiency Response Letter.
4.10.1 (d)	All other actions, including sampling, analysing and reporting, associated with the Soil Management Program.	X				Tetra Tech 2019 Soil Monitoring Program Report, dated January 31, 2020.	Actions in program reflect the 2019 Soil Monitoring Program Proposal and Deficiency Response Letter.

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Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 4 - Operations, Limits, Monitoring, and Reporting							
Soil Monitoring and Reporting							
4.10.2	The approval holder shall submit the Soil Monitoring Program proposal to the Director according to the following schedule: - For the first soil monitoring event on or before January 31, 2019. - For the second soil monitoring event on or before January 31, 2024.	X				Tetra Tech 2017 Soil Management Program Proposal, including Soil Monitoring Program.	Compliance confirmed: • March 21, 2017 - Soil Management Program Proposal (incl. monitoring program submitted to AEP. • September 11, 2017 - Supplemental Information to Soil Management Program Proposal (revisions), submitted to AEP. • September 13, 2017 - Approval letter from AEP regarding Soil Management Program Proposal.
4.10.3	If any Soil Monitoring Program proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.	X					
4.10.4	Subject to 4.10.3, the approval holder shall implement the Soil Monitoring Program as authorized in writing by the Director.	X				Tetra Tech 2019 Soil Monitoring Program.	Confirmed that this was completed in Fall 2019.
4.10.5	If an authorization or a deficiency letter is not issued within 120 days of the applicable date required by 4.10.2, the approval holder shall implement the Soil Monitoring Program in accordance with the program as set out in the proposal submitted by the approval holder and within 270 days after the applicable date required by 4.10.2	X				Tetra Tech 2019 Soil Monitoring Program.	Confirmed that this was completed in Fall 2019.
4.10.6	The approval holder shall submit to the Director each Soil Monitoring Program Report obtained from the soil monitoring referred to in 4.10.4 and 4.10.5 according to the following schedule:	X				Tetra Tech 2019 Soil Monitoring Program.	Confirmed that this was completed in Fall 2019.
4.10.6 (a)	For the first Soil Monitoring Program Report on or before January 31, 2020.	X				Tetra Tech 2019 Soil Monitoring Program Report, dated January 31, 2020.	Submit to the AEP on time, January 31, 2020
4.10.6 (b)	For the second Soil Monitoring Program Report on or before January 31, 2025.				X	Not applicable.	Not applicable. To be completed in the summer of 2024.
4.10.7	If any Soil Monitoring Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.	X				Tetra Tech 2019 Soil Monitoring Program Report, dated January 31, 2020.	Actions in program reflect the 2019 Soil Monitoring Program Proposal and Deficiency Response Letter.
Soil Management Program							
4.10.8	If the Soil Monitoring Program, or any other soil monitoring, reveals that there are substances present in the soil at concentrations greater than any of the applicable concentrations set out in the standards in the Soil Monitoring Directive, Alberta Environment, 2009, as amended, the approval holder shall develop a Soil Management Program Proposal.	X				• Tetra Tech 2017 Soil Management Program Proposal, including Soil Monitoring Program. • Tetra Tech Soil Management Program 2017 Cell 4 Soil Sampling, dated March 12, 2018.	Soil Management Program Proposal was developed and compliance was confirmed through a review.
4.10.9	If a Soil Management Program Proposal is required pursuant to 4.10.8, the approval holder shall submit a Soil Management Program Proposal to the Director according to the following schedule:				X	Not applicable.	Not applicable. Information only
4.10.9 (a)	For Soil Management Program Proposal that is triggered by the findings from the first soil monitoring event on or before the date in 4.10.6(a).	X				Soil Management Program - 2017 Cell 4 Soil Sampling	Updated Soil Management Plan and recommendations are being followed by consultant.
4.10.9 (b)	For Soil Management Program Proposal that is triggered by the findings from a second soil monitoring event on or before the date in 4.10.6(b).	X				Soil Management Program - 2017 Cell 4 Soil Sampling	Updated Soil Management Plan and recommendations are being followed by consultant.
4.10.9 (c)	For any other soil monitoring event not specified in this approval within six months of completion of the soil monitoring event.				X	Not applicable.	Not applicable. Information only
4.10.10	If any Soil Management Program Proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.	X				Soil Management Program - 2017 Cell 4 Soil Sampling	Updated Soil Management Plan and recommendations are being followed by consultant.
4.10.11	The approval holder shall implement the Soil Management Program as authorized in writing by the Director.	X				Soil Management Program - 2017 Cell 4 Soil Sampling	Updated Soil Management Plan and recommendations are being followed by consultant.
4. 10.12	If the approval holder is required to implement a Soil Management Program pursuant to 4.10.11, the approval holder shall submit a written Soil Management Program Report to the Director on or before March 31 of each year following the year in which the information was collected.	X				Soil Management Program - 2017 Cell 4 Soil Sampling	Updated Soil Management Plan and recommendations are being followed by consultant.
4.10.13	If any Soil Management Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified by the Director by the date specified in writing by the Director.				X	Not applicable.	Not applicable. No deficiencies identified by the Director.

Section 6 - Decommissioning

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 6 - Decommissioning and Land Reclamation							
6.1.1	The approval holder shall apply for an amendment to this approval to reclaim the HWRSP Facility by submitting to the Director: - A Decommissioning Plan. - A Land Reclamation Plan.				X	Not applicable.	Not applicable. Facility is still operational and expanding.
6.1.2	The approval holder shall submit the Decommissioning Plan and Land Reclamation Plan referred to in 6.1.1 within six (6) months of the HWRSP Facility ceasing operation, except for repairs and maintenance, unless otherwise authorized in writing by the Director.				X		
6.2.1	The Decommissioning Plan referred to in 6.1.1 shall include, at a minimum, all of the following:				X	Not applicable.	Not applicable. Facility is still operational and expanding.
6.2.1 (a)	A plan for dismantling the HWRSP Facility.				X		
6.2.1 (b)	A comprehensive study to determine the nature, degree and extent of contamination at the HWRSP Facility and affected lands.				X		
6.2.1 (c)	A plan to manage all wastes at the HWRSP Facility.				X		
6.2.1 (d)	Evaluation of remediation technologies proposed to be used at the HWRSP Facility and affected lands.				X		
6.2.1 (e)	A plan for decontamination of the HWRSP Facility and affected lands in accordance with the following: - For soil or groundwater, Alberta Tier 1 Soil and Groundwater Remediation Guidelines, Alberta Environment, February 2009, as amended. - For soil or groundwater, Alberta Tier 2 Soil and Groundwater Remediation Guidelines, Alberta Environment, February 2009, as amended. - For drinking water, Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, PN 1299, 1999, as amended. - For surface water, Surface Water Quality Guidelines for Use in Alberta, Alberta Environment, November 1999, as amended.				X		
6.2.1 (f)	Confirmatory testing to indicate compliance with the remediation objectives.				X		
6.2.1 (g)	A plan for maintaining and operating contaminant monitoring systems.				X		
6.2.1 (h)	A schedule for activities (a) through (g) above.				X		
6.2.1 (i)	Any other information as required in writing by the Director.				X		
6.2.2	If the Decommissioning Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.				X		

Section 6 - Decommissioning

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
6.3.1	The Land Reclamation Plan referred to in 6.1.1 shall include, at a minimum, all of the following:				X	Not applicable.	Not applicable. Facility is still operational and expanding.
6.3.1 (a)	The final use of the reclaimed area and how equivalent land capability will be achieved.				X		
6.3.1 (b)	Removal of infrastructure.				X		
6.3.1 (c)	Restoration of drainage.				X		
6.3.1 (d)	Soil replacement.				X		
6.3.1 (e)	Erosion control.				X		
6.3.1 (f)	Revegetation and conditioning of the HWRSP Facility including: - Species list, seed source and quality, seeding rates and methods. - Fertilization rates and methods. - Reclamation schedule.				X		
6.3.1 (g)	Reclamation schedule.				X		
6.3.1 (h)	Any other information as required in writing by the Director.				X		
6.3.2	If the Land Reclamation Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.				X		

Section 7 - Final Closure

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 7 - Final Landfill Closure and Post-Closure							
7.1.1	The approval holder shall submit a Landfill Cell Closure Plan for individual landfill cell closure to the Director on or before September 30, 2017, unless otherwise authorized in writing by the Director.			X		Construction and record drawing packages for Cell 3B.	Based on further discussion with Clean Harbors, the Landfill Cell Closure Plan is formed by the stamped design work completed as part of the issued for construction and final record drawing packages and associated documents, and as such, we have considered this matter closed. Further monitoring of this requirement is recommended for future landfill cell closure activities.
7.1.2	The Landfill Cell Closure Plan submitted pursuant to 7.1.1 shall be signed and stamped by a professional registered with APEGA.			X			
7.1.3	If the Landfill Cell Closure Plan submitted pursuant to 7.1.1 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.				X	Not applicable.	Not applicable. Information only.
7.1.4	The approval holder shall implement the Landfill Cell Closure Plan submitted pursuant to 7 .1.1 as authorized in writing by the Director.				X	Not applicable.	Not applicable. Information only.
7.1.5	The approval holder shall maintain the closed landfill cells to:				X	Not applicable.	Not applicable. Information only.
7.1.5 (a)	Protect and maintain the integrity of the final cover and surface water drainage systems.	X				Field observations.	• Surface run-off goes to perimeter ditch system. • Vegetated final caps. • Sloping and drainage per approved designs. • Leachate collection system and storage tanks. • No subsidence or settlement observed. Monitoring consistent with Operations Plan.
7.1.5 (b)	Prevent erosion.	X					
7.1.5 (c)	Prevent surface water ponding.	X					
7.1.5 (d)	Remediate areas affected by subsidence and differential settlement.	X					
7.1.5 (e)	Prevent leachate break out.	X					
7.1.6	If the approval holder completes landfill cell closure in a year, the approval holder shall prepare an Annual Landfill Cell Closure Report, and include, at a minimum, all of the following information in the Report:				X	Not applicable.	Not applicable. Information only.
7.1.6 (a)	As-built plans and details on the location of landfill cells that have been closed.	X				Annual Landfill Cell Closure Report - Cell 3B, report from Dillon Consulting dated March 2, 2021.	Confirmed that the Closure Report was submitted in the 2020 Annual Report.
7.1.6 (b)	Certified construction QA/QC procedures employed during cover construction and installation.	X					
7.1.6 (c)	Survey reports showing the final cover depths.	X					
7.1.7	The approval holder shall submit the Annual Landfill Cell Closure Report with the Annual Landfill Operations Report required in 4.6.58.	X					

Section 7 - Final Closure

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
7.2.1	The approval holder shall apply for an amendment to this approval for final landfill closure by submitting to the Director: - A Detailed Final Landfill Closure Plan. - A Landfill Post-Closure Plan.				X	Not applicable.	The landfill is still operational and expanding. Landfill Closure Plan and Post-Closure Plan is to be submitted 180 days prior to implementation.
7.2.2	The approval holder shall submit the Detailed Final Closure Plan and Landfill Post-Closure Plan referred to in 7.2.1 within six (6) months of the landfill ceasing operations, unless otherwise authorized in writing by the Director.				X	Not applicable.	The landfill is still operational and expanding.
Detailed Final Closure Plan							
7.2.3	The Detailed Final Landfill Closure Plan shall be developed in accordance with sections 6.1 (b) and 6.1 (c) of the Standards for Landfills in Alberta, as amended.				X	Not applicable.	The landfill is still operational and expanding.
7.2.4	In addition to 7.2.3, the Detailed Final Landfill Closure Plan shall include, at a minimum, all of the following:				X	Not applicable.	The landfill is still operational and expanding.
7.2.4 (a)	A plan for replacement of soil.				X	Not applicable.	The landfill is still operational and expanding.
7.2.4 (b)	A QA/QC Program.				X	Not applicable.	The landfill is still operational and expanding.
7.2.4 (c)	Any deviations from the most recently submitted closure plan.				X	Not applicable.	The landfill is still operational and expanding.
7.2.5	The Detailed Final Landfill Closure Plan shall be signed and stamped by a professional registered with APEGA.				X	Not applicable.	The landfill is still operational and expanding.
7.2.6	If the Detailed Final Landfill Closure Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.				X	Not applicable.	The landfill is still operational and expanding.
7.2.7	The approval holder shall implement the Detailed Final Landfill Closure Plan as authorized in writing by the Director.				X	Not applicable.	The landfill is still operational and expanding.
Landfill Post-Closure Plan							
7.2.8	The Landfill Post-Closure Plan shall be developed in accordance with sections 6.2 and 6.3 of the Standards for Landfills in Alberta, as amended.				X	Not applicable.	The landfill is still operational and expanding.
7.2.9	In addition to 7.2.8, the Landfill Post-Closure Plan shall include, at a minimum, all of the following:				X	Not applicable.	The landfill is still operational and expanding.
7.2.9 (a)	The groundwater monitoring program including performance standards and points of compliance.				X	Not applicable.	The landfill is still operational and expanding.
7.2.9 (b)	The subsurface landfill gas monitoring program and performance standards at points of compliance.				X	Not applicable.	The landfill is still operational and expanding.
7.2.9 (c)	A plan for erosion control.				X	Not applicable.	The landfill is still operational and expanding.
7.2.9 (d)	A plan for maintaining vegetative cover.				X	Not applicable.	The landfill is still operational and expanding.
7.2.9 (e)	Any other information requested in writing by the Director.				X	Not applicable.	The landfill is still operational and expanding.

Section 7 - Final Closure

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
7.2.10	The Landfill Post-Closure Plan shall be signed and stamped by a professional registered with APEGA.				X	Not applicable.	The landfill is still operational and expanding.
7.2.11	If the Landfill Post-Closure Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.				X	Not applicable.	The landfill is still operational and expanding.
7.2.12	The approval holder shall implement the Landfill Post-Closure Plan as authorized in writing by the Director.				X	Not applicable.	The landfill is still operational and expanding.

Section 8 - SWM Pond Closure

Approval Line Item	Action	Finding				Documents Reviewed	Details
		Compliant	Non-Compliant	OFI	Info, N/A		
Part 8 - Decommissioning and Land Reclamation of Old Surface Water Detention Pond							
8.1.1	The approval holder shall decommission and reclaim the old surface water detention pond prior to construction of Cell 4.	X				• Soil Management Program - 2017 Cell 4 Soil Sampling, report dated March 12, 2018 from Tetra Tech. • Soil Management Program - 2018 Cell 4 Remediation Report, May 31, 2019 from Tetra Tech.	Confirmed that this was done concurrent with earthworks for Cell 4 construction.
8.1.2	The approval holder shall submit a Decommissioning and Land Reclamation Plan for the old surface water detention pond to the Director a minimum of six (6) months prior to decommissioning and land reclamation of the pond.	X					• Soil Management Program (2017 Cell 4 Soil Sampling) submitted to AEP Industrial Reporting email address on March 23, 2018. • Soil Management Program (2018 Cell 4 Remediation Report) submitted June 11, 2019. • Report details pond draining and soil sampling following remediation to meet guidelines and approval.
8.1.3	If the Decommissioning and Land Reclamation Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.	X				Not applicable.	AEP did not comment on any deficiencies.

APPENDIX I

Stabilization Facility

Integrity Testing SERVICES INC.

UT REPORT SUMMARY

W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	South Sludge Pit		

DWG #: (006)

EQUIPMENT INSPECTION SUMMARY:

NO DATA PLATE
2020/08 - ALL READINGS CONFIRMED.

CML No.	CML Location	Nom. Thick mm	Mill. Tol. mm	CA mm	Min. Nom. mm	Calc. T-Min. mm	Survey Date MM/DD/YY	Last Survey Thick mm	Short Term Rate mm/yr	Long Term Rate mm/yr	Rem. Half Life yr
02	SOUTH WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	25.00	0.0000	0.0337	100.00
04	SOUTH WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	25.00	0.0000	0.0421	100.00
06	WEST WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	24.70	0.0000	0.0589	100.00
08	WEST WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	24.60	0.0000	0.1060	100.00
10	WEST WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	24.60	0.0000	0.0783	100.00
12	NORTH WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	25.20	0.0000	0.0488	100.00
14	NORTH WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	25.20	0.0000	0.0236	100.00
16	EAST WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	24.50	0.0986	0.0926	100.00
18	EAST WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	24.50	0.1973	0.1018	100.00
20	EAST WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	24.20	0.0000	0.1119	100.00
22	SOUTH FLOOR N-S	N/S	N/S	N/S	N/S	N/S	08/15/22	23.80	0.0000	0.1430	100.00
24	MIDDLE FLOOR N-S	N/S	N/S	N/S	N/S	N/S	08/15/22	23.80	0.0986	0.1329	100.00
26	NORTH FLOOR N-S	N/S	N/S	N/S	N/S	N/S	08/15/22	24.00	0.0000	0.1287	100.00

Comments:
2020/08 - PITTING/CORROSION NOTED.

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

UT REPORT SUMMARY

W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	East Sludge Pit		

DWG #: (017)

EQUIPMENT INSPECTION SUMMARY:

NO DATA PLATE

CML No.	CML Location	Nom. Thick mm	Mill. Tol. mm	CA mm	Min. Nom. mm	Calc. T-Min. mm	Survey Date MM/DD/YY	Last Survey Thick mm	Short Term Rate mm/yr	Long Term Rate mm/yr	Rem. Half Life yr
02	EAST WALL (1) T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	18.00	0.0000	0.1888	100.00
04	EAST WALL (2) T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	17.50	0.0000	**0.2905**	100.00
Comments: 2020/08 - PITTING/CORROSION NOTED.											
06	EAST SOUTH WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	16.70	0.0000	**0.3195**	100.00
Comments: 2020/08 - PITTING/CORROSION NOTED.											
08	MIDDLE SOUTH WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	17.90	0.0000	0.1452	100.00
Comments: 2020/08 - PITTING/CORROSION NOTED.											
10	WEST SOUTH WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	18.10	0.0000	0.1017	100.00
Comments: 2020/08 - PITTING/CORROSION NOTED.											
12	WEST WALL (1) T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	18.50	0.0000	0.1162	100.00
14	WEST WALL (2) T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	18.80	0.0000	0.1017	100.00
16	WEST NORTH WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	17.40	0.0000	0.1743	100.00
Comments: 2020/08 - PITTING/CORROSION NOTED.											
18	MIDDLE NORTH WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	17.10	0.0000	**0.2614**	100.00
Comments: 2020/08 - PITTING/CORROSION NOTED.											
20	EAST NORTH WALL T-B	N/S	N/S	N/S	N/S	N/S	08/15/22	12.80	0.0000	**0.9150**	100.00
Comments: 2020/08 - PITTING/CORROSION NOTED.											

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

UT REPORT SUMMARY

W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	East Sludge Pit		

DWG #: (017)

CML No.	CML Location	Nom. Thick mm	Mill. Tol. mm	CA mm	Min. Nom. mm	Calc. T-Min. mm	Survey Date MM/DD/YY	Last Survey Thick mm	Short Term Rate mm/yr	Long Term Rate mm/yr	Rem. Half Life yr
22	WEST FLOOR E-W	N/S	N/S	N/S	N/S	N/S	08/15/22	17.80	0.0000	0.1307	100.00

Comments:
2020/08 - PITTING/CORROSION NOTED.

24	MIDDLE FLOOR E-W	N/S	N/S	N/S	N/S	N/S	08/15/22	17.70	0.0000	0.1598	100.00

Comments:
2020/08 - PITTING/CORROSION NOTED.

26	EAST FLOOR E-W	N/S	N/S	N/S	N/S	N/S	08/15/22	17.60	0.0000	0.1598	100.00

Comments:
2020/08 - PITTING/CORROSION NOTED.

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.
4340 - 97 Street, Edmonton AB, T6E 5R9
Tel.: (780) 417-0340
Fax: (780) 417-0348
www.integrity-testing.com

Report No.: VI-1-4758-01-MAM

TANK INTERNAL INSPECTION REPORT

Customer:	Clean Harbors	**ITS Job No.:**	1-4758
District:	Central	**Date:**	15-Aug-2022
Facility:	Ryley Facility	**LSD:**	04-09-050-17W4M
Tank Description:	South Sludge Pit	**Serial No.:**	Not Stated
Equip./OIP No.:	Not Stated		

Remedial Action	Access and Coverage	Internal Coating	Heating Coil
☐ Adequate Cleaning	☑ Internal Inspection	☑ Not Applicable	☑ Not Applicable
☐ No Action Required	☐ Part. Internal Inspection	☐ Good Condition	☐ Good Condition
☐ Paint/Coating Repairs	NDE Examination	☐ Coated ☐ Full ☐ Partial	☐ Corrosion
☐ Further Assessment Required	☐ UT	☐ Holidays/Cracking	☐ Pitting: (max depth)
	☐ MT	☐ Blisters/Bulges	☐ Cracked
☐ Condition Damage	☐ PT	☐ Flaking	☐ Scaled
☐ Does not comply with applicable code/safe operating requirement.	☐ RT	☐ See Comments	☐ Worn
	☐ BH	**Internal Supports**	☐ Loose
	☐ MFL	☑ Not Applicable	☐ Poor Installation
☐ Repairs Required	☐ Other	☐ Good Condition	☐ See Comments
☑ See Comments	☐ Double Walled	☐ Distorted	**Bolted Tanks**
Manway	☐ See Comments	☐ Cracked	☑ Not Applicable
☑ Not Applicable	**Internal Components**	☐ Broken	☐ Good Condition
☐ Good Condition	☐ Anodes Present	☐ Poor Installation	☐ Missing Bolts
☐ Coating Damage	☐ Level Gauge Float in Good Condition	☐ Bolts Missing/ Loose/ Damage	☐ Gasket in Good Condition
☐ Internal Corrosion			
☐ Mechanical Damage	☐ Level Gauge Float or Lower Support Attachment Damaged	☐ See Comments	☐ Gasket Damaged
☐ Seal Face Corrosion			☐ Seepage at Seams
☐ Pitting: (max depth)	☐ Level Gauge Float Wires Damaged		☐ Leakage at Seams
☐ See Comments			☐ See Comments
	☑ See Comments		

Shell Internal	Floor (Internal)	Nozzle Internal	Firetube(s)
☐ Good Condition	☐ Good Condition	☐ RF ☐ NPT	☑ Not Applicable
☐ Internal Corrosion	☐ Internal Corrosion	☐ Good Condition	☐ Good Condition
☐ Pitting: (max depth)	☐ Pitting: (max depth)	☐ Nozzles are Gusseted	☐ Corrosion
☐ Scale	☐ Scale	☐ Nozzles Plugged	☐ Pitting: (max depth)
☐ Blistered	☐ Blistered	☐ Internal Corrosion	☐ Wear/Erosion
☑ Mechanical Damage	☑ Mechanical Damage	☐ Damaged/Cracked	☐ Cracked
☐ Deformation/Distortion	☐ Deformation/Distortion	☐ Deflection/Distortion	☐ Scaled
☐ Weld(s) in Good Condition	☐ Weld(s) in Good Condition	☐ Partial Internal Inspection	☐ Coated
☐ Weld(s) Corroded	☐ Weld(s) Corroded	☐ Weld(s) in Good Condition	☐ Heat Impinged
☐ Weld(s) Poor Quality	☐ Weld(s) Poor Quality	☐ Weld(s) Corroded	☐ Burner Misalignment
☐ Weld(s) Cracked	☐ Weld(s) Cracked	☐ Weld(s) Poor Quality	☐ Damaged Supports
☐ Previous Repairs	☐ Previous Repairs	☐ Weld(s) Cracked	☐ Damaged Guides/Tracks
☑ See Comments	☐ See Comments	☑ Not Applicable	
			☐ See Comments

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Tel.: (780) 417-0340
Fax: (780) 417-0348
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Observations:

Tank is in ☐ Good, ☑ Fair, or ☐ Poor Condition

Good: No concerns found (may still have recommendations)
Fair: Minor issues found that do not impair the "fitness for service" of the Tank, (internal coating deterioration, general internal surface corrosion - no measurable metal loss, etc.)
Poor: Equipment had moderate to major concerns found (Tank is damaged; moderate to severe corrosion noted, cracked or broken component(s), etc.)

☑ **Based on API 653 Visual Internal Inspection this Tank is fit for service**
(This piece of equipment meets the Jurisdictional requirements based on the information available at the time of the inspection.)

- Open top sludge tank. Inspection performed by entering the tank via ladder.
- Tank was not adequately cleaned for inspection. Limited access for inspection on the South, West, North and East walls due to product build up.
- Minor mechanical damage found on the tank shell and floor with an approximate depth of 0.070" – 0.100" (1.8mm - 2.5mm).
- The lifting lugs in each corner of the tank are all damaged/broken.
- UT performed; pitting/corrosion noted on the soil side of the tank wall and floor. See UT data report for remaining wall thicknesses. Thickness was consistent with previous surveys

Recommendations:

- None

Non-Conformance Conditions and Corrective Actions:

Note: Reference any and all Non-Conformance Report (NCR) numbers and Corrective Action Report (CAR) numbers.

- None

Recommended Inspection Interval:

Recommended Maximum Inspection Interval: 12 Months

Pictures:


(Photo 1) Overview


(Photo 2) Floor

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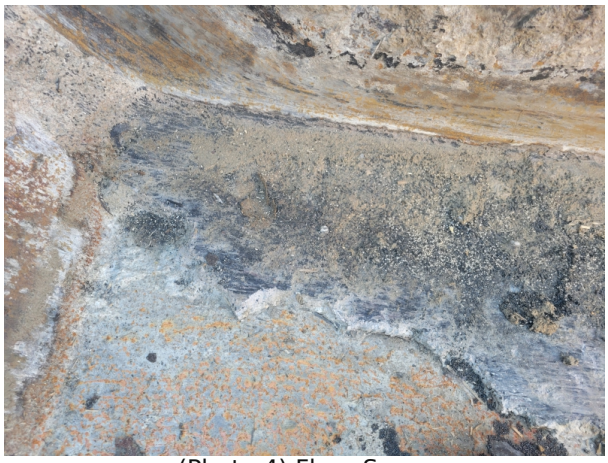
Tel.: (780) 417-0340
Fax: (780) 417-0348
www.integrity-testing.com

Pictures:

(Photo 3) Floor (2)



(Photo 4) Floor Seam

(Photo 5) Scraping On The Wall

(Photo 6) Scraping On The Wall (2)

Internal Inspection Performed By:

Print Name: Murray MacGregor

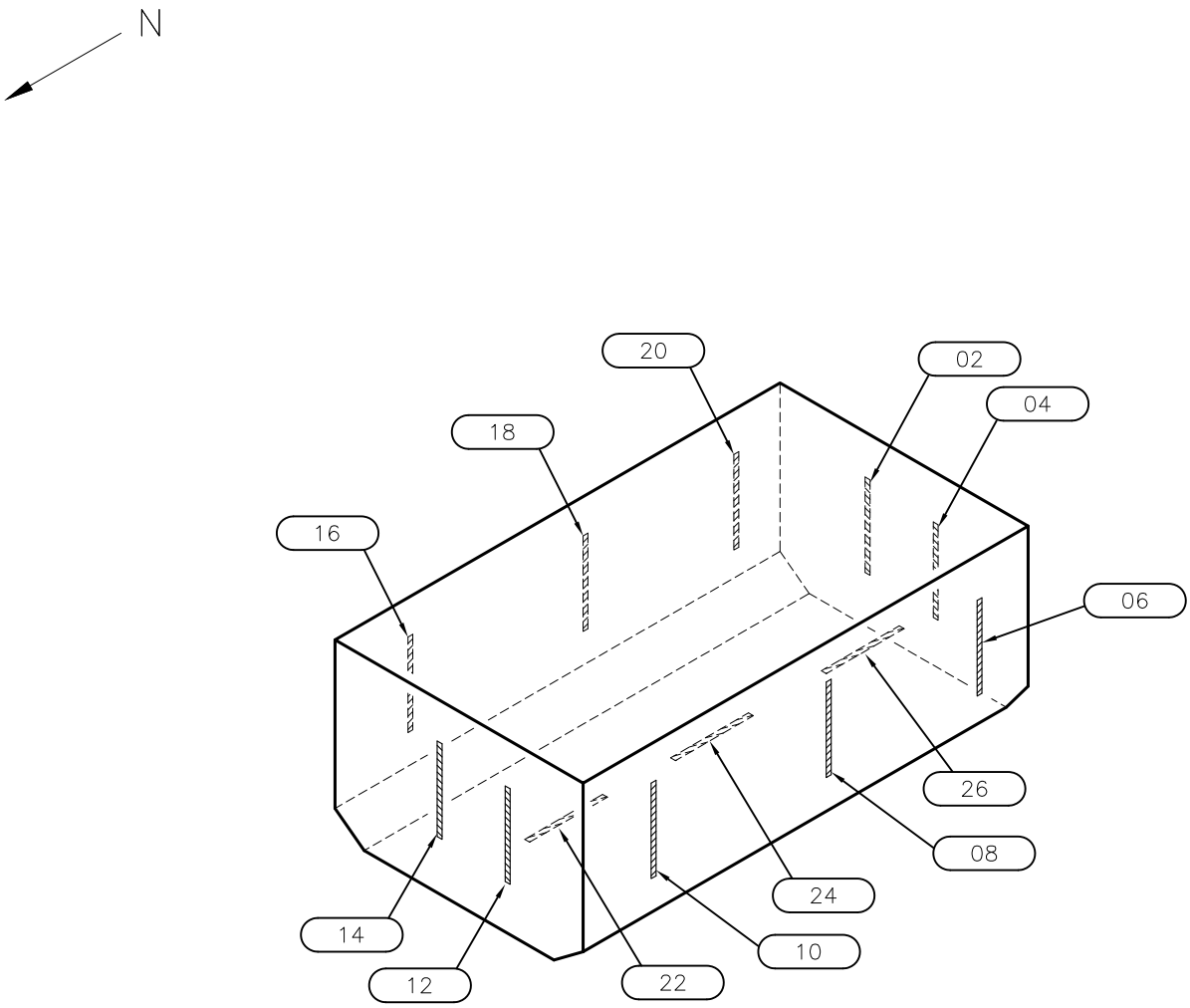
Certification No.: ABSA IBPV PESL: 000430
API 510: 40801
API 653: 48515
CWB Level 2: 8501

Signature:

Report Reviewed: _____ Initial

Chief Inspector / Client Representative: _____ Name (Print) _____ Signature _____ Date:

Integrity Testing
SERVICES INC.



☐ Column ☐ Cooler ☐ Exchanger ☐ Furnace ☐ Heater ☐ Plate Exchanger ☐ Reboiler ☐ Vessel ☒ Other					
Description:	SOUTH SLUDGE PIT				
P.R.N. No.:	N/S	Size:	24' X 14' X 8'		
Equipment No.	N/S	N.B. No.:	N/S		
Serial No.:	N/S				
HEAD Material:	N/S	Nominal:	N/S	C.A.:	N/S
HEAD Material:		Nominal:			
SHELL Material:	N/S	Nominal:	N/S	C.A.:	N/S
SHELL Material:		Nominal:			
MAWP S.Side @TEMP:	N/S	MAWP T.Side @TEMP:			

Comments: NO NAMEPLATE.

Client:, District:, LSD:, Etc.:

CLEAN HARBORS
RYLEY FACILITY

LSD 04-09-050-17W4M

Tech.: MAM	Date: 2022/08
ITS Job No.: 1-4758	DWG No.: 006

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	South Sludge Pit		

EQUIPMENT INSPECTION SUMMARY:

NO DATA PLATE
2020/08 - ALL READINGS CONFIRMED.

Description: **SOUTH WALL T-B** **CML: 006-02**

NOM. THICK.:	Not Stated	MATERIAL:	Not Stated
MILL. TOL.:	Not Stated	MINIMUM THICKNESS MEASURED:	**25.00 mm**
CA:	Not Stated	AVERAGE THICKNESS MEASURED:	25.10 mm
MIN. NOM.:	Not Stated	CALCULATED T-MIN:	Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.50	25.50	24.90	24.90	25.20	25.20	25.20	0.0000	0.0252	100.00
2	25.48	25.40	25.00	25.00	25.30	25.30	25.20	0.0986	0.0236	100.00
3	25.48	25.30	25.00	25.00	25.10	25.10	25.20	0.0000	0.0236	100.00
4	25.27	25.20	25.10	25.10	25.10	25.10	25.10	0.0000	0.0143	100.00
5	25.68	25.10	24.90	24.90	24.70	25.00	25.10	0.0000	0.0488	100.00
6	25.40	25.20	24.10	24.10	24.80	24.90	25.00	0.0000	0.0337	100.00
7	25.83	25.40	25.00	25.00	25.00	25.00	25.00	0.0000	0.0698	100.00
8	25.55	25.40	25.00	25.00	24.90	24.90	25.00	0.0000	0.0463	100.00

Description: **SOUTH WALL T-B** **CML: 006-04**

NOM. THICK.:	Not Stated	MATERIAL:	Not Stated
MILL. TOL.:	Not Stated	MINIMUM THICKNESS MEASURED:	**25.00 mm**
CA:	Not Stated	AVERAGE THICKNESS MEASURED:	25.00 mm
MIN. NOM.:	Not Stated	CALCULATED T-MIN:	Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.50	25.00	24.80	24.80	25.00	25.00	25.00	0.0000	0.0421	100.00
2	25.76	25.00	24.70	24.70	25.00	25.00	25.00	0.0000	0.0639	100.00
3	25.48	25.20	24.90	24.80	25.00	25.00	25.00	0.0000	0.0404	100.00
4	25.58	25.30	24.50	24.50	25.00	24.90	25.00	0.0000	0.0488	100.00
5	25.50	25.10	24.50	24.50	25.00	25.00	25.00	0.0000	0.0421	100.00
6	25.71	25.00	24.50	24.50	25.00	25.00	25.00	0.0000	0.0597	100.00
7	25.68	25.00	24.10	24.10	25.00	24.80	25.00	0.0000	0.0572	100.00
8	25.68	25.00	24.10	24.10	25.00	24.80	25.00	0.0000	0.0572	100.00

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	South Sludge Pit		

Description: WEST WALL T-B

CML: 006-06

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **24.70 mm**
AVERAGE THICKNESS MEASURED: 24.83 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.50	25.30	25.00	25.00	25.00	25.80	25.00	**0.7892**	0.0421	100.00	
2	25.65	25.10	24.90	24.90	24.80	24.80	24.80	0.0000	0.0715	100.00	
3	25.40	25.20	24.90	24.90	24.90	24.90	24.80	0.0986	0.0505	100.00	
4	25.50	24.80	24.90	25.00	25.00	25.00	24.90	0.0986	0.0505	100.00	
5	25.40	25.00	24.50	24.50	24.50	24.60	24.70	0.0000	0.0589	100.00	
6	25.27	24.80	25.00	24.90	24.80	24.70	24.70	0.0000	0.0480	100.00	
7	25.48	24.80	25.00	24.70	24.70	24.80	24.80	0.0000	0.0572	100.00	
8	25.88	25.10	25.00	25.00	24.70	24.80	24.90	0.0000	0.0825	100.00	

Description: WEST WALL T-B

CML: 006-08

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **24.60 mm**
AVERAGE THICKNESS MEASURED: 24.83 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.86	25.20	24.70	24.70	24.60	24.60	24.60	0.0000	0.1060	100.00	
2	25.48	25.00	24.70	24.90	25.00	24.80	24.80	0.0000	0.0572	100.00	
3	25.53	25.10	24.70	24.70	24.90	24.80	24.80	0.0000	0.0614	100.00	
4	25.43	25.00	24.80	24.80	24.80	24.90	24.80	0.0986	0.0530	100.00	
5	25.40	25.10	24.70	24.80	24.80	24.90	24.90	0.0000	0.0421	100.00	
6	25.71	25.10	24.80	24.80	24.80	24.90	24.90	0.0000	0.0682	100.00	
7	25.45	25.10	24.90	24.90	24.90	24.80	24.90	0.0000	0.0463	100.00	
8	25.50	25.00	25.00	24.80	24.80	24.80	24.90	0.0000	0.0505	100.00	

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	South Sludge Pit		

Description: WEST WALL T-B

CML: 006-10

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **24.60 mm**
AVERAGE THICKNESS MEASURED: 24.78 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.45	25.00	24.90	24.90	24.90	24.80	24.80		0.0000	0.0547	100.00
2	25.32	25.00	24.70	24.80	24.80	24.80	24.80		0.0000	0.0438	100.00
3	25.45	25.00	24.70	24.70	24.90	24.90	24.80		0.0986	0.0547	100.00
4	25.78	25.00	24.70	24.70	24.90	24.90	24.80		0.0986	0.0825	100.00
5	25.38	25.00	24.70	24.70	24.70	24.80	24.80		0.0000	0.0488	100.00
6	25.68	24.90	24.80	24.70	24.90	24.80	24.80		0.0000	0.0740	100.00
7	25.40	25.00	24.60	24.60	24.90	24.80	24.80		0.0000	0.0505	100.00
8	25.53	24.90	24.50	24.50	24.50	24.60	24.60		0.0000	0.0783	100.00

Description: NORTH WALL T-B

CML: 006-12

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **25.20 mm**
AVERAGE THICKNESS MEASURED: 25.20 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.78	25.10	25.10	25.10	25.30	25.20	25.20		0.0000	0.0488	100.00
2	25.83	25.30	25.10	25.10	25.20	25.10	25.20		0.0000	0.0530	100.00
3	25.58	25.30	25.00	25.00	25.30	25.20	25.20		0.0000	0.0320	100.00
4	25.50	25.40	25.10	25.10	25.20	25.20	25.20		0.0000	0.0252	100.00
5	25.45	25.30	25.10	25.10	25.20	25.10	25.20		0.0000	0.0210	100.00
6	25.43	25.30	25.10	25.10	25.20	25.10	25.20		0.0000	0.0194	100.00
7	25.50	25.40	25.10	25.10	25.20	25.10	25.20		0.0000	0.0252	100.00
8	25.58	25.40	25.10	25.10	25.20	25.10	25.20		0.0000	0.0320	100.00

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	South Sludge Pit		

Description: NORTH WALL T-B

CML: 006-14

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **25.20 mm**
AVERAGE THICKNESS MEASURED: 25.20 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.48	25.10	25.00	25.00	25.20	25.10	25.20		0.0000	0.0236	100.00
2	25.48	25.00	25.00	25.00	25.20	25.10	25.20		0.0000	0.0236	100.00
3	25.50	25.40	25.00	25.00	25.20	25.10	25.20		0.0000	0.0252	100.00
4	25.55	25.30	25.00	24.90	25.20	25.10	25.20		0.0000	0.0294	100.00
5	25.43	25.30	24.90	24.90	25.30	25.20	25.20		0.0000	0.0194	100.00
6	25.53	25.10	25.00	25.00	25.40	25.20	25.20		0.0000	0.0278	100.00
7	25.60	25.20	25.00	25.00	25.40	25.20	25.20		0.0000	0.0337	100.00
8	25.58	25.20	24.90	24.90	25.40	25.20	25.20		0.0000	0.0320	100.00

Description: EAST WALL T-B

CML: 006-16

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **24.50 mm**
AVERAGE THICKNESS MEASURED: 24.60 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.48	24.40	24.80	24.80	24.70	24.60	24.60		0.0000	0.0740	100.00
2	25.38	24.90	24.80	24.70	24.30	24.40	24.70		0.0000	0.0572	100.00
3	25.40	24.90	24.80	24.70	24.70	24.60	24.60		0.0000	0.0673	100.00
4	25.50	25.00	24.90	24.80	24.80	24.60	24.60		0.0000	0.0757	100.00
5	25.63	24.90	24.80	24.80	24.50	24.50	24.60		0.0000	0.0867	100.00
6	25.60	25.10	24.80	24.70	24.60	24.60	24.50		0.0986	0.0926	100.00
7	25.76	25.00	24.80	24.70	24.70	24.60	24.60		0.0000	0.0976	100.00
8	25.71	25.10	24.80	24.70	24.50	24.50	24.60		0.0000	0.0934	100.00

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	South Sludge Pit		

Description: **EAST WALL T-B** **CML: 006-18**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **24.50 mm**
AVERAGE THICKNESS MEASURED: 24.60 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.53	24.30	24.70	24.70	24.70	24.60	24.60		0.0000	0.0783	100.00
2	25.43	24.60	24.70	24.70	24.50	24.60	24.60		0.0000	0.0698	100.00
3	25.48	24.90	24.60	24.60	24.50	24.50	24.60		0.0000	0.0740	100.00
4	25.71	24.90	24.50	24.50	24.60	24.60	24.60		0.0000	0.0934	100.00
5	25.40	24.90	24.60	24.60	24.30	24.50	24.60		0.0000	0.0673	100.00
6	25.40	25.00	24.60	24.60	24.70	24.60	24.70		0.0000	0.0589	100.00
7	25.71	24.90	24.60	24.70	24.80	24.70	24.50		0.1973	0.1018	100.00
8	26.01	24.90	24.60	24.70	24.60	24.60	24.60		0.0000	0.1186	100.00

Description: **EAST WALL T-B** **CML: 006-20**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **24.20 mm**
AVERAGE THICKNESS MEASURED: 24.48 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.55	25.00	24.70	24.70	24.80	24.60	24.50		0.0986	0.0883	100.00
2	25.55	25.00	24.70	24.80	24.70	24.60	24.50		0.0986	0.0883	100.00
3	25.50	25.20	24.50	24.50	24.50	24.50	24.50		0.0000	0.0841	100.00
4	25.53	25.10	24.40	24.40	24.40	23.90	24.20		0.0000	0.1119	100.00
5	25.50	25.10	24.40	24.40	24.50	24.50	24.50		0.0000	0.0841	100.00
6	25.73	25.10	24.50	24.70	24.80	24.70	24.50		0.1973	0.1035	100.00
7	25.86	25.10	24.50	24.30	24.50	24.50	24.60		0.0000	0.1060	100.00
8	25.58	25.10	24.50	24.10	24.50	24.50	24.50		0.0000	0.0909	100.00

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	South Sludge Pit		

Description: SOUTH FLOOR N-S

CML: 006-22

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **23.80 mm**
AVERAGE THICKNESS MEASURED: 23.93 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.40	24.50	24.50	24.50	24.00	24.00	24.00		0.0000	0.1178	100.00
2	25.38	24.50	24.40	24.30	24.00	24.00	24.00		0.0000	0.1161	100.00
3	25.76	24.50	24.30	24.30	23.90	24.00	24.00		0.0000	0.1481	100.00
4	25.48	24.60	24.20	24.30	23.60	23.80	23.90		0.0000	0.1329	100.00
5	25.60	24.50	24.20	24.40	23.80	23.90	23.90		0.0000	0.1430	100.00
6	25.38	24.50	24.20	24.30	24.00	23.90	23.90		0.0000	0.1245	100.00
7	25.40	24.50	24.50	24.30	24.00	23.90	23.90		0.0000	0.1262	100.00
8	25.50	24.40	24.50	24.30	23.50	23.70	23.80		0.0000	0.1430	100.00

Description: MIDDLE FLOOR N-S

CML: 006-24

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **23.80 mm**
AVERAGE THICKNESS MEASURED: 23.80 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.38	24.30	23.80	No Access	23.90	23.90	23.80		0.0986	0.1329	100.00
2	25.32	24.20	23.80		23.80	23.80	23.80		0.0000	0.1279	100.00
3	25.40	24.20	23.90		23.80	23.80	23.80		0.0000	0.1346	100.00
4	25.38	24.20	24.10		23.80	23.80	23.80		0.0000	0.1329	100.00
5	25.38	24.20	24.10		23.80	23.80	23.80		0.0000	0.1329	100.00
6	25.38	24.40	24.10		23.80	23.80	23.80		0.0000	0.1329	100.00
7	25.35	24.30	24.00		23.80	23.80	23.80		0.0000	0.1304	100.00
8	25.38	24.30	24.00		23.80	23.80	23.80		0.0000	0.1329	100.00

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	South Sludge Pit		

Description: **NORTH FLOOR N-S**

CML: 006-26

NOM. THICK.:	Not Stated	MATERIAL:	Not Stated
MILL. TOL.:	Not Stated	MINIMUM THICKNESS MEASURED:	**24.00 mm**
CA:	Not Stated	AVERAGE THICKNESS MEASURED:	24.11 mm
MIN. NOM.:	Not Stated	CALCULATED T-MIN:	Not Stated

Rdg.	B/L Thick. MM/DD/YY	09/29/10	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	25.48	24.50	24.50	No Access	24.30	24.10	24.20		0.0000	0.1077	100.00
2	25.50	24.40	24.40		24.20	24.20	24.20		0.0000	0.1094	100.00
3	25.71	24.50	24.40		24.00	24.00	24.20		0.0000	0.1271	100.00
4	25.58	24.40	24.30		24.10	24.10	24.10		0.0000	0.1245	100.00
5	25.55	24.50	24.40		24.00	24.00	24.20		0.0000	0.1136	100.00
6	25.53	24.50	24.50		24.00	23.90	24.00		0.0000	0.1287	100.00
7	25.48	24.50	24.50		23.90	23.90	24.00		0.0000	0.1245	100.00
8	25.50	24.50	24.60		24.00	23.90	24.00		0.0000	0.1262	100.00

COMMENTS:
2020/08 - PITTING/CORROSION NOTED.

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

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Tel.: (780) 417-0340
Fax: (780) 417-0348
www.integrity-testing.com

Report No.: VI-1-4758-02-MAM

TANK INTERNAL INSPECTION REPORT

Customer:	Clean Harbors	**ITS Job No.:**	1-4758
District:	Central	**Date:**	15-Aug-2022
Facility:	Ryley Facility	**LSD:**	04-09-050-17W4M
Tank Description:	East Sludge Pit	**Serial No.:**	Not Stated
Equip./OIP No.:	Not Stated		

Remedial Action	Access and Coverage	Internal Coating	Heating Coil
☑ Adequate Cleaning	☑ Internal Inspection	☑ Not Applicable	☑ Not Applicable
☐ No Action Required	☐ Part. Internal Inspection	☐ Good Condition	☐ Good Condition
☐ Paint/Coating Repairs	NDE Examination	☐ Coated ☐ Full ☐ Partial	☐ Corrosion
☐ Further Assessment Required	☑ UT	☐ Holidays/Cracking	☐ Pitting: (max depth)
	☐ MT	☐ Blisters/Bulges	☐ Cracked
☐ Condition Damage	☐ PT	☐ Flaking	☐ Scaled
☐ Does not comply with applicable code/safe operating requirement.	☐ RT	☐ See Comments	☐ Worn
	☐ BH	**Internal Supports**	☐ Loose
	☐ MFL	☑ Not Applicable	☐ Poor Installation
☐ Repairs Required	☐ Other	☐ Good Condition	☐ See Comments
☑ See Comments	☐ Double Walled	☐ Distorted	**Bolted Tanks**
Manway	☐ See Comments	☐ Cracked	☑ Not Applicable
☑ Not Applicable	**Internal Components**	☐ Broken	☐ Good Condition
☐ Good Condition	☐ Anodes Present	☐ Poor Installation	☐ Missing Bolts
☐ Coating Damage	☐ Level Gauge Float in Good Condition	☐ Bolts Missing/ Loose/ Damage	☐ Gasket in Good Condition
☐ Internal Corrosion			
☐ Mechanical Damage	☐ Level Gauge Float or Lower Support Attachment Damaged	☐ See Comments	☐ Gasket Damaged
☐ Seal Face Corrosion			☐ Seepage at Seams
☐ Pitting: (max depth)	☐ Level Gauge Float Wires Damaged		☐ Leakage at Seams
☐ See Comments			☐ See Comments
	☑ See Comments		

Shell Internal	Floor (Internal)	Nozzle Internal	Firetube(s)
☐ Good Condition	☑ Good Condition	☐ RF ☐ NPT	☑ Not Applicable
☐ Internal Corrosion	☐ Internal Corrosion	☐ Good Condition	☐ Good Condition
☐ Pitting: (max depth)	☐ Pitting: (max depth)	☐ Nozzles are Gusseted	☐ Corrosion
☐ Scale	☐ Scale	☐ Nozzles Plugged	☐ Pitting: (max depth)
☐ Blistered	☐ Blistered	☐ Internal Corrosion	☐ Wear/Erosion
☑ Mechanical Damage	☑ Mechanical Damage	☐ Damaged/Cracked	☐ Cracked
☐ Deformation/Distortion	☐ Deformation/Distortion	☐ Deflection/Distortion	☐ Scaled
☐ Weld(s) in Good Condition	☐ Weld(s) in Good Condition	☐ Partial Internal Inspection	☐ Coated
☐ Weld(s) Corroded	☐ Weld(s) Corroded	☐ Weld(s) in Good Condition	☐ Heat Impinged
☐ Weld(s) Poor Quality	☐ Weld(s) Poor Quality	☐ Weld(s) Corroded	☐ Burner Misalignment
☐ Weld(s) Cracked	☐ Weld(s) Cracked	☐ Weld(s) Poor Quality	☐ Damaged Supports
☐ Previous Repairs	☐ Previous Repairs	☐ Weld(s) Cracked	☐ Damaged Guides/Tracks
☑ See Comments	☑ See Comments	☑ Not Applicable	
			☐ See Comments

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Observations:

Tank is in ☐ Good, ☑ Fair, or ☐ Poor Condition

Good: No concerns found (may still have recommendations)
Fair: Minor issues found that do not impair the "fitness for service" of the Tank, (internal coating deterioration, general internal surface corrosion - no measurable metal loss, etc.)
Poor: Equipment had moderate to major concerns found (Tank is damaged; moderate to severe corrosion noted, cracked or broken component(s), etc.)

☑ **Based on API 653 Visual Internal Inspection this Tank is fit for service**
(This piece of equipment meets the Jurisdictional requirements based on the information available at the time of the inspection.)

- Open top sludge tank. Inspection performed by entering the tank via ladder.
- Tank was adequately cleaned for inspection.
- Minor mechanical damage found throughout the tank shell and floor.
- Pitting/corrosion noted on the tank internal surface on the lower shell. Pitting/corrosion depths are approximately 0.070" - 0.100" (1.8mm - 2.5mm).
- UT performed; Corrosion/pitting noted on the soil side on the shell and floor. See UT data report for remaining wall thicknesses. UT readings were consistent with previous readings
- Minor mechanical deformation of the tank shell on the North side of the tank.

Recommendations:

- None

Non-Conformance Conditions and Corrective Actions:

Note: Reference any and all Non-Conformance Report (NCR) numbers and Corrective Action Report (CAR) numbers.

- None

Recommended Inspection Interval:

Recommended Maximum Inspection Interval: 12 Months

Pictures:

(Photo 1) Bottom Seam

(Photo 2) Corner Seam

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Pictures:

(Photo 3) Pit Overview

(Photo 4) Scraping On The Wall

Internal Inspection Performed By:

Print Name: Murray MacGregor

Certification No.: ABSA IBPV PESL: 000430
API 510: 40801
API 653: 48515
CWB Level 2: 8501

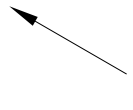
Signature:

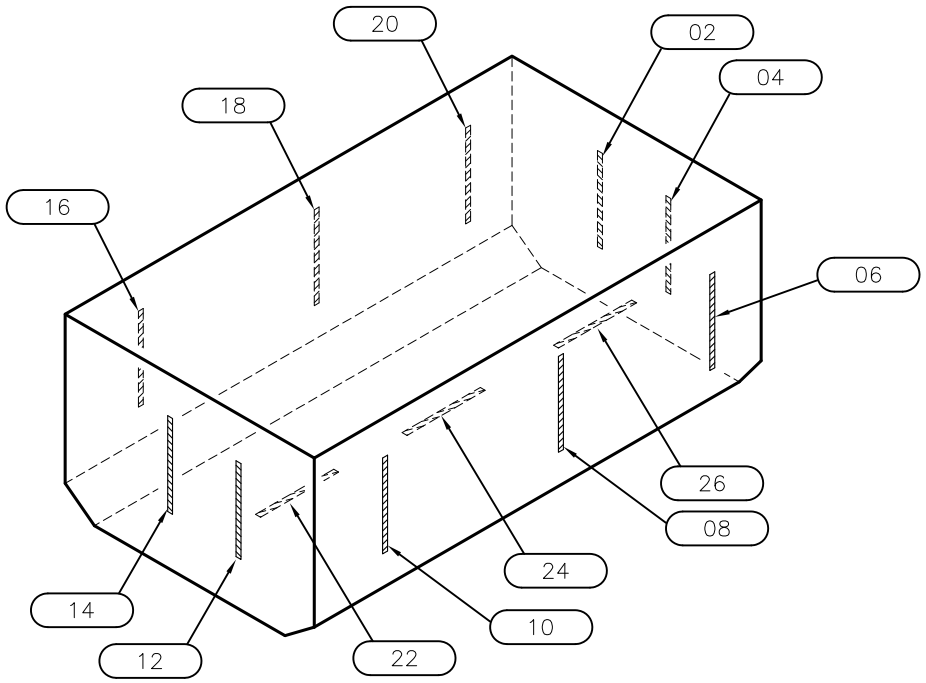
Report Reviewed: Initial

Chief Inspector / Client Representative:

Name (Print) | Signature | Date:

Integrity Testing
SERVICES INC.





☐ Column ☐ Cooler ☐ Exchanger ☐ Furnace ☐ Heater ☐ Plate Exchanger ☐ Reboiler ☐ Vessel ☒ Other					
Description:	EAST SLUDGE PIT				
P.R.N. No.:	N/S	Size:	24' X 14' X 8'		
Equipment No.	N/S	N.B. No.:	N/S		
Serial No.:	N/S				
HEAD Material:	N/S	Nominal:	N/S	C.A.:	N/S
HEAD Material:		Nominal:			
SHELL Material:	N/S	Nominal:	N/S	C.A.:	N/S
SHELL Material:		Nominal:			
MAWP S.Side @TEMP:	N/S	MAWP T.Side @TEMP:			

Comments: NO NAMEPLATE.

Client:, District:, LSD:, Etc.:

CLEAN HARBORS
RYLEY FACILITY

LSD 04-09-050-17W4M

Tech.: MAM	Date: 2022/08
ITS Job No.: 1-4758	DWG No.: 017

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	East Sludge Pit		

EQUIPMENT INSPECTION SUMMARY:

NO DATA PLATE

Description: **EAST WALL (1) T-B** **CML: 017-02**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **18.00 mm**
AVERAGE THICKNESS MEASURED: 18.37 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY 09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	19.30	19.00	18.80	18.80	18.60	18.60	18.70	0.0000	0.0871	100.00
2	19.30	18.90	18.80	18.80	18.30	18.30	18.60	0.0000	0.1017	100.00
3	19.40	18.90	18.60	18.60	18.40	18.40	18.60	0.0000	0.1162	100.00
4	19.40	18.90	18.30	18.30	18.20	18.20	18.30	0.0000	0.1598	100.00
5	19.30	19.00	17.40	17.40	18.00	18.00	18.00	0.0000	0.1888	100.00
6	19.40	18.90	17.40	17.30	18.00	18.00	18.00	0.0000	0.2033	100.00

Description: **EAST WALL (2) T-B** **CML: 017-04**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **17.50 mm**
AVERAGE THICKNESS MEASURED: 18.17 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY 09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22	Short Term mm/yr	Long Term mm/yr	Rem. Half Life
1	19.30	18.70	18.50	18.50	18.30	18.30	18.30	0.0000	0.1452	100.00
2	19.40	18.90	18.80	18.80	18.10	18.10	18.10	0.0000	0.1888	100.00
3	19.50	18.00	17.60	17.50	17.50	17.50	17.50	0.0000	**0.2905**	100.00
4	19.50	17.50	18.00	18.00	18.00	18.00	18.00	0.0000	0.2179	100.00
5	19.60	17.90	18.70	18.70	18.70	18.70	18.70	0.0000	0.1307	100.00
6	19.50	19.10	18.70	18.50	18.30	18.30	18.40	0.0000	0.1598	100.00

COMMENTS:
2020/08 - PITTING/CORROSION NOTED.

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	East Sludge Pit		

Description: **EAST SOUTH WALL T-B** **CML: 017-06**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **16.70 mm**
AVERAGE THICKNESS MEASURED: 17.20 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY							Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22			
1	18.90	18.00	18.50	18.50	16.40	16.50	16.70	0.0000	**0.3195**	100.00
2	18.90	18.10	18.50	18.50	16.80	16.80	16.70	0.0986	**0.3195**	100.00
3	18.80	18.10	18.10	18.10	16.20	16.60	16.80	0.0000	**0.2905**	100.00
4	18.80	18.80	18.30	18.30	16.80	16.80	16.90	0.0000	**0.2760**	100.00
5	18.90	18.50	18.40	18.40	18.10	18.10	18.10	0.0000	0.1162	100.00
6	18.90	18.50	18.20	18.10	18.00	18.00	18.00	0.0000	0.1307	100.00

COMMENTS:
2020/08 - PITTING/CORROSION NOTED.

Description: **MIDDLE SOUTH WALL T-B** **CML: 017-08**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **17.90 mm**
AVERAGE THICKNESS MEASURED: 18.10 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY							Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22			
1	18.90	18.90	18.60	18.60	17.80	17.80	17.90	0.0000	0.1452	100.00
2	18.90	17.60	18.70	18.50	18.20	18.20	18.10	0.0986	0.1162	100.00
3	18.80	18.70	18.60	18.50	18.10	18.10	18.10	0.0000	0.1017	100.00
4	18.70	17.90	18.40	18.20	18.10	18.10	18.10	0.0000	0.0871	100.00
5	18.80	18.60	18.60	18.20	18.00	18.00	18.00	0.0000	0.1162	100.00
6	18.90	18.80	18.60	18.40	18.40	18.40	18.40	0.0000	0.0726	100.00

COMMENTS:
2020/08 - PITTING/CORROSION NOTED.

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	East Sludge Pit		

Description: **WEST SOUTH WALL T-B** **CML: 017-10**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **18.10 mm**
AVERAGE THICKNESS MEASURED: 18.27 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY							Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22			
1	18.80	19.00	18.50	18.50	18.10	18.10	18.10	0.0000	0.1017	100.00
2	18.80	18.90	18.50	18.30	18.30	18.30	18.30	0.0000	0.0726	100.00
3	18.90	18.80	18.50	18.40	17.90	18.10	18.20	0.0000	0.1017	100.00
4	18.90	18.90	18.60	18.40	18.30	18.30	18.30	0.0000	0.0871	100.00
5	18.90	18.80	18.30	18.50	18.50	18.50	18.40	0.0986	0.0726	100.00
6	18.90	18.80	18.40	18.30	18.30	18.30	18.30	0.0000	0.0871	100.00

COMMENTS:
2020/08 - PITTING/CORROSION NOTED.

Description: **WEST WALL (1) T-B** **CML: 017-12**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **18.50 mm**
AVERAGE THICKNESS MEASURED: 18.70 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY							Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22			
1	19.10	19.20	19.30	19.30	18.70	18.70	18.70	0.0000	0.0581	100.00
2	19.20	19.20	19.30	19.30	18.60	18.60	18.70	0.0000	0.0726	100.00
3	19.40	19.30	19.20	19.20	18.80	18.80	18.70	0.0986	0.1017	100.00
4	19.30	19.30	18.60	18.60	18.80	18.80	18.90	0.0000	0.0581	100.00
5	19.30	19.50	18.70	18.50	18.50	18.50	18.50	0.0000	0.1162	100.00
6	19.20	19.10	18.80	18.70	18.70	18.70	18.70	0.0000	0.0726	100.00

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	East Sludge Pit		

Description: **WEST WALL (2) T-B** **CML: 017-14**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated
MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **18.80 mm**
AVERAGE THICKNESS MEASURED: 18.88 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY							Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22			
1	19.60	19.10	19.10	19.10	19.00	19.00	19.00	0.0000	0.0871	100.00
2	19.70	19.10	18.80	18.80	18.80	18.70	18.90	0.0000	0.1162	100.00
3	19.50	19.10	18.90	18.90	19.00	19.00	18.90	0.0986	0.0871	100.00
4	19.70	19.10	18.70	18.70	18.70	18.70	18.90	0.0000	0.1162	100.00
5	19.50	19.00	18.80	18.80	18.80	18.80	18.80	0.0000	0.1017	100.00
6	19.20	19.00	18.90	18.90	18.90	18.90	18.80	0.0986	0.0581	100.00

Description: **WEST NORTH WALL T-B** **CML: 017-16**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated
MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **17.40 mm**
AVERAGE THICKNESS MEASURED: 18.02 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY							Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22			
1	19.20	19.00	18.90	18.90	18.10	18.10	18.10	0.0000	0.1598	100.00
2	19.00	19.10	17.90	18.00	18.00	18.00	18.10	0.0000	0.1307	100.00
3	19.30	18.90	18.60	18.30	17.90	17.80	17.90	0.0000	0.2033	100.00
4	18.90	18.90	18.20	18.20	18.20	18.20	18.20	0.0000	0.1017	100.00
5	18.70	16.20	18.30	18.30	18.30	18.30	18.40	0.0000	0.0436	100.00
6	18.60	17.70	17.40	17.40	17.40	17.30	17.40	0.0000	0.1743	100.00

COMMENTS:
2020/08 - PITTING/CORROSION NOTED.

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	East Sludge Pit		

Description: **MIDDLE NORTH WALL T-B** **CML: 017-18**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **17.10 mm**
AVERAGE THICKNESS MEASURED: 18.00 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY							Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22			
1	18.90	18.90	18.90	18.90	18.20	18.20	18.40	0.0000	0.0726	100.00
2	18.80	18.90	17.50	17.70	17.70	17.70	17.70	0.0000	0.1598	100.00
3	18.90	18.80	17.00	17.00	17.00	17.00	17.10	0.0000	**0.2614**	100.00
4	18.80	18.70	18.50	18.20	18.20	18.20	18.20	0.0000	0.0871	100.00
5	18.90	18.70	18.80	18.50	18.30	18.30	18.20	0.0986	0.1017	100.00
6	18.80	18.70	18.60	18.40	18.40	18.40	18.40	0.0000	0.0581	100.00

COMMENTS:
2020/08 - PITTING/CORROSION NOTED.

Description: **EAST NORTH WALL T-B** **CML: 017-20**

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **12.80 mm**
AVERAGE THICKNESS MEASURED: 16.67 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY							Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22			
1	19.10	18.80	18.20	18.20	13.40	12.20	12.80	0.0000	**0.9150**	100.00
2	19.10	18.90	18.00	18.00	17.80	17.80	17.90	0.0000	0.1743	100.00
3	19.00	18.80	15.90	15.90	16.50	16.40	16.50	0.0000	**0.3631**	100.00
4	19.00	17.80	18.00	17.50	17.50	17.50	17.60	0.0000	0.2033	100.00
5	18.90	16.90	17.80	17.30	17.50	17.50	17.60	0.0000	0.1888	100.00
6	18.90	18.00	18.20	17.80	17.50	17.50	17.60	0.0000	0.1888	100.00

COMMENTS:
2020/08 - PITTING/CORROSION NOTED.

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	East Sludge Pit		

Description: WEST FLOOR E-W

CML: 017-22

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **17.80 mm**
AVERAGE THICKNESS MEASURED: 17.80 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY							Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22			
1	18.70	18.50	18.30	18.30	17.80	17.80	17.80	0.0000	0.1307	100.00
2	18.60	18.40	18.30	18.20	17.70	17.70	17.80	0.0000	0.1162	100.00
3	18.50	18.40	18.30	18.00	17.90	17.80	17.80	0.0000	0.1017	100.00
4	18.50	18.50	18.40	18.40	17.70	17.70	17.80	0.0000	0.1017	100.00
5	18.60	18.50	18.20	18.00	17.80	17.80	17.80	0.0000	0.1162	100.00
6	18.70	18.40	18.30	18.00	17.90	17.90	17.80	0.0986	0.1307	100.00

COMMENTS:
2020/08 - PITTING/CORROSION NOTED.

Description: MIDDLE FLOOR E-W

CML: 017-24

NOM. THICK.: Not Stated
MILL. TOL.: Not Stated
CA: Not Stated
MIN. NOM.: Not Stated

MATERIAL: Not Stated
MINIMUM THICKNESS MEASURED: **17.70 mm**
AVERAGE THICKNESS MEASURED: 17.73 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY							Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22			
1	18.80	18.60	18.20	No Access	17.70	17.70	17.70	0.0000	0.1598	100.00
2	18.70	18.60	18.20		17.80	17.80	17.80	0.0000	0.1307	100.00
3	18.80	18.60	18.20		17.80	17.80	17.80	0.0000	0.1452	100.00
4	19.00	18.60	18.20		17.60	17.60	17.70	0.0000	0.1888	100.00
5	18.90	18.60	18.10		17.70	17.70	17.70	0.0000	0.1743	100.00
6	18.80	18.60	18.20		17.80	17.80	17.70	0.0986	0.1598	100.00

COMMENTS:
2020/08 - PITTING/CORROSION NOTED.

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

Integrity Testing SERVICES INC.

Unit: W-001

CLIENT:	**Clean Harbors**	PROV. REG. #:	Not Stated
FACILITY:	Ryley Facility	SERIAL #:	Not Stated
UNIT/AREA:		EQUIP. NO.:	Not Stated
LSD:	04-09-050-17W4M		
DESCRIPTION:	East Sludge Pit		

Description: **EAST FLOOR E-W**

CML: 017-26

NOM. THICK.:	Not Stated	MATERIAL:	Not Stated
MILL. TOL.:	Not Stated	MINIMUM THICKNESS MEASURED:	**17.60 mm**
CA:	Not Stated	AVERAGE THICKNESS MEASURED:	17.68 mm
MIN. NOM.:	Not Stated	CALCULATED T-MIN:	Not Stated

Rdg.	B/L Thick. MM/DD/YY							Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	09/28/15	05/12/17	04/27/18	08/26/19	08/17/20	08/10/21	08/15/22			
1	18.60	18.70	18.30	No Access	17.70	17.70	17.70	0.0000	0.1307	100.00
2	18.60	18.80	18.20		17.80	17.70	17.70	0.0000	0.1307	100.00
3	18.70	18.70	18.30		17.60	17.60	17.70	0.0000	0.1452	100.00
4	18.90	18.60	18.20		17.70	17.60	17.70	0.0000	0.1743	100.00
5	18.80	18.20	18.30		17.70	17.70	17.70	0.0000	0.1598	100.00
6	18.70	18.50	18.30		17.50	17.50	17.60	0.0000	0.1598	100.00

COMMENTS:
2020/08 - PITTING/CORROSION NOTED.

Minimum Thickness is calculated.
Design Minimum Thickness = Nom Thick. - CA - Manufacturing Steel Tolerance.
Manufacturing Tolerance of pipe and forged fittings is + or - 12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).
BLUE (Caution TML Point) - if Half Life is less than 15 years.
RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.
CA - Corrosion Allowance, CR - Corrosion Rate (**Highlight and bolded if CR >= 0.250mm or 0.009in/yr.**).

APPENDIX J

Response Action Plans

Response Action Plans

No Response Action Plans were required to be submitted in 2022.

APPENDIX K

Annual Dugout and Water Well

Sampling Program Report

2022 Dugout Sampling Program
Clean Harbors Class 1 Waste Management Facility
Ryley, Alberta

PRESENTED TO

Clean Harbors Canada Inc.

JANUARY 30, 2023
ISSUED FOR USE
FILE: 704-SWM.SWOP04592-01

Tetra Tech Canada Inc.
14940 - 123 Avenue
Edmonton, AB T5V 1B4 CANADA
Tel 780.451.2121 Fax 780.454.5688

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EXECUTIVE SUMMARY

Foreword

Tetra Tech Canada Inc. (Tetra Tech) was retained by Clean Harbors Canada Inc. (Clean Harbors) to sample all in-use dugouts located within a 1.6 km radius of the Ryley Class I Hazardous Waste Facility in Ryley, Alberta.

This sampling program is required by Alberta's *Environmental Protection and Enhancement Act* (EPEA). The facility operates under Alberta Environment and Protected Areas (EPA), in accordance with EPEA Approval No. 10348-03-00 (Appendix A). The program includes the surface water testing of all in-use dugouts, as identified during the October 1996 baseline sampling program and subsequent annual events. The permit to operate defines "in-use" as stored water used for human consumption, cooking, washing, and gardening or livestock purposes. An additional four dugouts (2, 3, 4, and 19) are sampled that are slightly outside of the 1.6 km radius since they were close to the 1.6 km boundary, owned by landowners with dugouts within the 1.6 km radius and defined as "in-use."

Twenty (20) dugouts were inspected and sampled during the 2022 dugout sampling program, which is the 27th annual sampling event, including the baseline event in 1996. The baseline sampling program is detailed in the report titled *Water Sampling and Testing Program*. All annual dugout sampling has taken place in October.

Discussion and Recommendations

Analytical results of the dugout sampling program conducted in October 2022 indicate that the Ryley Class I Hazardous Waste Facility does not appear to be adversely impacting water quality in dugouts within the 1.6 km radius sampled.

Some parameters analyzed in 2022 exhibited an upward trend in concentrations in one or more dugouts relative to historical baseline values, but the majority of concentrations were within the historical ranges for those parameters.

Select parameters had historically high values or concentrations for specific parameters during the 2022 sampling and should continue to be monitored and evaluated in future sampling events.

A similar sampling program is recommended for October 2023, as part of the ongoing site permit compliance process.

Each landowner should be forwarded a copy of the water chemistry analysis report pertaining to the dugout(s) sampled on their property once the 2022 report is finalized.

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LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Clean Harbors Canada Inc. and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Clean Harbors Canada Inc. or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech Canada Inc.'s Services Agreement. Tetra Tech's Limitations on the Use of This Document are provided in Appendix B of this report.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by Clean Harbors Canada Inc. (Clean Harbors) to sample all in-use dugouts located within a 1.6 km radius of the Ryley Class I Hazardous Waste Facility in Ryley, Alberta.

The sampling program is required by Alberta's *Environmental Protection and Enhancement Act* (EPEA). The facility operates under Alberta Environment and Protected Areas (EPA), in accordance with EPEA Approval No.10348-03-00 (Appendix A). The program included the surface water testing of all in-use dugouts, as identified during the baseline sampling program completed during the fall of 1996 and any additions or subtractions from subsequent annual events. The permit to operate defines "in-use" as water used for human consumption, cooking, washing, and gardening or livestock purposes. An additional four dugouts (Dugouts 2, 3, 4, and 19) are sampled that are slightly outside of the 1.6 km radius since they are close to the limit, included within similar landowner holdings and defined as "in-use."

Twenty (20) dugouts were inspected and sampled during the 2022 dugout sampling program, which is the 27th annual sampling event, including the baseline event in 1996. The baseline sampling program is detailed in the report titled *Water Sampling and Testing Program*[1]. All annual dugout sampling has taken place in October since 1996.

This report presents the field observations and analytical water quality results of the 2022 sampling program with reference to recently collected data.

2.0 FIELD SAMPLING METHODS

2.1 Landowner Summary

The contact information for each landowner and their number of dugouts in the sampling program is presented in Table A. All landowners were contacted about a week prior to the sampling event, and each will be provided with a copy of the water chemistry of their dugout(s) once this report is finalized and sent to EPA. Landowners and contact information was updated as necessary in October 2022. The location of each sampled water source and residence, if found, is indicated on Figure 1.

Table A: Landowner Information

Landowner (October 2022)	Contact Name and (Number of Dugouts)	Mailing Address	Telephone Number
D. Booth	Doyle Booth (1)	Box 185, Ryley, Alberta T0B 4A0	780.999.4577
Ewert Farms Ltd.	Mark Ewert (4)	Box 355, Ryley, Alberta T0B 4A0	780.914.5766
B.L. Lyons	Brian Lyons (4)	Box 222, Ryley, Alberta T0B 4A0	780.984.5026
T. Magneson	Terry Magneson (6)	Box 374, Ryley, Alberta T0B 4A0	780.603.1537
County of Beaver	c/o Margaret Jones (1)	Box 140, Ryley, Alberta T0B 4A0	780.663.3730 (direct 825.385.0061)
W. Winsnes	William Winsnes (1)	Box 74, Ryley, Alberta T0B 4A0 SW8-50-17-W4M	780.699.4009
G. Balash	George and Rose Balash (3)	Box 291, St Paul, Alberta T0A 3AO gsbfarm@gmail.com	780.646.2001

[1]Tetra Tech. 1996. Water Sampling and Testing Program.

2.2 Sampling Procedure

The water samples were collected on October 18 and 19, 2022 by two Tetra Tech personnel. A Health and Safety Plan was completed and reviewed prior to initiating sampling. Twenty (20) dugouts were sampled at seven properties, and 22 samples were collected: one from each dugout, plus two duplicate samples. Subsamples were collected from the four corners of each respective dugout at 0.20 m to 0.30 m below surface and about 2 metres from the dugout edge and submitted as an equal-weighted composite sample. Care was taken not to disturb bank or bed sediments in the sampling area.

All samples were obtained using standard procedures that minimized potential for contamination during collection, handling, preservation, and transportation to ensure representative samples were collected and tested. Table B contains a summary of the information gathered during the sampling program, including sample name, legal land description and relative dugout location with locations on Figure 1. The lands containing Dugout 12 (Magneson D.3) have been purchased by Clean Harbors and will be noted as such in future monitoring reports. All dugouts were photographed with representative photos presented in Appendix E.

Table B: Sample Location Information

Sample	Sample Name	Legal Land Description (W4M)	Dugout Location
1	Booth D.1	NW ¼ 10-50-17	Dugout northwest of house
2	Ewert D.1	SW ¼ 15-50-17	Dugout south of center barn
3	Ewert D.2	SW ¼ 15-50-17	Extreme west dugout
4	Ewert D.3	SW ¼ 15-50-17	Extreme east dugout
5	Ewert D.4	SW ¼ 15-50-17	Southeast corner of southwest quarter of Section 15
6	Lyons D.1	SE ¼ 16-50-17	Northeast dugout on southeast quarter of Section 16
7	Lyons D.2	SE ¼ 16-50-17	Northwest dugout on southeast quarter of Section 16
8	Lyons D.3	SE ¼ 16-50-17	Southwest dugout on southeast quarter of Section 16
9	Lyons D.4	SW ¼ 16-50-17	Southwest dugout on southwest quarter of Section 16
10	Magneson D.1	SW ¼ 9-50-17	Dugout with windmill on northeast end of yard
11	Magneson D.2	SW ¼ 9-50-17	Southeast corner of northwest quarter of Section 9
12	Magneson D.3 (now on Clean Harbors owned property)	NE ¼ 9-50-17	Southwest corner of northeast quarter of Section 9, north of Clean Harbors
13	Magneson D.4	SW ¼ 9-50-17	South end of southwest quarter of Section 9, east of main house
14	Magneson D.5	SW ¼ 9-50-17	East end of southwest quarter of Section 9, west of Clean Harbors
15	Magneson D.6	SW ¼ 9-50-17	South end of southwest quarter of Section 9, north of main house
16	Beaver County D.1	NW ¼ 3-50-17	Dugout south of house, northwest quarter of Section 3
18	Beaver County D.2 (not sampled)	SW ¼ 3-50-17	Southwest quarter of Section 3, east of Highway 854
19	Winsnes D.1	SW ¼ 4-50-17	Dugout on southwest corner of southwest quarter of Section 4
20	Balash D.1	NE ¼ 5-50-17	Dugout south of west approach, northeast quarter of Section 5
21	Balash D.2	SE ¼ 8-50-17	Dugout on southeast quarter of Section 8
22	Balash D.3	SE ¼ 8-50-17	Dugout is immediately west of Balash D.2

ALS Laboratory Group (ALS) of Edmonton was the laboratory selected to perform the sample analysis and is certified by the Canadian Association of Laboratory Accreditation (CALA) for the parameters tested. ALS prepared sampling sets beforehand with bottles for each dugout to be tested. These sets included the individual sample bottles and preservatives needed to perform the analysis required by the Permit to Operate.

The following analytical parameters were tested for all dugouts and duplicate samples, as required by Approval No. 10348-03-00, Section 4.5:

- Major ions: calcium, magnesium, sodium, potassium, chloride, carbonate, bicarbonate, nitrate and sulphate
- Dissolved metals (Canadian Council of Ministers of the Environment): aluminum, arsenic, boron, barium, beryllium, cadmium, cobalt, chromium, copper, iron, lithium mercury, molybdenum, manganese, nickel, lead, antimony, tin, silver, strontium, titanium, thallium, uranium, vanadium and zinc
- pH (field and laboratory)
- Electrical conductivity (EC) (field and laboratory)
- Benzene, toluene, ethylbenzene, xylenes (BTEX)
- Petroleum hydrocarbon (PHC) fractions F1 and F2
- Total dissolved solids (TDS)
- Total suspended solids (TSS)
- Chemical oxygen demand (COD)
- Dissolved organic carbon (DOC)
- Nutrients; and
- Phenols

Analytical request forms, including chain-of-custody data, were completed by Tetra Tech when the samples were submitted to the laboratory for analysis.

In addition, field testing of the composite water sample was carried out at each dugout for the following:

- pH
- Electrical Conductivity (EC)
- Photo taken
- Visual inspection including notable sheen, colour, odour or other observations

The analytical reports for each sample collected were forwarded to Tetra Tech once the analysis was completed. The 2022 water quality analytical reports, as received from ALS, are presented in Appendix C. Table 1 summarizes the data collected in the last five years, including the 2022 sampling program for each dugout. Appendix D contains the historical dugout chemical analytical results from 1996 up to 2021 data.

2.3 Quality Control and Quality Assurance

To evaluate field sampling reproducibility, duplicate water samples were collected during the 2022 sampling event at an approximate rate of 10%. In October 2022, the duplicates were taken from Dugout 4 (Duplicate 1) and Dugout 21 (Duplicate 2) and submitted for laboratory analysis for the same suite of parameters as the original samples (Tables 2 and 3).

To analyze the field sampling and laboratory testing reproducibility, the sample-duplicate pair was evaluated using the relative percentage difference (RPD) method, involving calculation of RPD when both sample and duplicate concentrations were greater than, or equal to, five times the laboratory reporting detection limit (RDL), as shown in Equation 1 below.

Equation 1:

$$\%RPD = \left(\left| \text{sample} - \text{duplicate concentrations} \right| \text{ divided by } \overline{X} \right) \text{ multiplied by } 100$$

Where $\overline{X}$ is the average concentration of a sample and its duplicate.

Surface water quality parameters were considered as having passed the quality assurance (QA)/quality control (QC) reproducibility procedure if the RPD was less than or equal to 20%, indicating a close correlation between the sample-duplicate pair. RPD is usually used for objectively flagging data for further review, rather than for taking corrective action.

RPD values were not calculated if one or both of the sample-duplicate concentrations were less than five times the RDL. In these cases, water quality parameters were still considered as having passed the QA/QC reproducibility procedure if the other sample duplicate concentration difference was less than one RDL value.

The RPD calculations are summarized in Table 2 (Duplicate 1) and Table 3 (Duplicate 2). All but four RPD tests satisfied the requirements (all four failing tests were from Duplicate 2). The QA/QC reproducibility guidelines were not satisfied for the following parameters:

- Duplicate 2: Dissolved aluminum (36%), dissolved copper (25%), dissolved selenium (21%), and fluoride (66%)

Small variations due to variability in field sampling or laboratory analytical methods (i.e., residuals from previous analysis, etc.) can result in concentration differences that are two or three times greater than the concentration result, which results in higher RPDs which fail the requirements. However, the concentrations are similar in most cases and often have acceptable variability even though the RPD calculation may indicate otherwise. The Duplicate 2 RPD failures are limited in number (four out of 60 tests conducted), and two of the failures are marginal (RPD of 21% and 25%). Based on this fact, a limited number of failed results is within acceptable variability, and the duplicate analysis indicates the data are stable and considered reliable overall.

3.0 FINDINGS AND TREND ANALYSIS

The chemical analysis results from the dugout sampling program are reviewed for significant changes in parameters and compared to the range of results of previous sampling events, with particular focus on the past five years. The intent is not to compare results to provincial standards for acceptable water quality, but to pre-existing, baseline conditions in 1996 and identify trends, if any. High variability between years and between sites is possible and expected given only one sampling event per year and high variability in monthly and annual temperature and precipitation data. In addition, parameters at some locations have exceeded provincial water quality objectives since 1996 and are characteristic of natural conditions in the area or related to pre-existing and ongoing agricultural land

use. The objective of this work is to identify elevated levels and/or upward trends in parameters that might be sourced from the landfill through a groundwater, air or surface water pathway. Emphasis has been placed on reviewing sampling points down-gradient (generally east) of the landfill site, although the landfill site is near a local highpoint and groundwater and surface water flow may also be towards the north.

A summary of the 2022 data follows with data in Tables 1, 2 and 3. Mann-Kendall trends are summarized in Table C below and presented on Figure 2.

Environment Canada's and Alberta Agriculture and Forestry's monthly and annual precipitation data from the Elk Island National Park meteorological station were reviewed and are summarized in Table 4. The total annual precipitation in 2022 was 399.9 mm which was 57.8 mm lower than the mean annual precipitation (or 87% of average) in the region (several different stations as available) since 1996. The months of May, July and October 2022 were particularly low in 2022. The 2014, 2015, 2019, 2021, and 2022 annual precipitation data was from the Elk Island National Park meteorological station. Note that previous precipitation data (1996 to 2013) were obtained from the Tofield North Station when active. The Alberta Agriculture precipitation website[2] was updated to include more station data, so during 2016-2018, the Holden Alberta Government Drought Monitoring (AGDM) meteorological station data was utilized as it was closer to the subject site than others available. These shifts in the local reporting stations over the years are not expected to have a material impact on annual averages but may somewhat affect monthly precipitation data. Overall, there was generally lower than average precipitation in 2022 for a second consecutive year.

The two duplicate samples (Duplicate 1 from Dugout 4 and Duplicate 2 from Dugout 21) were tested for the same parameters as all other dugouts. All data is presented as follows:

A Mann-Kendall test was used as a statistical means of objectively investigating possible trends in water quality[3] for parameters analyzed for the past 3 to 26 years. The analysis indicates whether there is an upward or downward trend or, in the case where results are similar, no trend at all (normal scatter of data). The concentrations of most parameters were similar to historical concentrations or were on a downward trend. Parameters on an upward trend in specific dugouts are summarized in Table C.

Table C: Dugouts with Parameters in Upward Trends

Parameter	Dugouts with Upward Trends	Upward Trends Explanation
Alkalinity	1, 2, 3, 4, 8, 9, 10, 14, 15, and 16	All dugout concentrations are within the historical range except dugout 2 which had its highest alkalinity concentration in 2022 compared to historical values
Aluminum	1, 2, 3, 4, 6, 7, 19, 20, 21, and 22	All dugout concentrations are within the historical range
Ammonia (Ammonia as N)	1, 2, 3, 6, 7, 8, 9, 10, 19, and 20	All dugout concentrations are within the historical range except dugout 7 which had its highest ammonia concentration in 2022 compared to historical values
Antimony	2, 3, 4, 5, 6, 7, 8, 9, 13, 15, 16, 20, and 22	All dugout concentrations are within the historical range except dugout 2 which had its highest antimony concentration in 2022 compared to historical values
Arsenic	1, 2, 3, 4, 5, 10, 11, 14, 16, 20, and 22	The dugout concentrations are within the historical range except dugouts 2 and 14, which had their highest arsenic concentration in 2022 compared to historical values. Several dugouts continue to show relatively high arsenic concentrations in 2022

[2] http://www.agriculture.alberta.ca/acis/alberta-weather-data-viewer.jsp

[3] Harmancioglu, B. Nilgun, et al. 2010. Environmental Data Management. Water Science and Technology Library

Table C: Dugouts with Parameters in Upward Trends

Parameter	Dugouts with Upward Trends	Upward Trends Explanation
Barium	19 and 21	All dugout concentrations are within the historical range
Bicarbonate	1, 2, 3, 4, 5, 8, 9, 10, 14, 16, and 21	All dugout concentrations are within the historical range
Boron	1, 3, 4, 5, 7, 8, 9, 10, 12, 14, 16, and 20	All dugout concentrations are within the historical ranges except dugouts 10 and 12 which had their highest boron concentrations in 2022 compared to historical values
Cadmium	2, 7, 8, 9, 10, 12, 13, 14, 16, 19, and 22	The concentrations of most dugouts have been gradually increasing since 1996.
Calcium	2, 3, 4, 5, 8, 10, 12, 14, 16, 19, 20, 21, and 22	All dugout concentrations are within the historical ranges except dugouts 10 and 21 which had their highest calcium concentrations in 2022 compared to historical values
Carbonate	3, 10, 14, 15, and 16	All dugout concentrations are within the historical ranges
Chemical Oxygen Demand (COD)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 14, 15, 20, 21, and 22	All dugout concentrations are within the historical ranges expect dugouts 2, 4, and 20 which had their highest COD concentrations in 2022 compared to historical values
Chloride	2, 3, 4, 10, 12, 14, 19, 20, 21, and 22	The concentrations of dugouts 2, 3, 4, 10, 14, 19, 20, 21, and 22 have generally been gradually increasing since 1996. Dugout 10 had its highest chloride concentration in 2022 compared to historical values
Chromium	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 20, and 22	All chromium concentrations were below the laboratory RDL in 2022
Cobalt	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 16, 19, 20, 21, and 22	All dugout concentrations are generally within the historical ranges
Copper	1, 4, 16, 19, 20, 21, and 22	All dugout concentrations are generally within the historical ranges
DOC	1, 3, 4, 7, 8, 9, 10,14, 20, and 22	All dugout concentrations are within the historical ranges except dugouts 4 and 20 which had their highest DOC concentrations in 2022 compared to historical values
EC	2, 3, 4, 5, 8, 10, 14, 16, 20, 21, and 22	All dugout concentrations are within the historical ranges except dugout 10 which had its highest EC reading in 2022 compared to historical values
Fluoride	4, 10, and 16	Dugout 10 had its highest fluoride concentration in 2022 compared to historical values
Hardness as $CaCO_3$	2, 3, 4, 5, 8, 10, 12, 14, 15, 16, 19, 20, 21, and 22	All dugout concentrations are within the historical ranges except dugout 21 which had its highest hardness concentration in 2022 compared to historical values
Iron	1, 3, 4, 6, and 7	All dugout concentrations are within the historical ranges
Lead	1, 2, 3, 4, 5, 6, 7, 9, 11, 14, 19, 20, and 22	All dugout concentrations are within the historical ranges
Lithium	3, 4, 8, 10, 16, and 22	All dugout concentrations are within the historical ranges
Magnesium	2, 3, 4, 5, 8, 9, 10, 12, 14, 15, 16, 19, 20, 21 and 22	All dugout concentrations are within the historical ranges except dugout 22 which had its highest magnesium concentration in 2022 compared to historical values
Manganese	1, 2, 3, 4, 5, 6, 7, 10, 14, 16, 20, and 21	All concentrations are within the historical ranges except dugouts 7 and 22 which had their highest manganese concentrations in 2022 compared to historical values

Table C: Dugouts with Parameters in Upward Trends

Parameter	Dugouts with Upward Trends	Upward Trends Explanation
Mercury	8	All mercury concentrations were below the laboratory RDL in 2022
Molybdenum	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 16, 19, 20, 21, and 22	All dugout concentrations are within the historical ranges except dugouts 12 and 19 which had their highest molybdenum concentrations in 2022 compared to historical values
Nickel	4, 8, 10, 12, and 19	All dugout concentrations are within the historical ranges
Nitrate (as NO_3-N)	1, 2, 3, 7, 8, 9, 10, 16, 19, and 20	All dugout concentrations are within the historical ranges
Nitrate and Nitrate (as N)	2, 3, 7, 8, 9, 10, 16, 19, and 20	All dugout concentrations are within the historical ranges
Nitrite (as NO_2-N)	1, 3, 5, 7, 9, 16, and 19	All dugout concentrations are within the historical ranges
pH	10, 14, 15, and 16	All dugout concentrations are within the historical ranges except dugouts 14 and 15 which had their highest pH values in 2022 compared to historical values
Phosphorus	1, 3, 4, 5, 7, 16, and 21	All dugout concentrations are within the historical ranges except dugouts 3, 4, 7, and 16 which had their highest phosphorus concentrations in 2022 compared to historical values
Potassium	1, 2, 3, 4, 5, 8, 9, 10, 12, 14, 15, 16, 19, 21, and 22	All dugout concentrations are within the historical ranges except for dugout 12 which had its highest potassium concentration in 2022 compared to historical values
Selenium	1, 2, 3, 4, 6, 7, 8, 9, 10, 16, and 20	All dugout concentrations are within the historical ranges except dugout 4 which had its highest selenium concentration in 2022 compared to historical values
Silver	13	The dugout concentration is within the historical range
Sodium	2, 3, 4, 5, 8, 9, 10, 14, 16, 20, 21, and 22	All dugout concentrations are within the historical range
Sulfate	5, 8, 10, 13, 15, 20, 21, and 22	All dugout concentrations are within the historical ranges except dugouts 10 and 22 which had their highest sulfate concentrations in 2022 compared to historical values
Thallium	8	The dugout concentration is within the historical range
Tin	7	The dugout concentration is within the historical range
Titanium	1, 2, 3, 4, 6, 7, 16, 19, 20, and 22	All dugout concentrations are within the historical ranges
TDS	2, 3, 4, 5, 8, 10, 12, 14, 16, 20, 21, and 22	All dugout concentrations are within the historical ranges except dugouts 10, 20, and 22 which had their highest TDS concentrations in 2022 compared to historical values
Total Kjeldahl Nitrogen	1, 3, 4, 5, 7, 8, 10, 14, and 20	All dugout concentrations are within the historical ranges
Uranium	2, 8, and 21	All dugout concentrations are within the historical ranges
Vanadium	2, 3, 4, 5, 6, 9, 10, 14, and 20	All dugout concentrations are within the historical ranges except dugouts 2 and 9 which had their highest vanadium concentrations in 2022 compared to historical values

Results of the Mann Kendall trend analysis are presented on Figure 2 in the Figures Section of this report. Only data for up-trending parameters are shown.

4.0 DISCUSSION

The dugout water levels in 2022 had recovered somewhat relative to the observed low levels reported in 2021. Photos 1 and 2 show typical water levels at dugouts 12 and 21, respectively, and photographs of each dugout were taken at the time of sampling. Sufficient water was available for sampling at all dugouts in 2022.

In general, the concentrations of most parameters analyzed in 2022 were similar, had no trend or were on a downward trend compared to past years with the exceptions as described below and in Section 3.0. The following discussion focuses on parameters with upwards trends and with 2022 data that were greater than past results.

The higher upward trend concentrations of ammonia (dugout 7), and sulfate (dugouts 10 and 22) may be attributed to elevated levels of nutrients in the surface water draining into these dugouts. Dugout 7 is adjacent to an active farmstead and dugouts 10 and 22 are adjacent to active agricultural operations.

The up-trend in concentrations of calcium (dugouts 2, 3, 4, 5, 8, 10, 12, 14, 16, 19, 20, 21, and 22), chloride (dugouts 2, 3, 4, 10, 12, 14, 19, 20, 21, and 22), magnesium (dugouts 2, 3, 4, 5, 8, 9, 10, 12, 14, 15, 16, 19, 20, 21 and 22), potassium (1, 2, 3, 4, 5, 8, 9, 10, 12, 14, 15, 16, 19, 21, and 22) and TDS (dugouts 2, 3, 4, 5, 8, 10, 12, 14, 16, 20, 21, and 22) may be attributed to the naturally saline and sodic soils in the area (solonetzic soils).

Other up-trending parameters with concentrations or values greater than the historical values include alkalinity (dugout 2), antimony (dugout 2), arsenic (dugouts 2 and 14), boron (dugouts 10 and 12), COD (dugouts 2, 4, and 20), , DOC (dugouts 4 and 20), EC (dugout 10), fluoride (dugout 10), hardness (as $CaCO_3$) (dugout 21), manganese (dugouts 7 and 22), molybdenum (dugouts 12 and 19), pH (dugouts 14 and 15), phosphorus (dugouts 3, 4, 7, and 16), selenium (dugout 4), TSS (dugouts 4 and 16), and vanadium (dugouts 2 and 9). Of these, only DOC in dugout 20 has continued to increase in concentration greater than the historical value since 2021. Tetra Tech suggests that these up-trending parameters with historically high concentrations, particularly DOC in dugout 20, be monitored closely during future sampling events. Some concentration increases could be expected in 2022 given the lower than average annual regional precipitation for two consecutive years which may have resulted in lower water levels in the dugouts and therefore increased concentrations of some parameters.

The assessment of parameters analyzed does not indicate off-site impacts from the Ryley Class I landfill site to these dugouts through groundwater, surface water or air pathways within a 1.6 km radius study area which includes the 20 dugouts sampled in 2022.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Analytical results of the dugout sampling program conducted in October 2022 indicate that the Ryley Class I Hazardous Waste Facility does not appear to be adversely impacting water quality in dugouts within a 1.6 km radius.

Some parameters analyzed in 2022 exhibited an upward trend in concentrations in one or more dugouts relative to historical baseline values, but the majority of concentrations were within the historical ranges for those parameters.

Select parameters had historically high values or concentrations for specific parameters during the 2022 sampling and should continue to be monitored and evaluated in future sampling events.

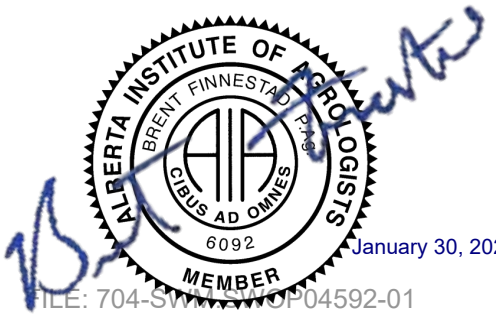
A similar sampling program is recommended for October 2023, as part of the ongoing site permit compliance process.

Each landowner should be forwarded a copy of the water chemistry analysis report pertaining to the dugout(s) sampled on their property once the 2022 report is finalized.

6.0 CLOSURE

We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Respectfully submitted,
Tetra Tech Canada Inc.



January 30, 2023

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Prepared by:
Brent Finnestad, P.Ag.
Project Manager
Environment & Water Practice
Direct Line: 780.718.9317
Brent.Finnestad@tetratech.com

FILE: 704-SWM.SWOP04592-01
FILE: 704-SWM.SWOP04592-01

Reviewed by:
Brian C. Adeney, P.Eng.
Principal Consultant
Environment & Water Practice
Direct Line: 587.460.3445
Brian.Adeney@tetratech.com

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TABLES

Table 1.1: Chemical Analytical Results

Sample ID:		**Booth D.1**				
Site Number:		**1**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**19-Oct-2022**
Chem. O_2 Demand	mg/L	98	84	82	95	96
Ammonia-N	mg/L	0.565	<0.050	<0.050	0.051	0.117
Total Kjeldahl Nitrogen	mg/L	4.70	2.51	2.75	3.45	3.52
Dissolved Organic Carbon	mg/L	29.9	22.9	19.9	28.9	23.5
Phenols	mg/L	0.0019	0.0075	0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	10.6	18.2	41.2
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0056	0.0021	0.0036	0.0049	0.0041
Antimony	mg/L	0.00029	0.00020	0.00016	0.00034	<0.00010
Arsenic	mg/L	0.00703	0.00484	0.00583	0.00809	0.00297
Barium	mg/L	0.0714	0.0614	0.0612	0.0471	0.0992
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L	0.049	0.047	0.025	0.037	0.023
Cadmium	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00050
Cobalt	mg/L	0.00045	0.00035	0.00030	0.00051	0.00029
Copper	mg/L	0.00049	0.00053	0.00040	0.00147	0.0002
Iron	mg/L	0.028	0.121	0.179	0.041	<0.030
Lead	mg/L	<0.000050	0.000072	0.000055	0.000071	<0.000050
Lithium	mg/L	0.0446	0.0327	0.0335	0.0456	0.0192
Manganese	mg/L	0.00864	0.00250	0.00783	0.00753	0.08
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000113
Molybdenum	mg/L	0.000989	0.000853	0.000611	0.00117	0.000419
Nickel	mg/L	0.00279	0.00353	0.00304	0.00382	0.00277
Selenium	mg/L	0.000143	0.000115	0.000156	0.000096	0.00017
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L	0.000016	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.00049	0.00059	0.00089	0.00077	<0.00030
Uranium	mg/L	0.000784	0.000578	0.000578	0.000824	0.000245
Vanadium	mg/L	0.00135	0.00076	0.00072	0.00221	0.00092
Zinc	mg/L	<0.0010	<0.0010	<0.0010	0.0018	<0.0010
Routine Water						
Ion Balance	%	107	103	94.7	106	102
Bicarbonate	mg/L	345	328	358	424	291
Chloride	mg/L	54.6	46.3	40.2	55.0	49.2
Carbonate	mg/L	7.6	<5.0	6.4	7.2	<1.0
Conductivity (EC)	uS/cm	845	714	712	808	651
Calcium	mg/L	14.7	21.5	20.4	13.9	45.5
Potassium	mg/L	15.1	12.5	13.2	16.4	14.2
Magnesium	mg/L	11.7	10.8	9.69	11.5	16.2
Sodium	mg/L	156	128	120	181	74.6
Sulfate	mg/L	43.0	43.4	26.6	28.0	42.4
Phosphorus	mg/L	0.276	0.211	0.466	0.148	0.525
pH in H_20	pH	8.49	8.36	8.42	8.48	8.24
TDS (Calculated)	mg/L	472	428	413	522	423
Nitrate	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Nitrite	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L	<0.022	<0.022	<0.022	<0.022	<0.050
Hardness as $CaCO_3$	mg/L	84.9	98.2	90.8	82.1	180
Alkalinity (total as $CaCO_3$)	mg/L	295	276	304	360	238
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.146	0.284	0.270	0.406	0.162
Field Data						
pH in H_20	pH	11.1	8.4	8.27	9.57	8.23
Conductivity (EC)	uS/cm	858	80	758	507	803

Notes:
"-" Not required under previous permit

Table 1.2: Chemical Analytical Results

Sample ID:		**Ewert D.1**				
Site Number:		**2**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**19-Oct-2022**
Chem. O_2 Demand	mg/L	53	79	78	99	153
Ammonia-N	mg/L	3.79	<0.050	<0.050	0.122	0.0625
Total Kjeldahl Nitrogen	mg/L	5.64	2.70	3.08	2.26	3.8
Dissolved Organic Carbon	mg/L	21.6	22.2	21.1	33.7	45.3
Phenols	mg/L	0.0018	0.0101	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	10.6	8.0	35.8
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0303	0.0349	0.0059	0.109	0.0179
Antimony	mg/L	<0.00010	0.00025	0.00021	0.00052	0.00051
Arsenic	mg/L	0.00165	0.0137	0.00823	0.0103	0.0164
Barium	mg/L	0.118	0.0449	0.0508	0.0812	0.0401
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L	0.046	0.040	0.028	0.035	0.041
Cadmium	mg/L	<0.0000050	0.0000070	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	0.00011	<0.00010	<0.00010	0.00018	<0.00050
Cobalt	mg/L	0.00065	0.00062	0.00046	0.00117	0.00067
Copper	mg/L	0.00081	0.00271	0.00065	0.00389	0.00143
Iron	mg/L	0.166	0.077	0.032	0.086	0.063
Lead	mg/L	0.000113	0.000076	<0.000050	0.000082	0.000097
Lithium	mg/L	0.0263	0.0222	0.0236	0.0399	0.0366
Manganese	mg/L	0.192	0.0138	0.00492	0.00745	0.0287
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.00136	0.00198	0.000868	0.00316	0.00196
Nickel	mg/L	0.00389	0.00321	0.00290	0.00698	0.00434
Selenium	mg/L	0.000169	0.000258	0.000172	0.000373	0.000435
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L	0.000017	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.0029	0.00517	0.00055	0.00368	0.00229
Uranium	mg/L	0.00123	0.00138	0.00101	0.00290	0.00253
Vanadium	mg/L	0.00067	0.00299	0.00158	0.00442	0.00499
Zinc	mg/L	<0.0010	0.0011	<0.0010	0.0042	<0.0010
Routine Water						
Ion Balance	%	102	100	96.9	106	106
Bicarbonate	mg/L	319	304	367	551	375
Chloride	mg/L	30.8	32.9	34.5	56.7	60.1
Carbonate	mg/L	8.2	38.3	16.4	14.3	135
Conductivity (EC)	uS/cm	758	675	732	1110	1340
Calcium	mg/L	26.0	21.5	22.6	22.4	19
Potassium	mg/L	19.9	16.0	20.3	26.7	23.5
Magnesium	mg/L	12.8	10.2	12.0	14.9	16.1
Sodium	mg/L	109	124	121	255	295
Sulfate	mg/L	65.3	24.3	28.9	103	118
Phosphorus	mg/L	0.065	0.628	0.745	0.408	0.578
pH in H20	pH	8.49	9.16	8.69	8.59	9.75
TDS (Calculated)	mg/L	429	417	436	764	897
Nitrate	mg/L	0.072	0.047	<0.020	0.021	<0.020
Nitrite	mg/L	<0.010	0.013	<0.010	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L	0.072	0.06	<0.022	<0.022	<0.050
Hardness as $CaCO_3$	mg/L	118	95.7	106	117	114
Alkalinity (total as $CaCO_3$)	mg/L	275	313	328	475	532
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.154	0.372	0.276	0.523	0.435
Field Data						
pH in H_20	pH	8.7	EF	8.94	9.35	10.06
Conductivity (EC)	uS/cm	776	829	777	344.6	1388

Notes:

"-" Not required under previous permit

"EF" Equipment malfunction

Table 1.3: Chemical Analytical Results

Sample ID:		**Ewert D.2**				
Site Number:		**3**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**19-Oct-2022**
Chem. O_2 Demand	mg/L	127	92	119	133	124
Ammonia-N	mg/L	0.113	0.254	1.13	0.67	0.0393
Total Kjeldahl Nitrogen	mg/L	5.07	3.01	4.86	4.98	4.24
Dissolved Organic Carbon	mg/L	44.0	28.2	31.3	42.5	37.8
Phenols	mg/L	0.0018	0.0068	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	13.6	93	53.8
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0317	0.0334	0.0316	0.032	0.009
Antimony	mg/L	0.00038	0.00020	0.00025	0.00064	0.00022
Arsenic	mg/L	0.00803	0.00619	0.00841	0.0153	0.0113
Barium	mg/L	0.0439	0.0364	0.0509	0.0929	0.0252
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L	0.039	0.034	0.011	0.024	0.03
Cadmium	mg/L	0.0000154	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	0.00011	0.00013	0.00019	0.00013	<0.00050
Cobalt	mg/L	0.00063	0.00061	0.00125	0.00153	0.00088
Copper	mg/L	0.00234	0.00127	0.00082	0.00197	0.00088
Iron	mg/L	0.054	0.256	0.545	0.079	0.112
Lead	mg/L	0.00010	0.000164	0.000215	0.000102	0.000089
Lithium	mg/L	0.0323	0.0261	0.0291	0.0399	0.0232
Manganese	mg/L	0.0131	0.00377	0.264	0.0538	0.0343
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.0010	0.000761	0.000587	0.00204	0.000878
Nickel	mg/L	0.00423	0.00630	0.00565	0.0086	0.00503
Selenium	mg/L	0.000319	0.000366	0.000326	0.000582	0.00038
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L	0.000016	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.00375	0.00694	0.00693	0.00346	0.00114
Uranium	mg/L	0.00159	0.000775	0.000892	0.00274	0.000777
Vanadium	mg/L	0.00513	0.00218	0.00226	0.0084	0.00363
Zinc	mg/L	<0.0010	<0.0010	<0.0010	0.0027	<0.0010
Routine Water						
Ion Balance	%	107	105	94.9	97.5	109
Bicarbonate	mg/L	433	407	498	662	393
Chloride	mg/L	35.7	33.3	45.9	62.2	40.2
Carbonate	mg/L	11.9	<5.0	12.6	19.9	23.8
Conductivity (EC)	uS/cm	885	844	1220	1590	922
Calcium	mg/L	17.1	25.8	30.1	44.0	28.3
Potassium	mg/L	20.5	19.0	23.5	28.9	19.3
Magnesium	mg/L	11.2	13.4	16.6	23.8	13.6
Sodium	mg/L	179	157	222	317	180
Sulfate	mg/L	46.2	77.3	193	284	80.2
Phosphorus	mg/L	0.542	0.576	1.19	1.14	1.43
pH in H20	pH	8.57	8.29	8.49	8.61	8.92
TDS (Calculated)	mg/L	535	531	789	1110	617
Nitrate	mg/L	<0.020	0.388	0.099	0.034	<0.020
Nitrite	mg/L	<0.010	0.029	0.057	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L	<0.022	0.416	0.156	0.034	<0.050
Hardness as $CaCO_3$	mg/L	88.8	120	144	208	127
Alkalinity (total as $CaCO_3$)	mg/L	375	339	429	576	362
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.194	0.292	0.274	0.466	0.305
Field Data						
pH in H_20	pH	11.3	6.49	8.17	8.94	9.19
Conductivity (EC)	uS/cm	950	104.3	1322	986	943

Notes:

"-" Not required under previous permit

Table 1.4: Chemical Analytical Results

Sample ID:		**Ewert D.3**				
Site Number:		**4**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**19-Oct-2022**
Chem. O_2 Demand	mg/L	78	106	116	115	164
Ammonia-N	mg/L	0.655	<0.050	<0.050	0.60	0.07
Total Kjeldahl Nitrogen	mg/L	3.31	3.22	3.45	4.27	4.87
Dissolved Organic Carbon	mg/L	38.0	28.3	29.0	38.2	45.9
Phenols	mg/L	0.0018	0.0058	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	7.6	8.0	37.8
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0673	0.0107	0.0155	0.0129	0.0111
Antimony	mg/L	0.00016	0.00016	0.00018	0.00025	0.00016
Arsenic	mg/L	0.0032	0.0031	0.00513	0.0077	0.00691
Barium	mg/L	0.0656	0.0418	0.0342	0.0468	0.0208
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L	0.035	0.039	0.025	0.032	0.039
Cadmium	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	0.00018	0.00017	0.00023	0.00011	<0.00050
Cobalt	mg/L	0.00095	0.00036	0.00075	0.00080	0.00106
Copper	mg/L	0.00163	0.00163	0.0010	0.00255	0.00091
Iron	mg/L	0.848	1.01	1.66	0.269	0.586
Lead	mg/L	0.000389	0.000211	0.000278	0.000189	0.000136
Lithium	mg/L	0.0153	0.0125	0.0142	0.0173	0.0116
Manganese	mg/L	0.194	0.00879	0.0441	0.114	0.146
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.000956	0.000489	0.000407	0.00143	0.000938
Nickel	mg/L	0.00396	0.00281	0.00314	0.00375	0.00468
Selenium	mg/L	0.000192	0.000188	0.000206	0.000252	0.000277
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L	0.000032	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.00499	0.00168	0.00266	0.00249	0.00124
Uranium	mg/L	0.000531	0.000262	0.000262	0.000768	0.000332
Vanadium	mg/L	0.00193	0.00144	0.00194	0.00358	0.0029
Zinc	mg/L	<0.0010	<0.0010	<0.0010	0.0017	0.0012
Routine Water						
Ion Balance	%	105	103	94.7	102	110
Bicarbonate	mg/L	308	290	338	426	291
Chloride	mg/L	64.6	56.2	73.5	99.8	68
Carbonate	mg/L	<5.0	<5.0	5.3	<5.0	2.5
Conductivity (EC)	uS/cm	708	622	750	894	696
Calcium	mg/L	23.4	22.5	19.5	25.5	20.7
Potassium	mg/L	22.0	14.2	15.7	21.0	18.9
Magnesium	mg/L	10.9	10.7	10.2	11.5	10.9
Sodium	mg/L	114	103	126	173	124
Sulfate	mg/L	19.1	14.3	15.8	13.4	17.2
Phosphorus	mg/L	0.523	0.605	1.08	0.701	1.46
pH in H_20	pH	8.05	7.98	8.39	8.40	8.38
TDS (Calculated)	mg/L	406	364	432	560	457
Nitrate	mg/L	0.198	0.027	<0.020	0.103	<0.020
Nitrite	mg/L	<0.010	0.010	<0.010	0.016	<0.010
Nitrate and Nitrite (as N)	mg/L	0.198	0.037	<0.022	0.119	<0.050
Hardness as $CaCO_3$	mg/L	103	100	90.7	111	96.6
Alkalinity (total as $CaCO_3$)	mg/L	252	238	286	358	243
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.102	0.169	0.178	0.322	0.249
Field Data						
pH in H_20	pH	9.9	EF	8.34	8.60	8.53
Conductivity (EC)	uS/cm	971	803	793	275.9	716

Notes:

"-" Not required under previous permit

"EF" Equipment malfunction

Table 1.5: Chemical Analytical Results

Sample ID:		**Ewert D.4**				
Site Number:		**5**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**19-Oct-2022**
Chem. O_2 Demand	mg/L	86	92	75	124	114
Ammonia-N	mg/L	0.120	<0.050	0.235	0.51	0.0678
Total Kjeldahl Nitrogen	mg/L	2.91	3.61	3.64	5.41	4.27
Dissolved Organic Carbon	mg/L	38.0	22.7	23.0	35.9	28.3
Phenols	mg/L	0.0015	0.0076	0.0012	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	33.8	69	40.2
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	0.77	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0194	0.0015	0.0425	0.0782	0.0645
Antimony	mg/L	0.00025	0.00015	0.00035	0.00057	0.00031
Arsenic	mg/L	0.0114	0.00313	0.00692	0.00694	0.00625
Barium	mg/L	0.0588	0.0528	0.0823	0.102	0.0589
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L	0.050	0.042	0.018	0.034	0.042
Cadmium	mg/L	0.0000196	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	<0.00010	<0.00010	0.00013	0.00012	<0.00050
Cobalt	mg/L	0.00094	0.00043	0.00113	0.00146	0.00093
Copper	mg/L	0.00102	0.00054	0.00123	0.00282	0.00078
Iron	mg/L	0.087	0.026	0.353	0.059	0.113
Lead	mg/L	0.00010	<0.000050	0.000273	0.000078	0.000093
Lithium	mg/L	0.0247	0.016	0.0128	0.0207	0.0162
Manganese	mg/L	0.00626	0.00080	0.0246	0.00707	0.0131
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.0019	0.00118	0.00177	0.00312	0.00205
Nickel	mg/L	0.00569	0.00406	0.00732	0.00852	0.00442
Selenium	mg/L	0.000299	0.000217	0.00037	0.000469	0.000305
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L	0.000015	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.00219	<0.00030	0.00991	0.00321	0.00314
Uranium	mg/L	0.001	0.000602	0.00121	0.00245	0.0013
Vanadium	mg/L	0.00251	<0.00050	0.0018	0.00225	0.00153
Zinc	mg/L	<0.0010	<0.0010	<0.0010	0.0039	<0.0010
Routine Water						
Ion Balance	%	115	102	96.8	100	112
Bicarbonate	mg/L	398	356	312	494	364
Chloride	mg/L	21.7	18	12.9	20.5	15.2
Carbonate	mg/L	<5.0	6.6	<5.0	9.8	14.9
Conductivity (EC)	uS/cm	713	624	796	878	718
Calcium	mg/L	19.1	23.9	28.5	29.5	22.2
Potassium	mg/L	14.8	14.5	15.3	19.6	16.7
Magnesium	mg/L	13.3	13.3	13.4	17.1	15.2
Sodium	mg/L	141	103	118	168	136
Sulfate	mg/L	15.1	20.2	136	80.9	42.3
Phosphorus	mg/L	0.493	0.225	0.591	0.105	0.301
pH in H_20	pH	8.32	8.44	8.37	8.50	8.75
TDS (Calculated)	mg/L	424	375	482	583	472
Nitrate	mg/L	<0.020	<0.020	<0.020	<0.020	0.032
Nitrite	mg/L	<0.010	<0.010	0.011	<0.010	0.013
Nitrate and Nitrite (as N)	mg/L	<0.022	<0.022	<0.022	<0.022	<0.050
Hardness as $CaCO_3$	mg/L	102	114	126	144	118
Alkalinity (total as $CaCO_3$)	mg/L	331	303	263	422	324
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.396	0.499	0.379	0.736	0.481
Field Data						
pH in H_20	pH	10.4	EF	8.10	9.00	9.23
Conductivity (EC)	uS/cm	780	788	829	551	739

Notes:

"-" Not required under previous permit

"EF" Equipment malfunction

Table 1.6: Chemical Analytical Results

Sample ID:		**Lyons D.1**				
Site Number:		**6**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**18-Oct-2022**
Chem. O_2 Demand	mg/L	78	89	98	93	95
Ammonia-N	mg/L	0.063	0.575	0.191	0.054	0.021
Total Kjeldahl Nitrogen	mg/L	2.89	3.01	3.13	3.19	2.44
Dissolved Organic Carbon	mg/L	28.0	24.7	25.0	29.7	27.1
Phenols	mg/L	0.0013	0.0087	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	5.2	23.6	16.6
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.015	0.0306	0.0366	0.0034	0.0023
Antimony	mg/L	0.00022	0.00017	0.00017	0.00024	0.00015
Arsenic	mg/L	0.00522	0.00531	0.00537	0.00773	0.00591
Barium	mg/L	0.0495	0.0421	0.0372	0.0330	0.0286
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L	0.050	0.029	<0.010	0.023	0.056
Cadmium	mg/L	0.0000172	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	0.00011	0.0002	0.00028	<0.00010	<0.00050
Cobalt	mg/L	0.00063	0.00038	0.00065	0.00078	0.00057
Copper	mg/L	0.00071	0.00063	0.00060	0.00119	0.00044
Iron	mg/L	0.136	0.958	0.677	0.016	0.042
Lead	mg/L	0.000112	0.000229	0.000149	<0.000050	<0.000050
Lithium	mg/L	0.0136	0.0074	0.0076	0.0128	0.0103
Manganese	mg/L	0.0135	0.00866	0.223	0.00485	0.0169
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.00112	0.00076	0.000751	0.00132	0.000992
Nickel	mg/L	0.00414	0.00361	0.00335	0.00336	0.00338
Selenium	mg/L	0.000273	0.000212	0.000251	0.000271	0.000256
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L	0.000017	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.00113	0.00329	0.00355	0.00031	<0.00030
Uranium	mg/L	0.000909	0.000234	0.00025	0.000932	0.000393
Vanadium	mg/L	0.00256	0.00205	0.00227	0.00399	0.00245
Zinc	mg/L	<0.0010	0.0016	<0.0010	0.0022	0.0014
Routine Water						
Ion Balance	%	110	101	95.7	95.0	106.0
Bicarbonate	mg/L	270	217	210	325	228
Chloride	mg/L	20.6	12.9	13.1	18.3	24.2
Carbonate	mg/L	<5.0	<5.0	<5.0	<5.0	9.7
Conductivity (EC)	uS/cm	519	405	439	586	535
Calcium	mg/L	22.3	18.6	16.9	29.8	23.6
Potassium	mg/L	21.7	17.1	13.6	18.1	17.4
Magnesium	mg/L	8.55	8.46	7.41	10.8	9.12
Sodium	mg/L	84.3	51	59.0	84.7	76.7
Sulfate	mg/L	22.3	15	36.4	48.8	30.4
Phosphorus	mg/L	0.520	1.38	1.23	0.589	1.15
pH in H_20	pH	8.17	7.91	8.06	8.30	8.72
TDS (Calculated)	mg/L	313	232	250	368	331
Nitrate	mg/L	<0.020	0.429	<0.020	<0.020	<0.020
Nitrite	mg/L	<0.010	0.045	<0.010	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L	<0.022	0.474	<0.022	<0.022	<0.050
Hardness as $CaCO_3$	mg/L	90.9	81.3	72.7	119	96.5
Alkalinity (total as $CaCO_3$)	mg/L	222	178	172	268	203
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.104	0.155	0.140	0.256	0.201
Field Data						
pH in H_20	pH	10.4	EF	7.69	9.13	8.62
Conductivity (EC)	uS/cm	566	496	953	355.1	535

Notes:
"-" Not required under previous permit
"EF" Equipment malfunction

Table 1.7: Chemical Analytical Results

Sample ID:		**Lyons D.2**				
Site Number:				**7**		
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**18-Oct-2022**
Chem. O_2 Demand	mg/L	70	83	76	182	87
Ammonia-N	mg/L	1.17	0.414	0.236	0.090	1.330
Total Kjeldahl Nitrogen	mg/L	4.37	2.58	2.67	9.30	3.66
Dissolved Organic Carbon	mg/L	25.0	23.4	20.8	46.8	33.5
Phenols	mg/L	0.0018	0.0075	0.0017	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	3.4	43.5	8.6
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0643	0.0613	0.0189	0.0176	0.0049
Antimony	mg/L	0.00021	0.00012	0.00014	0.00025	0.00014
Arsenic	mg/L	0.00407	0.00497	0.00461	0.00725	0.00513
Barium	mg/L	0.0655	0.0649	0.0240	0.0357	0.034
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L	0.044	0.022	<0.010	0.032	0.05
Cadmium	mg/L	<0.0000050	<0.0000050	<0.0000050	0.0000065	<0.0000050
Chromium	mg/L	0.00028	0.00018	0.00016	0.00011	<0.00050
Cobalt	mg/L	0.00079	0.00049	0.00025	0.00081	0.00069
Copper	mg/L	0.00116	0.00083	0.00095	0.00233	0.00046
Iron	mg/L	0.275	1.51	0.472	0.046	0.145
Lead	mg/L	0.000218	0.000281	0.000087	0.000056	<0.000050
Lithium	mg/L	0.0137	0.0071	0.0070	0.0113	0.0101
Manganese	mg/L	0.122	0.0361	0.0155	0.0101	0.162
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.00102	0.00063	0.000745	0.00176	0.000826
Nickel	mg/L	0.00453	0.00341	0.00326	0.00415	0.00279
Selenium	mg/L	0.00023	0.000212	0.000249	0.000257	0.000192
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L	0.000018	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	0.00012	<0.00010
Titanium	mg/L	0.00545	0.00488	0.00214	0.00090	0.00062
Uranium	mg/L	0.000787	0.000266	0.000275	0.00114	0.000342
Vanadium	mg/L	0.0023	0.00206	0.00214	0.00444	0.0021
Zinc	mg/L	<0.0010	0.0018	<0.0010	0.0046	<0.0010
Routine Water						
Ion Balance	%	109	97.4	98.6	105	103
Bicarbonate	mg/L	278	232	202	289	270
Chloride	mg/L	21.4	15.6	13.0	17.9	21.6
Carbonate	mg/L	<5.0	<5.0	<5.0	<5.0	<1.0
Conductivity (EC)	uS/cm	536	435	409	515	549
Calcium	mg/L	24.9	17.4	16.9	26.2	22.5
Potassium	mg/L	21.8	18.5	15.5	21.3	19.7
Magnesium	mg/L	8.34	7.74	6.42	9.62	8.64
Sodium	mg/L	79.7	56.5	54.3	82.2	74.4
Sulfate	mg/L	15.7	14.5	24.9	32.8	22.6
Phosphorus	mg/L	0.580	1.13	1.09	0.865	1.20
pH in H_20	pH	8.24	8.11	8.12	8.25	8.06
TDS (Calculated)	mg/L	310	246	230	333	346
Nitrate	mg/L	0.316	0.396	<0.020	0.047	0.045
Nitrite	mg/L	<0.010	0.042	0.013	<0.010	0.02
Nitrate and Nitrite (as N)	mg/L	0.316	0.437	<0.022	0.047	0.065
Hardness as $CaCO_3$	mg/L	96.5	75.3	68.6	105	91.8
Alkalinity (total as $CaCO_3$)	mg/L	228	190	165	237	222
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.118	0.176	0.139	0.236	0.233
Field Data						
pH in H_20	pH	9.3	10.73	7.81	9.07	7.93
Conductivity (EC)	uS/cm	589	529	923	173	541

Notes:

"-" Not required under previous permit

Table 1.8: Chemical Analytical Results

Sample ID:		**Lyons D.3**				
Site Number:		**8**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**18-Oct-2022**
Chem. O_2 Demand	mg/L	171	105	116	378	125
Ammonia-N	mg/L	0.186	<0.050	0.286	2.13	0.0994
Total Kjeldahl Nitrogen	mg/L	8.83	3.66	4.93	18.0	4.0
Dissolved Organic Carbon	mg/L	41.4	30.9	30.8	108	45.7
Phenols	mg/L	0.0021	0.0137	<0.0010	<0.003	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	52.8	1040	56.2
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0563	0.0192	0.0175	1.28	0.0064
Antimony	mg/L	0.00096	0.0003	0.00046	0.00131	0.00052
Arsenic	mg/L	0.00277	0.00261	0.00407	0.00556	0.00575
Barium	mg/L	0.108	0.0461	0.0697	0.185	0.0423
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	0.00011	<0.000020
Boron	mg/L	0.035	0.027	0.014	0.060	0.033
Cadmium	mg/L	0.000031	0.0000068	<0.0000050	0.0000423	0.0000081
Chromium	mg/L	0.00058	0.00010	0.00011	0.00163	<0.00050
Cobalt	mg/L	0.00183	0.00161	0.00247	0.00303	0.00136
Copper	mg/L	0.00582	0.00484	0.00425	0.00613	0.0028
Iron	mg/L	0.046	0.064	0.050	3.00	<0.030
Lead	mg/L	0.000076	0.000051	<0.000050	0.00289	<0.000050
Lithium	mg/L	0.028	0.0166	0.015	0.0234	0.0213
Manganese	mg/L	0.00185	0.00279	0.0179	0.166	0.00573
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	0.0000088	<0.0000050
Molybdenum	mg/L	0.0144	0.00452	0.00583	0.0316	0.0103
Nickel	mg/L	0.0151	0.0112	0.0125	0.0195	0.0136
Selenium	mg/L	0.00113	0.000684	0.000967	0.00153	0.001
Silver	mg/L	<0.000010	<0.000010	<0.000010	0.000018	<0.000010
Thallium	mg/L	0.000021	<0.000010	<0.000010	0.000016	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.0040	0.00244	0.00282	0.0326	0.00081
Uranium	mg/L	0.01	0.00318	0.00422	0.0213	0.00628
Vanadium	mg/L	0.00126	0.00110	0.00171	0.00605	0.00182
Zinc	mg/L	<0.0010	0.0017	<0.0010	0.0108	<0.0010
Routine Water						
Ion Balance	%	113	103	97.1	86.0	102.0
Bicarbonate	mg/L	409	413	426	557	481
Chloride	mg/L	48.4	22.3	17.5	66.3	26.5
Carbonate	mg/L	12.7	14.5	15.7	<5.0	15.6
Conductivity (EC)	uS/cm	1420	978	816	1470	1240
Calcium	mg/L	37.6	41.3	31.8	31.8	34.4
Potassium	mg/L	29.2	22.2	20.9	26.6	24.4
Magnesium	mg/L	23.1	24.6	17.1	14.5	23.4
Sodium	mg/L	270	149	126	262	216
Sulfate	mg/L	280	138	60.5	306	200
Phosphorus	mg/L	0.737	0.290	0.447	0.228	0.251
pH in H_20	pH	8.57	8.60	8.60	8.31	8.61
TDS (Calculated)	mg/L	906	615	500	985	824
Nitrate	mg/L	0.689	<0.020	0.079	0.096	<0.020
Nitrite	mg/L	<0.010	<0.010	0.020	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L	0.689	<0.022	0.099	0.096	<0.050
Hardness as $CaCO_3$	mg/L	189	204	150	139	182
Alkalinity (total as $CaCO_3$)	mg/L	357	362	376	460	420
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.478	0.472	0.616	1.62	0.876
Field Data						
pH in H_20	pH	10.1	7.24	8.54	8.58	8.53
Conductivity (EC)	uS/cm	1488	1198	861	845	1238

Notes:

"-" Not required under previous permit

Table 1.9: Chemical Analytical Results

Sample ID:		**Lyons D.4**				
Site Number:		**9**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**18-Oct-2022**
Chem. O_2 Demand	mg/L	221	137	137	258	236
Ammonia-N	mg/L	1.82	0.397	0.888	0.43	0.134
Total Kjeldahl Nitrogen	mg/L	10.3	4.26	4.02	9.10	6.67
Dissolved Organic Carbon	mg/L	74.0	42.9	43.2	85.3	79.1
Phenols	mg/L	0.0019	0.0088	0.0013	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	61.0	96	40.4
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0911	0.0764	0.125	0.221	0.0145
Antimony	mg/L	0.00058	0.00024	0.00024	0.00117	0.00052
Arsenic	mg/L	0.00685	0.00314	0.00702	0.00526	0.0122
Barium	mg/L	0.0935	0.0406	0.0370	0.153	0.052
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L	0.040	0.024	0.011	0.053	0.045
Cadmium	mg/L	0.0000297	0.0000099	<0.0000050	0.0000115	0.0000157
Chromium	mg/L	0.00033	0.00031	0.00035	0.00048	<0.00050
Cobalt	mg/L	0.0022	0.00060	0.00092	0.00232	0.00161
Copper	mg/L	0.00383	0.00123	0.00083	0.00522	0.00299
Iron	mg/L	0.168	0.922	1.32	0.068	0.121
Lead	mg/L	0.000125	0.000283	0.000366	0.000096	0.000076
Lithium	mg/L	0.0339	0.016	0.0156	0.0362	0.0266
Manganese	mg/L	0.0927	0.00266	0.0884	0.0828	<0.0050
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.00662	0.00164	0.000964	0.0136	0.00296
Nickel	mg/L	0.0132	0.00455	0.00468	0.0139	0.0105
Selenium	mg/L	0.000795	0.000262	0.000408	0.000441	0.000688
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L	0.000019	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.0104	0.00661	0.0117	0.00754	0.002
Uranium	mg/L	0.00446	0.000924	0.000664	0.0113	0.00227
Vanadium	mg/L	0.00393	0.00222	0.00294	0.00398	0.00652
Zinc	mg/L	<0.0010	0.0024	<0.0010	0.0022	<0.0010
Routine Water						
Ion Balance	%	112	101	102	98.8	108
Bicarbonate	mg/L	564	442	375	734	633
Chloride	mg/L	48.6	22.9	21.0	77.8	20.2
Carbonate	mg/L	<5.0	<5.0	<5.0	20.2	17.2
Conductivity (EC)	uS/cm	1050	734	639	1430	1040
Calcium	mg/L	28.6	22.2	23.5	36.5	37.8
Potassium	mg/L	43.5	26.8	28.1	61.4	32.4
Magnesium	mg/L	16.5	12.7	11.6	21.0	19.4
Sodium	mg/L	197	121	94.5	264	188
Sulfate	mg/L	28.9	5.32	3.99	81.2	3.8
Phosphorus	mg/L	1.89	0.614	2.71	0.315	0.885
pH in H_20	pH	8.29	8.23	8.39	8.59	8.58
TDS (Calculated)	mg/L	644	431	373	936	715
Nitrate	mg/L	0.157	0.336	0.141	2.56	<0.020
Nitrite	mg/L	<0.010	0.030	0.058	0.050	<0.010
Nitrate and Nitrite (as N)	mg/L	0.157	0.365	0.20	2.61	<0.050
Hardness as $CaCO_3$	mg/L	139	108	106	178	174
Alkalinity (total as $CaCO_3$)	mg/L	466	363	316	635	548
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.39	0.369	0.307	1.20	0.71
Field Data						
pH in H_20	pH	10.2	6.14	8.08	8.60	8.20
Conductivity (EC)	uS/cm	1133	897	666	68	1060

Notes:

"-" Not required under previous permit

Table 1.10: Chemical Analytical Results

Sample ID:		Magneson D.1				
Site Number:		10				
Date Sampled:	Units	16-Oct-2018	29-Oct-2019	8-Oct-2020	21-Oct-2021	19-Oct-2022
Chem. O_2 Demand	mg/L	268	339	280	272	245
Ammonia-N	mg/L	0.123	0.104	0.166	0.26	0.422
Total Kjeldahl Nitrogen	mg/L	10.4	11.0	9.55	8.70	8.71
Dissolved Organic Carbon	mg/L	91.0	102	85.6	84.0	80.6
Phenols	mg/L	0.0017	0.0084	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	4.4	10.6	22.8
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.302	0.039	0.187	0.583	0.0607
Antimony	mg/L	0.00059	0.0005	0.00054	0.00072	<0.0020
Arsenic	mg/L	0.0181	0.0175	0.0169	0.0225	0.0222
Barium	mg/L	0.0720	0.0701	0.0728	0.0553	0.0332
Beryllium	mg/L	<0.00020	<0.00020	<0.00020	<0.00050	<0.00040
Boron	mg/L	0.091	0.091	0.097	0.125	0.226
Cadmium	mg/L	0.000056	0.00005	0.000024	0.000031	<0.00010
Chromium	mg/L	0.00115	0.00092	0.00097	0.00109	<0.010
Cobalt	mg/L	0.00608	0.0051	0.00494	0.00628	0.00545
Copper	mg/L	0.0521	0.0255	0.0184	0.0301	0.0318
Iron	mg/L	1.41	1.08	1.40	0.887	<0.60
Lead	mg/L	0.00118	0.00105	0.00131	0.00091	<0.0010
Lithium	mg/L	0.0639	0.0537	0.0541	0.0777	0.0776
Manganese	mg/L	0.333	0.587	0.621	0.521	0.359
Mercury	mg/L	<0.0000050	0.0000086	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.00457	0.00327	0.00339	0.00439	0.00541
Nickel	mg/L	0.0293	0.0243	0.0200	0.0255	0.0244
Selenium	mg/L	0.00099	0.00080	0.00087	0.00105	0.00102
Silver	mg/L	<0.000020	<0.000020	<0.000020	<0.000050	<0.00020
Thallium	mg/L	0.000023	<0.000020	<0.000020	<0.000050	<0.00020
Tin	mg/L	<0.00020	<0.00020	<0.00020	<0.00050	<0.0020
Titanium	mg/L	0.0552	0.00886	0.0281	0.0271	0.00841
Uranium	mg/L	0.00196	0.00185	0.00221	0.00292	0.0031
Vanadium	mg/L	0.0154	0.0131	0.0122	0.0189	0.0166
Zinc	mg/L	0.0071	0.0076	0.0063	0.0103	<0.020
Routine Water						
Ion Balance	%	103	102	98.1	97.9	101
Bicarbonate	mg/L	617	609	578	707	650
Chloride	mg/L	197	202	217	281	287
Carbonate	mg/L	17.9	16.1	22.7	24.1	34.6
Conductivity (EC)	uS/cm	2150	2150	2230	2690	2810
Calcium	mg/L	51.1	51.7	56.8	74.9	75.5
Potassium	mg/L	127	135	116	152	146
Magnesium	mg/L	26.9	31.0	31.9	43.5	42.1
Sodium	mg/L	327	326	347	426	460
Sulfate	mg/L	252	284	363	480	512
Phosphorus	mg/L	8.88	8.91	7.55	7.01	6.31
pH in H_20	pH	8.54	8.52	8.60	8.61	8.78
TDS (Calculated)	mg/L	1310	1350	1440	1830	1980
Nitrate	mg/L	0.958	1.12	0.85	1.07	<0.10
Nitrite	mg/L	<0.020	<0.020	0.062	0.018	<0.050
Nitrate and Nitrite (as N)	mg/L	0.958	1.12	0.91	1.09	<0.112
Hardness as $CaCO_3$	mg/L	238	257	273	366	362
Alkalinity (total as $CaCO_3$)	mg/L	536	526	512	620	591
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.129	0.297	0.310	0.365	0.416
Field Data						
pH in H_20	pH	10.2	9.73	8.63	8.77	8.79
Conductivity (EC)	uS/cm	2290	2.66	2390	278	2850

Notes:

"-" Not required under previous permit

Table 1.11: Chemical Analytical Results

Sample ID:		Magneson D.2				
Site Number:		11				
Date Sampled:	Units	16-Oct-2018	29-Oct-2019	8-Oct-2020	21-Oct-2021	19-Oct-2022
Chem. O_2 Demand	mg/L	160	114	196	Dry	224
Ammonia-N	mg/L	0.137	0.063	<0.050		0.1
Total Kjeldahl Nitrogen	mg/L	6.13	3.46	7.09		7.23
Dissolved Organic Carbon	mg/L	60.0	33.5	54.6		67.7
Phenols	mg/L	0.0028	0.0142	0.0010		<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	345		56.8
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	Dry	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050		<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050		<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050		<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050		<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071		<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050		<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10		<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10		<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10		<0.10
Dissolved Metals						
Aluminium	mg/L	0.217	0.168	0.0606	Dry	0.0338
Antimony	mg/L	0.00024	0.00018	0.00026		0.00039
Arsenic	mg/L	0.0137	0.00332	0.00542		0.00544
Barium	mg/L	0.0136	0.0524	0.0423		0.045
Beryllium	mg/L	<0.00010	<0.00010	<0.00010		<0.000020
Boron	mg/L	0.036	0.024	0.031		0.03
Cadmium	mg/L	0.0000249	0.0000153	0.0000129		0.000007
Chromium	mg/L	0.00053	0.00034	0.00035		<0.00050
Cobalt	mg/L	0.00070	0.00057	0.00124		0.00222
Copper	mg/L	0.00276	0.00211	0.00224		0.00314
Iron	mg/L	0.197	1.43	0.683		0.222
Lead	mg/L	0.000151	0.000582	0.000394		0.000162
Lithium	mg/L	0.0124	0.0104	0.0118		0.0183
Manganese	mg/L	0.0111	0.00213	0.0308		0.00785
Mercury	mg/L	<0.0000050	0.000005	<0.0000050		<0.0000050
Molybdenum	mg/L	0.00352	0.00111	0.00138		0.00643
Nickel	mg/L	0.00544	0.00512	0.00635		0.0116
Selenium	mg/L	0.000474	0.000263	0.000417		0.000663
Silver	mg/L	<0.000010	<0.000010	<0.000010		<0.000010
Thallium	mg/L	0.000018	<0.000010	<0.000010		<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010		<0.00010
Titanium	mg/L	0.0158	0.0141	0.00792		0.00166
Uranium	mg/L	0.00188	0.000954	0.00203		0.00497
Vanadium	mg/L	0.0122	0.00364	0.00603		0.00476
Zinc	mg/L	<0.0010	0.0015	<0.0010		<0.0010
Routine Water						
Ion Balance	%	107	102	100	Dry	111
Bicarbonate	mg/L	332	296	338		464
Chloride	mg/L	48.5	19.2	27.6		28.7
Carbonate	mg/L	12.7	<5.0	<5.0		13.2
Conductivity (EC)	uS/cm	760	516	625		837
Calcium	mg/L	19.9	20.8	21.0		34.2
Potassium	mg/L	39.1	32.9	33.5		48.4
Magnesium	mg/L	8.43	9.31	9.13		14
Sodium	mg/L	128	69.1	91.7		138
Sulfate	mg/L	21.6	5.44	14.5		9.38
Phosphorus	mg/L	2.28	1.21	2.61		0.836
pH in H_20	pH	8.68	8.19	8.39		8.62
TDS (Calculated)	mg/L	442	303	369		584
Nitrate	mg/L	<0.020	0.253	<0.020		<0.020
Nitrite	mg/L	<0.010	<0.010	<0.010		<0.010
Nitrate and Nitrite (as N)	mg/L	<0.022	0.253	<0.022		<0.050
Hardness as $CaCO_3$	mg/L	84.4	90.3	90.0		143
Alkalinity (total as $CaCO_3$)	mg/L	293	242	285		403
Hydroxide	mg/L	<5	<5.0	<5.0		<1.0
Fluoride	mg/L	0.284	0.228	0.252		0.482
Field Data						
pH in H_20	pH	11.4	10.3	8.42	Dry	8.78
Conductivity (EC)	uS/cm	786	650	662		858

Notes:

"-" Not required under previous permit

Table 1.12: Chemical Analytical Results

Sample ID:		**Magneson D.3 (now on Clean Harbors' property)**				
Site Number:		**12**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**18-Oct-2022**
Chem. O_2 Demand	mg/L	Not analyzed	119	48	12	74
Ammonia-N	mg/L		<0.050	<0.050	<0.050	0.0335
Total Kjeldahl Nitrogen	mg/L		3.49	2.02	0.57	2.37
Dissolved Organic Carbon	mg/L		17.9	15.1	8.3	23.3
Phenols	mg/L		0.0136	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L		-	19.2	7.4	39
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	Not analyzed	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L		<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L		<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L		<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L		<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L		<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L		<0.00050	<0.00050	<0.00050	<0.00050
F1 (C6-C10)	mg/L		<0.10	<0.10	<0.10	<0.10
F1 - BTEX	mg/L		<0.10	<0.10	<0.10	<0.10
F2 - (>C10-C16)	mg/L		<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	Not analyzed	0.0033	0.0088	0.0125	0.0024
Antimony	mg/L		0.00029	0.00029	0.00028	0.00036
Arsenic	mg/L		0.00194	0.00169	0.00105	0.00256
Barium	mg/L		0.0773	0.053	0.0364	0.0954
Beryllium	mg/L		<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L		0.060	0.062	0.05	0.084
Cadmium	mg/L		0.0000188	<0.0000050	0.0000153	0.0000201
Chromium	mg/L		0.00016	<0.00010	0.00029	<0.00050
Cobalt	mg/L		0.00052	0.00022	<0.00010	0.00028
Copper	mg/L		0.00242	0.0011	0.00276	0.00121
Iron	mg/L		0.015	0.013	<0.010	<0.030
Lead	mg/L		<0.000050	<0.000050	<0.000050	<0.000050
Lithium	mg/L		0.0409	0.0411	0.0202	0.0498
Manganese	mg/L		0.00123	0.00125	0.00067	<0.0050
Mercury	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L		0.0254	0.0234	0.0364	0.0434
Nickel	mg/L		0.0203	0.0146	0.00476	0.0171
Selenium	mg/L		0.000304	0.000259	0.000246	0.000414
Silver	mg/L		<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L		<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L		<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L		<0.00030	0.00105	<0.00030	<0.00030
Uranium	mg/L		0.00247	0.00265	0.00127	0.00322
Vanadium	mg/L		0.00262	0.00154	0.00122	0.0024
Zinc	mg/L		0.0028	<0.0010	0.0044	0.0012
Routine Water						
Ion Balance	%	Not analyzed	102	95.2	98.5	106
Bicarbonate	mg/L		268	282	117	261
Chloride	mg/L		14.7	13.6	49.9	12.9
Carbonate	mg/L		<5.0	5.0	<5.0	3.4
Conductivity (EC)	uS/cm		960	947	772	992
Calcium	mg/L		49.1	41.3	43.7	35.5
Potassium	mg/L		13.6	12.2	3.22	14.6
Magnesium	mg/L		17.4	16.1	13.5	16.8
Sodium	mg/L		139	144	109	162
Sulfate	mg/L		252	253	235	252
Phosphorus	mg/L		0.185	0.081	<0.050	0.122
pH in H_20	pH		8.38	8.40	7.87	8.39
TDS (Calculated)	mg/L		623	625	478	656
Nitrate	mg/L		0.029	<0.020	<0.020	<0.020
Nitrite	mg/L		<0.010	<0.010	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L		0.029	<0.022	<0.022	<0.050
Hardness as CaCO3	mg/L		194	169	165	158
Alkalinity (total as CaCO3)	mg/L		227	240	95.6	219
Hydroxide	mg/L		<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L		0.465	0.450	0.459	0.825
Field Data						
pH in H_20	pH	Not analyzed	11.68	8.36	8.48	8.28
Conductivity (EC)	uS/cm		1203	1017	483	1010

Notes:

"-" Not required under previous permit

Table 1.13: Chemical Analytical Results

Sample ID:		Magneson D.4				
Site Number:		13				
Date Sampled:	Units	16-Oct-2018	29-Oct-2019	8-Oct-2020	21-Oct-2021	19-Oct-2022
Chem. O_2 Demand	mg/L	960	1370	1300	3420	1100
Ammonia-N	mg/L	0.409	2.85	2.02	<2.5	1.63
Total Kjeldahl Nitrogen	mg/L	39.4	43.7	42.6	122	42.1
Dissolved Organic Carbon	mg/L	329	415	295	1070	277
Phenols	mg/L	<0.01	0.0116	0.0013	0.0054	0.0018
Total Suspended Solids (TSS)	mg/L	-	-	24.4	1660	12.6
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.145	0.080	0.0915	0.167	0.273
Antimony	mg/L	0.00082	0.00064	0.00074	0.0021	0.00091
Arsenic	mg/L	0.0327	0.0275	0.0310	0.0841	0.0347
Barium	mg/L	0.383	0.166	0.195	0.436	0.15
Beryllium	mg/L	<0.00050	<0.00050	<0.0005	<0.001	<0.00010
Boron	mg/L	0.267	0.204	0.223	0.46	0.211
Cadmium	mg/L	0.000064	0.000079	0.000036	0.000131	0.0000275
Chromium	mg/L	0.00482	0.00285	0.00373	0.0077	0.00337
Cobalt	mg/L	0.00594	0.00794	0.00817	0.0157	0.0113
Copper	mg/L	0.0069	0.0093	0.0103	0.0364	0.00685
Iron	mg/L	3.26	1.99	3.63	7.34	3.93
Lead	mg/L	0.00422	0.00304	0.00391	0.00584	0.0031
Lithium	mg/L	0.128	0.0902	0.0902	0.33	0.096
Manganese	mg/L	1.39	0.748	0.882	1.8	0.77
Mercury	mg/L	<0.000050	<0.000050	<0.0000050	<0.000050	<0.0000050
Molybdenum	mg/L	0.00333	0.00193	0.00371	0.0242	0.00656
Nickel	mg/L	0.0350	0.0350	0.0394	0.0967	0.0435
Selenium	mg/L	0.00159	0.00142	0.00184	0.00626	0.00155
Silver	mg/L	0.00009	<0.000050	<0.000050	0.00012	0.000059
Thallium	mg/L	<0.000050	<0.000050	<0.000050	<0.00010	<0.000050
Tin	mg/L	<0.00050	<0.00050	<0.00050	<0.0010	<0.00050
Titanium	mg/L	0.0716	0.0444	0.0700	0.1030	0.0586
Uranium	mg/L	0.00295	0.00214	0.00303	0.0119	0.00323
Vanadium	mg/L	0.0277	0.0286	0.0276	0.0466	0.024
Zinc	mg/L	0.0247	0.032	0.0233	0.041	0.0165
Routine Water						
Ion Balance	%	101	110	96.9	96.2	83.8
Bicarbonate	mg/L	1580	1310	1430	3440	1560
Chloride	mg/L	894	603	668	3040	831
Carbonate	mg/L	87.5	47.6	64.6	522	74.9
Conductivity (EC)	uS/cm	6470	4570	4960	16400	5,390
Calcium	mg/L	118	84.2	82.2	109	101
Potassium	mg/L	717	634	602	2420	696
Magnesium	mg/L	84.4	71.6	69.2	262	80
Sodium	mg/L	844	596	655	2840	596
Sulfate	mg/L	637	361	530	2940	715
Phosphorus	mg/L	31.3	26.9	26.8	34.8	26.2
pH in H_20	pH	8.73	8.64	8.68	9.12	8.74
TDS (Calculated)	mg/L	4160	3040	3380	11000	4,190
Nitrate	mg/L	0.33	0.570	0.26	<0.20	0.15
Nitrite	mg/L	<0.050	0.083	0.073	<0.10	1.73
Nitrate and Nitrite (as N)	mg/L	0.33	0.65	0.33	<0.22	1.88
Hardness as $CaCO_3$	mg/L	642	505	490	1350	582
Alkalinity (total as $CaCO_3$)	mg/L	1440	1150	1280	3690	1400
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	<0.1	<0.10	1.19	0.27	0.940
Field Data						
pH in H_20	pH	10.4	9.81	8.59	9.36	8.68
Conductivity (EC)	uS/cm	2230	6.83	5430	5513	5580

Notes:
"-" Not required under previous permit

Table 1.14: Chemical Analytical Results

Sample ID:		**Magneson D.5**				
Site Number:		**14**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**19-Oct-2022**
Chem. O_2 Demand	mg/L	243	370	380	670	282
Ammonia-N	mg/L	0.455	0.600	0.210	0.370	0.158
Total Kjeldahl Nitrogen	mg/L	10.0	13.9	14.6	23	9.6
Dissolved Organic Carbon	mg/L	88.0	100	100	171	84.6
Phenols	mg/L	0.0025	0.0071	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	73.0	359.0	63.8
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0245	0.0182	0.0145	1.21	0.0676
Antimony	mg/L	0.00101	0.00073	0.00059	0.00079	0.00104
Arsenic	mg/L	0.019	0.0155	0.0168	0.0221	0.0242
Barium	mg/L	0.0764	0.0337	0.0317	0.0979	0.0817
Beryllium	mg/L	<0.00020	<0.00020	<0.00020	<0.00050	<0.000040
Boron	mg/L	<0.020	0.048	0.059	0.079	0.031
Cadmium	mg/L	0.000019	0.000012	<0.000010	0.000026	0.0000161
Chromium	mg/L	0.00025	0.00055	0.00051	0.00153	<0.0010
Cobalt	mg/L	0.00364	0.00428	0.00328	0.0032	0.00241
Copper	mg/L	0.0052	0.00527	0.00426	0.004	0.00187
Iron	mg/L	0.070	0.277	0.178	1.38	0.083
Lead	mg/L	0.00011	0.00037	0.00017	0.00235	0.00014
Lithium	mg/L	0.0576	0.0533	0.050	0.079	0.0597
Manganese	mg/L	0.00515	0.220	0.218	0.342	0.0226
Mercury	mg/L	<0.0000050	0.0000063	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.0110	0.00592	0.00596	0.016	0.0238
Nickel	mg/L	0.0232	0.0225	0.0181	0.0228	0.0205
Selenium	mg/L	0.00078	0.00088	0.00096	0.00121	0.00074
Silver	mg/L	<0.000020	<0.000020	<0.000020	<0.000050	<0.000020
Thallium	mg/L	<0.00002	<0.000020	<0.000020	<0.000050	<0.000020
Tin	mg/L	<0.00020	<0.00020	<0.00020	<0.00050	<0.00020
Titanium	mg/L	0.00511	0.00459	0.00431	0.0411	0.0048
Uranium	mg/L	0.00351	0.0023	0.00191	0.00347	0.00441
Vanadium	mg/L	0.0188	0.0269	0.0142	0.0189	0.0153
Zinc	mg/L	<0.0020	0.004	0.0039	0.0088	<0.0020
Routine Water						
Ion Balance	%	99.5	104	99.7	75.6	97.9
Bicarbonate	mg/L	932	850	795	1440	769
Chloride	mg/L	145	175	207	476	230
Carbonate	mg/L	37.6	21.7	40.1	107	80.5
Conductivity (EC)	uS/cm	2030	2120	2230	3780	2500
Calcium	mg/L	35.6	50.3	45.7	83.3	51
Potassium	mg/L	67.2	119	122	137	113
Magnesium	mg/L	18.2	35.9	30.6	41.6	29.2
Sodium	mg/L	391	353	370	572	461
Sulfate	mg/L	71.6	162	185	333	319
Phosphorus	mg/L	2.99	10.1	12.5	2.17	2.05
pH in H_20	pH	8.66	8.53	8.78	8.89	9.11
TDS (Calculated)	mg/L	1230	1340	1390	2460	1760
Nitrate	mg/L	<0.040	0.557	0.19	<0.20	<0.10
Nitrite	mg/L	<0.020	<0.020	0.065	<0.10	<0.050
Nitrate and Nitrite (as N)	mg/L	<0.045	0.557	0.25	<0.22	<0.112
Hardness as $CaCO_3$	mg/L	164	273	240	379	248
Alkalinity (total as $CaCO_3$)	mg/L	827	733	719	1360	765
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.512	0.180	0.480	1.010	0.979
Field Data						
pH in H_20	pH	10.6	11.75	8.81	9.13	9.31
Conductivity (EC)	uS/cm	2140	2.78	2300	2551	2520

Notes:

"-" Not required under previous permit

Table 1.15: Chemical Analytical Results

Sample ID:		**Magneson D.6**				
Site Number:		**15**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**19-Oct-2022**
Chem. O_2 Demand	mg/L	125	125	88	148	127
Ammonia-N	mg/L	<0.050	<0.050	<0.050	0.28	0.0747
Total Kjeldahl Nitrogen	mg/L	4.58	4.16	3.27	2.55	4.17
Dissolved Organic Carbon	mg/L	43.0	33.1	26.6	39	39.7
Phenols	mg/L	0.0021	0.013	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	11.2	14.2	32
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0151	0.0051	0.0136	0.0211	0.0041
Antimony	mg/L	0.00113	0.00086	0.00067	0.00107	0.00088
Arsenic	mg/L	0.019	0.0134	0.0139	0.0337	0.0209
Barium	mg/L	0.0302	0.0512	0.0370	0.0465	0.0212
Beryllium	mg/L	<0.00020	<0.00020	<0.00020	<0.00050	<0.000040
Boron	mg/L	0.301	0.237	0.230	0.302	0.239
Cadmium	mg/L	0.000018	0.000012	<0.000010	<0.000025	<0.000010
Chromium	mg/L	<0.00020	<0.00020	<0.00020	<0.00050	<0.0010
Cobalt	mg/L	0.00089	0.00075	0.0011	0.00084	0.00069
Copper	mg/L	0.00103	0.00174	0.00085	0.0013	0.0008
Iron	mg/L	0.037	0.023	0.082	<0.050	<0.060
Lead	mg/L	<0.00010	<0.00010	<0.00010	<0.00025	<0.00010
Lithium	mg/L	0.13	0.0978	0.088	0.148	0.128
Manganese	mg/L	0.00962	0.00599	0.172	0.505	0.0308
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.00211	0.00179	0.00128	0.00099	0.00151
Nickel	mg/L	0.0067	0.0082	0.0059	0.007	0.0050
Selenium	mg/L	0.00032	0.00029	0.00027	0.00029	0.000297
Silver	mg/L	<0.000020	<0.000020	<0.000020	<0.000050	<0.000020
Thallium	mg/L	<0.00002	<0.000020	<0.000020	<0.000050	<0.000020
Tin	mg/L	<0.00020	<0.00020	<0.00020	<0.00050	<0.00020
Titanium	mg/L	0.00146	0.00134	0.00232	<0.0015	<0.00060
Uranium	mg/L	0.00442	0.00507	0.0040	0.0036	0.00437
Vanadium	mg/L	0.0042	0.0063	0.0026	0.004	0.0035
Zinc	mg/L	0.0020	<0.0020	<0.0020	<0.0050	0.0021
Routine Water						
Ion Balance	%	98.7	101	101	93	95.8
Bicarbonate	mg/L	538	520	427	577	417
Chloride	mg/L	359	286	294	453	358
Carbonate	mg/L	14.5	16.6	11.2	12.7	28.1
Conductivity (EC)	uS/cm	4070	3120	3050	4140	3760
Calcium	mg/L	41.7	97.9	91.4	83.6	67.4
Potassium	mg/L	29.8	34.1	26.6	40.2	33.1
Magnesium	mg/L	58.5	56.6	57.8	82.8	66.7
Sodium	mg/L	794	558	510	823	726
Sulfate	mg/L	1120	818	772	1380	1210
Phosphorus	mg/L	0.486	0.745	0.582	1.25	0.625
pH in H_20	pH	8.47	8.52	8.48	8.47	8.84
TDS (Calculated)	mg/L	2680	2120	1970	2920	2730
Nitrate	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
Nitrate and Nitrite (as N)	mg/L	<0.11	<0.101	<0.11	<0.11	<0.112
Hardness as $CaCO_3$	mg/L	345	478	466	550	443
Alkalinity (total as $CaCO_3$)	mg/L	465	454	369	494	389
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.22	0.35	0.290	0.380	0.382
Field Data						
pH in H_20	pH	10.9	9.48	8.37	8.55	9.02
Conductivity (EC)	uS/cm	4140	3.82	3170	2705	3770

Notes:

"-" Not required under previous permit

Table 1.16: Chemical Analytical Results

Sample ID:		**Beaver D.1**				
Site Number:				**16**		
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**19-Oct-2022**
Chem. O_2 Demand	mg/L	66	93	84	114	185
Ammonia-N	mg/L	1.10	0.071	0.200	2.200	0.49
Total Kjeldahl Nitrogen	mg/L	4.27	2.46	3.01	2.38	8.06
Dissolved Organic Carbon	mg/L	25.6	28.1	26.2	36.8	42.7
Phenols	mg/L	0.0023	0.0099	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	8.0	12.0	161
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0064	0.0036	0.0039	0.0218	0.0046
Antimony	mg/L	0.00024	0.00022	0.00027	0.00057	0.00042
Arsenic	mg/L	0.00455	0.00586	0.00534	0.0131	0.0114
Barium	mg/L	0.0833	0.0489	0.0504	0.0955	0.0243
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L	0.051	0.039	0.020	0.041	0.058
Cadmium	mg/L	<0.0000050	0.0000056	<0.0000050	0.0000066	<0.0000050
Chromium	mg/L	<0.00010	0.00013	0.00014	0.00016	<0.00050
Cobalt	mg/L	0.00094	0.00038	0.00050	0.00136	0.00111
Copper	mg/L	0.00057	0.00071	0.00037	0.00154	0.00077
Iron	mg/L	0.026	0.049	0.125	0.032	0.032
Lead	mg/L	<0.000050	<0.000050	<0.000050	0.000059	<0.000050
Lithium	mg/L	0.0329	0.0308	0.0262	0.0443	0.0343
Manganese	mg/L	0.387	0.00491	0.134	0.494	0.409
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.00153	0.00067	0.00047	0.00268	0.00168
Nickel	mg/L	0.00697	0.00493	0.00347	0.00754	0.00695
Selenium	mg/L	0.000284	0.000205	0.000184	0.000491	0.000302
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L	0.000015	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.00086	0.00069	0.00114	0.00121	0.00052
Uranium	mg/L	0.00225	0.00115	0.000827	0.00362	0.0021
Vanadium	mg/L	0.00363	0.00324	0.00251	0.00877	0.00761
Zinc	mg/L	<0.0010	<0.0010	<0.0010	0.0044	0.0011
Routine Water						
Ion Balance	%	103	109	98.5	98	104.0
Bicarbonate	mg/L	451	464	479	714	550
Chloride	mg/L	237	182	150	274	234
Carbonate	mg/L	7.9	6.7	7.4	22.8	13.3
Conductivity (EC)	uS/cm	1780	1490	1400	2010	1830
Calcium	mg/L	67.2	53.7	45.5	75	73.8
Potassium	mg/L	19.6	19.1	15.3	25.4	20.9
Magnesium	mg/L	28.5	28.2	21.0	34.7	32.3
Sodium	mg/L	275	266	233	367	312
Sulfate	mg/L	163	131	116	173	170
Phosphorus	mg/L	0.464	1.41	1.68	1.3	2.21
pH in H_20	pH	8.39	8.37	8.42	8.58	8.52
TDS (Calculated)	mg/L	1020	915	824	1230	1180
Nitrate	mg/L	0.299	<0.020	<0.020	0.153	<0.020
Nitrite	mg/L	<0.010	<0.010	0.017	0.149	<0.010
Nitrate and Nitrite (as N)	mg/L	0.299	<0.022	<0.022	0.302	<0.050
Hardness as $CaCO_3$	mg/L	285	250	200	330	317
Alkalinity (total as $CaCO_3$)	mg/L	383	392	405	623	473
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.129	0.208	0.179	0.398	0.356
Field Data						
pH in H_20	pH	9.6	10.32	8.15	8.53	8.68
Conductivity (EC)	uS/cm	1875	1940	1458	1307	1878

Notes:

"-" Not required under previous permit

Table 1.18: Chemical Analytical Results

Sample ID:		Beaver D.2				
Site Number:		18				
Date Sampled:	Units	16-Oct-2018	29-Oct-2019	8-Oct-2020	21-Oct-2021	19-Oct-2022
Chem. O_2 Demand	mg/L	35	158	106	Not monitored	Not monitored
Ammonia-N	mg/L	<0.050	<0.050	0.183		
Total Kjeldahl Nitrogen	mg/L	1.71	4.19	3.29		
Dissolved Organic Carbon	mg/L	21.6	39.2	27.5		
Phenols	mg/L	0.0019	0.0081	0.0018		
Total Suspended Solids (TSS)	mg/L	-	-	12.4		
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	Not monitored	Not monitored
Toluene	mg/L	<0.00050	<0.00050	<0.00050		
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050		
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050		
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050		
Xylenes	mg/L	<0.00071	<0.00071	<0.00071		
Styrene	mg/L	<0.0005	<0.00050	<0.00050		
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10		
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10		
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10		
Dissolved Metals						
Aluminium	mg/L	0.0034	0.0035	0.0195	Not monitored	Not monitored
Antimony	mg/L	0.00027	0.00021	0.00015		
Arsenic	mg/L	0.00107	0.00247	0.00172		
Barium	mg/L	0.0924	0.0716	0.0934		
Beryllium	mg/L	<0.00020	<0.00020	<0.00010		
Boron	mg/L	0.024	0.053	0.017		
Cadmium	mg/L	0.000018	<0.000010	<0.0000050		
Chromium	mg/L	<0.0002	<0.00020	0.00019		
Cobalt	mg/L	0.0101	0.00040	0.00062		
Copper	mg/L	0.00127	0.00049	0.00027		
Iron	mg/L	0.064	0.111	0.505		
Lead	mg/L	<0.00010	<0.00010	0.000172		
Lithium	mg/L	0.0698	0.0423	0.0294		
Manganese	mg/L	5.26	0.00533	0.713		
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050		
Molybdenum	mg/L	0.00304	0.00095	0.000111		
Nickel	mg/L	0.0113	0.0042	0.00261		
Selenium	mg/L	0.00013	0.00018	0.000429		
silver	mg/L	<0.000020	<0.000020	<0.000010		
Thallium	mg/L	0.000022	<0.000020	<0.000010		
Tin	mg/L	<0.00020	<0.00020	<0.00010		
Titanium	mg/L	<0.00060	<0.0006	0.00065		
Uranium	mg/L	0.0197	0.000974	0.000385		
Vanadium	mg/L	<0.0010	0.0013	<0.00050		
Zinc	mg/L	0.0064	<0.0020	0.0028		
Routine Water						
Ion Balance	%	109	107	97.1	Not monitored	Not monitored
Bicarbonate	mg/L	558	784	598		
Chloride	mg/L	688	285	235		
Carbonate	mg/L	<5.0	<5.0	5.0		
Conductivity (EC)	uS/cm	3810	2120	1690		
Calcium	mg/L	298	109	75.3		
Potassium	mg/L	26.1	26.1	15.2		
Magnesium	mg/L	87.2	43.8	25.2		
Sodium	mg/L	498	330	256		
Sulfate	mg/L	592	78.4	61.2		
Phosphorus	mg/L	0.243	1.02	0.732		
pH in H_20	pH	8.18	8.10	8.33		
TDS (Calculated)	mg/L	2460	1260	968		
Nitrate	mg/L	<0.10	<0.040	<0.020		
Nitrite	mg/L	<0.050	0.022	0.013		
Nitrate and Nitrite (as N)	mg/L	<0.11	<0.045	<0.022		
Hardness as $CaCO_3$	mg/L	1100	453	292		
Alkalinity (total as $CaCO_3$)	mg/L	457	643	499		
Hydroxide	mg/L	<5	<5.0	<5.0		
Fluoride	mg/L	0.15	0.273	0.229		
Field Data						
pH in H_20	pH	8.3	9.89	7.95	Not monitored	Not monitored
Conductivity (EC)	uS/cm	3960	2.62	1801		

Notes:

"-" Not required under previous permit

Table 1.19: Chemical Analytical Results

Sample ID:		Winsnes D.1				
Site Number:		19				
Date Sampled:	Units	16-Oct-2018	29-Oct-2019	8-Oct-2020	21-Oct-2021	19-Oct-2022
Chem. O_2 Demand	mg/L	92	75	83	73	80
Ammonia-N	mg/L	0.058	<0.050	0.251	0.71	0.061
Total Kjeldahl Nitrogen	mg/L	4.01	2.52	3.99	1.4	3.03
Dissolved Organic Carbon	mg/L	27.3	24.2	21.7	24.9	24.1
Phenols	mg/L	0.0026	0.0077	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	13.0	11.2	20.6
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0085	0.0017	0.0022	0.0096	0.0037
Antimony	mg/L	0.00030	0.0002	0.00029	0.00037	0.00023
Arsenic	mg/L	0.00574	0.00471	0.00454	0.00579	0.00529
Barium	mg/L	0.0623	0.0412	0.0729	0.0779	0.0592
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L	0.037	0.039	0.029	0.044	0.034
Cadmium	mg/L	0.0000168	<0.0000050	<0.0000050	0.0000071	<0.0000050
Chromium	mg/L	0.00011	<0.00010	<0.00010	0.00011	<0.00050
Cobalt	mg/L	0.00055	0.00035	0.00062	0.00056	0.00051
Copper	mg/L	0.00043	0.00027	0.00026	0.00177	0.00042
Iron	mg/L	0.038	0.011	0.041	0.034	<0.030
Lead	mg/L	0.000061	<0.000050	<0.000050	0.000055	<0.000050
Lithium	mg/L	0.0279	0.0235	0.0169	0.0247	0.0213
Manganese	mg/L	0.0371	0.00135	0.0111	0.136	<0.0050
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.000512	0.000602	0.000589	0.000873	0.000873
Nickel	mg/L	0.00316	0.00287	0.00304	0.00361	0.0029
Selenium	mg/L	0.000206	0.000204	0.000192	0.000263	0.000169
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L	0.000015	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.00093	<0.0003	<0.00030	0.00041	<0.00030
Uranium	mg/L	0.00159	0.00116	0.00136	0.00194	0.00143
Vanadium	mg/L	0.00163	0.00094	0.00166	0.00184	0.00166
Zinc	mg/L	<0.0010	<0.0010	<0.0010	0.013	0.0011
Routine Water						
Ion Balance	%	107	104	107	97.4	106
Bicarbonate	mg/L	469	416	359	370	305
Chloride	mg/L	58.7	71.6	76.8	103	89.1
Carbonate	mg/L	<5.0	10.8	7.6	<5.0	18.4
Conductivity (EC)	uS/cm	1070	1060	1020	1120	1070
Calcium	mg/L	26.8	39.2	44.7	33.1	35.9
Potassium	mg/L	15.8	15.7	12.7	16.5	15.8
Magnesium	mg/L	21.3	23.7	24.1	26.9	25.2
Sodium	mg/L	197	174	164	179	180
Sulfate	mg/L	92.4	106	123	166	160
Phosphorus	mg/L	0.339	0.263	0.425	0.306	0.249
pH in H_20	pH	8.36	8.51	8.46	8.32	8.86
TDS (Calculated)	mg/L	648	646	630	709	698
Nitrate	mg/L	<0.020	0.025	0.064	0.035	<0.020
Nitrite	mg/L	<0.010	0.014	0.025	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L	<0.022	0.039	0.089	0.035	<0.050
Hardness as $CaCO_3$	mg/L	155	195	211	193	193
Alkalinity (total as $CaCO_3$)	mg/L	393	359	307	307	280
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.16	0.292	0.229	0.304	0.263
Field Data						
pH in H_20	pH	10.7	10.44	8.50	8.57	9.22
Conductivity (EC)	uS/cm	1123	1306	1049	608	1098

Notes:
"-" Not required under previous permit

Table 1.20: Chemical Analytical Results

Sample ID:		**Balash D.1**				
Site Number:		**20**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**19-Oct-2022**
Chem. O_2 Demand	mg/L	61	79	75	65	96
Ammonia-N	mg/L	<0.050	0.824	0.356	1.32	0.117
Total Kjeldahl Nitrogen	mg/L	1.73	3.35	3.20	1.46	3.52
Dissolved Organic Carbon	mg/L	21.5	25.3	24.1	25.1	23.5
Phenols	mg/L	0.0018	0.0052	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	34.8	8.2	41.2
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0046	0.0052	0.0128	0.0067	0.0041
Antimony	mg/L	0.00016	0.00013	0.00017	0.00011	<0.00010
Arsenic	mg/L	0.00218	0.00283	0.00274	0.00397	0.00297
Barium	mg/L	0.104	0.0997	0.0979	0.116	0.0992
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020
Boron	mg/L	0.033	0.028	<0.010	<0.010	0.023
Cadmium	mg/L	0.0000237	0.0000063	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	0.00013	0.00012	0.00016	0.00011	<0.00050
Cobalt	mg/L	0.00053	0.00031	0.00027	0.00057	0.00029
Copper	mg/L	0.00027	0.00026	0.00023	0.0011	0.0002
Iron	mg/L	0.185	0.815	0.739	0.302	<0.030
Lead	mg/L	0.000067	0.000071	0.000138	0.0001	<0.000050
Lithium	mg/L	0.0237	0.0178	0.017	0.0241	0.0192
Manganese	mg/L	0.0629	0.00851	0.0070	0.6550	0.08
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000113
Molybdenum	mg/L	0.00061	0.00039	0.000304	0.000301	0.000419
Nickel	mg/L	0.00305	0.00293	0.00282	0.00257	0.00277
Selenium	mg/L	0.00018	0.000188	0.000245	0.00019	0.00017
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L	0.000024	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	0.00053	0.00095	0.00216	0.00063	<0.00030
Uranium	mg/L	0.000372	0.000199	0.000235	0.000194	0.000245
Vanadium	mg/L	0.00071	0.00095	0.00087	0.00062	0.00092
Zinc	mg/L	<0.0010	<0.0010	<0.0010	0.0029	<0.0010
Routine Water						
Ion Balance	%	108	106	105	92.3	102
Bicarbonate	mg/L	269	277	259	322	291
Chloride	mg/L	37.6	43.9	55.5	63	49.2
Carbonate	mg/L	<5.0	<5.0	<5.0	<5.0	<1.0
Conductivity (EC)	uS/cm	569	574	654	696	651
Calcium	mg/L	35.2	43.6	45.2	49.8	45.5
Potassium	mg/L	17.8	14.8	10.6	13.7	14.2
Magnesium	mg/L	16.3	15.8	16.8	16.7	16.2
Sodium	mg/L	66.1	57.3	74.3	67.1	74.6
Sulfate	mg/L	23.8	12.1	47.5	36.6	42.4
Phosphorus	mg/L	0.106	0.463	0.552	0.454	0.463
pH in H_20	pH	8.19	8.13	8.09	8.28	8.24
TDS (Calculated)	mg/L	329	324	378	406	423
Nitrate	mg/L	<0.020	0.037	0.053	<0.020	<0.020
Nitrite	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L	<0.022	0.037	0.053	<0.022	<0.050
Hardness as $CaCO_3$	mg/L	155	174	182	193	180
Alkalinity (total as $CaCO_3$)	mg/L	220	227	213	265	238
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.101	0.199	0.154	0.219	0.162
Field Data						
pH in H_20	pH	10.3	9.26	7.73	7.81	8.23
Conductivity (EC)	uS/cm	600	714	681	450.9	673

Notes:

"-" Not required under previous permit

Table 1.21: Chemical Analytical Results

Sample ID:		**Balash D.2**				
Site Number:		**21**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**21-Oct-2021**	**19-Oct-2022**
Chem. O_2 Demand	mg/L	112	93	130	175	148
Ammonia-N	mg/L	0.090	<0.050	0.072	0.26	0.0622
Total Kjeldahl Nitrogen	mg/L	4.39	2.75	4.86	2.69	5.08
Dissolved Organic Carbon	mg/L	32.4	29.5	35.3	56.8	36.7
Phenols	mg/L	0.0018	0.0093	<0.0010	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	29.6	53	55.8
BTEX, F1 (C6-C10) and F2(>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0177	0.0071	0.0118	0.0035	0.0069
Antimony	mg/L	0.00061	0.00024	0.0003	0.00053	0.00039
Arsenic	mg/L	0.00898	0.00575	0.0064	0.0155	0.00898
Barium	mg/L	0.114	0.0766	0.0595	0.103	0.114
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000040
Boron	mg/L	0.021	0.05	<0.010	<0.010	0.048
Cadmium	mg/L	0.0000199	<0.0000050	<0.0000050	<0.0000050	<0.000010
Chromium	mg/L	0.00014	<0.00010	0.00014	<0.00010	<0.0010
Cobalt	mg/L	0.00158	0.00056	0.00090	0.00198	0.00147
Copper	mg/L	0.00202	0.00071	0.00061	0.0025	0.00158
Iron	mg/L	0.037	0.038	0.138	0.016	<0.060
Lead	mg/L	0.00006	<0.000050	0.000061	<0.000050	<0.00010
Lithium	mg/L	0.0595	0.0419	0.0311	0.0589	0.049
Manganese	mg/L	0.00528	0.00437	0.0204	0.0227	0.286
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.00298	0.000719	0.000283	0.00164	0.00129
Nickel	mg/L	0.0072	0.00398	0.00343	0.00751	0.00614
Selenium	mg/L	0.000366	0.000201	0.000239	0.000475	0.000267
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020
Thallium	mg/L	0.000017	<0.000010	<0.000010	<0.000010	<0.000020
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020
Titanium	mg/L	0.00333	0.00134	0.00587	0.00049	<0.00060
Uranium	mg/L	0.00437	0.0021	0.00127	0.00338	0.00362
Vanadium	mg/L	0.00433	0.0018	0.00266	0.00815	0.0042
Zinc	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020
Routine Water						
Ion Balance	%	105	106	115	107	100
Bicarbonate	mg/L	429	435	472	671	494
Chloride	mg/L	304	244	311	537	393
Carbonate	mg/L	<5.0	<5.0	8.3	25.7	30.1
Conductivity (EC)	uS/cm	1710	1580	1800	2580	2410
Calcium	mg/L	46.7	69.8	61.4	86.6	105
Potassium	mg/L	28.5	22.6	37.7	47.2	39.3
Magnesium	mg/L	45.7	47.4	47.2	74.1	69.9
Sodium	mg/L	254	210	295	442	331
Sulfate	mg/L	67.1	104	57.2	92.7	300
Phosphorus	mg/L	0.654	0.755	1.50	0.72	0.928
pH in H_20	pH	8.30	8.22	8.41	8.61	8.73
TDS (Calculated)	mg/L	960	912	1050	1430	1570
Nitrate	mg/L	<0.020	<0.020	<0.020	0.031	<0.020
Nitrite	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L	<0.022	<0.022	<0.022	0.031	<0.050
Hardness as $CaCO_3$	mg/L	305	369	348	521	550
Alkalinity (total as $CaCO_3$)	mg/L	356	357	400	593	456
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.188	0.184	0.131	0.324	0.234
Field Data						
pH in H_20	pH	10.7	9.22	8.07	8.86	8.8
Conductivity (EC)	uS/cm	1198	1960	1869	799	2470

Notes:

"-" Not required under previous permit

Table 1.22: Chemical Analytical Results

Sample ID:		**Balash D.3**				
Site Number:		**22**				
Date Sampled:	**Units**	**16-Oct-2018**	**29-Oct-2019**	**8-Oct-2020**	**22-Oct-2021**	**19-Oct-2022**
Chem. O_2 Demand	mg/L	101	535	127	186	156
Ammonia-N	mg/L	0.055	0.075	0.059	1.32	0.109
Total Kjeldahl Nitrogen	mg/L	3.57	17.0	4.78	3.25	5.13
Dissolved Organic Carbon	mg/L	34.2	31.2	44.0	55.4	48
Phenols	mg/L	0.0012	0.0067	0.0014	<0.0010	<0.0010
Total Suspended Solids (TSS)	mg/L	-	-	27.4	434	32
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00030
Xylene (o)	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00040
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00050
Styrene	mg/L	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0455	0.0165	0.0065	0.641	0.0111
Antimony	mg/L	0.00029	0.00019	0.00022	0.00037	<0.00020
Arsenic	mg/L	0.00555	0.0057	0.00519	0.00704	0.00847
Barium	mg/L	0.0659	0.0437	0.0434	0.107	0.0503
Beryllium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.000040
Boron	mg/L	0.031	0.033	<0.010	<0.010	<0.02
Cadmium	mg/L	0.0000172	<0.0000050	<0.0000050	0.0000152	<0.000010
Chromium	mg/L	0.00012	0.00014	0.00014	0.00078	<0.0010
Cobalt	mg/L	0.00099	0.00101	0.00050	0.00166	0.00085
Copper	mg/L	0.00118	0.00101	<0.00020	0.00283	0.00074
Iron	mg/L	0.130	0.898	0.182	1.06	<0.060
Lead	mg/L	0.00012	0.000139	<0.000050	0.000967	<0.00010
Lithium	mg/L	0.0158	0.013	0.023	0.0343	0.0267
Manganese	mg/L	0.0104	0.410	0.00827	0.288	0.0551
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.00183	0.000865	0.000193	0.00154	0.000922
Nickel	mg/L	0.00364	0.00233	0.00188	0.00503	0.00269
Selenium	mg/L	0.000252	0.000201	0.000168	0.000324	0.000208
Silver	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020
Thallium	mg/L	0.000017	<0.000010	<0.000010	<0.000010	<0.000020
Tin	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020
Titanium	mg/L	0.00854	0.00139	0.00118	0.0211	<0.00060
Uranium	mg/L	0.00247	0.000959	0.000561	0.00331	0.00175
Vanadium	mg/L	0.00229	0.0018	0.00107	0.0054	0.0032
Zinc	mg/L	<0.0010	0.0012	<0.0010	0.0074	<0.0020
Routine Water						
Ion Balance	%	110	107	117	94.7	99.6
Bicarbonate	mg/L	290	264	408	607	334
Chloride	mg/L	222	246	294	515	469
Carbonate	mg/L	<5.0	<5.0	<5.0	15.7	37.8
Conductivity (EC)	uS/cm	1190	1230	1640	2450	2350
Calcium	mg/L	37.5	45.1	53.5	81.9	70.7
Potassium	mg/L	32.8	26.0	37.1	45.5	39.4
Magnesium	mg/L	26.7	29.2	40.4	55.6	57.4
Sodium	mg/L	177	173	269	359	359
Sulfate	mg/L	20.6	37.4	43.3	93.9	244
Phosphorus	mg/L	0.283	2.55	1.28	0.334	0.840
pH in H_20	pH	8.25	7.99	8.32	8.5	9.04
TDS (Calculated)	mg/L	660	687	941	1470	1490
Nitrate	mg/L	<0.020	<0.020	<0.020	0.039	0.024
Nitrite	mg/L	<0.010	<0.010	<0.010	0.011	<0.010
Nitrate and Nitrite (as N)	mg/L	<0.022	<0.022	<0.022	0.05	<0.050
Hardness as $CaCO_3$	mg/L	204	233	300	433	413
Alkalinity (total as $CaCO_3$)	mg/L	238	217	339	524	337
Hydroxide	mg/L	<5	<5.0	<5.0	<5.0	<1.0
Fluoride	mg/L	0.113	0.028	0.117	0.279	0.189
Field Data						
pH in H_20	pH	10.5	9.67	8.01	7.84	9.33
Conductivity (EC)	uS/cm	1274	1545	1687	849.1	2430

Notes:

"-" Not required under previous permit

Table 2: Duplicate 1 Chemical Analytical Results

		Sample ID:	EWERT D.3			
		Site Number:	EWERT D.3	DUPLICATE 1	% RPD	Pass/ Fail (>20%)
		Date Sampled:	19-Oct-2022	19-Oct-2022		
Parameter	**Units**	**RDL**				
Chem. O_2 Demand	mg/L	10	164	159	-	Pass
Ammonia-N	mg/L	0.05	0.073	0.0969	-	Pass
Total Kjeldahl Nitrogen	mg/L	0.2	4.87	4.79	-	Pass
Dissolved Organic Carbon	mg/L	1	45.9	47.8	4%	Pass
Phenols	mg/L	0.001	<0.0010	<0.0010	-	Pass
Total Suspended Solids (TSS)	mg/L	3	37.8	35.2	7%	Pass
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	0.0005	<0.00050	<0.00050	-	Pass
Toluene	mg/L	0.0005	<0.00050	<0.00050	-	Pass
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050	-	Pass
Xylenes (m & p)	mg/L	0.0005	<0.00030	<0.00030	-	Pass
Xylene (o)	mg/L	0.0005	<0.00040	<0.00040	-	Pass
Xylenes	mg/L	0.00071	<0.00050	<0.00050	-	Pass
Styrene	mg/L	0.0005	<0.00050	<0.00050	-	Pass
F1 (C_6-C_{10})	mg/L	0.1	<0.10	<0.10	-	Pass
F1 (C_6-C_{10}) - BTEX	mg/L	0.1	<0.10	<0.10	-	Pass
F2 - (C_{10}-C_{16})	mg/L	0.1	<0.10	<0.10	-	Pass
Dissolved Metals						
Aluminium	mg/L	0.001	0.0111	0.0103	7%	Pass
Antimony	mg/L	0.0001	0.00016	0.00015	-	Pass
Arsenic	mg/L	0.0001	0.00691	0.00701	1%	Pass
Barium	mg/L	0.0001	0.0208	0.0215	3%	Pass
Beryllium	mg/L	0.0001	<0.000020	<0.000020	-	Pass
Boron	mg/L	0.01	0.039	0.034	-	Pass
Cadmium	mg/L	0.000005	<0.0000050	<0.0000050	-	Pass
Chromium	mg/L	0.0001	<0.00050	<0.00050	-	Pass
Cobalt	mg/L	0.0001	0.00106	0.00106	0%	Pass
Copper	mg/L	0.0002	0.00091	0.00087	4%	Pass
Iron	mg/L	0.01	0.586	0.637	8%	Pass
Lead	mg/L	0.00005	0.000136	0.000149	9%	Pass
Lithium	mg/L	0.001	0.0116	0.0115	0.9%	Pass
Manganese	mg/L	0.0001	0.146	0.15400	5%	Pass
Mercury	mg/L	0.000005	<0.000005	<0.0000050	-	Pass
Molybdenum	mg/L	0.00005	0.000938	0.000895	5%	Pass
Nickel	mg/L	0.0005	0.00468	0.00467	0%	Pass
Selenium	mg/L	0.00005	0.000277	0.000304	9%	Pass
silver	mg/L	0.00001	<0.000010	<0.000010	-	Pass
Thallium	mg/L	0.00001	<0.000010	<0.000010	-	Pass
Tin	mg/L	0.0001	<0.00010	<0.00010	-	Pass
Titanium	mg/L	0.0003	0.00124	0.00124	0%	Pass
Uranium	mg/L	0.00001	0.000332	0.000324	2%	Pass
Vanadium	mg/L	0.0005	0.0029	0.00295	2%	Pass
Zinc	mg/L	0.001	0.0012	0.0021	-	Pass
Routine Water						
Bicarbonate	mg/L	5	291	292	0%	Pass
Chloride	mg/L	0.5	68	69.1	2%	Pass
Carbonate	mg/L	5	2.5	2.9	-	Pass
Conductivity (EC)	uS/cm	2	696	692	1%	Pass
Calcium	mg/L	0.5	20.7	21.7	5%	Pass
Potassium	mg/L	0.5	18.9	19.6	4%	Pass
Magnesium	mg/L	0.1	10.9	10.5	4%	Pass
Sodium	mg/L	1	124	124	0%	Pass
Sulfate	mg/L	0.3	17.2	17.8	3%	Pass
Phosphorus	mg/L	0.05	1.46	1.44	1%	Pass
pH in H_20	pH	0.1	8.38	8.41	0%	Pass
TDS (Calculated)	mg/L	10	457	462	1%	Pass
Nitrate	mg/L	0.02	<0.020	<0.020	-	Pass
Nitrite	mg/L	0.01	<0.010	<0.010	-	Pass
Nitrate and Nitrite (as N)	mg/L	0.022	<0.050	<0.050	-	Pass
Hardness as $CaCO_3$	mg/L	N/A	96.6	97.4	1%	Pass
Alkalinity (total as $CaCO_3$)	mg/L	2	243	244.0	0%	Pass
Hydroxide	mg/L	5	<1.0	<1.0	-	Pass
Fluoride	mg/L	0.02	0.249	0.27	8%	Pass

Notes:
RDL - Reportable detection limit
RPD - Relative Percentage Difference calculated as RPD(%)=(|V1-V2|)/[(V1+V2)/2])*100 where V1,V2 = concentrations of parent and duplicate sample, respectively.
"-" Indicates RPD not calculated. RPDs have only been calculated where a concentration is greater than 5 times the RDL
N/A - Not applicable
Shaded- RPD value greater than 20%

Table 3: Duplicate 2 Chemical Analytical Results

		Sample ID:	BALASH D.2			
		Site Number:	BALASH D.2	DUPLICATE 2	% RPD	Pass/ Fail (>20%)
		Date Sampled:	19-Oct-2022	19-Oct-2022		
Parameter	**Units**	**RDL**				
Chem. O_2 Demand	mg/L	10	148	152	3%	Pass
Ammonia-N	mg/L	0.005	0.0622	0.06	9%	Pass
Total Kjeldahl Nitrogen	mg/L	0.2	5.08	5.39	6%	Pass
Dissolved Organic Carbon	mg/L	0.5	36.7	38.4	5%	Pass
Phenols	mg/L	0.001	<0.0010	<0.0010	-	Pass
Total Suspended Solids (TSS)	mg/L	3	55.8	52.6	6%	Pass
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	0.0005	<0.00050	<0.00050	-	Pass
Toluene	mg/L	0.0005	<0.00050	<0.00050	-	Pass
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050	-	Pass
Xylenes (m & p)	mg/L	0.0003	<0.00030	<0.00030	-	Pass
Xylene (o)	mg/L	0.0004	<0.00040	<0.00040	-	Pass
Xylenes	mg/L	0.0005	<0.00050	<0.00050	-	Pass
Styrene	mg/L	0.0005	<0.00050	<0.00050	-	Pass
F1 (C_6-C_{10})	mg/L	0.1	<0.10	<0.10	-	Pass
F1 (C_6-C_{10}) - BTEX	mg/L	0.1	<0.10	<0.10	-	Pass
F2 - (C_{10}-C_{16})	mg/L	0.1	<0.10	<0.10	-	Pass
Dissolved Metals						
Aluminium	mg/L	0.001	0.0069	0.0099	36%	Fail
Antimony	mg/L	0.0001	0.00039	0.00037	5%	Pass
Arsenic	mg/L	0.0001	0.00898	0.00888	1%	Pass
Barium	mg/L	0.0001	0.114	0.112	2%	Pass
Beryllium	mg/L	0.00002	<0.000040	<0.000040	-	Pass
Boron	mg/L	0.01	0.048	0.049	2%	Pass
Cadmium	mg/L	0.000005	<0.000010	<0.000010	-	Pass
Chromium	mg/L	0.0005	<0.0010	<0.0010	-	Pass
Cobalt	mg/L	0.0001	0.00147	0.00144	2%	Pass
Copper	mg/L	0.0002	0.00158	0.00123	25%	Fail
Iron	mg/L	0.03	<0.060	<0.060	-	Pass
Lead	mg/L	0.00005	<0.00010	<0.00010	-	Pass
Lithium	mg/L	0.001	0.049	0.0505	3%	Pass
Manganese	mg/L	0.005	0.286	0.304	6%	Pass
Mercury	mg/L	0.000005	<0.000005	<0.0000050	-	Pass
Molybdenum	mg/L	0.00005	0.00129	0.00123	5%	Pass
Nickel	mg/L	0.0005	0.00614	0.00544	12%	Pass
Selenium	mg/L	0.00005	0.000267	0.000328	21%	Fail
Silver	mg/L	0.00001	<0.000020	<0.000020	-	Pass
Thallium	mg/L	0.00001	<0.000020	<0.000020	-	Pass
Tin	mg/L	0.0001	<0.00020	<0.00020	-	Pass
Titanium	mg/L	0.0003	<0.00060	<0.00060	-	Pass
Uranium	mg/L	0.00001	0.00362	0.00369	2%	Pass
Vanadium	mg/L	0.0005	0.0042	0.00431	3%	Pass
Zinc	mg/L	0.001	<0.0020	<0.0020	-	Pass
Routine Water						
Bicarbonate	mg/L	1	494	524	6%	Pass
Chloride	mg/L	0.5	393	396	1%	Pass
Carbonate	mg/L	1	30.1	31.7	5%	Pass
Conductivity (EC)	uS/cm	2	2410	2450	2%	Pass
Calcium	mg/L	0.05	105	106	1%	Pass
Potassium	mg/L	0.05	39.3	39.1	1%	Pass
Magnesium	mg/L	0.005	69.9	70.1	0%	Pass
Sodium	mg/L	0.05	331	333	1%	Pass
Sulfate	mg/L	0.3	300	299	0%	Pass
Phosphorus	mg/L	0.05	0.928	0.916	1%	Pass
pH in H_20	pH	0.1	8.73	8.73	0%	Pass
TDS (Calculated)	mg/L	1	1570	1590	1%	Pass
Nitrate	mg/L	0.02	<0.020	<0.10	-	Pass
Nitrite	mg/L	0.01	<0.010	<0.050	-	Pass
Nitrate and Nitrite (as N)	mg/L	0.05	<0.050	<0.112	-	Pass
Hardness as $CaCO_3$	mg/L	0.5	550	553	1%	Pass
Alkalinity (total as $CaCO_3$)	mg/L	2	456	482	6%	Pass
Hydroxide	mg/L	1	<1.0	<1.0	-	Pass
Fluoride	mg/L	0.02	0.23	0.464	66%	Fail

Notes:
RDL - Reportable detection limit
RPD - Relative Percentage Difference calculated as RPD(%)=(|V1-V2|)/[(V1+V2)/2])*100 where V1,V2 = concentrations of parent and duplicate sample, respectively.
"-" Indicates RPD not calculated. RPDs have only been calculated where a concentration is greater than 5 times the RDL
N/A - Not applicable
Shaded- RPD value greater than 20%

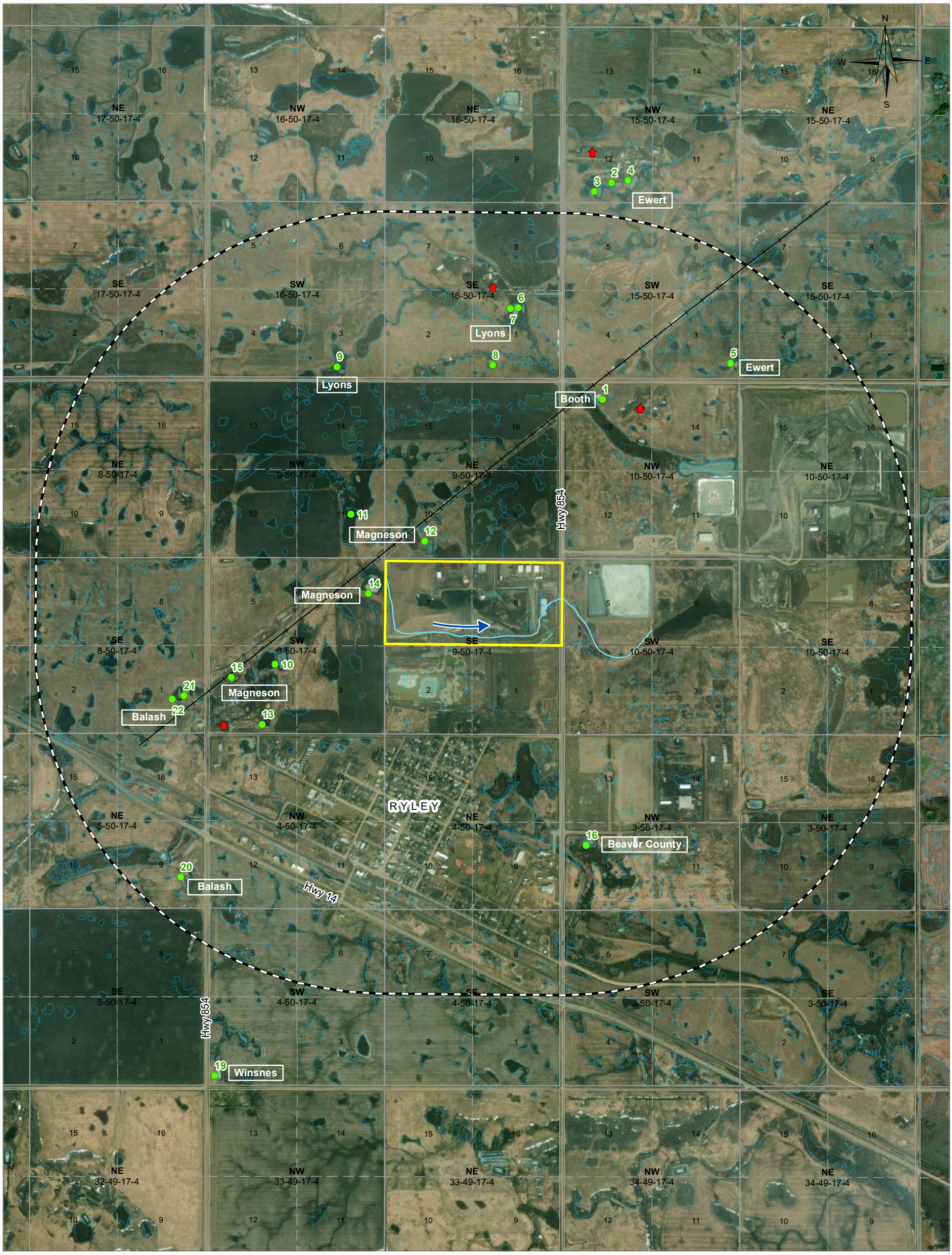
Table 4: Historical and 2022 Precipitation Data - Total Precipitation (mm)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual
1996	23	16	18	32.3	29.4	91.8	119.5	106.6	98.8	16.6	68.2	32.2	**652.4**
1997	11.1	12	24.5	27.7	50.7	143.3	52.3	71.4	96.6	31.6	7.2	4.5	**532.9**
1998	23	0	12.4	35.2	32.8	99.6	73	32.8	53.8	16.4	17.8	30	**426.8**
1999	64	4	19	19.6	64.8	21.6	123.8	60.8	11.4	9.4	14.6	12	**425**
2000	17.5	5	32	24	55.3	73.7	118	32.8	56.6	1	6.5	10	**432.4**
2001	1	5.8	6.5	0.8	55.2	94.2	260.2	8.4	37.4	23.4	34.5	6	**533.4**
2002	6	3.5	26	29.4	11.6	35.8	40	70	15.2	39.7	12	3	**292.2**
2003	39.7	19	20	46.9	64.3	110	80.8	40.8	27.2	23	19	8	**498.7**
2004	30.5	4	43	22.8	57.5	37.3	131.4	67.3	44.8	31.2	0	34.3	**504.1**
2005	10	5	35.5	18.6	43.6	95.3	82.8	59.3	24.4	18	3	14	**409.5**
2006	6	33	40	7.2	72.4	54.3	52.8	47.6	90.2	39.2	45	19.8	**507.5**
2007	7	23	5	46.9	51.5	78.8	59	59.1	9	5.8	9.6	27	**381.7**
2008	20.5	9	13.5	63.6	39	64.9	70.9	27.8	41.2	2.8	9	35	**397.2**
2009	22	9	24	32.7	7.6	20.6	67.6	19.2	5.8	31.1	8.6	41.5	**289.7**
2010	17	4	5	70.8	70	73.2	109	41.8	43.6	8.7	14	34	**491.1**
2011	69	20.5	8	14.4	6.8	146.6	113.4	61	12.4	14.8	19.2	16	**502.1**
2012	9	21.5	23	46.6	64.2	58.8	152.4	93.2	24.7	33.4	43	52	**621.8**
2013	39.5	10.5	31	17	23.9	96.6	101.4	71.6	4	9.8	61	41.5	**507.8**
2014	8.7	10.2	5.8	75.8	42.3	98.4	120.1	13.9	34.1	10.8	42.4	5.5	**468**
2015	19.8	24.9	31.3	16.5	37.3	59.7	108.6	10.3	71.1	22.7	17.4	3.5	**423.1**
2016	26.3	7.6	15.6	7.4	104	64.6	77.3	38.4	10.5	31.4	12.7	12	**407.8**
2017	10.2	1.9	5.9	45.9	56.5	32.4	44.5	41.3	27.1	25.2	2.4	5.7	**299**
2018	20.3	14.3	18.4	24.3	42.4	75.0	85.2	59.5	39.4	18.0	17.1	17.3	**431.2**
2019	26.8	18.6	7.1	29.6	49	155.8	153.7	31	43.7	27.3	25.3	11.1	**579**
2020	23.6	33	18.8	6	93.5	121.4	121.9	68.4	4.9	14.7	45.5	4.9	**556.6**
2021	10.8	12.2	7.3	13.2	65.5	38.9	25.3	63.5	22.4	9.1	21.1	39.2	**328.5**
2022	39.1	14.8	39.2	30	29	109.3	35	34.4	10.6	6.5	32.4	19.6	**399.9**
Mean	**22.3**	**12.7**	**19.8**	**29.8**	**48.9**	**79.7**	**95.6**	**49.3**	**36.6**	**19.3**	**22.2**	**20.0**	**457.7**

1. Denotes - Based on Incomplete Data so annual total is not reliable.
2. Data collected from Elk Island National Park Station (2014-2015, 2019-2022), Holden AGDM Stations (2016-2018) and Tofield North (1996-2013)
3. Link to 1996-2013, 2014-2015, 2019-2022 Data: http://climate.weather.gc.ca/historical_data/search_historic_data_e.html
4. Link to 2016-2018 data: http://agriculture.alberta.ca/acis/alberta-weather-data-viewer.jsp

FIGURES

M:\SOLID_WASTE\SWOP04592-01\Maps\SWOP04592-01_Fig01_SamplingPlan.mxd modified 2023-01-11 by Brittney.Bietz



LEGEND

- Rural Residence
- Water Sample Location
- Site Outline
- 1.6 km Buffer
- Abandoned Railway Bed (Approximate Centreline)
- Bible Creek (Approximate Centreline)
- Bible Creek Flow Direction
- Potential Wetland

NOTES
Base data source: ESRI, CanVec (50,000) & ESRD
Imagery provided by ESRI; Maxar (2017)

STATUS
ISSUED FOR USE

2022 DUGOUT SAMPLING PROGRAM
CLASS 1 WASTE MANAGEMENT FACILITY
RYLEY, AB

Dugout Sampling Location Plan

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

Scale: 1:17,000
300 150 0 300
Metres

TETRA TECH

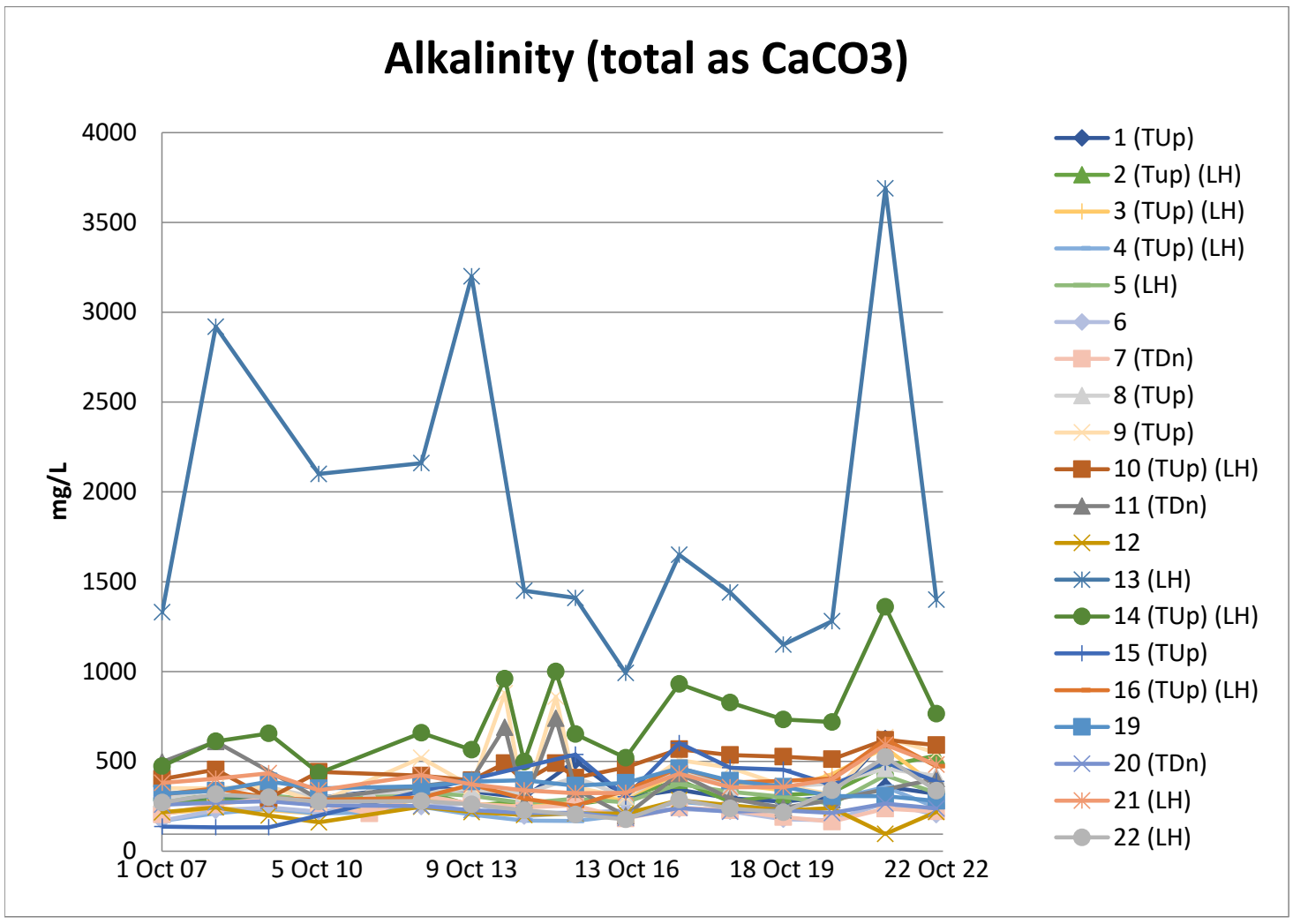
FILE NO. SWOP04592-01_Fig01_SamplingPlan.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-EDM	DS	SL	BF	0

DATE	PROJECT NO.
January 11, 2023	SWM.SWOP04592-01

Figure 1

Figure 2: Trend Charts



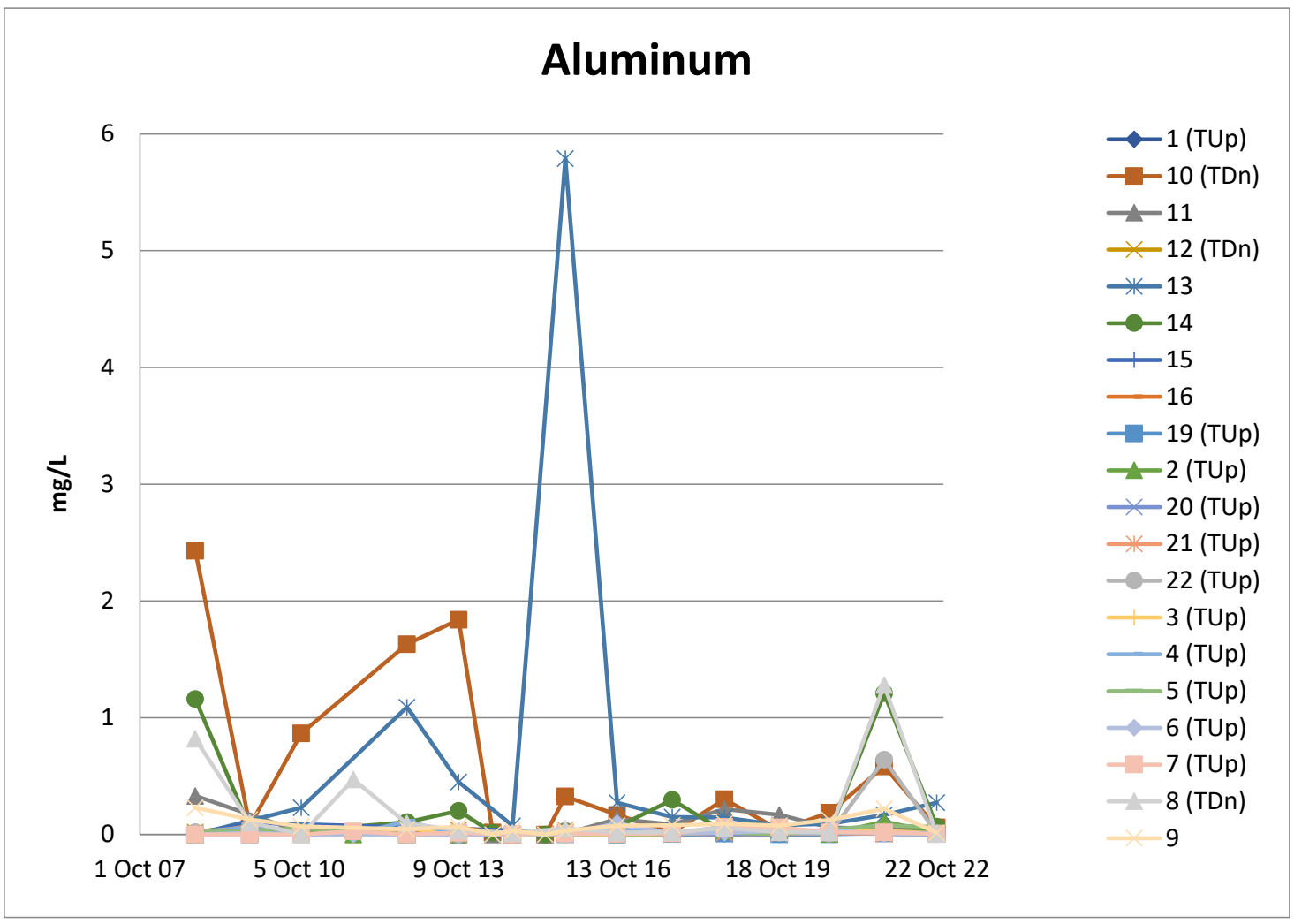
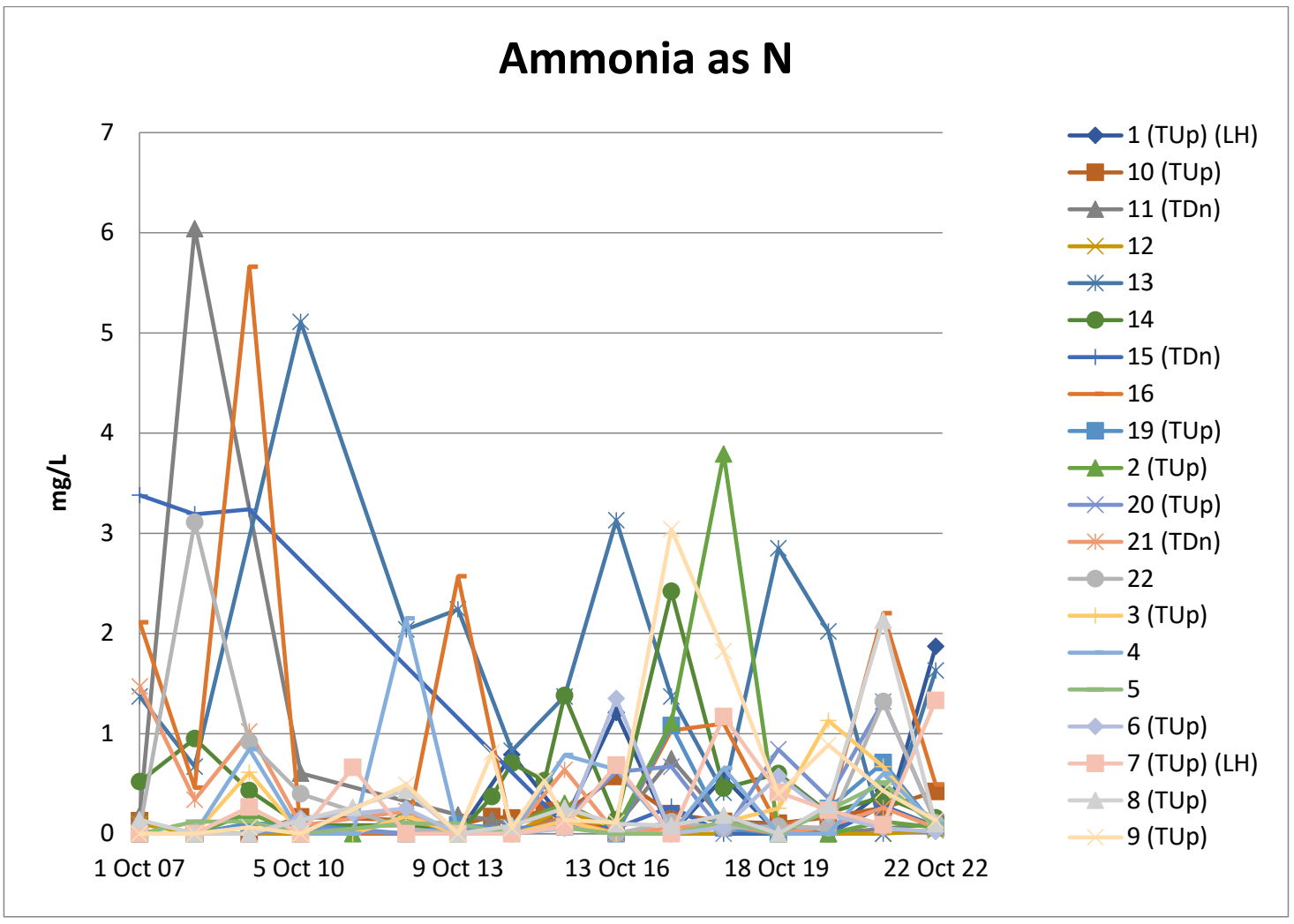


Figure 2: Trend Charts



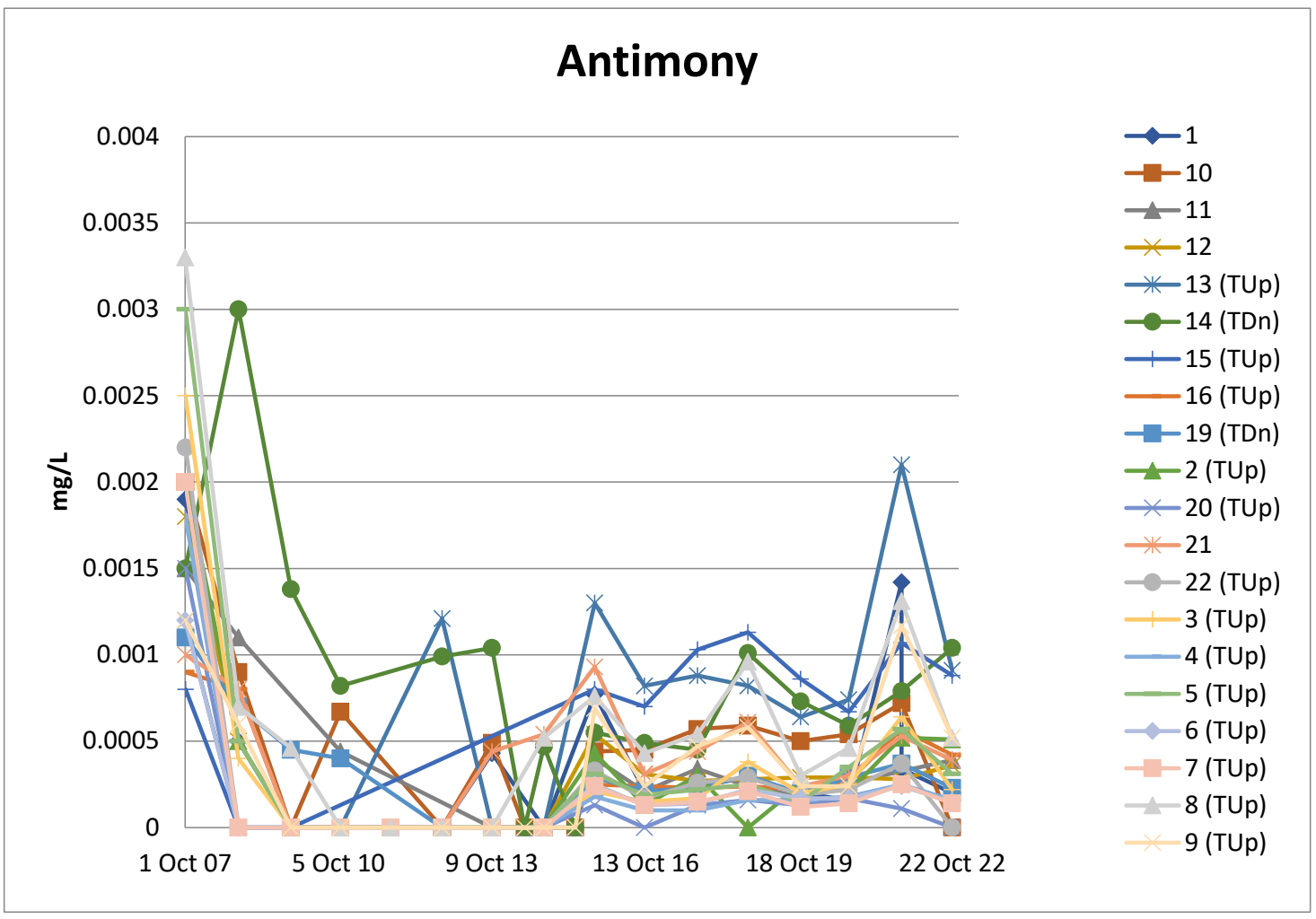
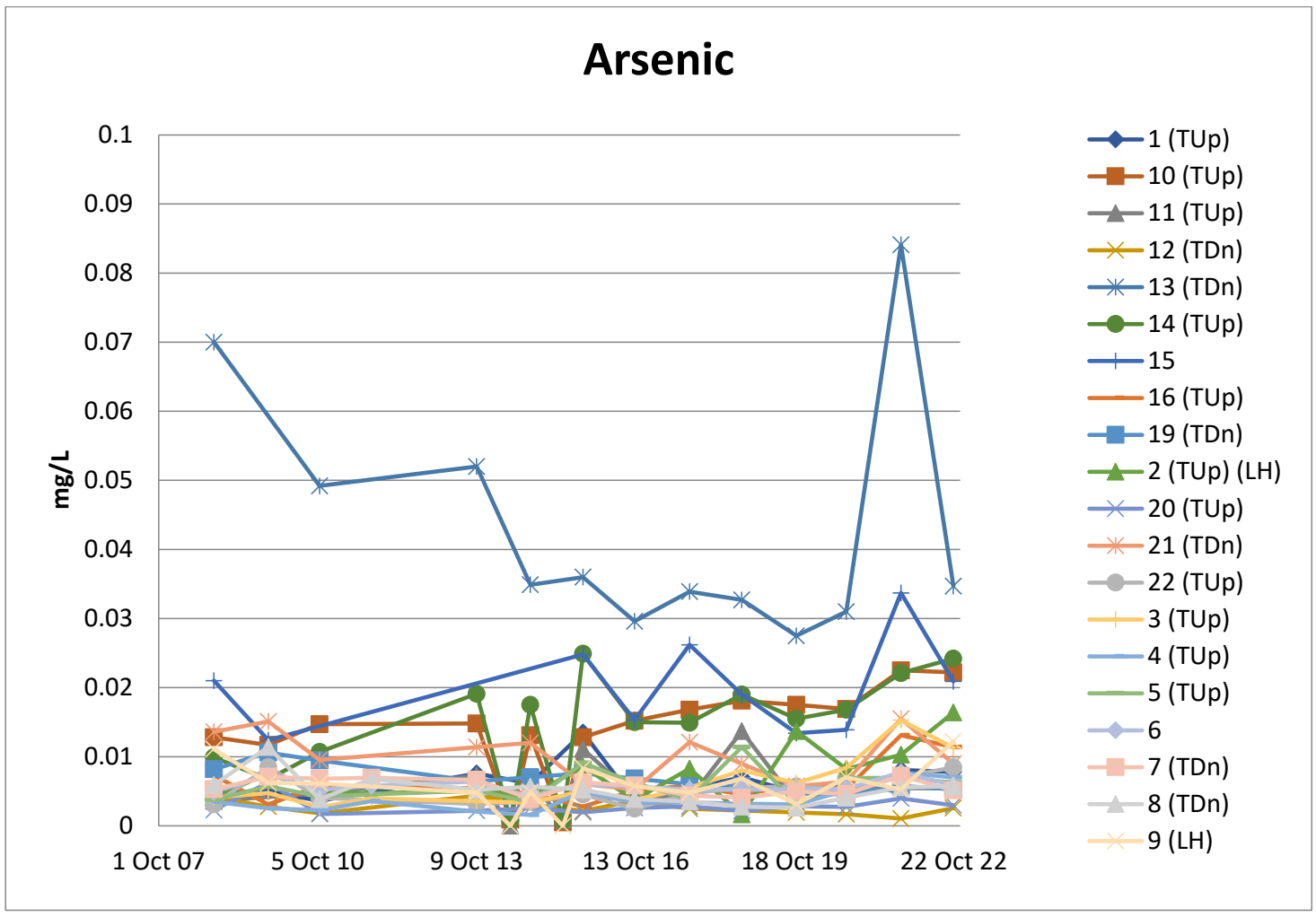
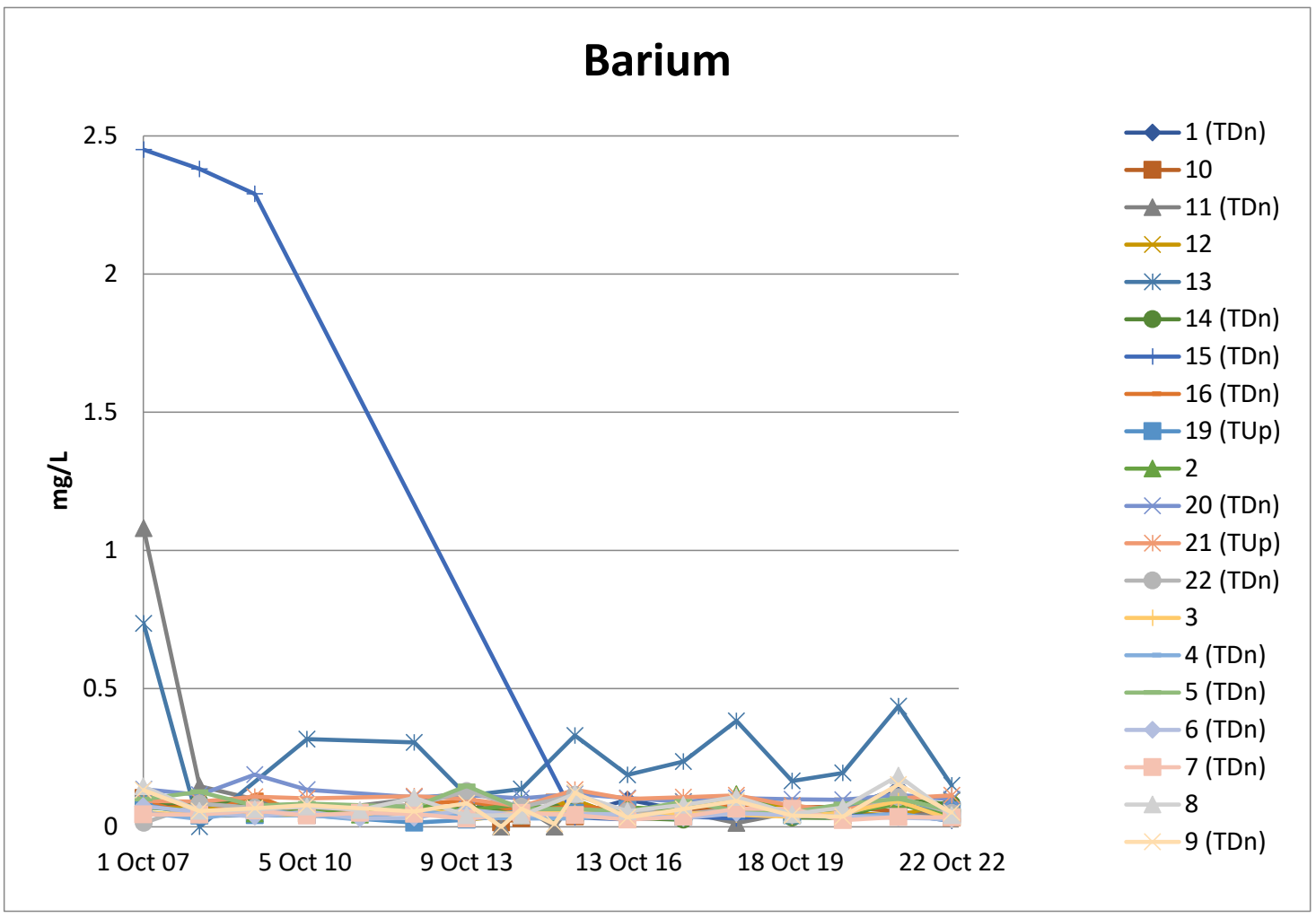


Figure 2: Trend Charts





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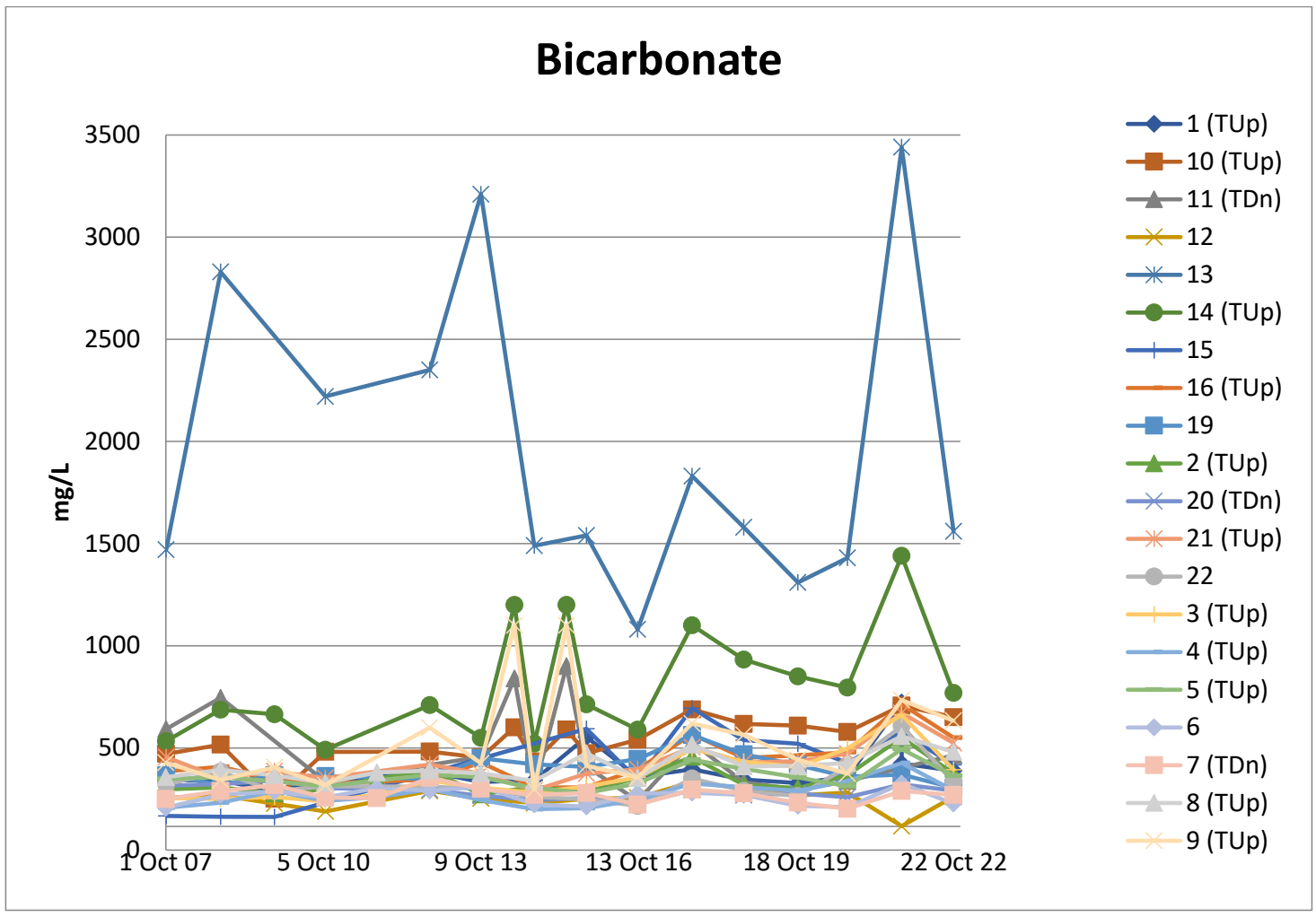

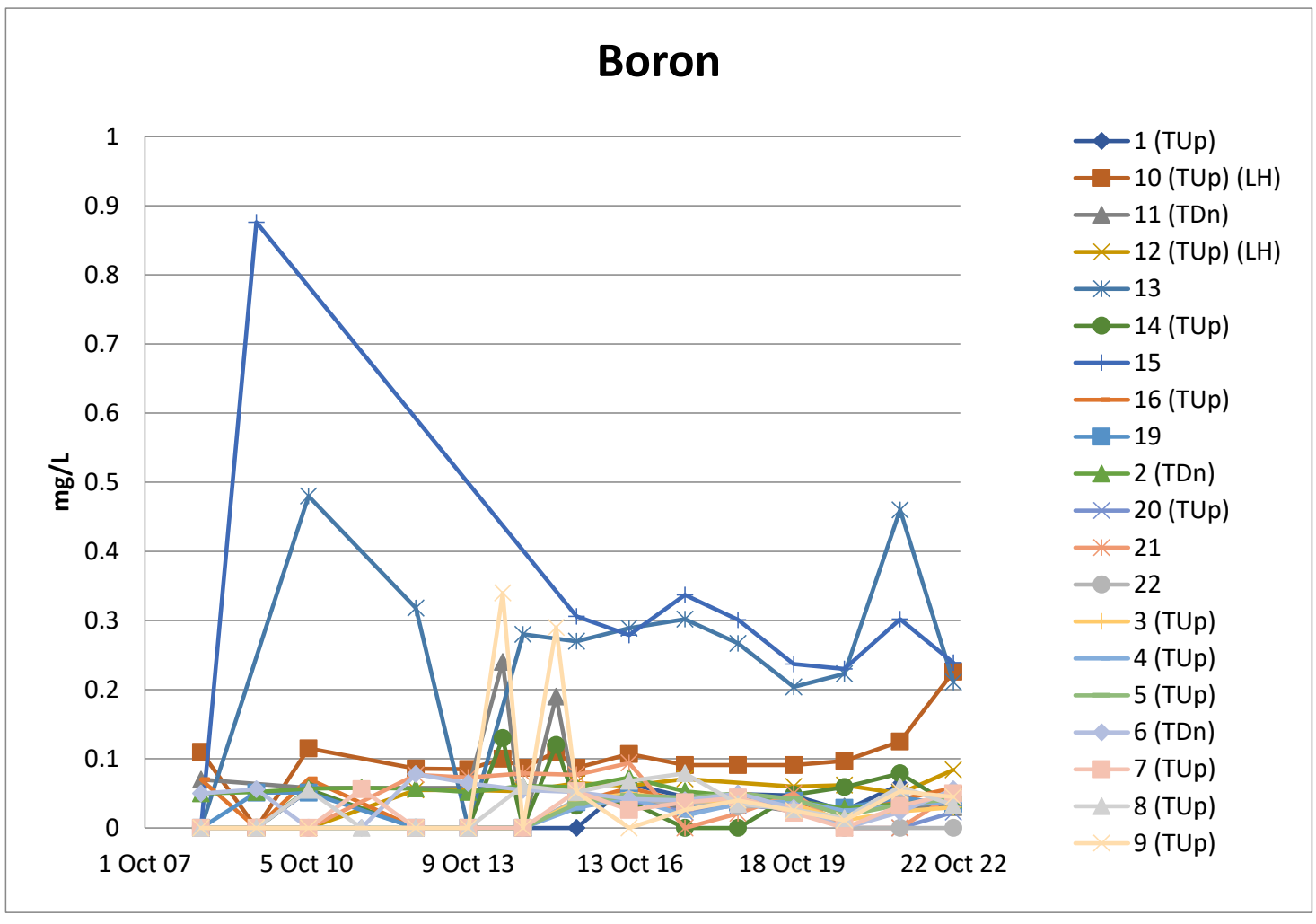

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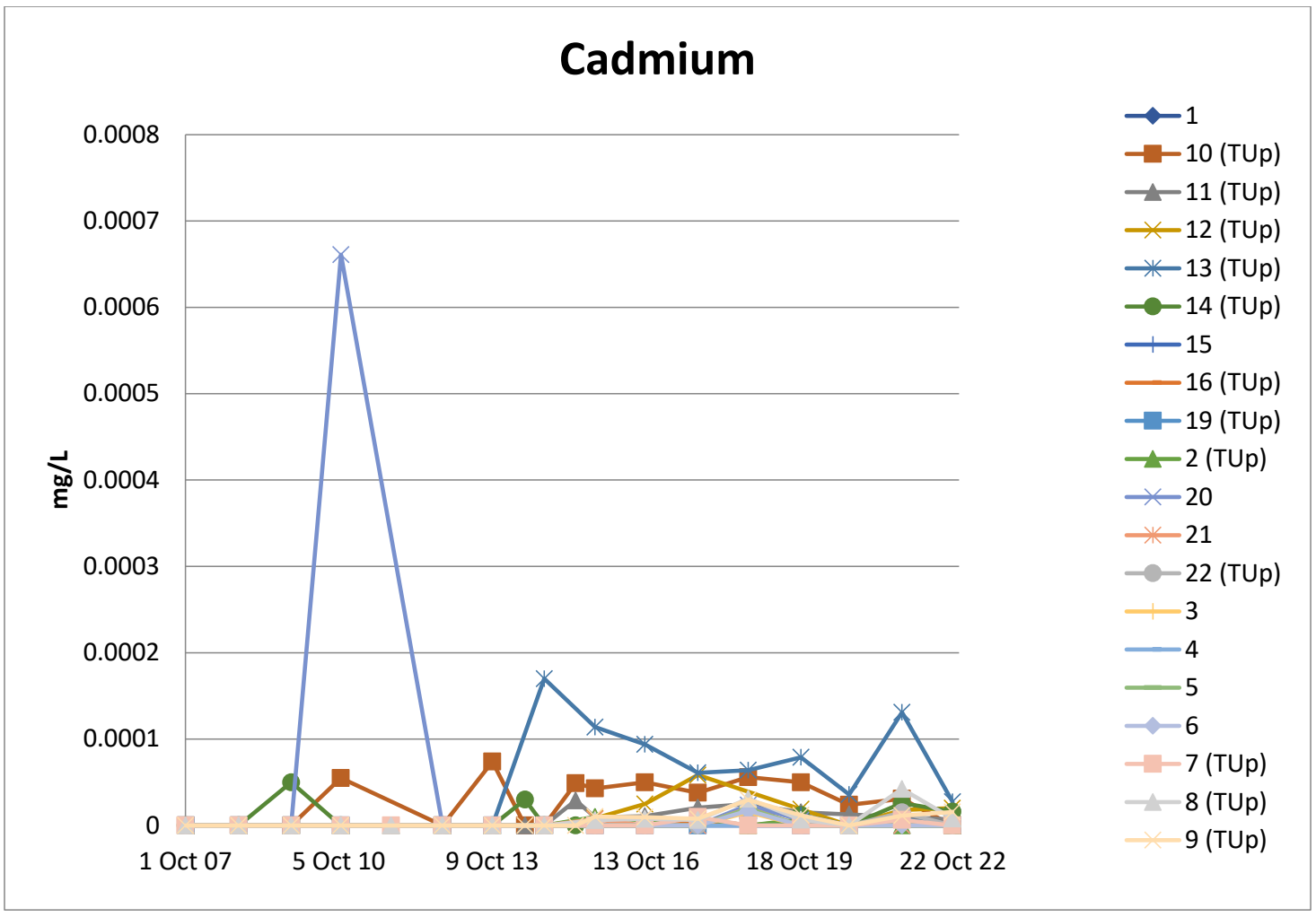

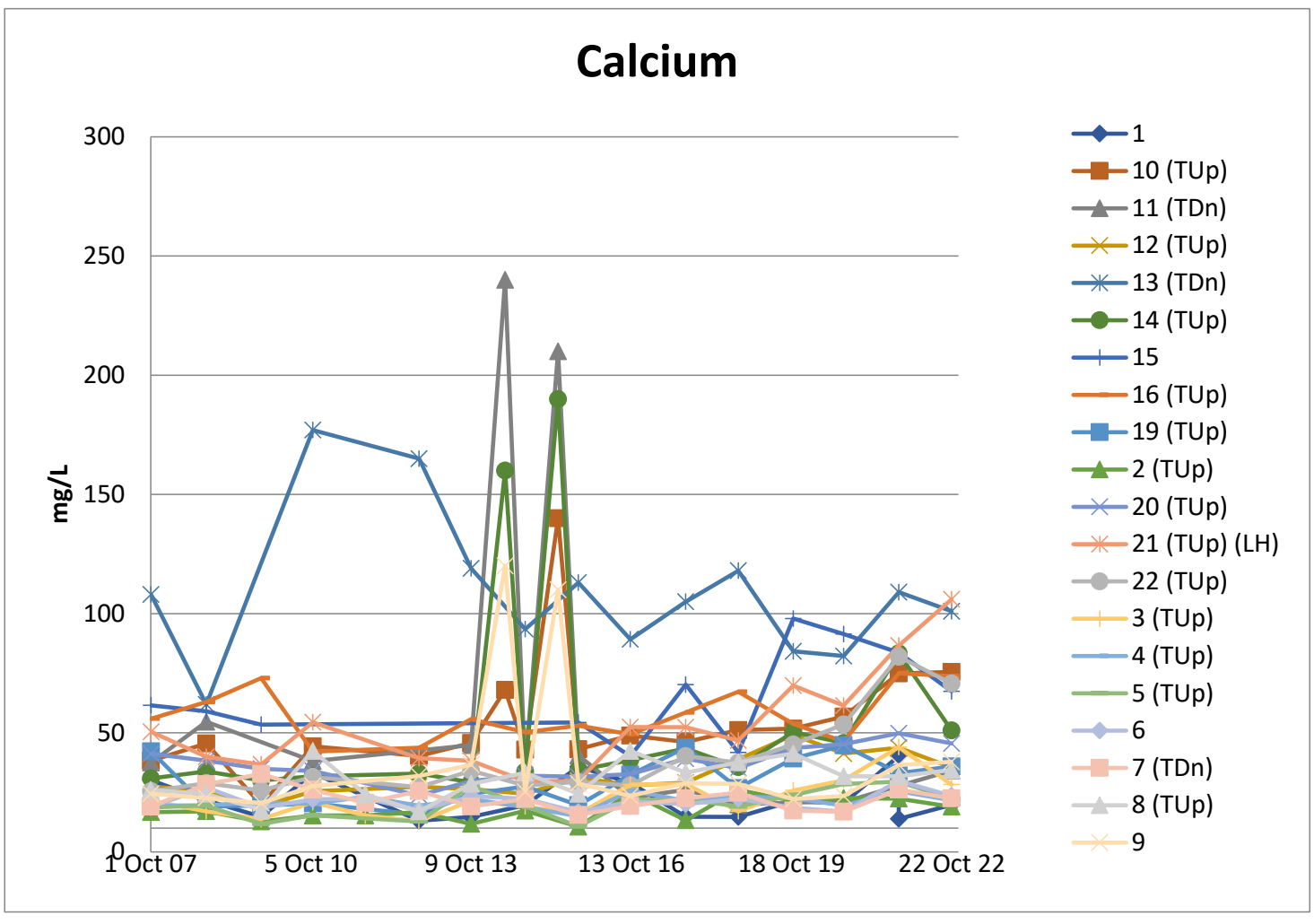

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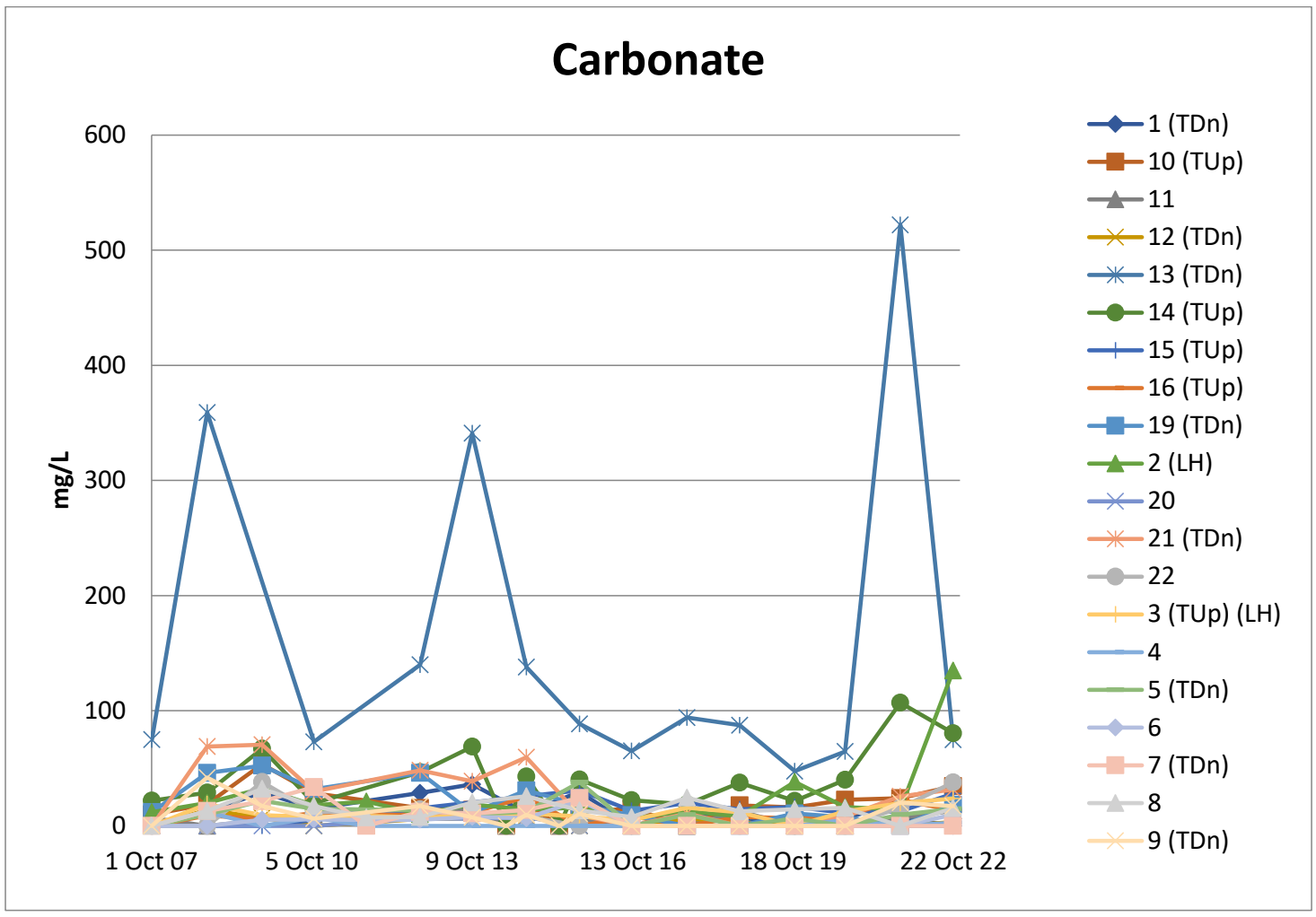

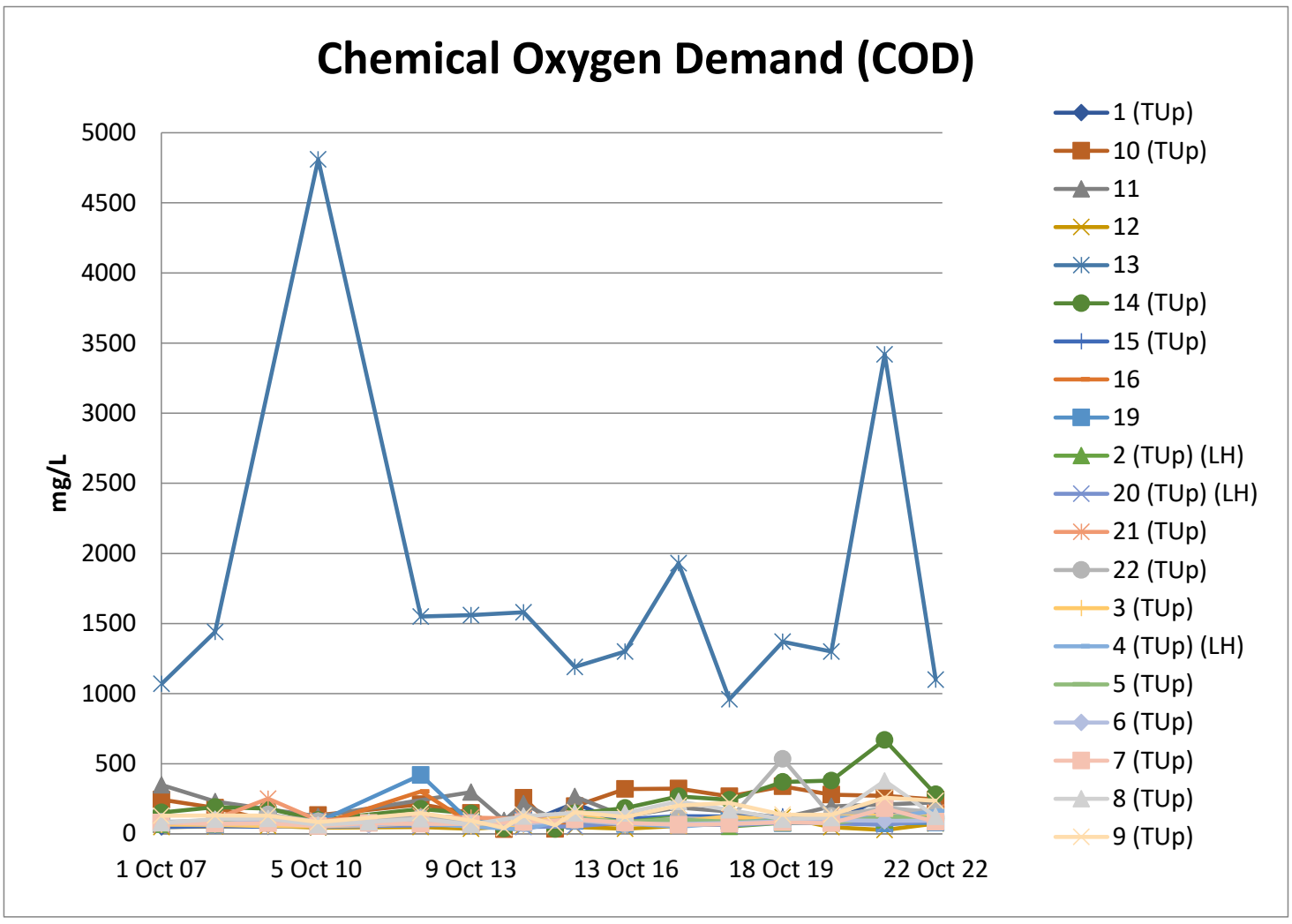

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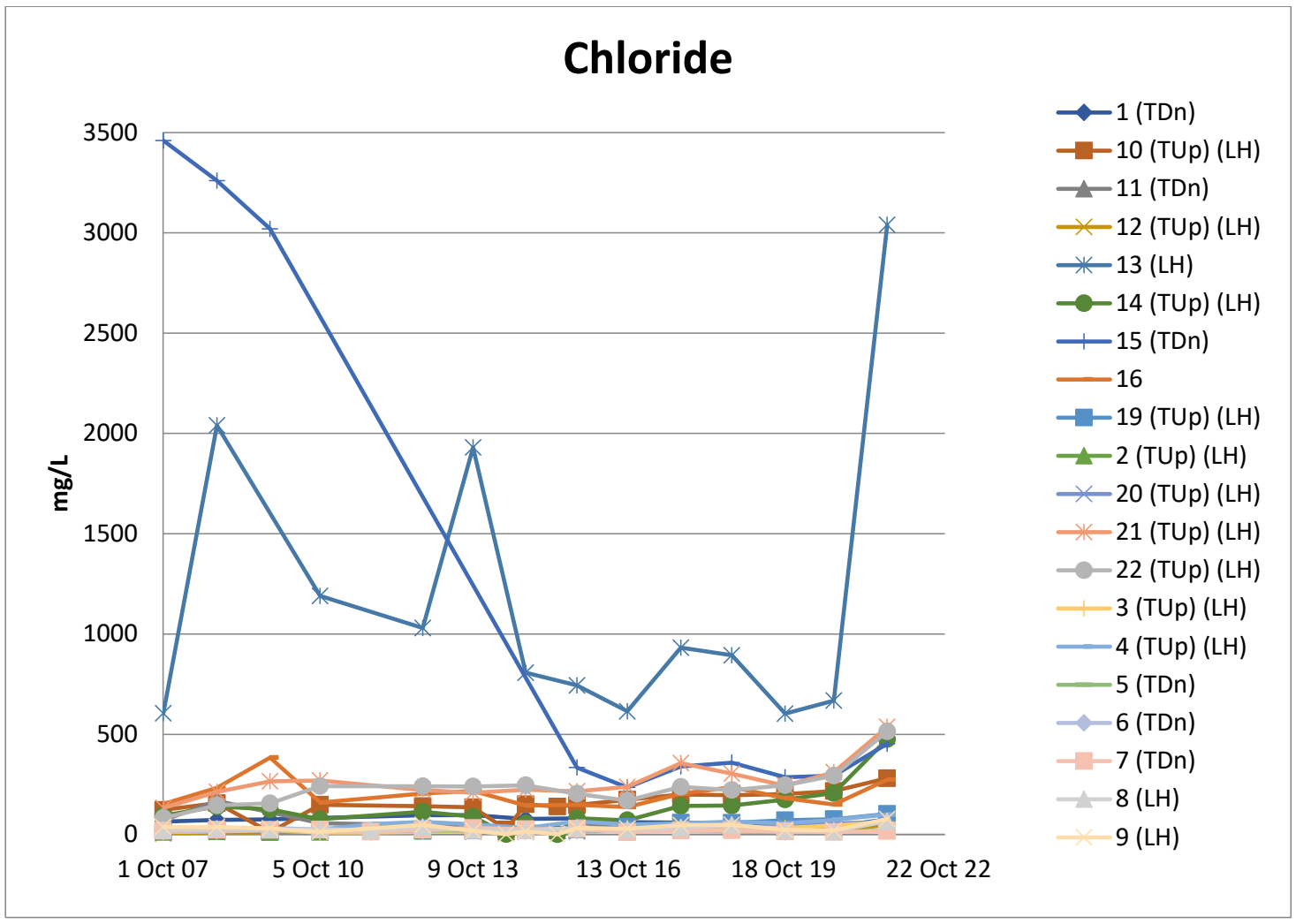

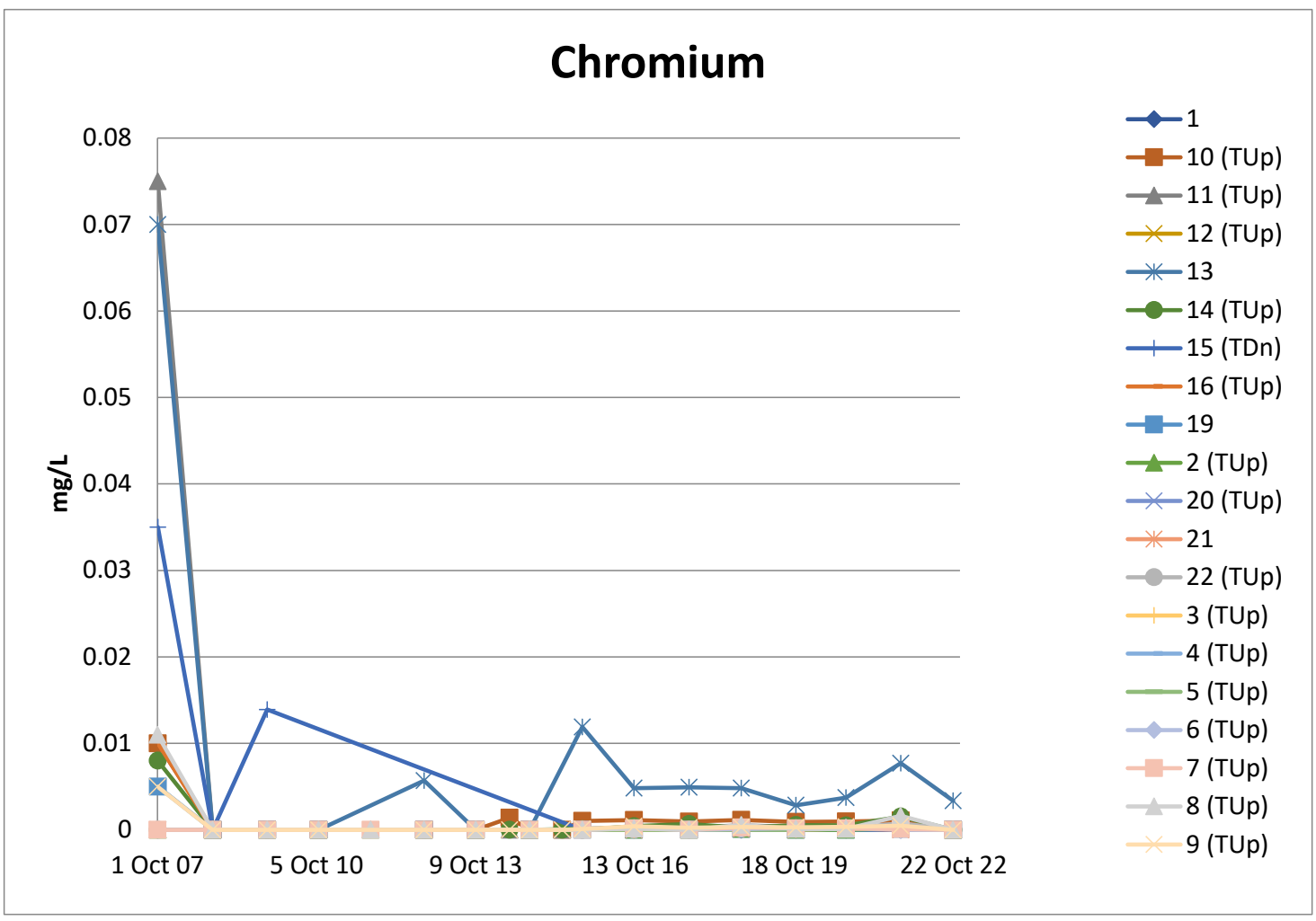

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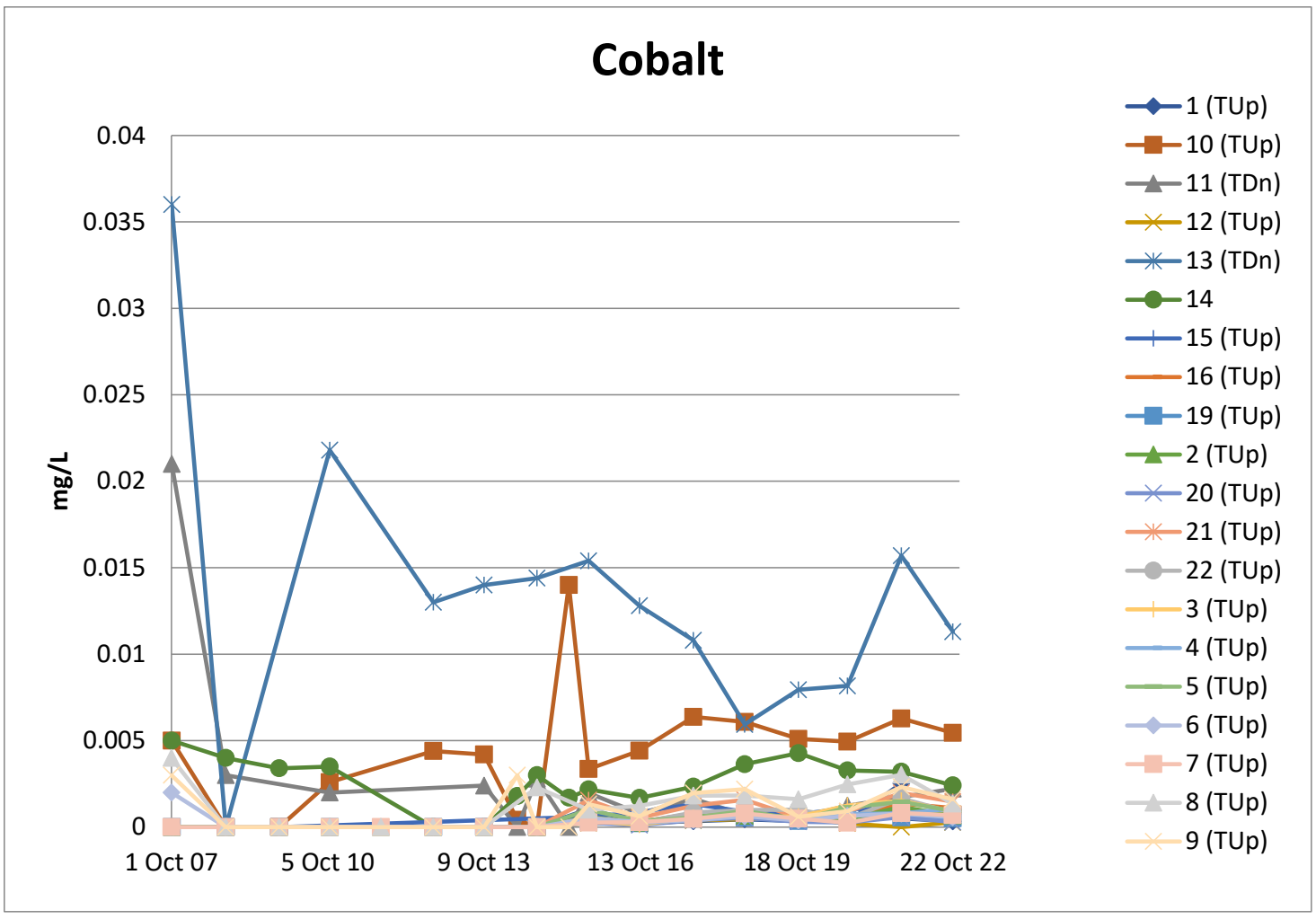

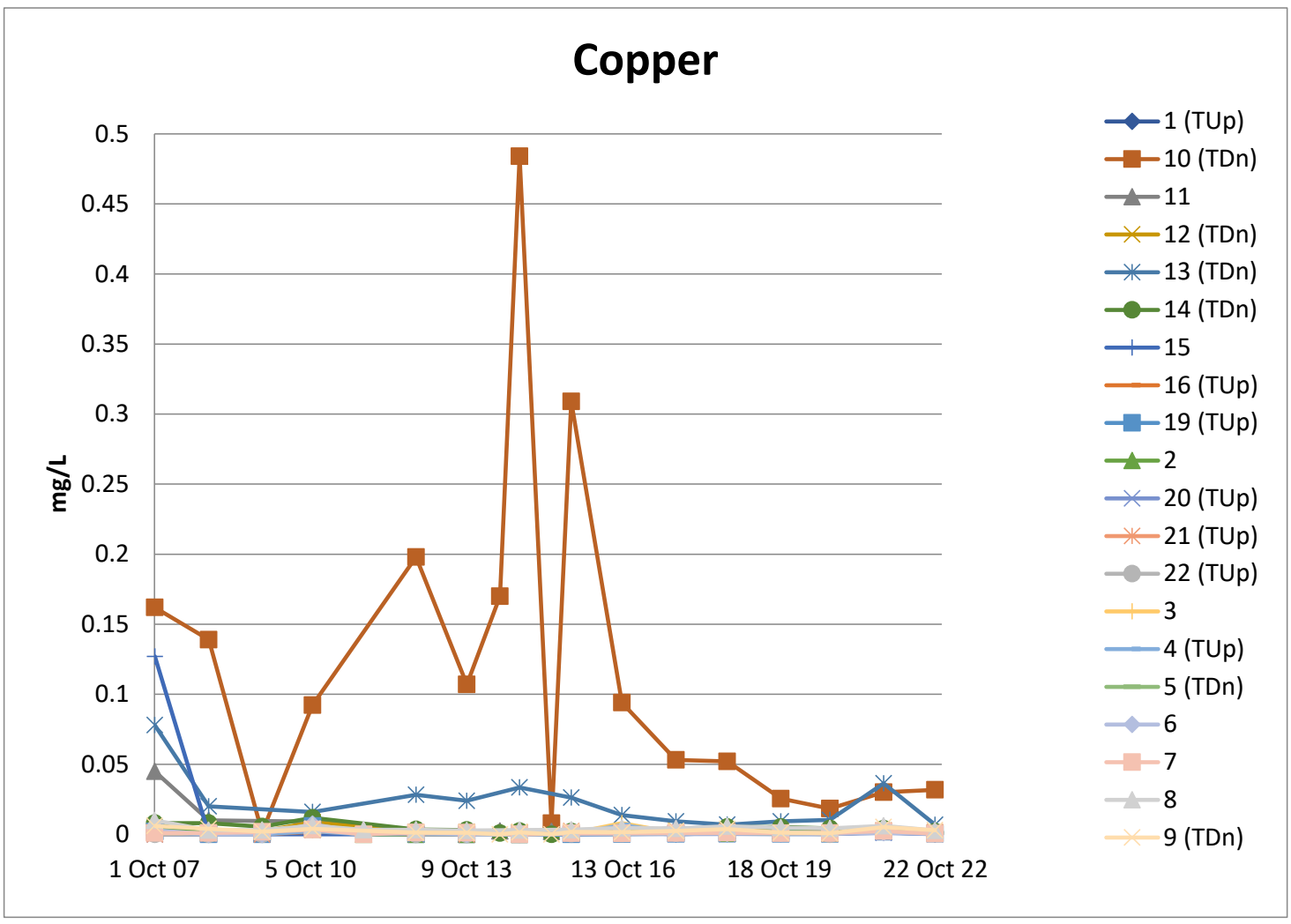

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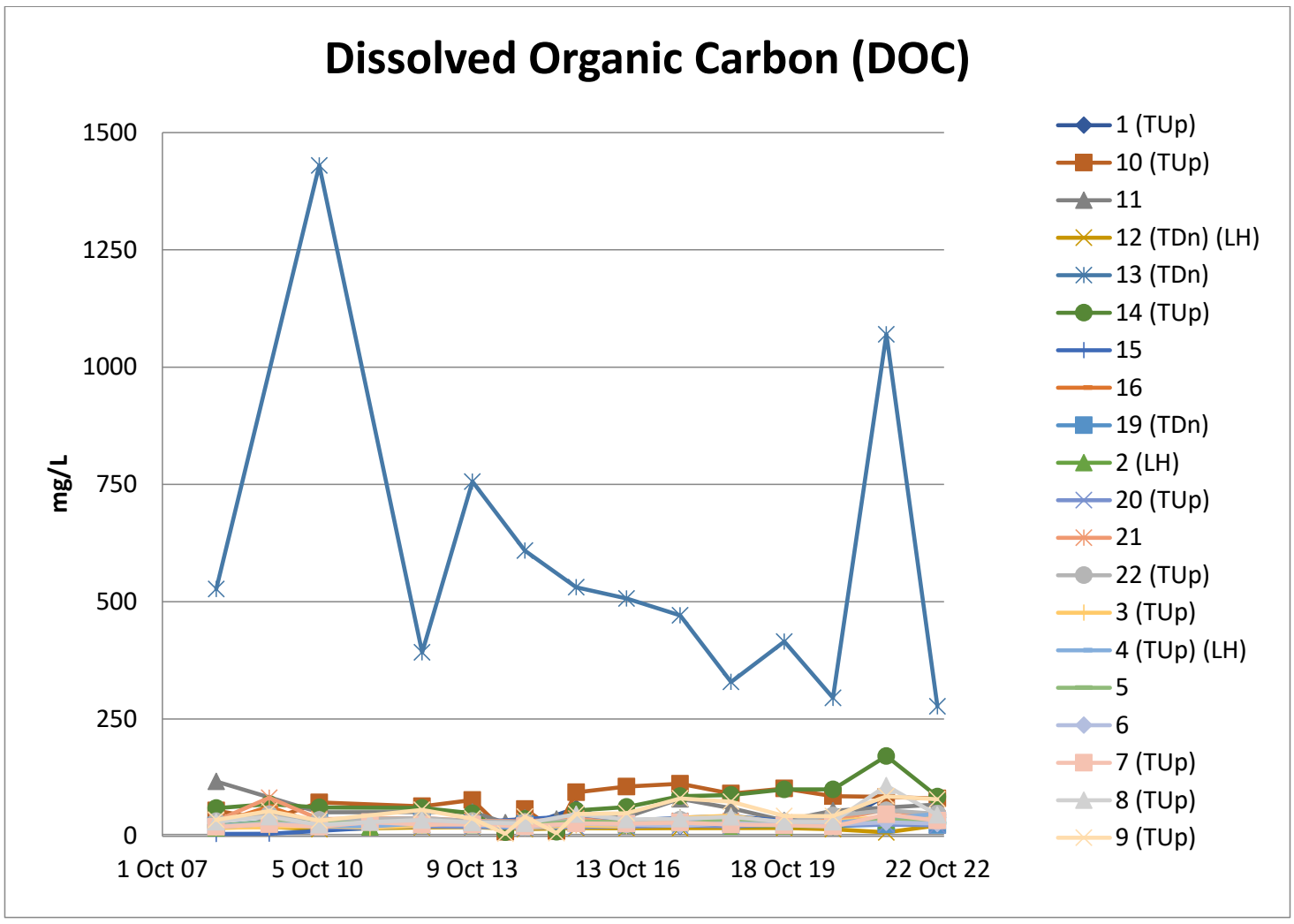

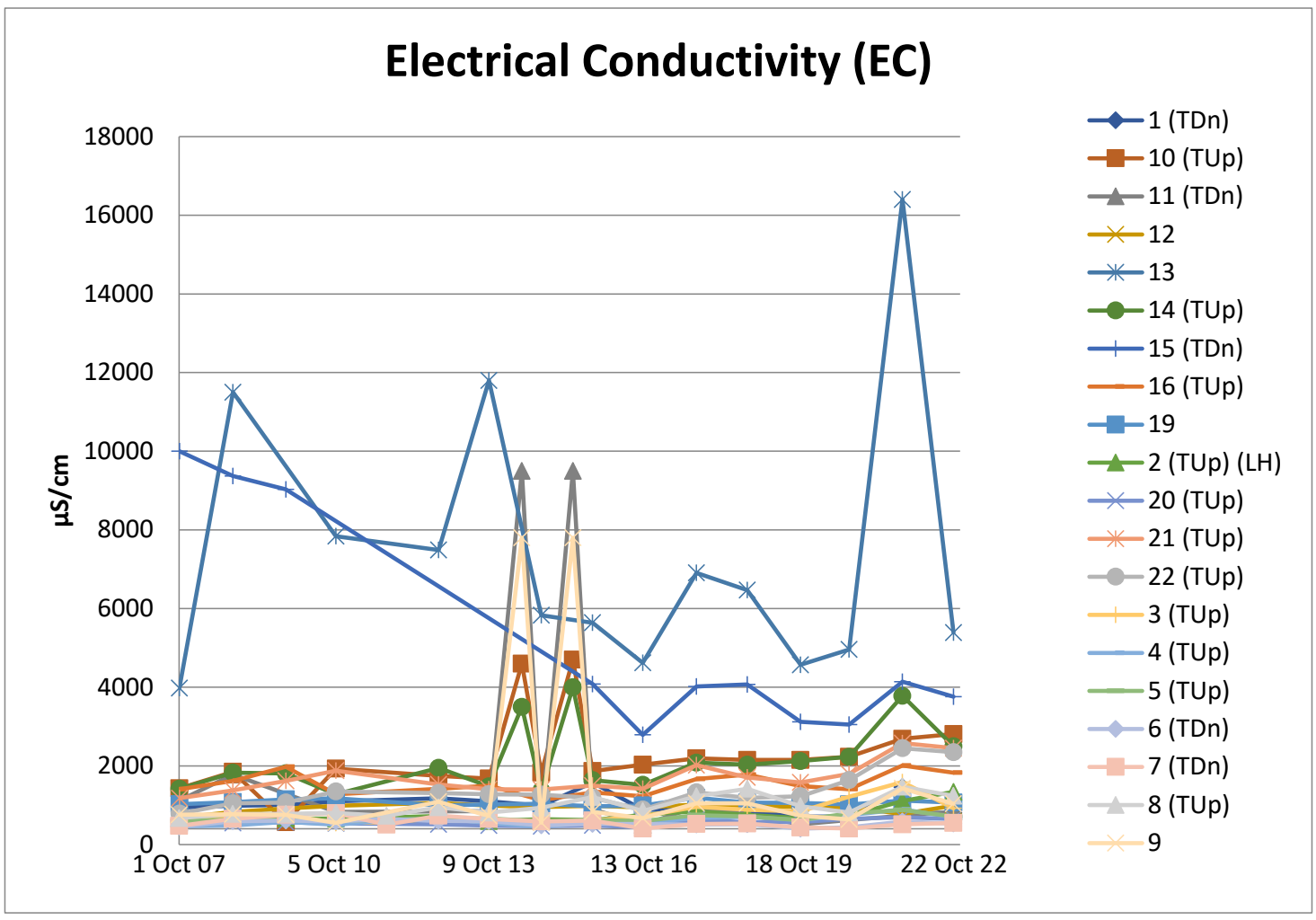

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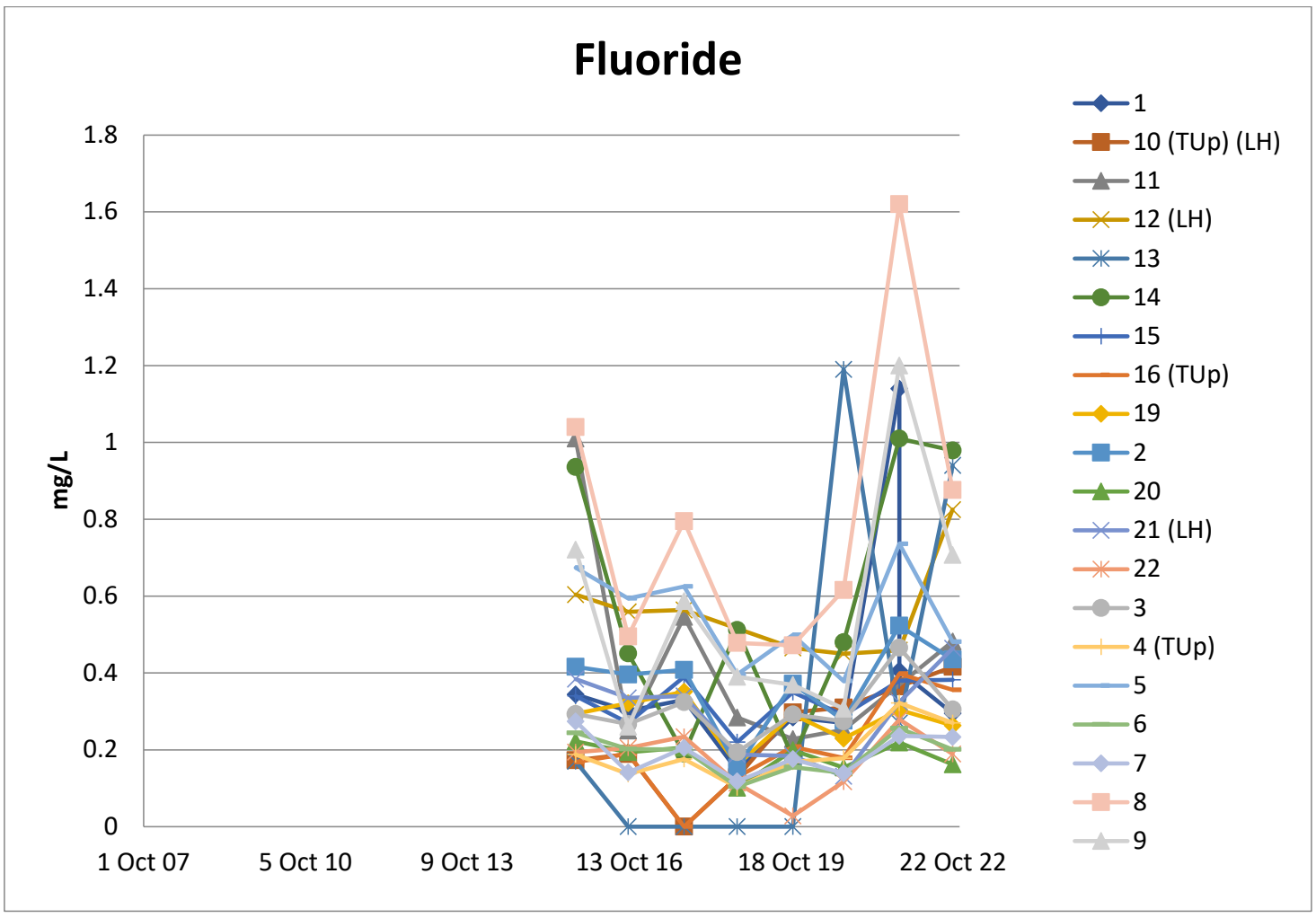

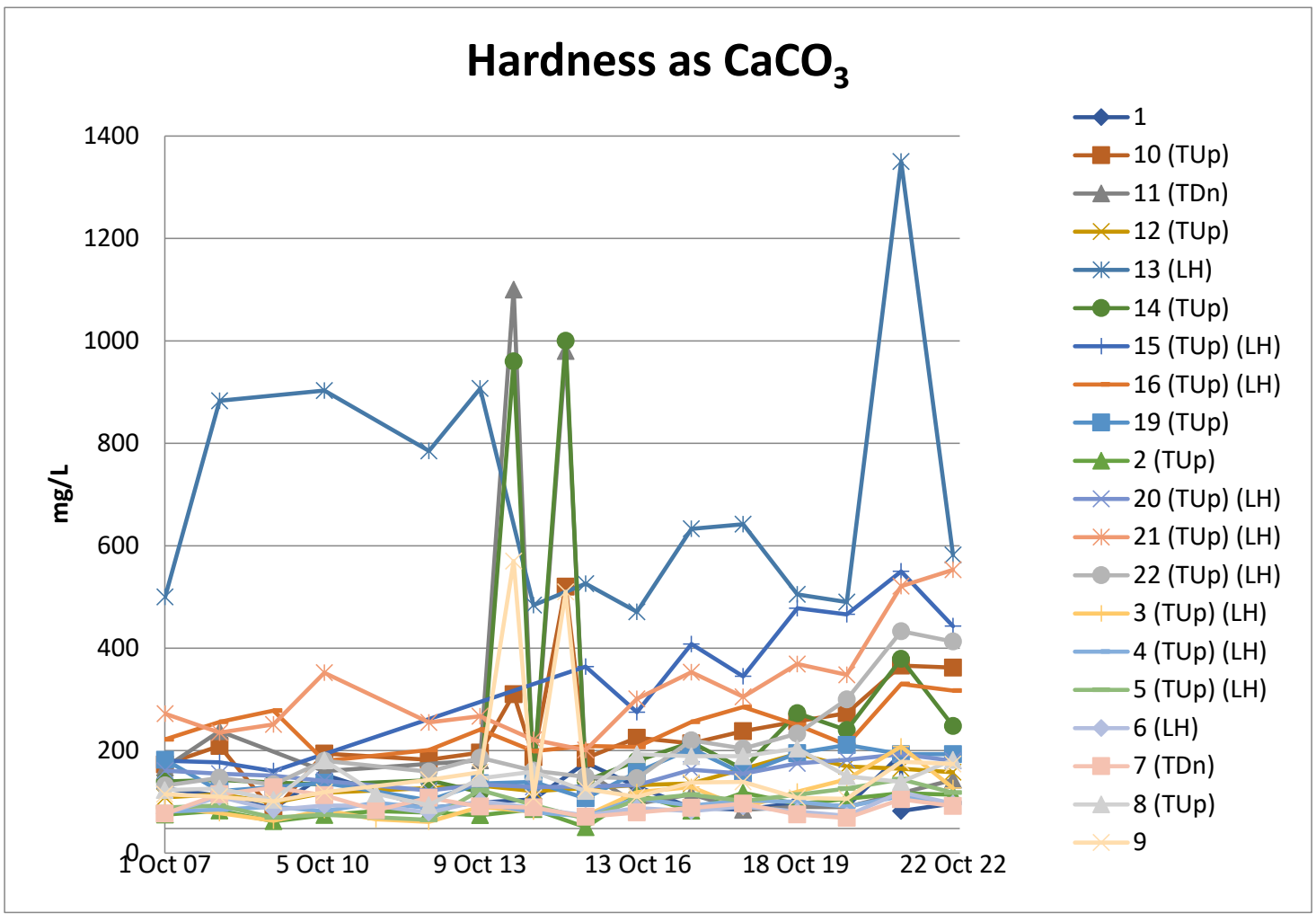

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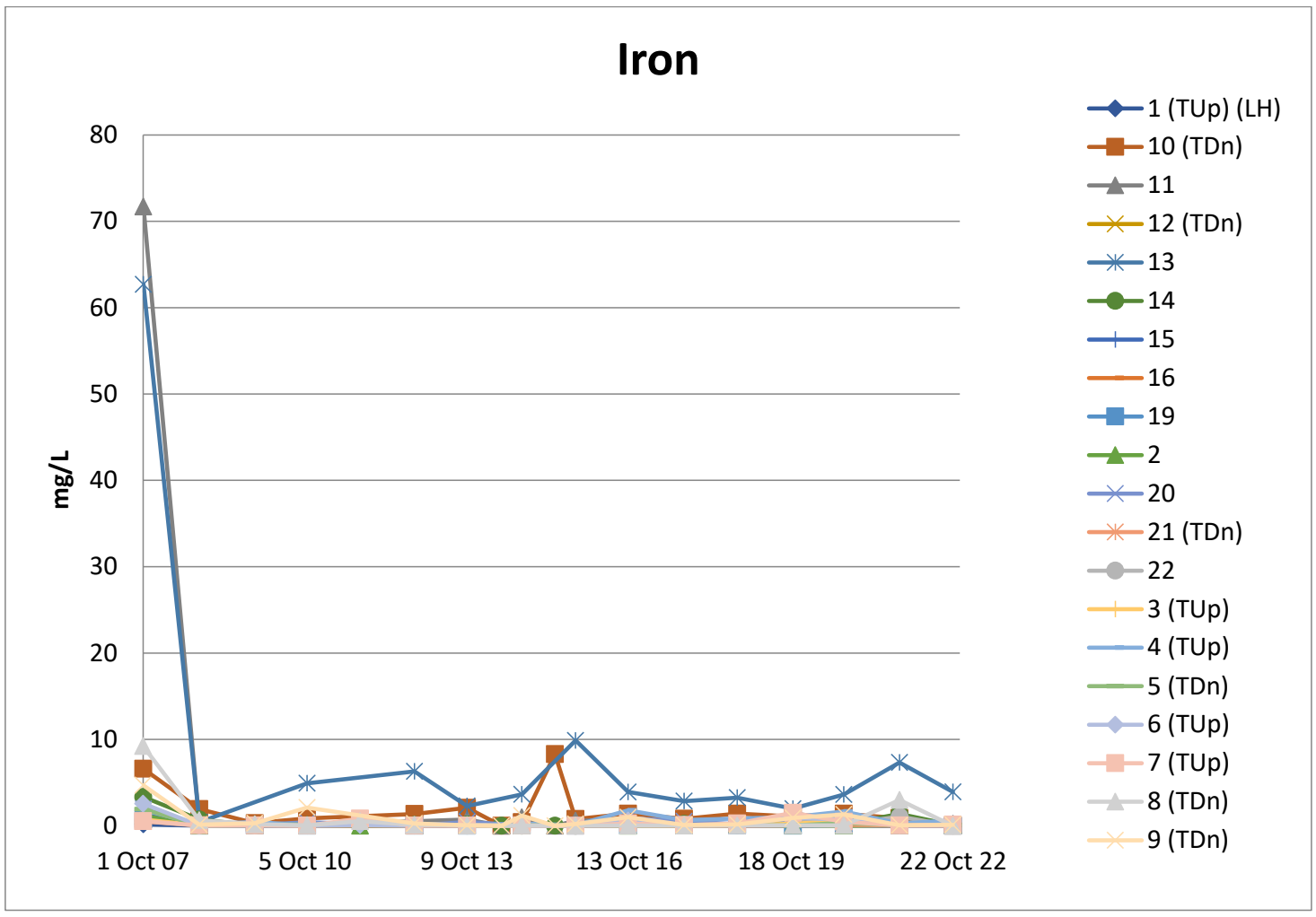

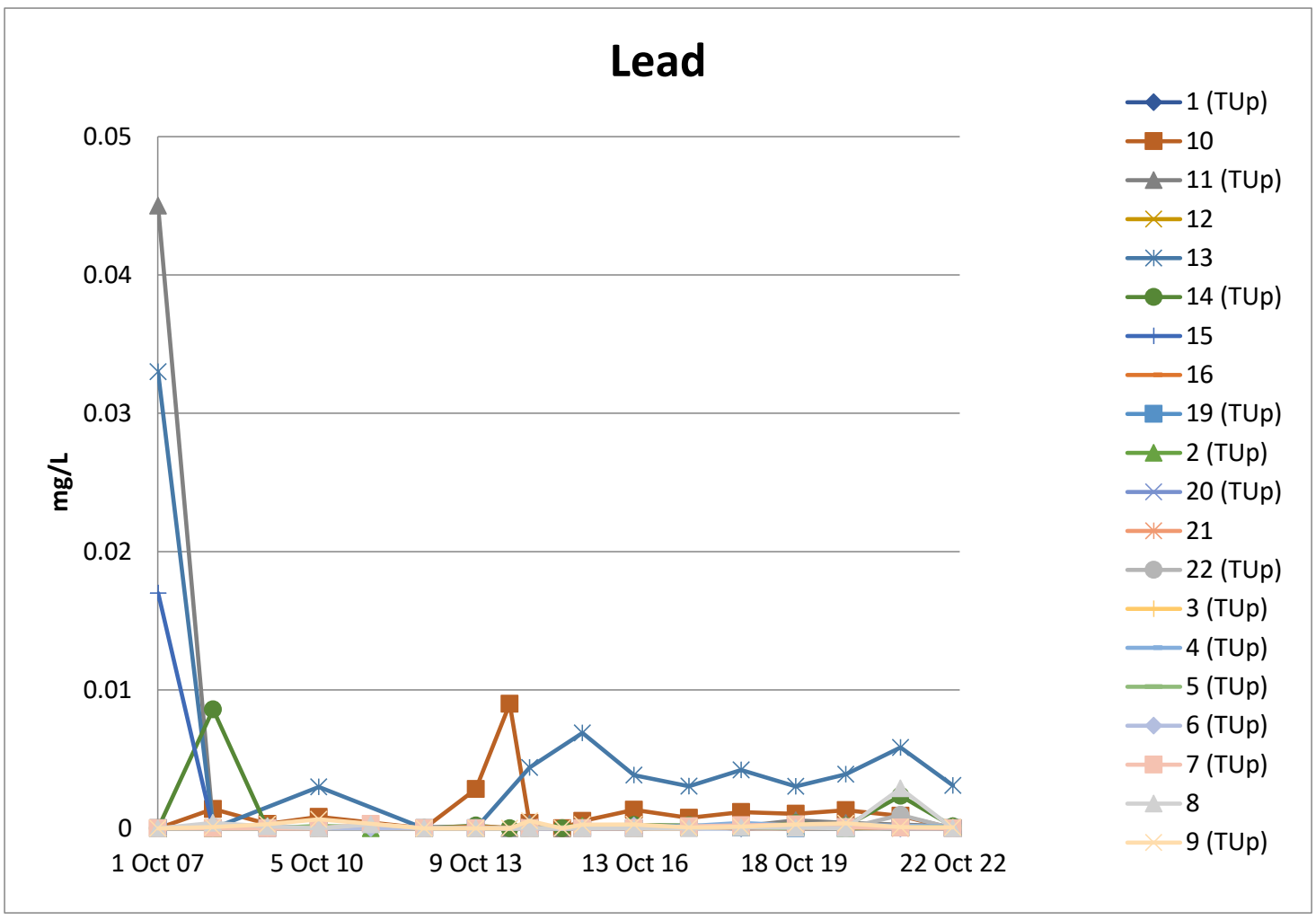

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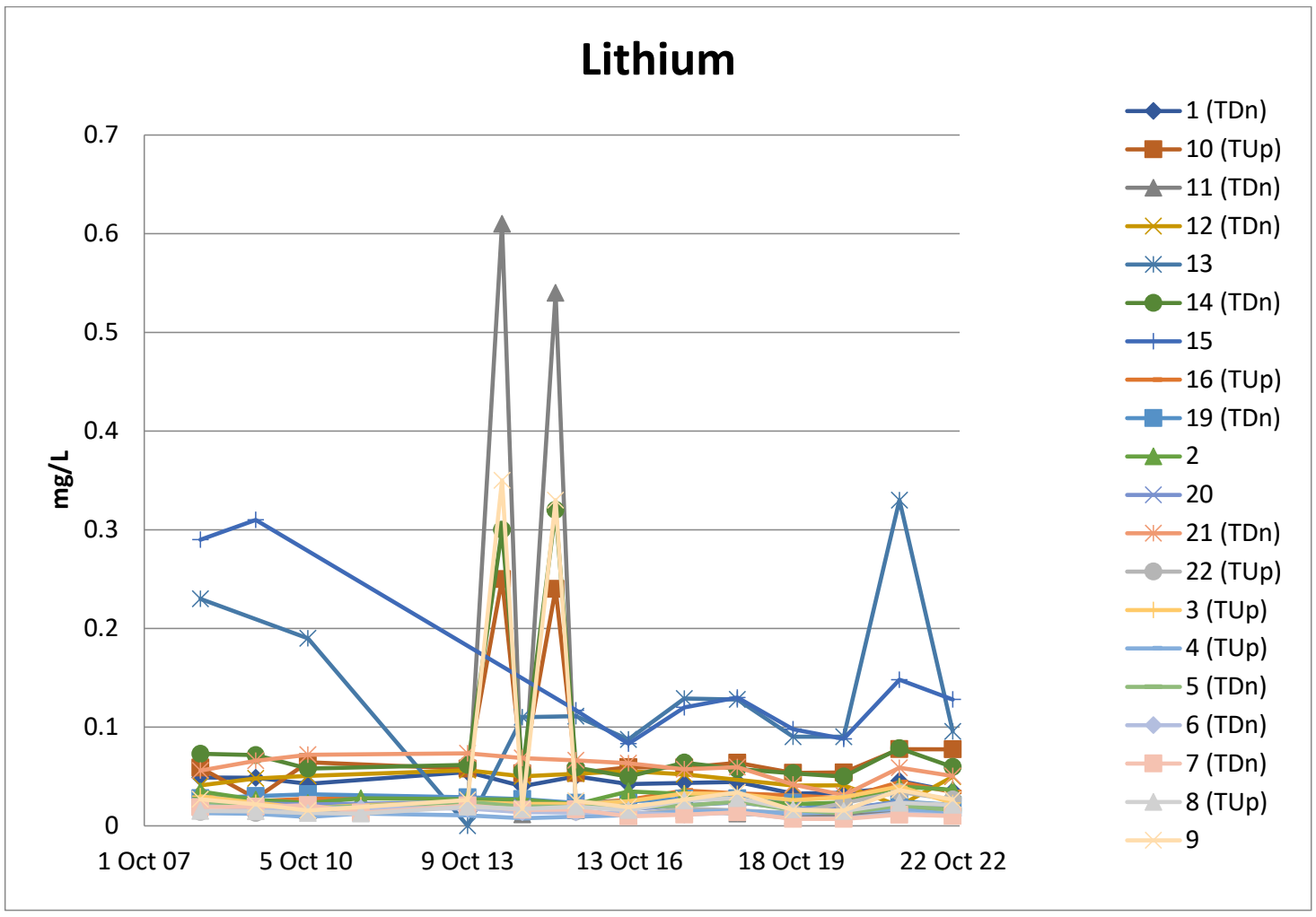

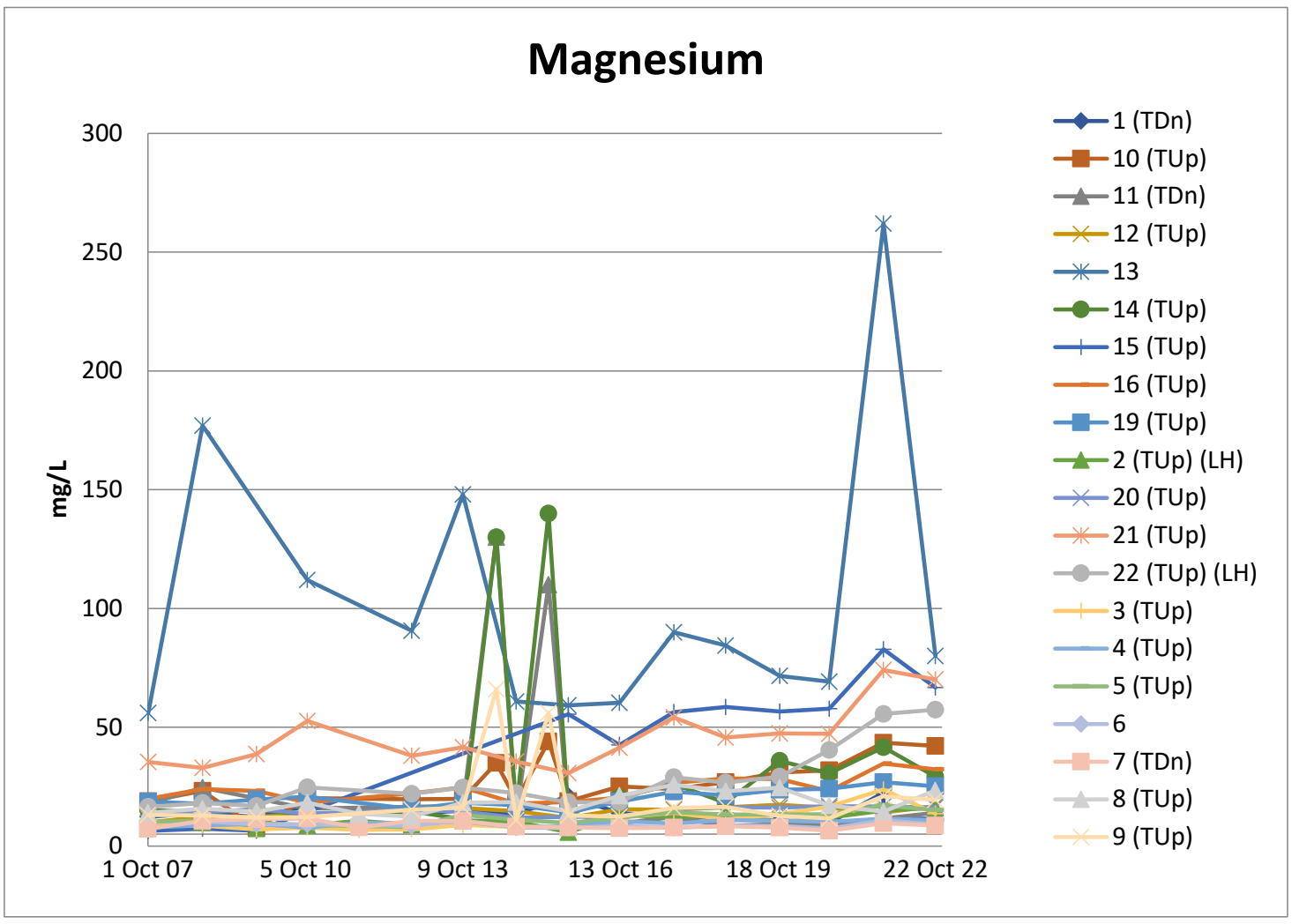

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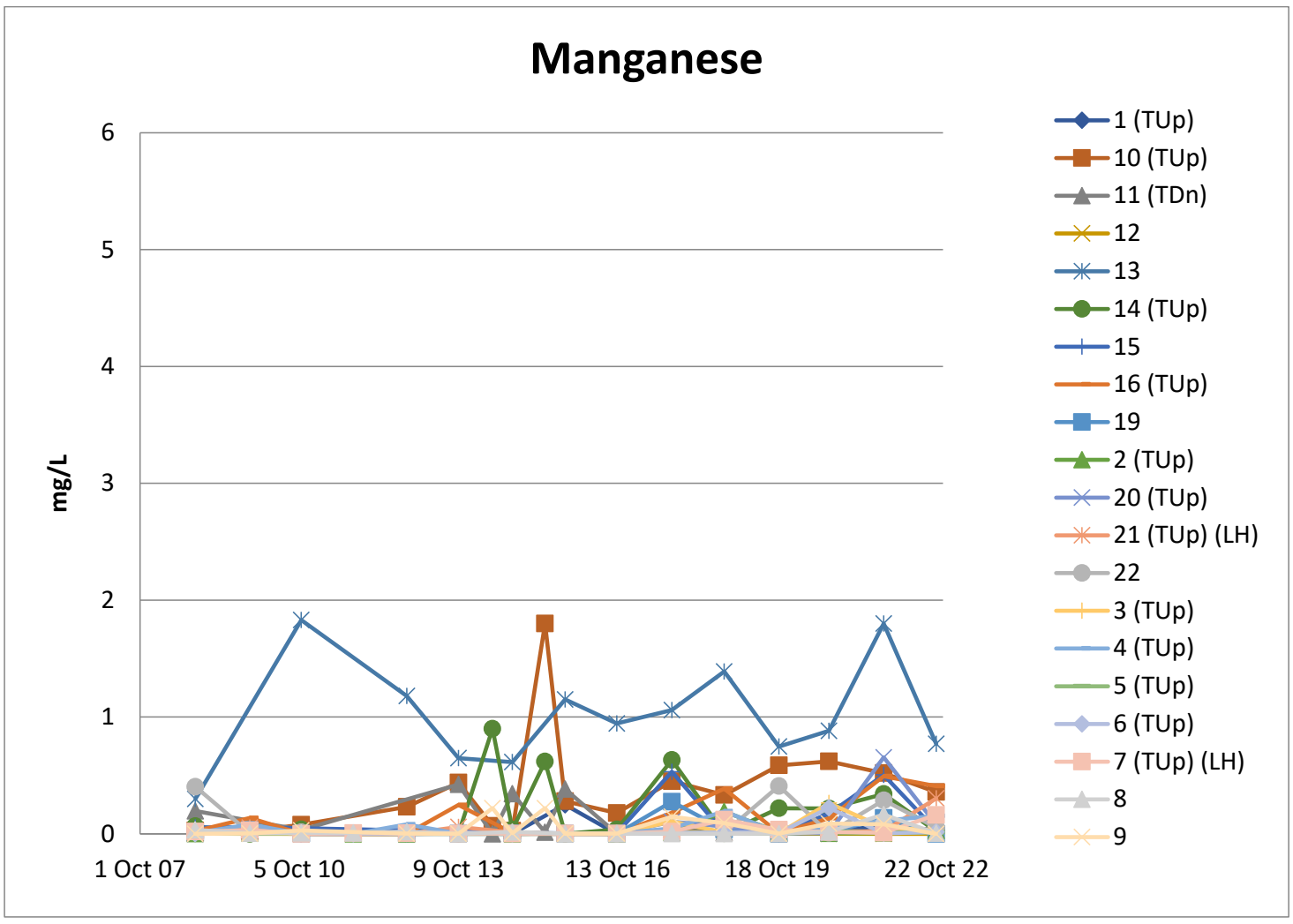

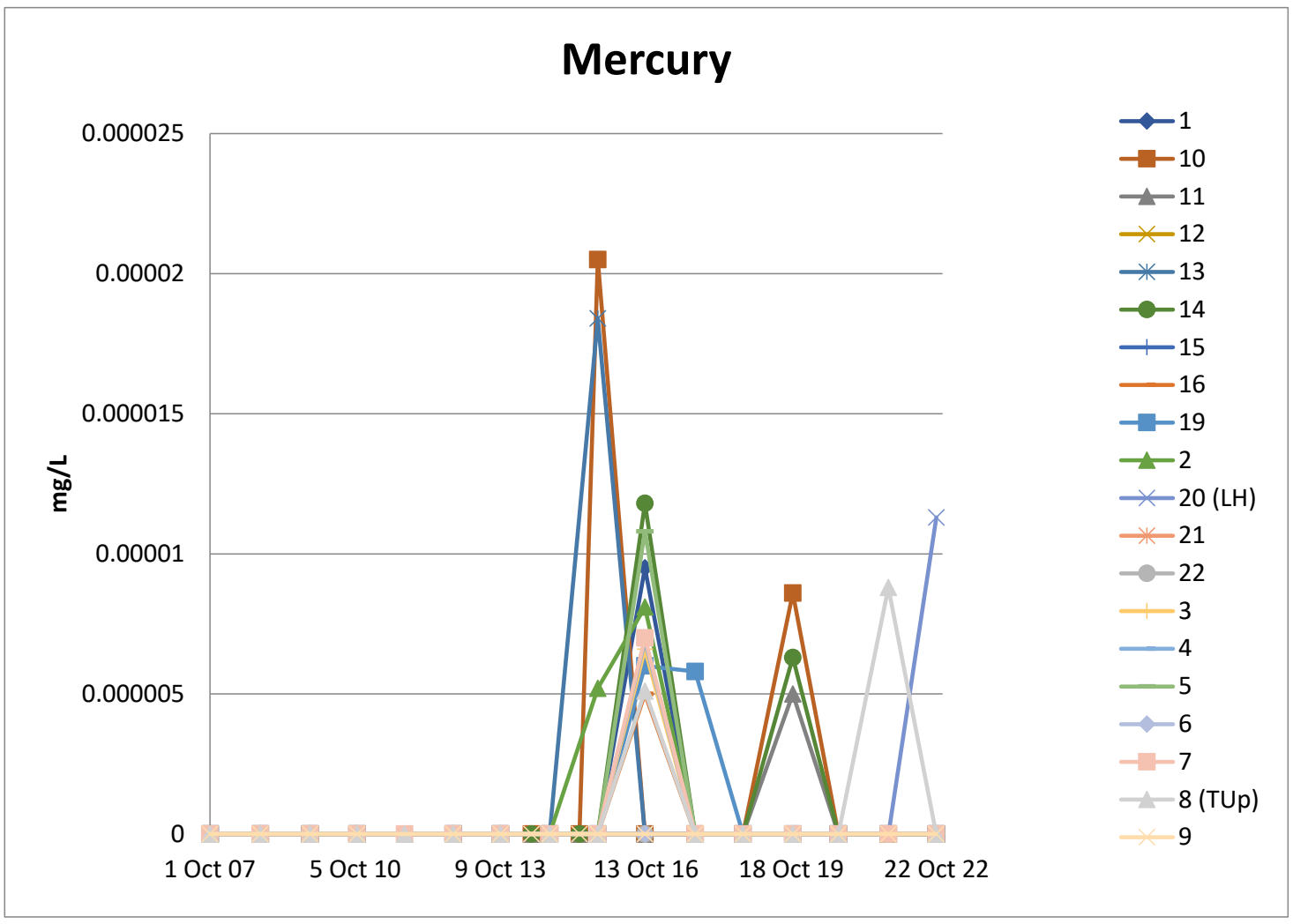

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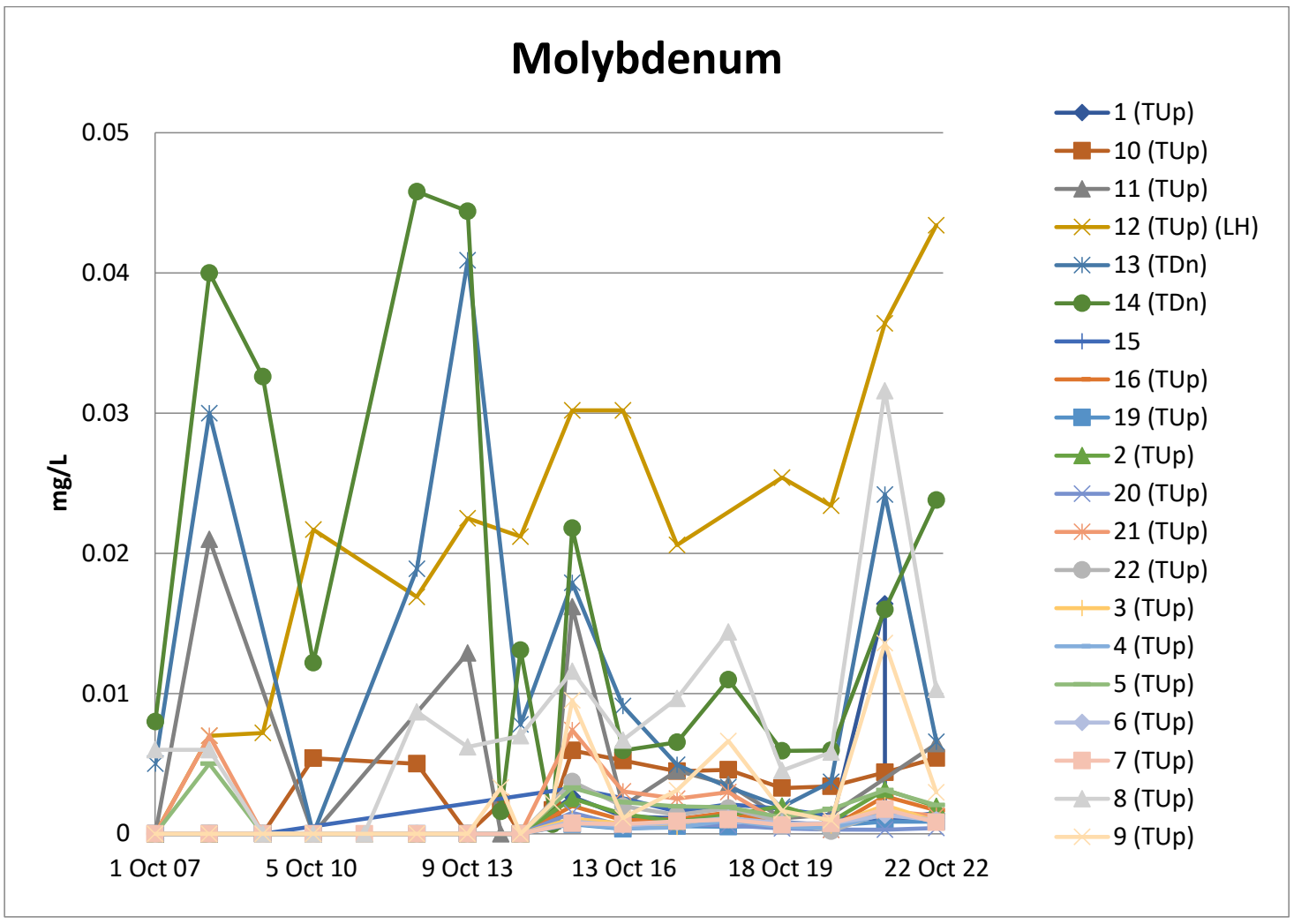

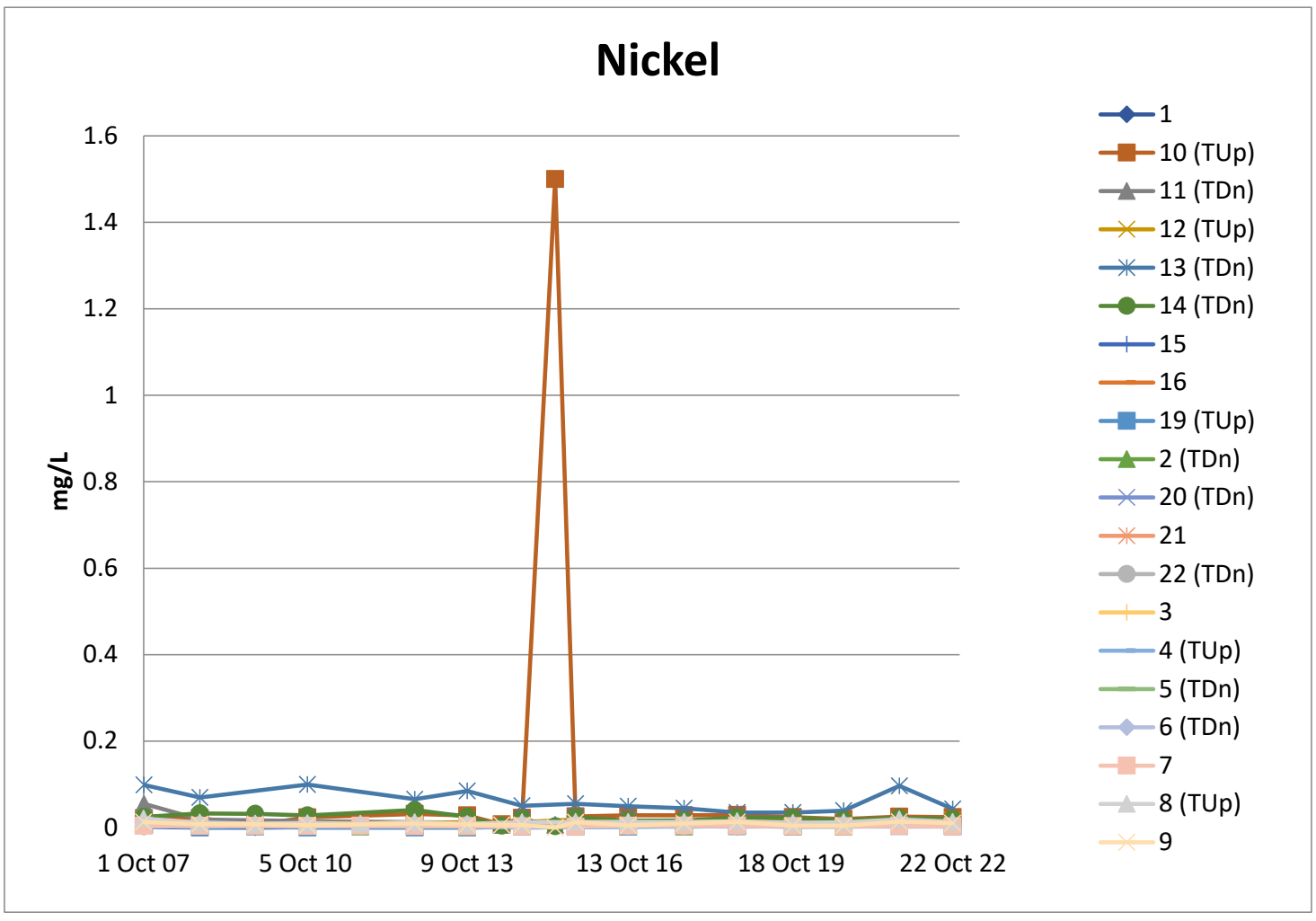

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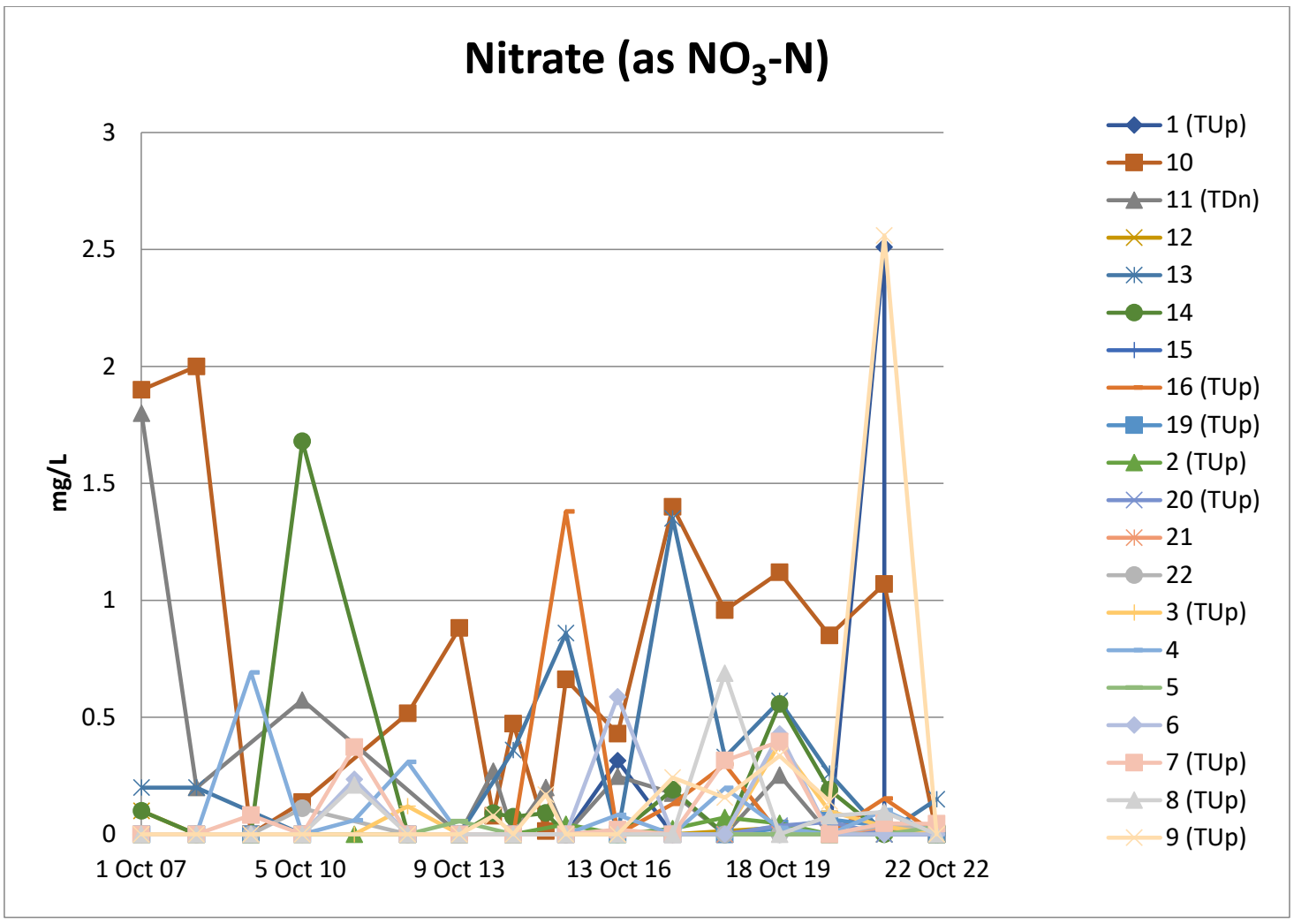

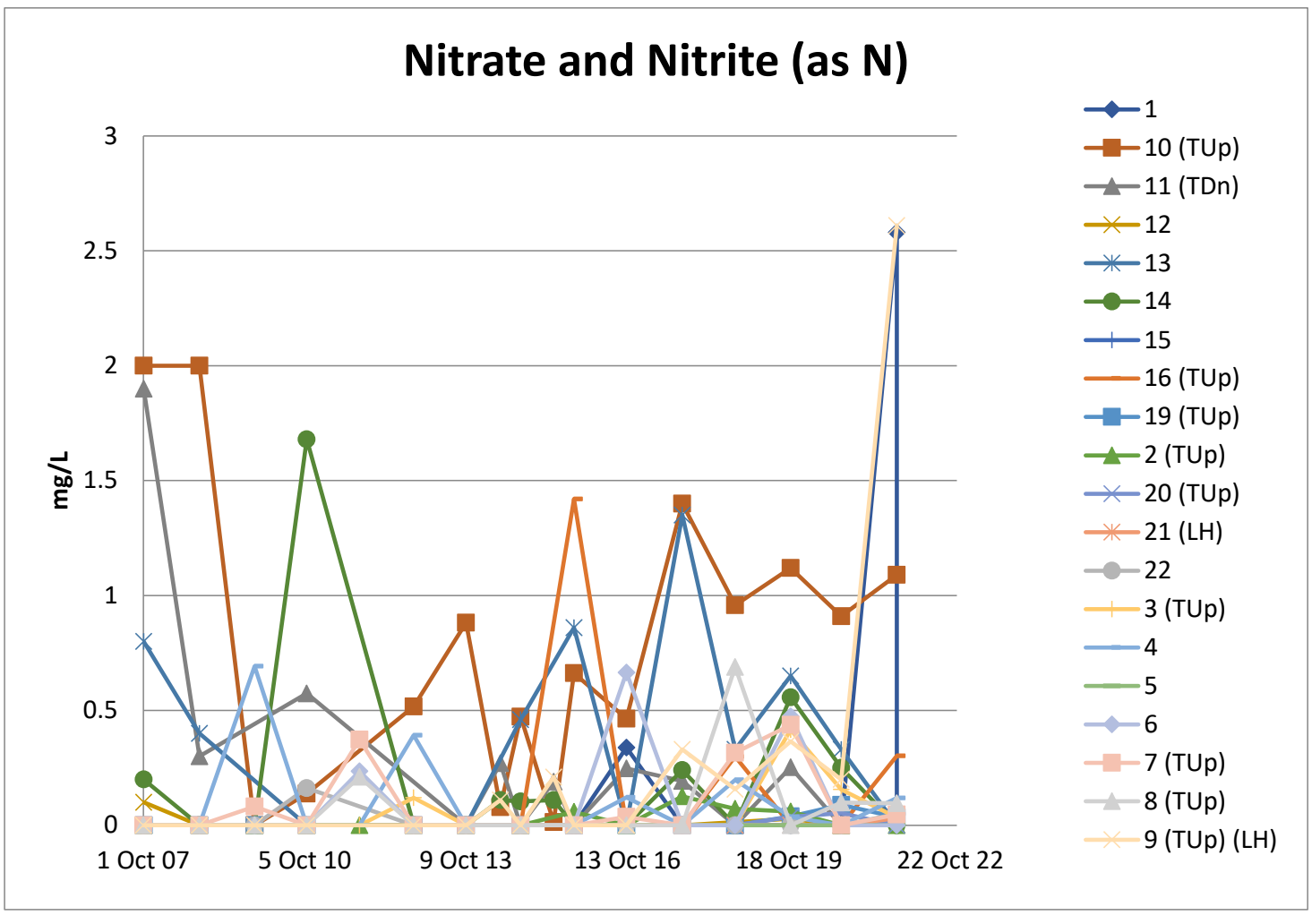

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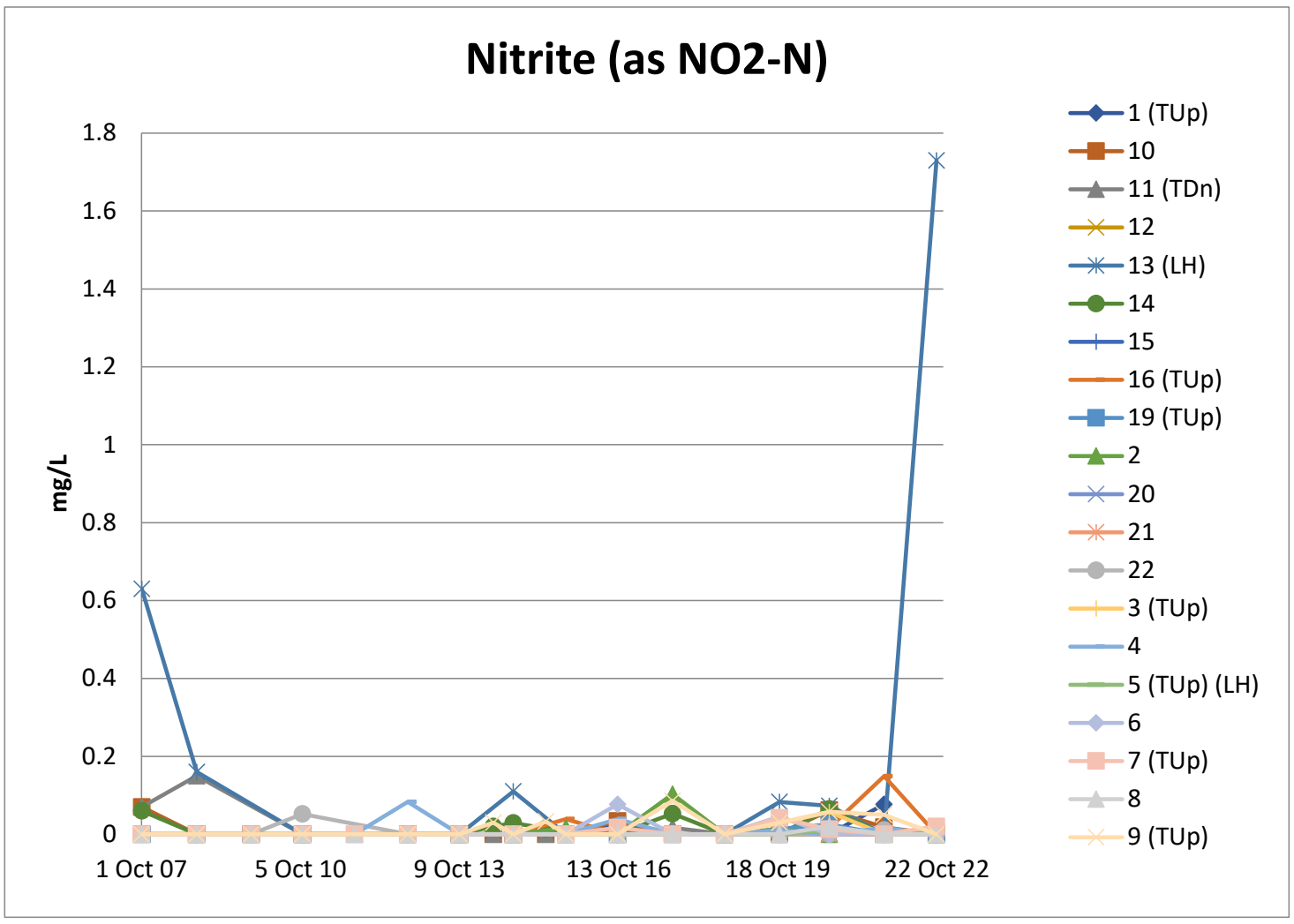

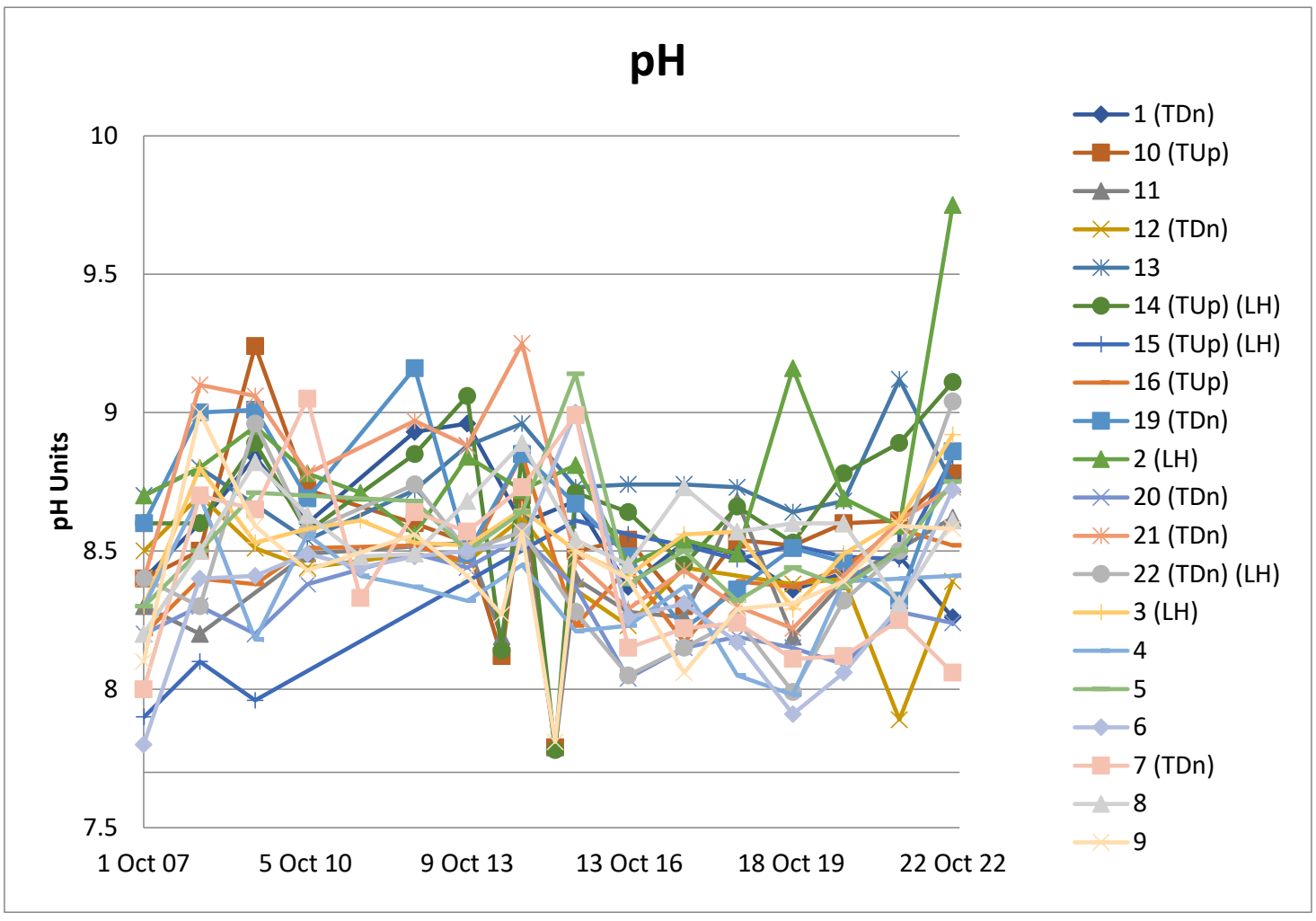

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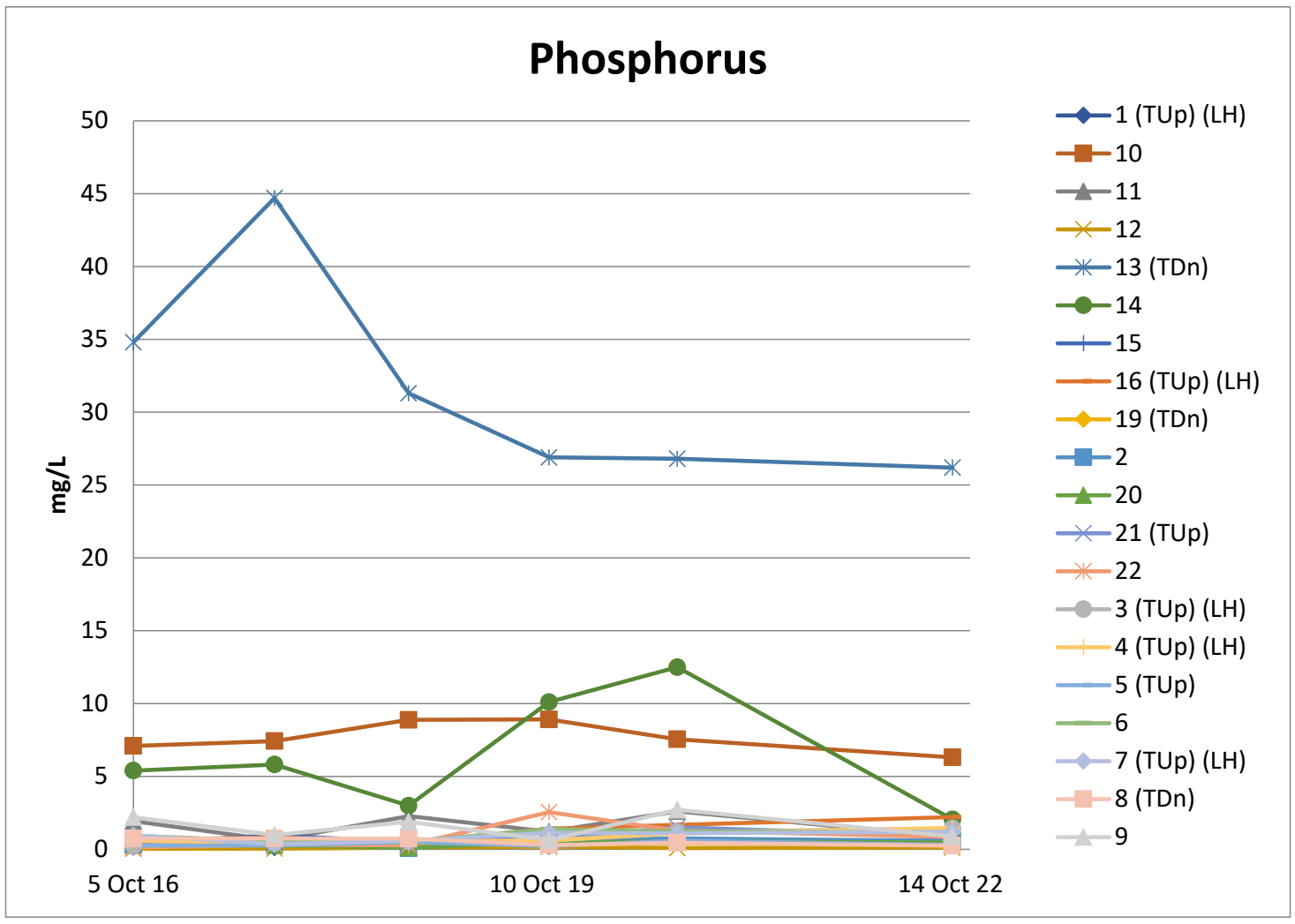

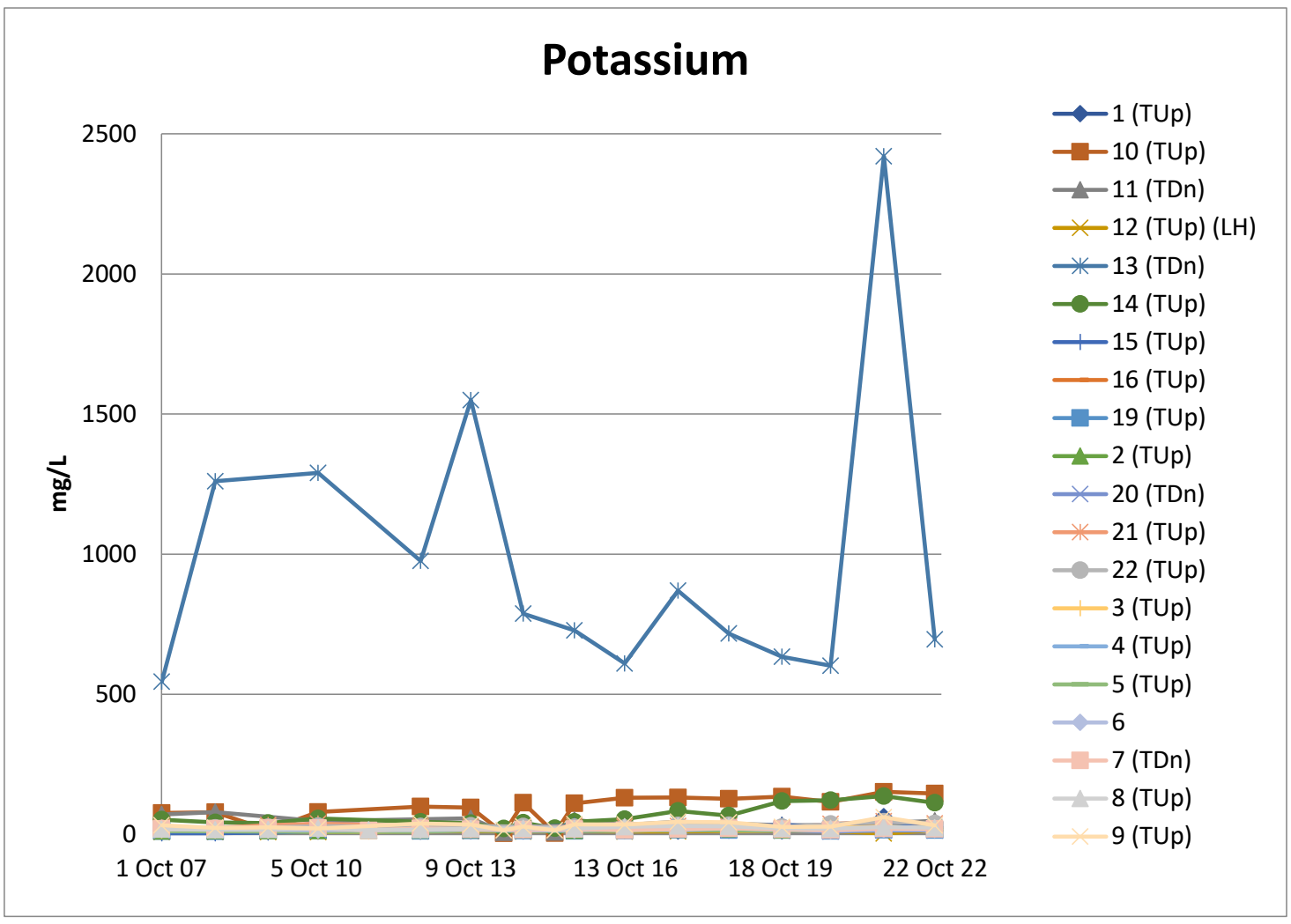

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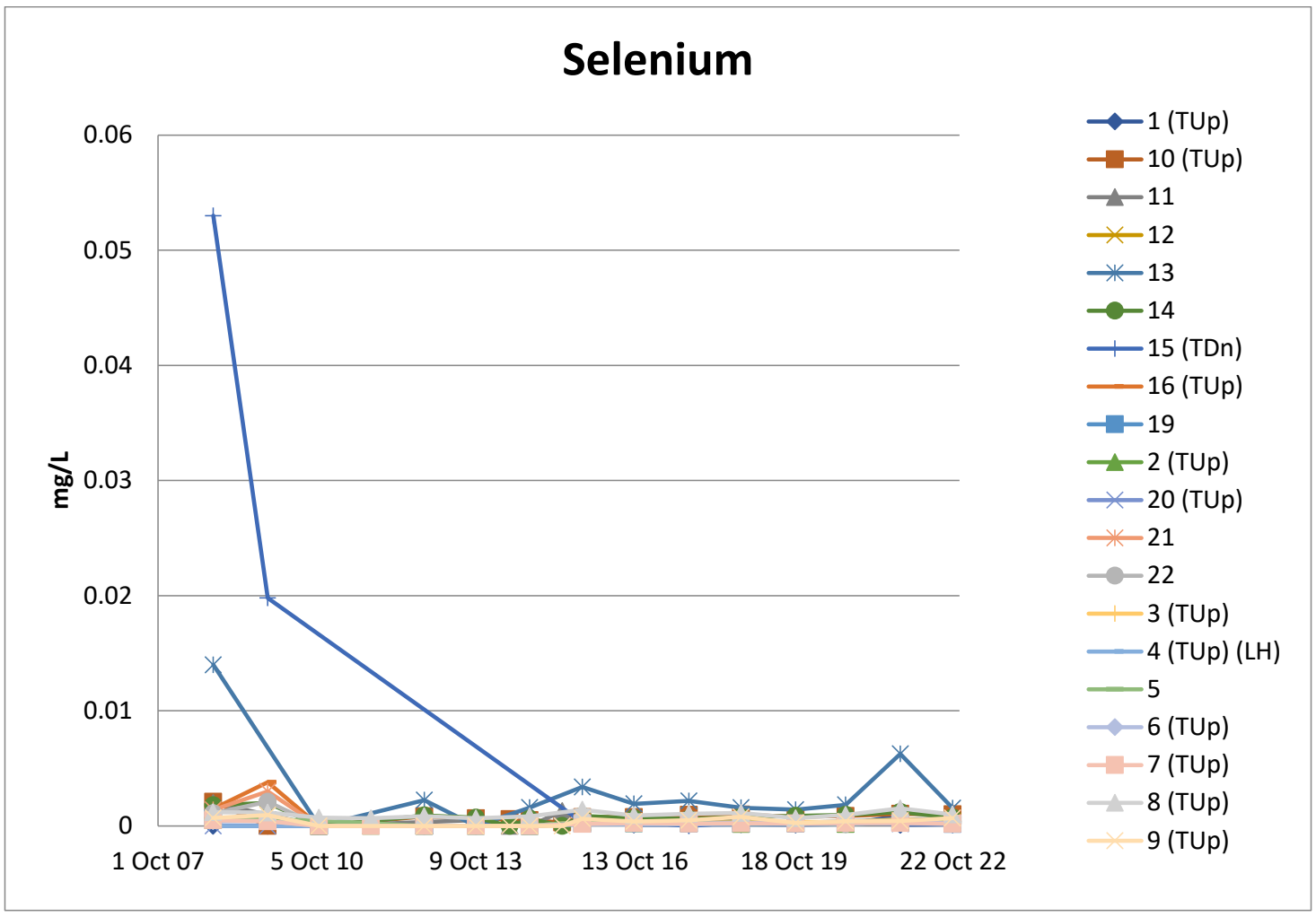

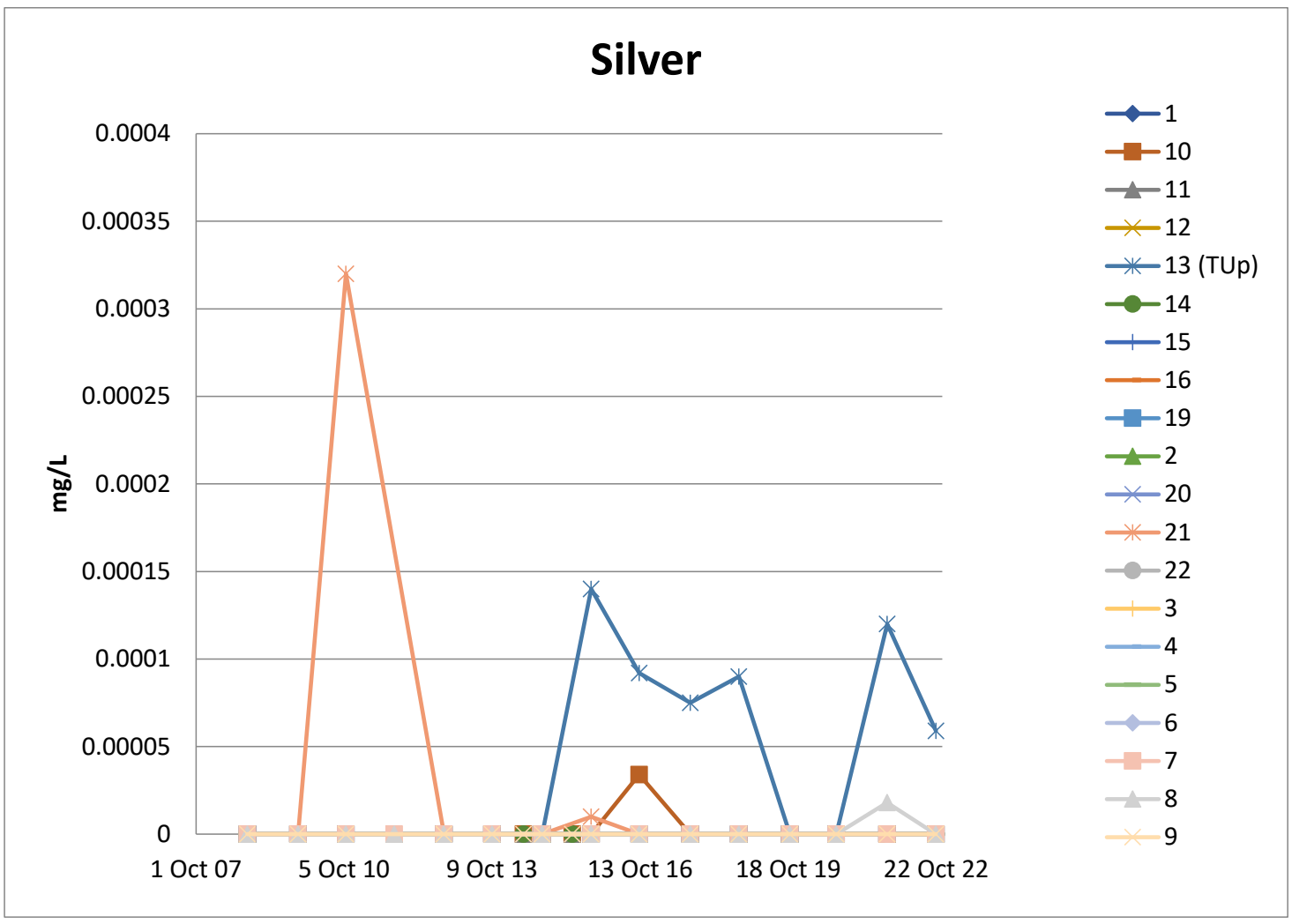

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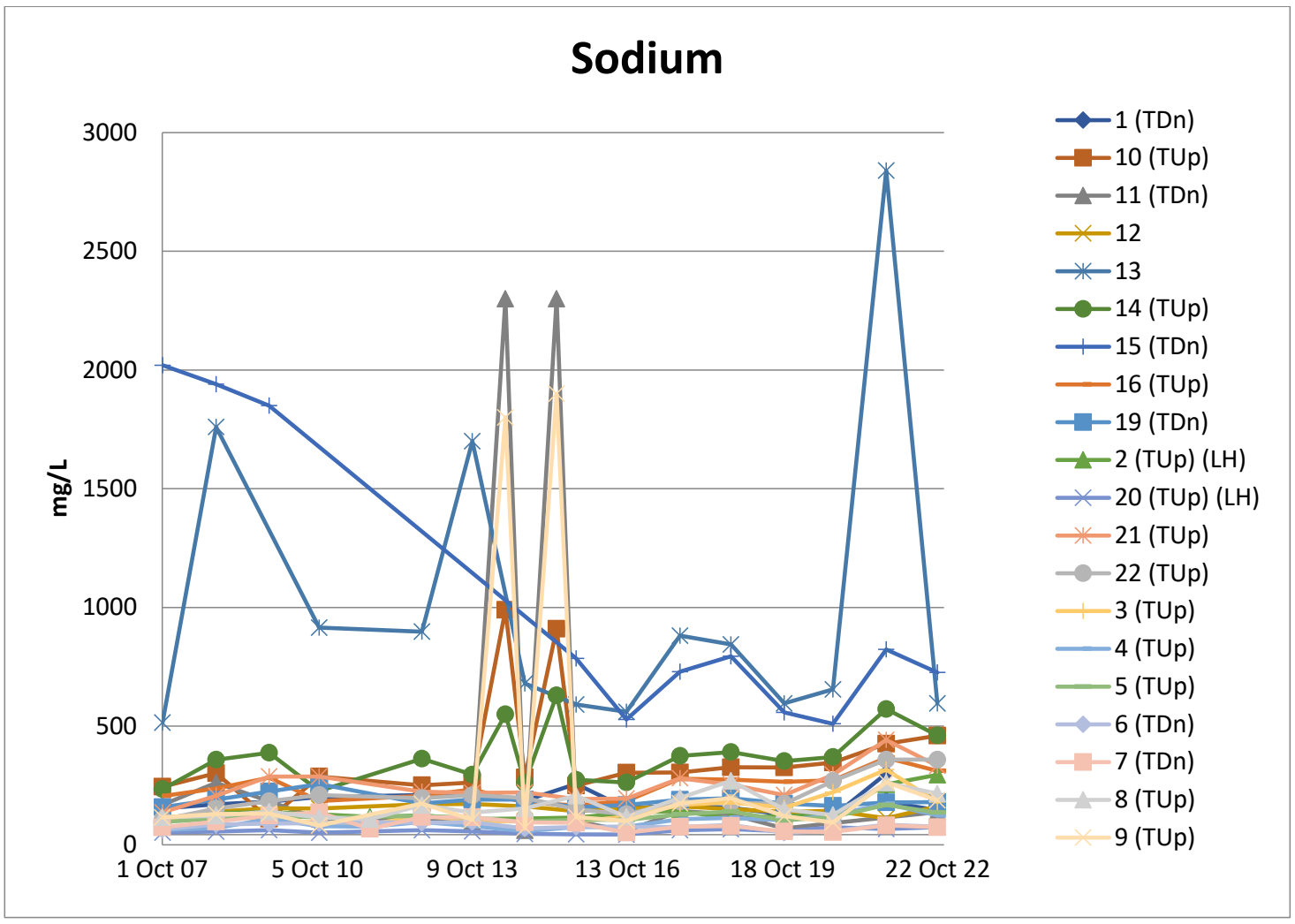

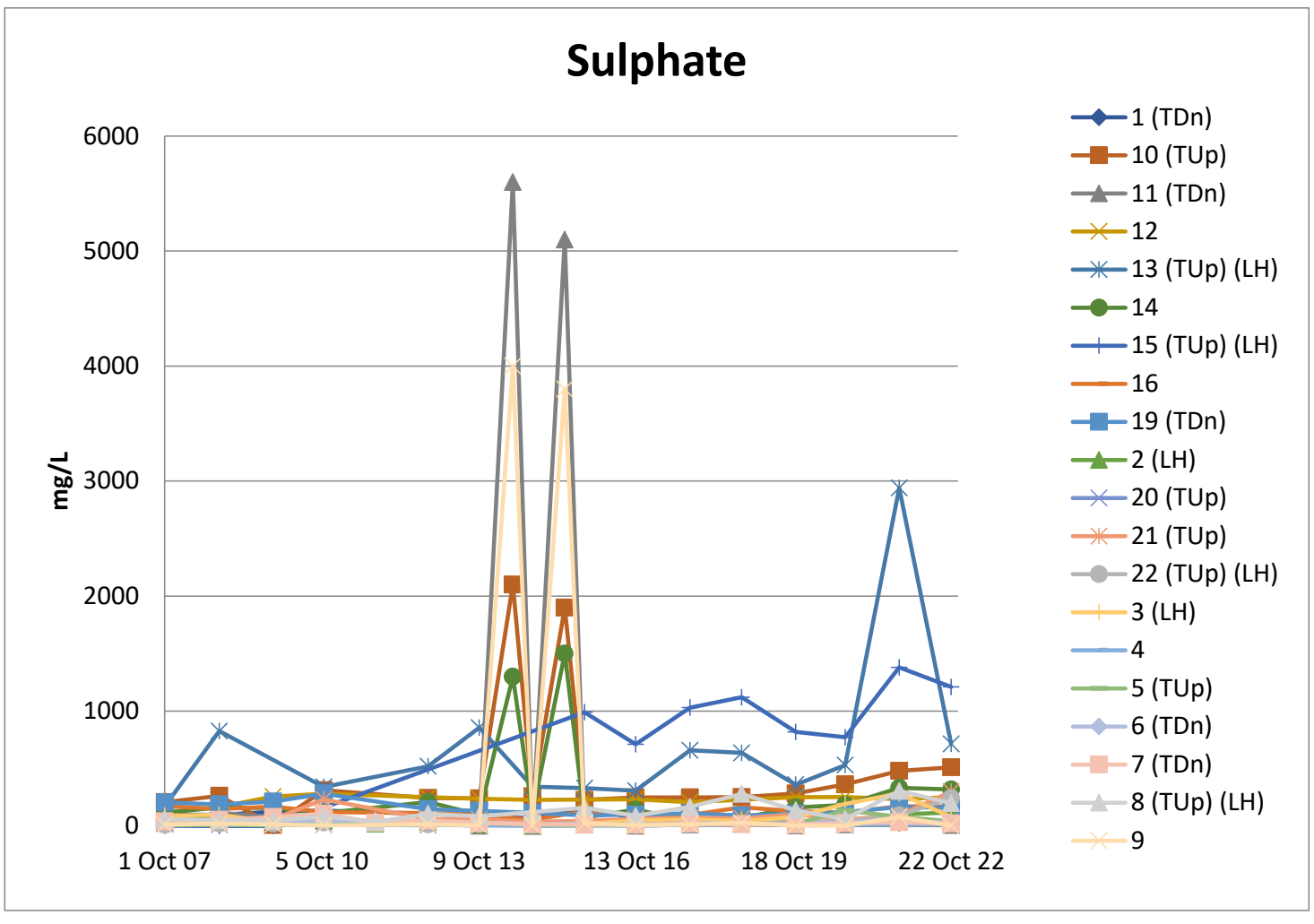

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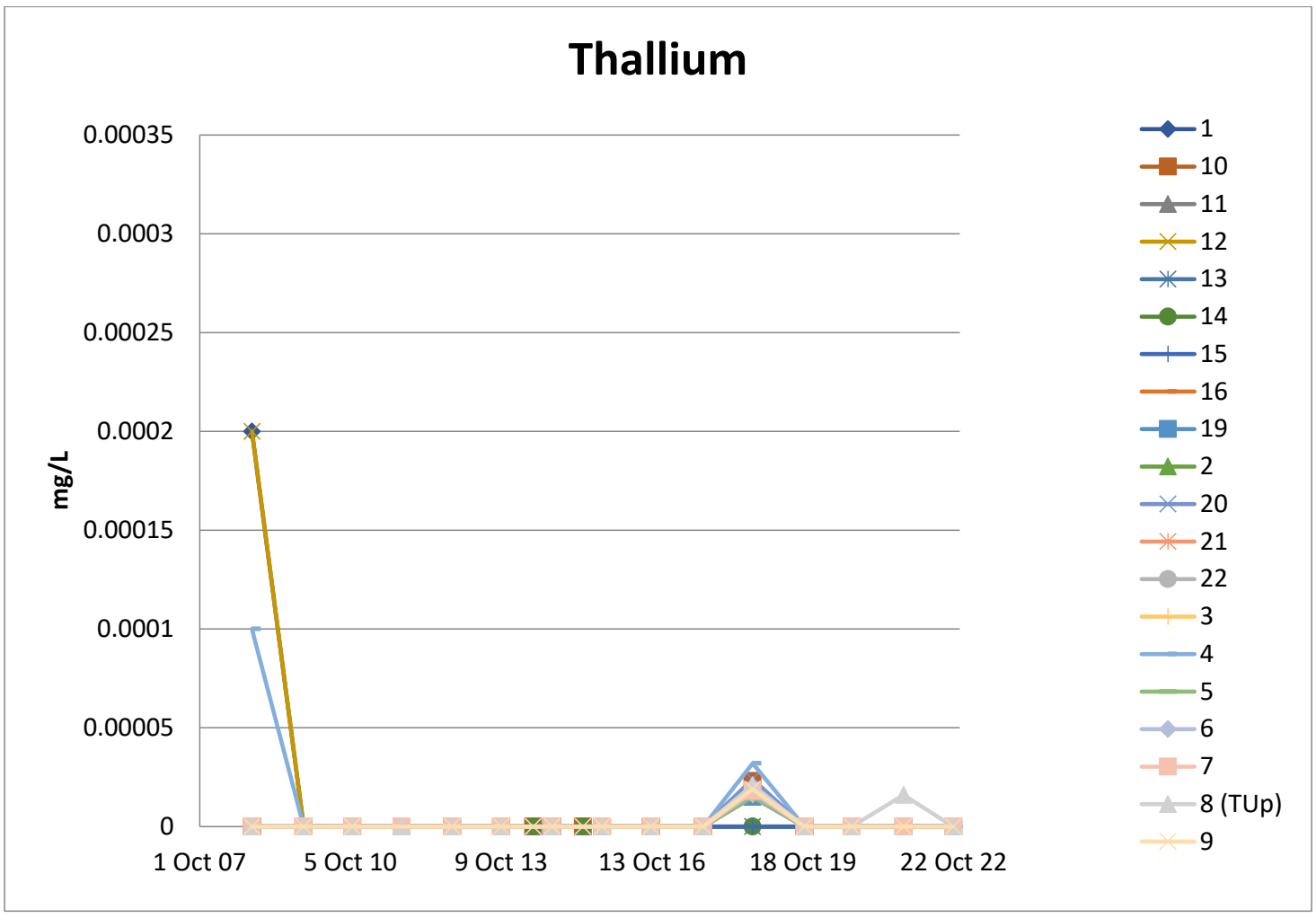

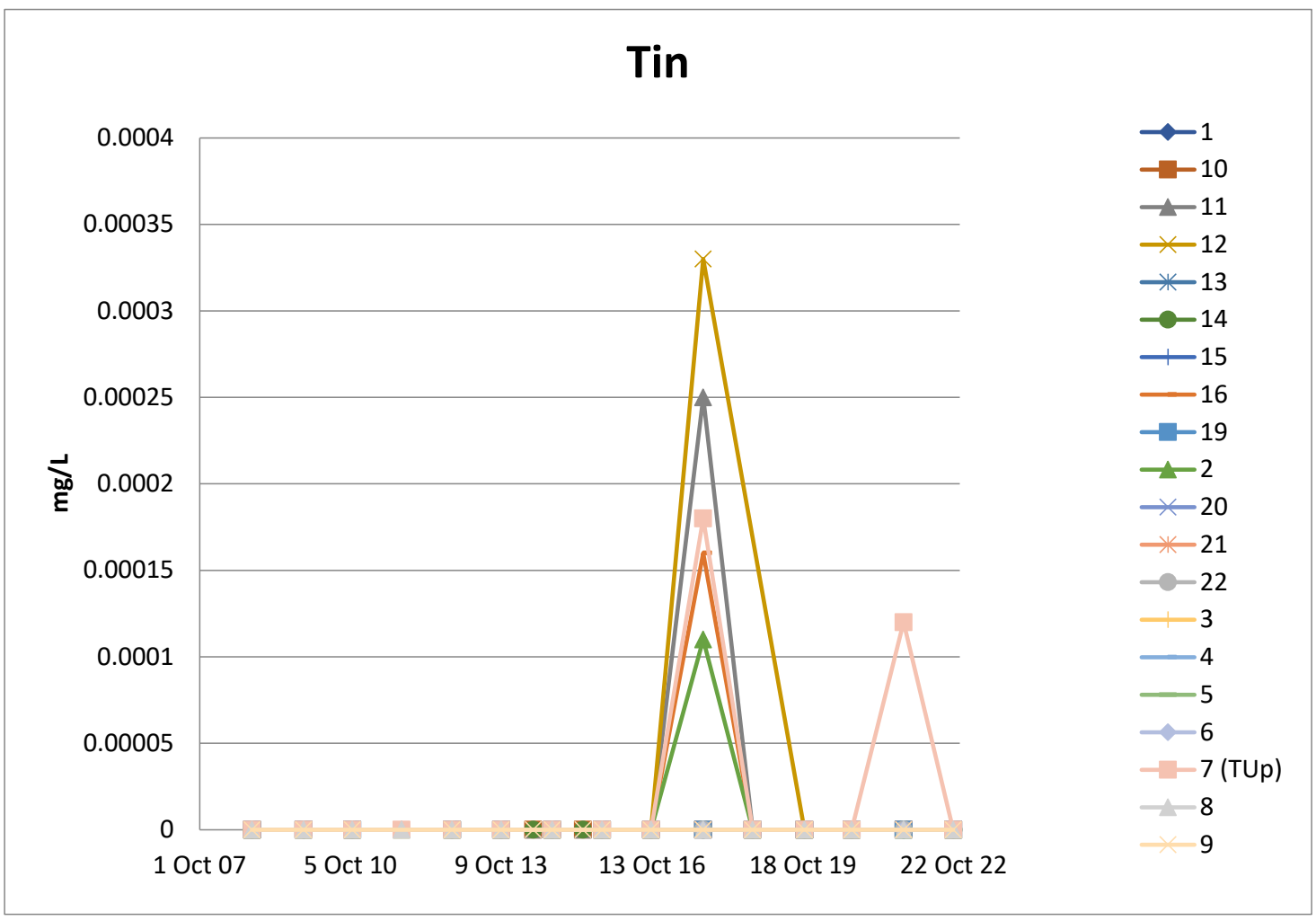

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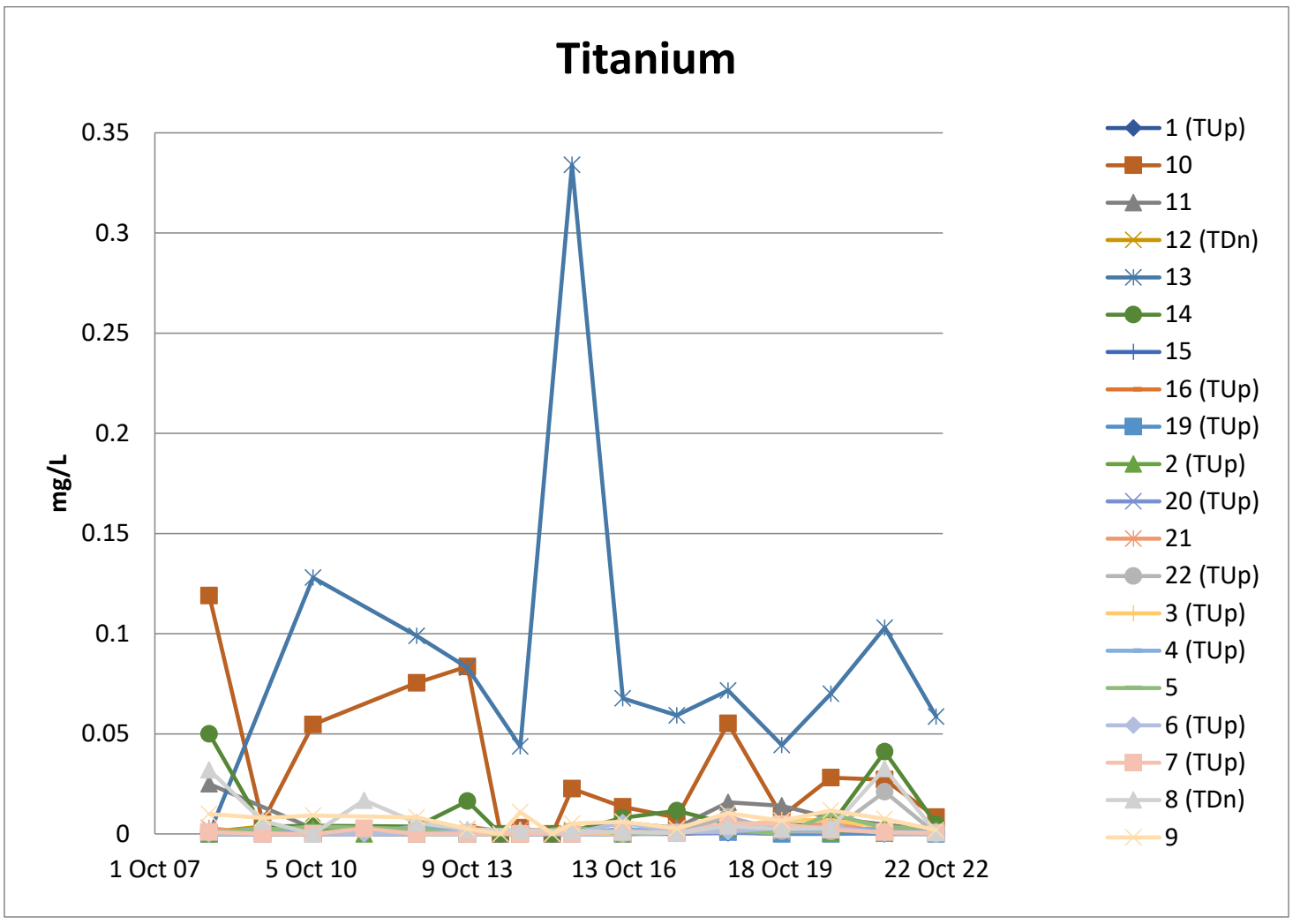

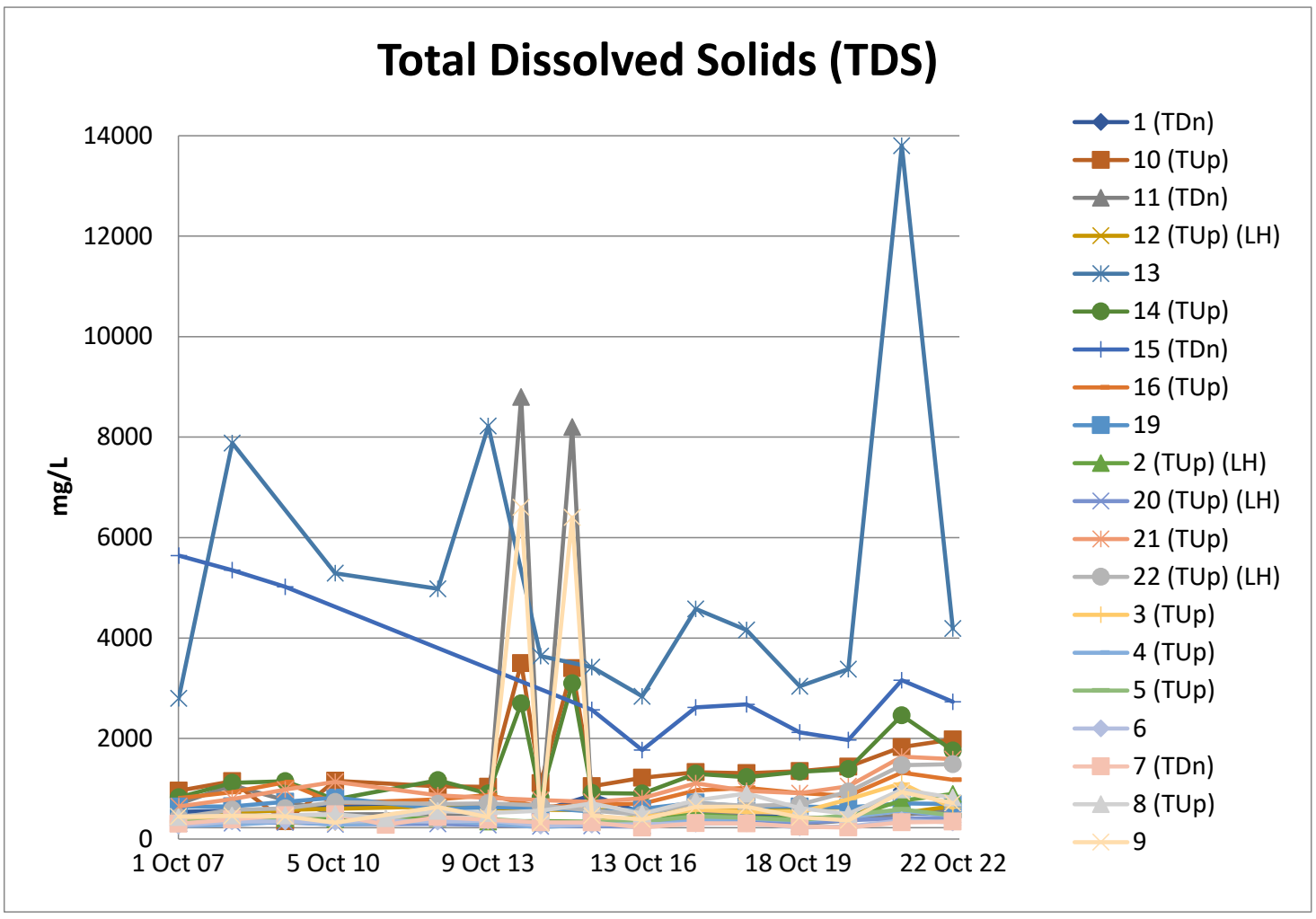

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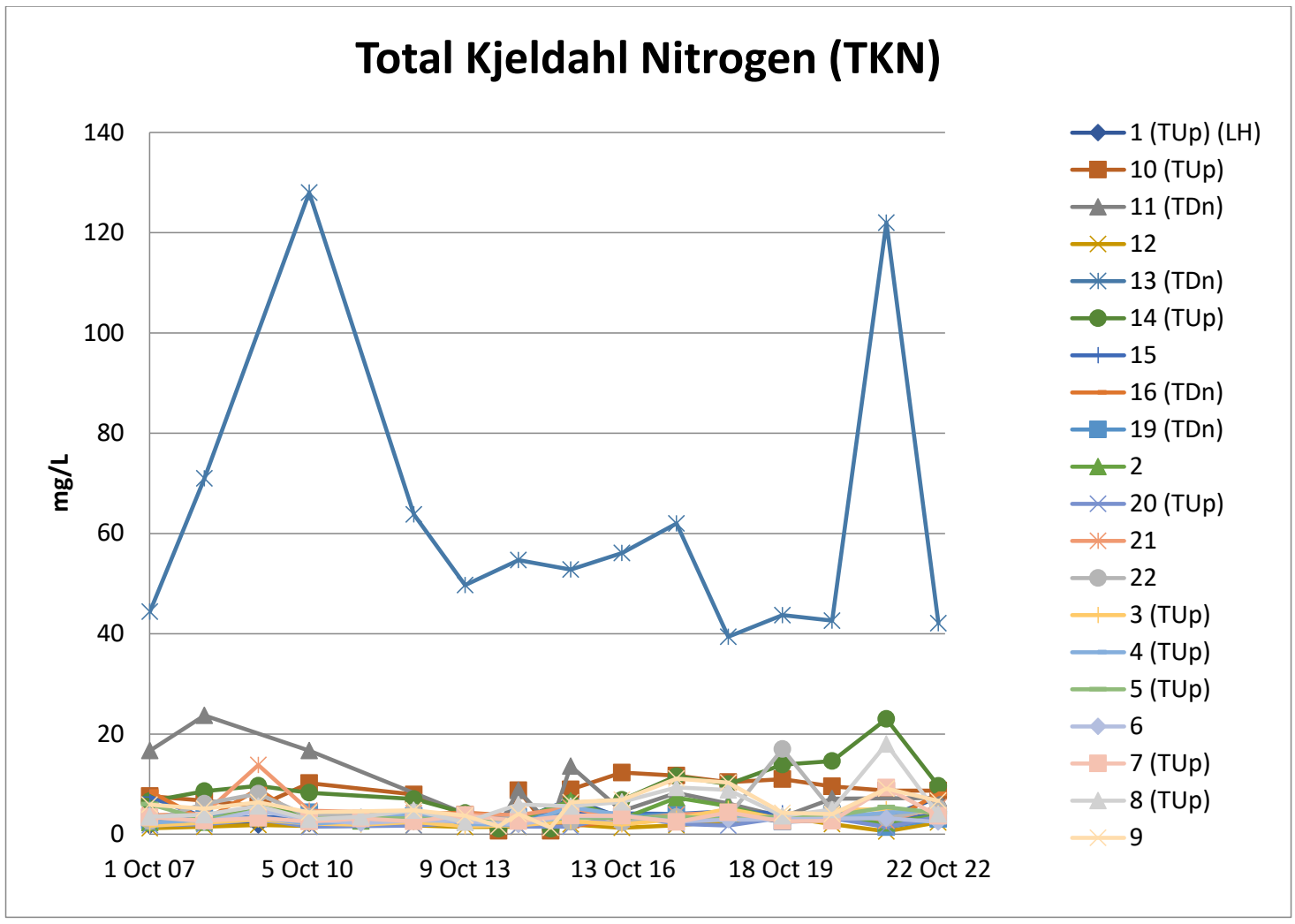

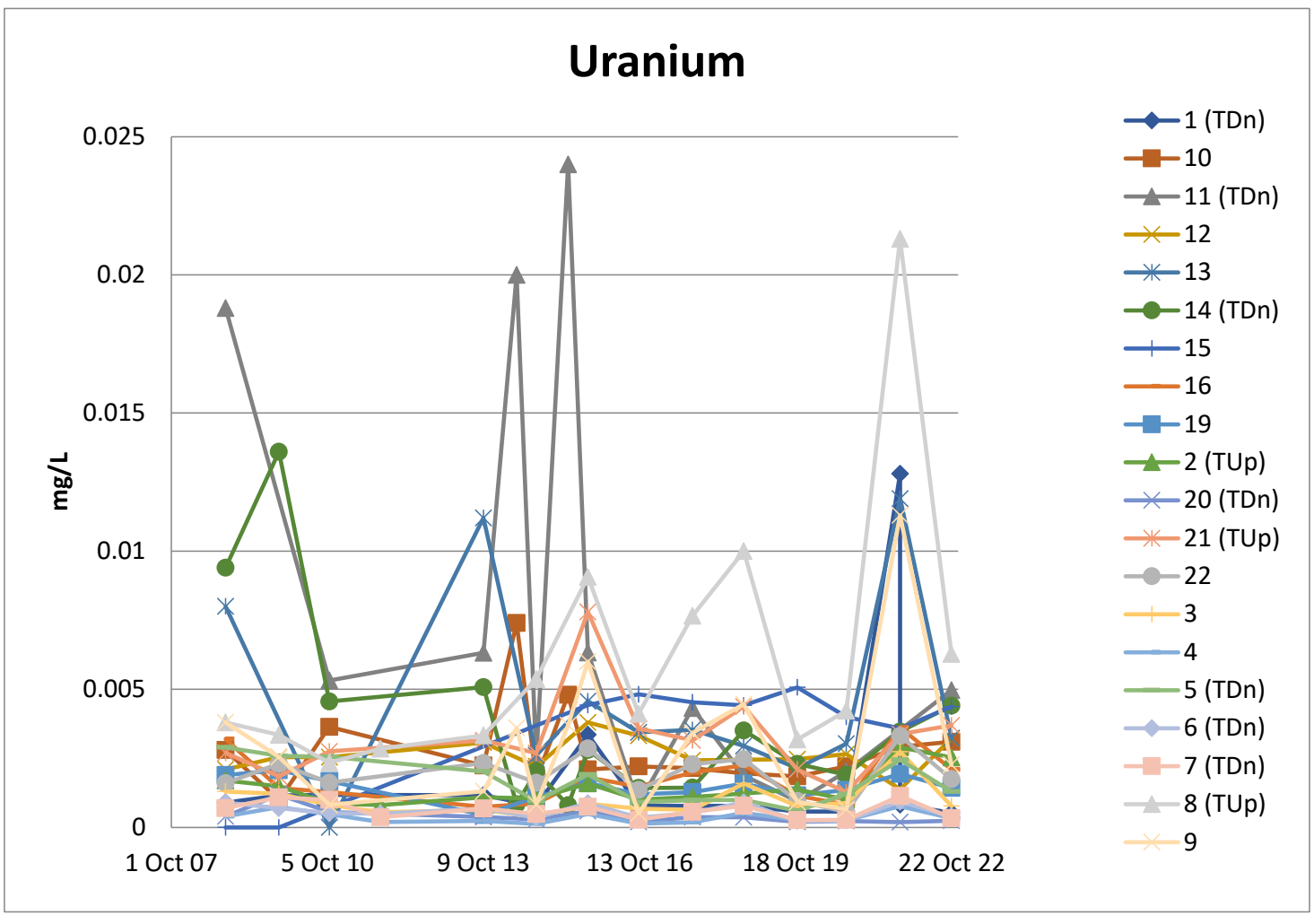

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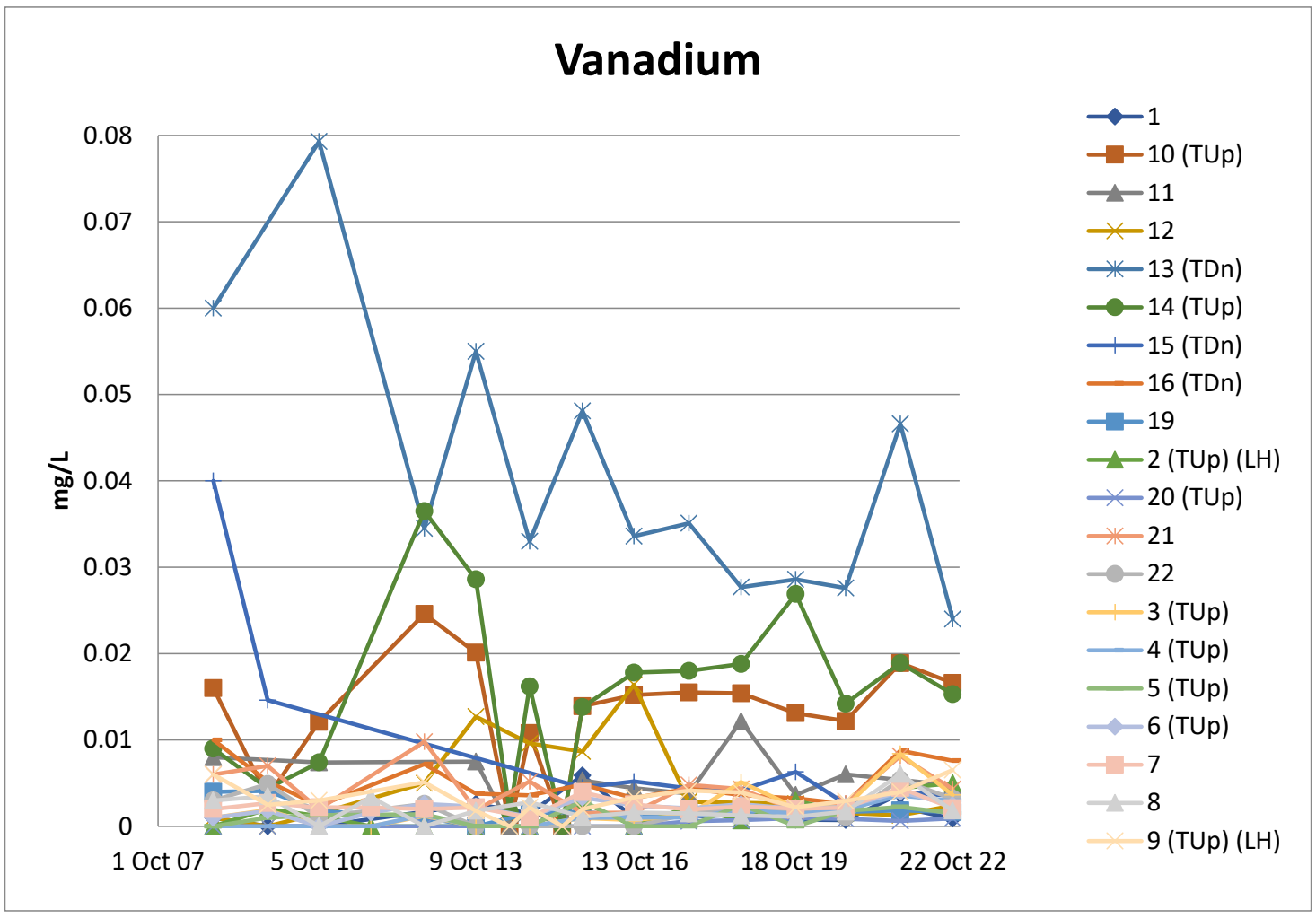

APPENDIX A

REGULATORY APPROVAL – ALBERTA ENVIRONMENT
EPEA APPROVAL NO.10348-03-00

Alberta Environment and Parks

Operations
Regulatory Approvals Centre
5 Floor, South Petroleum Plaza
9915 – 108 Street
Edmonton, Alberta T5K 2G8
Telephone: (780) 427-6311
Fax: (780) 422-0154
www.aep.alberta.ca

April 19, 2017

Michael Parker
Vice President, Canadian Environmental Compliance
Clean Harbors Canada, Inc.
4090 Telfer Road RR#1
Corunna ON NON 1G0

Dear Mr. Parker:

Re: Ryley Hazardous Waste Storage Facility and Landfill
Application No. 014-10348

Your application for a renewal of an existing approval under the *Environmental Protection and Enhancement Act* (EPEA) has been reviewed and enclosed is Approval No. 10348-03-00.

It is your responsibility to obtain any approvals, permits or licences that are required from other agencies.

The Act may provide the approval holder a right of appeal against any term or condition contained in the approval to the Alberta Environmental Appeals Board. You should note that there are strict time lines for filing an appeal dependent on the type of appeal. If you choose to appeal, please contact the office of the Registrar of Appeals, Environmental Appeals Board of Alberta, 3rd Floor, 10011 - 109 Street, Edmonton, Alberta, T5J 3S8, telephone (780) 427-6207.

If you have any questions, please contact me at (780) 415-2201 in Edmonton.

Yours truly,

A Vawter

Annette Vawter
Application Coordinator

Enclosure

cc: Weiguo Wu, Red Deer/North Saskatchewan Region - Edmonton
cc: Tetra Tech EBA Inc.
Attention: J. Paul Ruffell

Alberta Environment and Parks

APPROVAL

PROVINCE OF ALBERTA

ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT
R.S.A. 2000, c.E-12, as amended.

APPROVAL NO. 10348-03-00

APPLICATION NO. 014-10348

EFFECTIVE DATE: March 31, 2017

EXPIRY DATE: March 31, 2027

APPROVAL HOLDER: Clean Harbors Canada, Inc.

ACTIVITY: **CONSTRUCTION, OPERATION AND RECLAMATION OF THE**

Ryley Industrial Waste Management Facility, consisting of a Class I and Class II Industrial Landfill and a Hazardous Waste/Recyclable Storage and Processing Facility,

IS SUBJECT TO THE ATTACHED TERMS AND CONDITIONS.

Designated Director under the Act .....
Mohammad Habib, P. Eng.

Date Signed March 31, 2017

TERMS AND CONDITIONS ATTACHED TO APPROVAL

PART 1: DEFINITIONS

SECTION 1.1: DEFINITIONS

1.1.1 All definitions from the Act and the regulations apply except where expressly defined in this approval.

1.1.2 In all PARTS of this approval:

(a) "Act" means the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c.E-12, as amended;

(b) "action leakage rate" means the leakage rate that would occur through the primary liner, based on two holes per hectare, each with a diameter of 2 mm and that is calculated to be 790L/ha/day;

(c) "active landfill area" means the portion of the landfill that has received or is receiving waste for disposal, where final cover has not been placed, and includes areas that are being used for interim management of waste prior to disposition;

(d) "active landfill life" means the period of landfill life during which waste is received for disposal at the landfill, beginning with the initial receipt of waste and ending with the start of final landfill closure activities;

(e) "AER" means Alberta Energy Regulator;

(f) "affected lands" means lands which have received substances released from the facility;

(g) "air effluent stream" means any substance in a gaseous medium released by or from a facility;

(h) "APEGA" means the Association of Professional Engineers and Geoscientists of Alberta;

(i) "application" means the written submissions from the approval holder to the Director in respect of application No. 014-10348 and any subsequent applications where amendments are issued for this approval;

(j) "application No. 005-10348" means the written submissions from the approval holder to the Director in respect of renewal application No. 005-10348;

(k) "application No. 008-10348" means the written submissions from the approval holder to the Director in respect of amendment application No. 008-10348;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(l) "application No. 012-10348" means the written submissions from the approval holder to the Director in respect of amendment application No. 012-10348;

(m) "as-built plans" means survey plans, signed and stamped by a professional registered with APEGA, that document variances from design or construction plans that were either approved or authorized according to the terms and conditions of this approval;

(n) "BTEX" means benzene, toluene, ethylbenzene and xylene;

(o) "COD" means Chemical Oxygen Demand;

(p) "composite liner" means a liner that meets the specifications in 3.1.2(b) of this approval;

(q) "container" means any portable device in which a substance is kept, including but not limited to the following:

(i) drums, barrels and pails which have a capacity greater than 18 litres but less than 210 litres,

(ii) 320 litre overpack drums, and

(iii) 1000 litre tote tanks or sacks;

(r) "cover" means soil or other approved material that is used to cover compacted wastes in a landfill cell;

(s) "day", when referring to sampling, means any sampling period of 24 consecutive hours;

(t) "decommissioning" means the dismantling and decontamination of the facility undertaken subsequent to the termination or abandonment of any activity or any part of any activity regulated under the Act, excluding the landfill cells and those infrastructure components and facilities that are required for the landfill post-closure;

(u) "decontamination" means the treatment or removal of substances from the facility and affected lands;

(v) "Director" means an employee of the Government of Alberta designated as a Director under the Act;

(w) "dismantling" means the removal of buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling

TERMS AND CONDITIONS ATTACHED TO APPROVAL

facilities, railways, roadways, pipelines and any other installations that are being or have been used or held for or in connection with the facility;

(x) "DOC" means Dissolved Organic Carbon;

(y) "domestic wastewater" means wastewater that is the composite of liquid and water-carried wastes associated with the use of water for drinking, cooking, cleaning, washing, hygiene, sanitation or other domestic purposes, together with any infiltration and inflow wastewater, that is released into a wastewater collection system;

(z) "domestic wastewater system" means the parts of the facility that collect, store, or treat domestic wastewater from the facility;

(aa) "existing landfill cells" means Cell 1, Cell 2, Cell 3A, Cell 3B, and Cell 3C as described in application No. 005-10348;

(bb) "facility" means all buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling facilities, roadways, railways, pipelines and other installations, the Class I and Class II industrial landfill and the HWRSP Facility, and includes the land, located on the SE 1/4 of Section 9, Township 50, Range 17, West of the 4th Meridian, that is being or has been used or held for or in connection with the Ryley Industrial Waste Management Facility;

(cc) "facility developed area" means the areas of the facility used for the storage, treatment, processing, transport, or handling of raw material, intermediate product, by-product, finished product, process chemicals, or waste material, and includes the active landfill area;

(dd) "final cover" means a designed system, natural or man-made, that is placed on the surface of a landfill or landfill cell that has reached its maximum designated waste elevation to control transmission of moisture and landfill gas, and conforms to the end use plan;

(ee) "final landfill closure" means the period of time when waste is no longer placed in the defined portion of a landfill and activities are undertaken to complete the final cover system and decommission components and facilities that are no longer required, and includes the construction of any additional components or monitoring systems that are necessary for post-closure;

(ff) "free liquids" means the liquids as determined by the US EPA SW-846 Test Method 9095B: Paint Filter Liquids Test, as specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, US EPA Publication No. SW-846, as amended;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(gg) "fugitive emissions" means emissions of substances to the atmosphere other than ozone depleting substances, originating from a facility source other than a flue, vent, or stack but does not include sources which may occur due to breaks or ruptures in process equipment;

(hh) "GCL" means geosynthetic clay liner that is made of a thin layer of bentonite either bonded to a geomembrane or fixed between two sheets of geotextile;

(ii) "geomembrane" means a sheet of manufactured synthetic material designed to control migration of liquid and gas;

(jj) "grab sample" means an individual sample collected in less than 30 minutes and which is representative of the substance sampled;

(kk) "groundwater" means groundwater as defined in the *Water Act,* R.S.A. 2000, c.W-3, as amended;

(ll) "groundwater monitoring well" means a well drilled at a site to measure groundwater levels and collect groundwater samples for the purpose of physical, chemical, or biological analysis to determine the concentration of groundwater constituents;

(mm) "HDPE" means High Density Polyethylene;

(nn) "HWRSP Facility" means the Hazardous Waste/Recyclable Storage and Processing Facility as described in the application for storage, processing and transfer of hazardous wastes and hazardous recyclables and which includes the Maintenance Shop, and is an integral part of the facility;

(oo) "hydraulic conductivity" means the ease with which water can be transported through a material

(pp) "hydrocarbon" means a chemical compound that consists entirely of hydrogen and carbon;

(qq) "ISO/IEC 17025" means the international standard, developed and published by International Organization for Standardization (ISO), specifying management and technical requirements for laboratories;

(rr) "incompatible waste" means waste materials which could cause dangerous reactions from direct contact with one another;

(ss) "industrial wastewater" means the composite of liquid wastes and water-carried wastes, any portion of which results from any industrial process carried on at the HWRSP Facility;

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(tt) "landfill" means the Class I and Class II industrial landfill as described in the application and which includes the waste stabilization area, and is an integral part of the facility;

(uu) "landfill cell" means a designed area of a landfill comprised of an excavation or earthen structure in which waste is enclosed;

(vv) "landfill cell closure" means the construction of a final cover for landfill cell including placement of previously conserved top soil and upper subsoil and re-vegetation as required for the intended future use of the landfill;

(ww) "landfill gas" means a mixture of gases generated by the microbial decomposition of and chemical reactions between wastes in a landfill;

(xx) "lateral expansion" means an expansion of landfill cell boundaries beyond the approved area;

(yy) "leachate" means a liquid that has been in contact with waste in the landfill cell and has undergone chemical or physical changes;

(zz) "leachate collection system" means a system that gathers leachate so that it may be removed from a landfill, and includes a permeable drainage material, a network of perforated pipes and sumps or manholes from where leachate can be removed;

(aaa) "leak detection liquid" means any liquid collected within the leak detection system;

(bbb) "leak detection system" means a system that gathers liquid between a primary liner and a secondary liner system, and consists of a permeable drainage material, a network of perforated pipes and sumps or manholes from where the liquid can be removed;

(ccc) "liner" means a continuous layer of synthetic material or compacted natural clay placed beneath and at the sides of a landfill cell that is compatible with the waste and restricts the migration of leachate, or landfill gas, or both;

(ddd) "local environmental authority" means the Department of Environment and Parks, in the Province of Alberta, or the agency that has the equivalent responsibilities for any jurisdiction outside the Province;

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(eee) "major ions" means the following:

Calcium	Carbonate
Magnesium	Bicarbonate
Sodium	Chloride
Potassium	Sulfate

(fff) "maximum acceptable leachate head" means the maximum depth of leachate above the lowest part of the primary liner, not including the sumps or leachate collection pipe trenches, and is:

(i) 1.0 m in each of the existing landfill cells, and

(ii) 0.3 m in each of the new landfill cells

during active landfill life, landfill cell closure, final landfill closure, and post-closure;

(ggg) "maximum designated waste elevation" means the maximum elevation of waste in metres above sea level that can be disposed of at the landfill prior to construction of final cover, and is 714 metres;

(hhh) "metals" means the following:

Aluminum, dissolved	Chromium, dissolved (hexavalent)	Nickel, dissolved
Antimony, dissolved	Cobalt, dissolved	Selenium, dissolved
Arsenic, dissolved	Copper, dissolved	Silver, dissolved
Barium, dissolved	Lead, dissolved	Thallium, dissolved
Boron, dissolved	Manganese, dissolved	Tin, dissolved
Cadmium, dissolved	Mercury, total	Uranium, dissolved
Chromium, total	Molybdenum, dissolved	Zinc, dissolved

(iii) "monitoring system" means all equipment used for sampling, conditioning, analyzing or recording data in respect of any parameter listed or referred to in this approval, including equipment used for continuous monitoring;

(jjj) "month" means calendar month;

(kkk) "municipal solid waste" means solid waste resulting from or incidental to municipal, community, commercial, institutional and recreation activities, and includes garbage, rubbish, ashes, street cleanings, abandoned automobiles and all other solid wastes except hazardous waste, industrial solid waste, oilfield waste and biomedical wastes;

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(lll) "new landfill cells" means Cell 3D as described in application No. 005-10348, Cell 3E as described in application No. 012-10348, and Cell 4 as described in the application;

(mmm) "new surface water detention pond" means the surface water detention pond as described in application No. 012-10348;

(nnn) "NORM" means Naturally Occurring Radioactive Materials;

(ooo) "NORM waste" means any waste material with concentrations of NORM above the limits specified in Tables 5.1, 5.2, or 5.3 of the *Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials (NORM)*, Health Canada, 2011, as amended;

(ppp) "nutrients" means the following:

Ammonia nitrogen	Nitrite nitrogen
Total Kjeldahl nitrogen	Total phosphorus
Nitrate nitrogen	Dissolved phosphorus

(qqq) "old surface water detention pond" means the surface water detention pond as described in application No. 005-10348;

(rrr) "Petroleum Hydrocarbons Fractions F1 and F2" means the specific hydrocarbon fraction measured by the analytical methods described in the *Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method,* published by the Canadian Council of Ministers of the Environment, 2001, as amended;

(sss) "points of compliance" means the location or locations of the groundwater monitoring wells where measurements of groundwater quality are taken to assess landfill and waste treatment performance;

(ttt) "post-closure" means the period of time after completion of the final landfill closure;

(uuu) "ppm" means concentration in parts per million;

(vvv) "primary liner" means the uppermost geomembrane liner;

(www) "QA/QC" means quality assurance and quality control;

(xxx) "quarter year" means a time period of three consecutive months designated as January, February and March; or April, May and June; or July, August and September; or October, November and December;

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(yyy) "regulations" means the regulations enacted pursuant to the Act, as amended;

(zzz) "representative grab" means a sample consisting of equal volume portions of water collected from at least four sites between 0.20 to 0.30 metres below the water surface within a pond;

(aaaa) "runoff" means any rainwater or melt water that drains as surface flow from the facility developed areas, excluding leachate;

(bbbb) "runoff control system" means the parts of the facility that collect, store or treat runoff from the facility, and includes but is not limited to runoff collection ditches, surface water detention pond(s) and tank farm bermed area;

(cccc) "run-on" means any rainwater or melt water that drains as surface flow toward the active landfill area;

(dddd) "run-on control system" means the parts of the facility that divert run-on away from the active landfill area;

(eeee) "scrubber exhaust stack" means the exhaust stack through which the air effluent streams that are:

(i) collected from the exhaust vents of the Drum Processing Building or Staging Building or both, and

(ii) treated with the caustic scrubber and activated carbon filter

are released to the atmosphere as described in the application;

(ffff) "secondary liner" means the lowermost geomembrane liner;

(gggg) "soil" means mineral or organic earthen materials that can, have, or are being altered by weathering, biological processes, or human activity;

(hhhh) "SOP" means Standard Operating Procedures;

(iiii) "storm event" means a 1 in 25 year, 24 hour duration rainfall event at Ryley, Alberta;

(jjjj) "tank" means a stationary device, designed to contain an accumulation of a substance, which is constructed primarily of non-earthen materials that provide structural support including wood, concrete, steel, and plastic;

(kkkk) "TDGR" means the *Transportation of Dangerous Goods Regulations* (SOR/2001-286) made under the *Transportation of Dangerous Goods Act*, 1992 (Canada), as amended;

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(llll) "TDS" means Total Dissolved Solids;

(mmmm) "topsoil" means the uppermost layer of soil and consists of:

(i) the A-horizons and all organic horizons as defined in *The Canadian System of Soil Classification* (Third Edition), Agriculture and Agri-Food Canada, Publication 1646, 1998, as amended, and

(ii) the soil ordinarily moved during tillage;

(nnnn) "TSS" means Total Suspended Solids;

(oooo) "upper subsoil" means the layer of soil directly below the topsoil layer that consists of the B-horizons as defined in *The Canadian System of Soil Classification,* (Third Edition), Agriculture and Agri-Food Canada, Publication 1646, 1998, as amended;

(pppp) "volume estimate" means a technical evaluation based on the sources contributing to the release including but not limited to pump capabilities, water meters, and batch release volumes;

(qqqq) "waste stabilization area" means the portion of the landfill that is used for waste stabilization or solidification or both, as described in application no. 008-10348;

(rrrr) "waste storage area" means the areas designated for storage of containers for waste or hazardous recyclable or both, or for storage of tanks for waste or hazardous recyclable or both, or for storage of both, as described in application No. 005-10348;

(ssss) "week" means any consecutive 7-day period;

(tttt) "working face" means that portion of the active landfill area where waste is currently being deposited, spread and compacted; and

(uuuu) "year" means calendar year.

PART 2: GENERAL

SECTION 2.1: REPORTING

2.1.1 The approval holder shall immediately report to the Director by telephone any contravention of the terms and conditions of this approval at 1-780-422-4505.

2.1.2 The approval holder shall submit a written report to the Director within 7 days of the reporting pursuant to 2.1.1.

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2.1.3 The approval holder shall immediately notify the Director in writing if any of the following events occurs:

(a) the approval holder is served with a petition into bankruptcy;

(b) the approval holder files an assignment in bankruptcy or Notice of Intent to make a proposal;

(c) a receiver or receiver-manager is appointed;

(d) an application for protection from creditors is filed for the benefit of the approval holder under any creditor protection legislation; or

(e) any of the assets which are the subject matter of this approval are seized for any reason.

2.1.4 If the approval holder monitors for any substances or parameters which are the subject of operational limits as set out in this approval more frequently than is required and uses procedures authorized in this approval, then the approval holder shall provide the results of such monitoring as an addendum to the reports required by this approval.

2.1.5 The approval holder shall submit all monthly reports required by this approval to be compiled or submitted to the Director on or before the end of the month following the month in which the information was collected, unless otherwise specified in this approval.

2.1.6 The approval holder shall submit all annual reports required by this approval to be compiled or submitted to the Director on or before March 31 of the year following the year in which the information was collected, unless otherwise specified in this approval.

SECTION 2.2: RECORD KEEPING

2.2.1 The approval holder shall:

(a) record; and

(b) retain

all the following information in respect of any sampling conducted or analyses performed in accordance with this approval for a minimum of ten years, unless otherwise authorized in writing by the Director:

(i) the place, date and time of sampling,

(ii) sample type,

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(iii) the dates the analyses were performed,

(iv) the analytical techniques, methods or procedures used in the analyses,

(v) the names of the persons who collected and analysed each sample, and

(vi) the results of the analyses.

2.2.2 The approval holder shall keep and maintain an Operating Record of the landfill as per 4.6.34(a) until the end of the landfill post-closure.

2.2.3 The Operating Record referred to in 2.2.2 shall include, at a minimum, all of the following information:

(a) the information required in section 7.3(c) of the *Standards for Landfills in Alberta*, as amended;

(b) the name and contact information of all persons who discover any contravention;

(c) the names and contact information of all persons who take any remedial actions arising from the contravention of the Act, the regulations, or this approval; and

(d) a description of the remedial measures taken in respect of a contravention of the Act, the regulations, or this approval.

2.2.4 The approval holder shall submit a copy of the most recent Operating Record to the Director upon written request from the Director within the timeline specified in writing by the Director.

SECTION 2.3: ANALYTICAL REQUIREMENTS

2.3.1 With respect to any sample required to be taken pursuant to this approval, the approval holder shall ensure that:

(a) collection;

(b) preservation;

(c) storage;

(d) handling; and

(e) analysis

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shall be conducted in accordance with the following unless otherwise authorized in writing by the Director:

(i) for air:

(A) the *Alberta Stack Sampling Code*, Alberta Environment, 1995, as amended,

(B) the *Methods Manual for Chemical Analysis of Atmospheric Pollutants*, Alberta Environment, 1993, as amended, and

(C) the *Air Monitoring Directive*, Alberta Environment, 1989, as amended;

(ii) for industrial wastewater, industrial runoff, groundwater and domestic wastewater:

(A) the *Standard Methods for the Examination of Water and Wastewater*, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation, 1998, as amended;

(iii) for whole effluent toxicity tests:

(A) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, Environment Canada, Environmental Protection Series 1/RM/13, December 2000, as amended,

(B) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia Magna*, Environment Canada, Environmental Protection Series 1/RM/14, December 2000, as amended,

(C) the *Biological Test Method: Growth Inhibition Test Using the Freshwater Alga Selenastrum capricornutum*, Environment Canada, Environmental Protection Series, November 1992, as amended,

(D) the *Biological Test Method: Test of Reproduction and Survival Using the Cladoceran Ceriodaphnia dubia*, Environment Canada, Environmental Protection Series 1/RM/21, February 1992, as amended,

(E) the *Biological Test Method: Test of Larval Growth and Survival Using Fathead Minnows*, Environment Canada,

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Environmental Protection Series 1/RM/22, February 1992, as amended, and

(F) the *Biological Test Method: Toxicity Test Using Luminescent Bacteria (Photobacterium phosphoreum)*, Environment Canada, Environmental Protection Series, 1/RM/24, November 1992, as amended;

(iv) for soil:

(A) the *Soil Monitoring Directive,* Alberta Environment, May 2009, as amended, and

(B) the *Soil Quality Criteria Relative to Disturbance and Reclamation*, Alberta Agriculture, March 1987, as amended; and

(v) for waste:

(A) the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, USEPA, SW-846, September 1986, as amended,

(B) the *Methods Manual for Chemical Analysis of Water and Wastes*, Alberta Environmental Centre, Vegreville, Alberta, 1996, AECV96-M1, as amended,

(C) the *Toxicity Characteristic Leaching Procedure (TCLP)* USEPA Regulation 40 CFR261, Appendix II, Method No. 1311, as amended, or

(D) the *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, American Water Works Association, and the Water Environment Federation, 2010, as amended.

2.3.2 The approval holder shall analyse all samples that are required to be obtained by this approval in a laboratory accredited pursuant to ISO/IEC 17025, as amended, for the specific parameter(s) to be analysed, unless otherwise authorized in writing by the Director.

2.3.3 The term sample used in 2.3.2 does not include samples directed to continuous monitoring equipment, unless specifically required in writing by the Director.

2.3.4 The approval holder shall comply with the terms and conditions of any written authorization issued by the Director under 2.3.2.

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SECTION 2.4: OTHER

2.4.1 The terms and conditions of this approval are severable. If any term or condition of this approval or the application of any term or condition is held invalid, the application of such term or condition to other circumstances and the remainder of this approval shall not be affected thereby.

2.4.2 Any conflict between the *Standards for Landfills in Alberta*, as amended, and the terms and conditions of this approval shall be resolved in favour of this approval.

2.4.3 *Environmental Protection and Enhancement Act* Approval No. 10348-02-00, as amended, is cancelled.

2.4.4 All tanks shall conform to the *Guidelines for Secondary Containment for Above Ground Storage Tanks,* Alberta Environmental Protection, 1997, as amended, unless otherwise authorized in writing by the Director.

2.4.5 All above ground storage tanks containing liquid hydrocarbons or organic compounds shall conform to the *Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks*, Canadian Council of Ministers of the Environment, PN 1180, 1995, as amended.

PART 3: CONSTRUCTION

SECTION 3.1: LANDFILL

3.1.1 The approval holder shall not commence construction of Cell 4 unless and until updated financial security of the facility has been provided to include Cell 4 lateral expansion.

3.1.2 The approval holder shall construct each new Class I industrial landfill cell in such a way that each new Class I landfill cell shall consist of the following components, at a minimum, unless otherwise authorized in writing by the Director:

(a) a minimum of 0.45 metre thick cover of clean sand or soil placed over top of the uppermost drainage layer;

(b) a composite liner that consists of, at a minimum:

(i) a GCL liner placed in direct contact with an underlying 80 mil HDPE geomembrane liner as a primary liner;

(ii) a GCL liner placed in direct contact with an underlying 80 mil HDPE geomembrane liner as a secondary liner; and

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(iii) a GCL liner placed in direct contact with an underlying clay liner that has:

(A) a minimum thickness of 1.0 metre at all points, measured perpendicular to the slope, and

(B) been compacted to achieve an in-place hydraulic conductivity of 1×10^{-9} m/s or less;

(c) a leachate collection system that:

(i) is placed over the primary liner;

(ii) is capable of maintaining the maximum acceptable leachate head; and

(iii) consists of:

(A) a geo-composite drainage layer with a transmissivity of at least 1×10^{-4} m^2/s placed over top of the primary liner,

(B) a network of perforated leachate collection pipes, and

(C) a leachate collection sump placed over the primary liner;

(d) a leak detection system that:

(i) is installed over the secondary liner;

(ii) is capable of detecting the leakage through the primary liner; and

(iii) consists of:

(A) a geo-composite drainage layer with a transmissivity of at least 1×10^{-4} m^2/s placed over top of the secondary liner,

(B) a network of perforated leak detection liquid collection pipes, and

(C) a leak detection liquid collection sump placed over the secondary liner;

(e) a final cover:

(i) that meets the requirements in section 6.1(c) of the *Standards for Landfills in Alberta*, as amended; or

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(ii) as specified in the Landfill Cell Closure Plan submitted by the approval holder and authorized in writing by the Director pursuant to 7.1.1 and 7.1.4;

(f) a run-on control system capable of preventing flow onto the active landfill area from at least the peak discharge from a 1 in 25 year, 24 hour duration storm event at the facility; and

(g) a runoff control system capable of collecting and controlling at least the runoff volume resulting from a 1 in 25 year, 24 hour duration storm event at the facility.

3.1.3 The composite liner for the landfill shall be constructed on a foundation or base such that there shall be no failure of the liners due to settlement, compression, or uplift.

3.1.4 The approval holder shall submit to the Director the following plans and specifications for the proposed construction of each of the items listed in 3.1.2, signed and stamped by a professional registered with APEGA at least three (3) months prior to construction:

(a) a Detailed Construction Plan and Specifications prepared as per 3.1.2;

(b) a Construction Quality Assurance Plan; and

(c) a Construction Quality Control Plan.

3.1.5 If the Detailed Construction Plan and Specifications in 3.1.4 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

3.1.6 The approval holder shall implement the Detailed Construction Plan and Specifications in 3.1.4 as authorized in writing by the Director.

3.1.7 During construction of any of the items listed in 3.1.2, the approval holder shall not deviate from the Detailed Construction Plan and Specifications as authorized in writing by the Director in 3.1.6, unless the following conditions are met:

(a) the deviation results in a minor adjustment to the Detailed Construction Plan and Specifications in order to suit field conditions encountered; and

(b) the deviation will result in an equivalent or better design performance of the landfill.

3.1.8 The approval holder shall submit to the Director a summary report of the Construction Quality Assurance and Construction Quality Control results signed and stamped by a professional registered with APEGA.

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3.1.9 The summary report in 3.1.8 shall contain the following information, at a minimum:

(a) confirmation that the landfill has been constructed according to:

(i) the Construction Quality Assurance Plan,

(ii) the Construction Quality Control Plan, and

(iii) the Detailed Construction Plan and Specifications as authorized in writing by the Director in 3.1.6, subject to the deviations as per 3.1.7;

(b) description of any minor deviations as per 3.1.7;

(c) confirmation by the professional registered with APEGA, that deviations as per 3.1.7 will result in an equivalent or better design performance of the landfill;

(d) "as-built" plans;

(e) photo-documentation of important stages of construction including any repair work or remediation activities to establish or maintain liner integrity; and

(f) any other information as required in writing by the Director.

3.1.10 The approval holder shall notify the Director in writing at least fourteen (14) days prior to commencing operations of any new landfill cell.

3.1.11 The approval holder shall construct the off-loading area (tipping area) as described in the application, unless otherwise authorized in writing by the Director.

3.1.12 The approval holder shall manage landfill progression in such a manner as to minimize off-site visual impacts of the landfill, as described in the Landfill Cell Closure Plan submitted by the approval holder and authorized in writing by the Director pursuant to 7.1.1 and 7.1.4.

SECTION 3.2: WASTE STABILIZATION AREA

3.2.1 The approval holder shall construct the waste stabilization area in accordance with the following:

(a) application No. 008-10348; and

(b) within a Class I landfill cell;

unless otherwise authorized in writing by the Director.

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SECTION 3.3: SOIL CONSERVATION

3.3.1 The approval holder shall:

(a) salvage; and

(b) conserve

all topsoil for land reclamation of the landfill.

3.3.2 The approval holder shall:

(a) salvage; and

(b) conserve

all upper subsoil for land reclamation of the landfill.

3.3.3 The approval holder shall:

(a) conserve; and

(b) stockpile

all topsoil separately from the upper subsoil.

3.3.4 The approval holder shall place all:

(a) topsoil stockpiles; and

(b) upper subsoil stockpiles

at the landfill.

3.3.5 The approval holder shall stockpile all topsoil as follows:

(a) on stable foundations; and

(b) on undisturbed topsoil.

3.3.6 The approval holder shall stockpile all upper subsoil as follows:

(a) on stable foundations; and

(b) on areas where the topsoil has been removed.

3.3.7 The approval holder shall take all steps necessary to prevent any erosion (e.g., wind or water), including but not limited to, all of the following:

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(a) revegetating the stockpiles; and

(b) any other steps authorized in writing by the Director.

3.3.8 The approval holder shall immediately suspend conservation of:

(a) topsoil; and

(b) upper subsoil

when:

(i) wet or frozen conditions will result in mixing, loss, degradation or compaction of topsoil or upper subsoil, or

(ii) high wind velocities, any other field conditions or facility operations will result in mixing, loss, or degradation of topsoil or upper subsoil.

3.3.9 The approval holder shall recommence conservation of:

(a) topsoil; and

(b) upper subsoil

only when conditions in 3.3.8 no longer exist.

PART 4: OPERATIONS, LIMITS, MONITORING AND REPORTING

SECTION 4.1: GENERAL

4.1.1 The approval holder shall maintain the geographical boundaries of the landfill to that located within SE 1/4 of Section 9, Township 50, Range 17, West of the 4th Meridian, as described in the application.

4.1.2 The approval holder shall limit the waste elevation of the landfill to no more than the maximum designated waste elevation.

4.1.3 The approval holder shall restrict access to the facility to only personnel authorized by the approval holder.

4.1.4 The approval holder shall maintain a publicly available 24 hour "HOTLINE" number for a prompt response during an emergency.

4.1.5 The approval holder shall:

(a) operate; and

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(b) maintain the integrity of

the following waste management facilities at the facility:

(i) the HWRSP Facility;

(ii) the Class I and Class II industrial landfill, including:

(A) Class I landfill cells,

(B) Class II landfill cell(s), and

(C) waste stabilization area within a Class I landfill cell; and

(iii) waste storage area(s);

as described in the application.

4.1.6 In addition to 4.1.5, the approval holder shall:

(a) operate; and

(b) maintain the integrity of

the following infrastructure components at the facility:

(i) the composite liner;

(ii) the leachate collection system,

(iii) the leak detection system,

(iv) the run-on control system,

(v) the runoff control system,

(vi) the groundwater monitoring wells,

(vii) the weigh scale, and

(viii) the site access control;

as described in the application.

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FACILITY AUDIT

4.1.7 The approval holder shall cause the facility to be audited by an independent third-party environmental consultant or organization to assess compliance with the terms and conditions of this approval:

(a) at least once every three years; and

(b) commencing on or before October 1, 2018 for the first audit.

4.1.8 The approval holder shall submit the audit report required in 4.1.7 in the Annual Landfill Operations Report as required in 4.6.58(c).

4.1.9 The requirements in 4.1.7 and 4.1.8 shall not relieve the approval holder of any duty under the Act, or its associated regulations, or this approval.

SECTION 4.2: AIR

OPERATIONS

4.2.1 The approval holder shall not release any air effluent streams to the atmosphere except as authorized by this approval.

4.2.2 The approval holder shall only release air effluent streams to the atmosphere from the following sources:

(a) the scrubber exhaust stack;

(b) the Drum Processing Building natural gas fired air make up unit exhaust vent;

(c) the Staging Building natural gas fired air make up unit exhaust vent;

(d) the Administration Building natural gas fired furnaces exhaust vents;

(e) the Laboratory fume hood and natural gas fired air make up unit exhaust vents;

(f) the Maintenance Shop equipment and natural gas fired Radiant Heater exhaust vents;

(g) the Leachate Collection Tanks natural gas fired heaters exhaust vents;

(h) the leachate transfer lines passive gas vents; and

(i) any other source authorized in writing by the Director.

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4.2.3 The approval holder shall not operate any process equipment unless and until the pollution abatement equipment associated with the corresponding process equipment is:

(a) operational; and

(b) operating.

4.2.4 The approval holder shall treat all air effluent streams from the exhaust vents of the Drum Processing or Staging or both Buildings with a caustic scrubber and an activated carbon filter before directing the air effluent streams to the scrubber exhaust stack for release to the atmosphere while:

(a) hazardous waste or hazardous recyclables or both are being processed;

(b) hazardous waste or hazardous recyclables or both are being transferred; or

(c) containers of hazardous waste or hazardous recyclables or both are open

in the Drum Processing or Staging or both Buildings.

4.2.5 The approval holder shall control fugitive emissions and any source not specified in 4.2.2 in accordance with 4.2.6 of this approval unless otherwise authorized in writing by the Director.

4.2.6 With respect to fugitive emissions and any source not specified in 4.2.2, the approval holder shall not release a substance or cause to be released a substance that causes or may cause any of the following:

(a) impairment, degradation or alteration of the quality of natural resources;

(b) material discomfort, harm or adverse effect to the well being or health of a person; or

(c) harm to property or to vegetative or animal life.

4.2.7 The approval holder shall not burn any debris by means of an open fire unless authorized in writing by the Director.

4.2.8 If the approval holder receives complaints of offensive odours, or fugitive dust, or both, beyond the facility boundaries, the approval holder shall:

(a) conduct the following to reduce the release of those odours, or fugitive dust, or both by:

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(i) placing restrictions on types, or volumes, or both, of the wastes being handled or processed or deposited that are causing those odours, or fugitive dust, or both,

(ii) increasing the frequency of cover placement, or modifying waste handling activities, or performing both, at the landfill,

(iii) modifying waste handling activities at the HWRSP Facility, or

(iv) performing any combination of the above; and

(b) activate the Odour and Fugitive Dust Response Program as specified in the Landfill Operations Plan 4.6.34(j).

LIMITS

4.2.9 The approval holder shall maintain the pH of the scrubbing liquid of the caustic scrubber referred to in 4.2.4 at 8.0 or higher.

4.2.10 The approval holder shall replace activated carbon in the activated carbon filter referred to in 4.2.4 immediately when the concentration of total petroleum hydrocarbons in the air effluent streams released from the scrubber exhaust stack to the atmosphere exceeds 25 ppm.

MONITORING AND REPORTING

4.2.11 The approval holder shall monitor, daily at a minimum, the pH of the scrubbing liquid of the caustic scrubber referred to in 4.2.4.

4.2.12 The approval holder shall monitor, weekly at a minimum, the air effluent streams released from the scrubber exhaust stack, using a portable total petroleum hydrocarbon analyzer while:

(a) hazardous waste or hazardous recyclables or both are being processed;

(b) hazardous waste or hazardous recyclables or both are being transferred; or

(c) containers of hazardous waste or hazardous recyclables or both are open

in the Drum Processing or Staging or both Buildings.

4.2.13 The portable total petroleum hydrocarbon analyzer referred to in 4.2.12 shall:

(a) have a detection limit of 1 ppm or lower for total petroleum hydrocarbons;

(b) be located in a straight section of the scrubber exhaust stack, a minimum of one (1) metre downstream from the last flow disturbance; and

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(c) be calibrated regularly in accordance with the analyzer manufacturer's specifications.

4.2.14 The approval holder shall continue to implement the Ambient Air Monitoring Program as authorized in writing by the Director on June 24, 2009, unless and until otherwise authorized in writing by the Director pursuant to 4.2.18.

4.2.15 The approval holder shall submit to the Director the results of the Ambient Air Monitoring Program in 4.2.14 with the following reports:

(a) a Monthly Ambient Air Monitoring Report; and

(b) an Annual Ambient Air Monitoring Report

in accordance with the written authorization by the Director on June 24, 2009, unless and until otherwise authorized in writing by the Director pursuant to 4.2.18.

4.2.16 The approval holder shall submit:

(a) a revised Ambient Air Monitoring Program;

(b) revised reporting requirements, or

(c) both of the above

to the Director upon written request from the Director within the timeline specified in writing by the Director.

4.2.17 If the revised:

(a) Ambient Air Monitoring Program;

(b) reporting requirements; or

(c) both of the above

submitted pursuant to 4.2.16 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

4.2.18 The approval holder shall implement the revised:

(a) Ambient Air Monitoring Program;

(b) reporting requirements; or

(c) both of the above

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submitted pursuant to 4.2.16 as authorized in writing by the Director within the timeline specified in writing by the Director.

SECTION 4.3: RUNOFF AND INDUSTRIAL WASTEWATER

OPERATIONS

4.3.1 The approval holder shall not release any substances from the facility to the surrounding watershed except as authorized by this approval.

4.3.2 The approval holder shall operate and maintain the integrity of:

(a) the run-on control system to prevent flow onto the active landfill area from at least the peak discharge from a 1 in 25 year, 24 hour duration storm event at the facility; and

(b) the runoff control system for the facility to collect and control at least the runoff volume resulting from a 1 in 25 year, 24 hour duration storm event at the facility.

4.3.3 All runoff from the facility developed area shall be directed to the runoff control system as described in:

(a) application No. 012-10348, prior to decommissioning and reclamation of the old surface water detention pond; and

(b) the application, after decommissioning and reclamation of the old surface water detention pond;

unless otherwise authorized in writing by the Director.

4.3.4 Prior to decommissioning and reclamation of the old surface water detention pond and subject to 4.3.7, the approval holder shall only make or permit a release from the old surface water detention pond:

(a) at the release point as designated in application No. 012-10348, which is:

(i) located in the south east corner of the old surface water detention pond, and

(ii) referred to as sampling location A1 in 4.3.11;

(b) through a pump and a release hose over the south berm into the drainage control ditch, east of the landfill access road, to the new surface water detention pond, under normal operating conditions; and

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(c) through a pump and a release hose over the south berm directly to the culvert under Highway 854, during periods of high runoff exceeding the holding capacity of the old surface water detention pond;

unless otherwise authorized in writing by the Director.

4.3.5 Subject to 4.3.7, the approval holder shall only make or permit a release from the new surface water detention pond:

(a) at the release point as designated in application No. 012-10348, which is:

(i) located in the north east corner of the new surface water detention pond, and

(ii) referred to as sampling location B1 in 4.3.11; and

(b) through a pump and a release hose over the east berm into the culvert under Highway 854;

unless otherwise authorized in writing by the Director.

4.3.6 The approval holder shall only dispose of industrial wastewaters, or specified runoff in TABLE 4.3-A, or both, by one or more of the following methods:

(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER;

(d) as per 4.6.51; or

(e) as otherwise authorized in writing by the Director.

TABLE 4.3-A: SPECIFIED RUNOFF

SOURCES
Runoff that exceeds any of the limits for the parameters listed in TABLE 4.3-B.
Runoff for which the results of the parameters listed in TABLE 4.3-B are unavailable at the time that the runoff must be disposed of.
Runoff from within the tank farm bermed area.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

LIMITS

4.3.7 Releases of runoff from:

(a) the old surface water detention pond;

(b) the new surface water detention pond; or

(c) both ponds

to the surrounding watershed shall comply with the limits specified in TABLE 4.3-B.

4.3.8 Releases of runoff from within the tank farm bermed area to the old or new or both surface water detention ponds shall comply with the limits specified in TABLE 4.3-C.

TABLE 4.3-B: RUNOFF LIMITS FOR SURFACE WATER DETENTION POND

PARAMETER	LIMITS Maximum unless otherwise indicated
pH	6.0 – 9.5 pH units
COD	50 mg/L
TDS	2500 mg/L
TSS	25 mg/L
Ammonia (expressed as Nitrogen)	5 mg/L
Chloride	250 mg/L
Sodium	200 mg/L
Sulphate	500 mg/L
Oil or other substances	Not present in amounts sufficient to create a visible film or sheen
96-Hour Multiple Concentration Acute Lethality Test Using Rainbow Trout (*Oncorhynchus mykiss*)	50% or greater survival

TABLE 4.3-C: RUNOFF LIMITS FOR TANK FARM BERMED AREA

PARAMETER	LIMITS Maximum unless otherwise indicated
pH	6.0 – 9.5 pH units
COD	50 mg/L
TSS	25 mg/L
Ammonia (expressed as Nitrogen)	5 mg/L
Oil or other substances	Not present in amounts sufficient to create a visible film or sheen

TERMS AND CONDITIONS ATTACHED TO APPROVAL

MONITORING AND REPORTING

4.3.9 The approval holder shall monitor the runoff control system as required in TABLE 4.3-D, subject to 4.3.12.

4.3.10 The approval holder shall report to the Director the results of the runoff control system monitoring as required in TABLE 4.3-D, subject to 4.3.12.

4.3.11 For the purpose of TABLE 4.3-D:

(a) sampling location A1 is defined as the old surface water detention pond release point;

(b) sampling location A2 is defined as the old surface water detention pond;

(c) sampling location B1 is defined as the new surface water detention pond release point;

(d) sampling location B2 is defined as the new surface water detention pond; and

(e) sampling location C is defined as the tank farm bermed area.

4.3.12 The monitoring and reporting requirements in 4.3.9 and 4.3.10 for the old surface water detention pond (sampling locations A1 and A2) shall not apply after decommissioning and reclamation of the old surface water detention pond.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

TABLE 4.3-D: RUNOFF CONTROL SYSTEM MONITORING AND REPORTING

MONITORING				REPORTING	
Parameter	**Frequency**	**Sample Type**	**Sampling Location**	**Monthly**	**Annually**
Surface Water Detention Pond(s)				Monthly Runoff and Industrial Wastewater Report, for each month when release occurs	Annual Runoff and Industrial Wastewater Report
Flow (m^3/day)	Daily during release	Estimate	A1, B1		
pH	Once per batch release, prior to release	Representative Grab	A2, B2		
COD					
TDS					
TSS					
Ammonia (expressed as nitrogen)					
Chloride					
Sodium					
Sulphate					
Oil or other substances	Daily during release	Visual			
96-hour multiple concentration acute lethality test using rainbow trout (*oncorhynchus mykiss*)	Each month when release occurs, prior to release, for the first batch release of the month	Representative Grab			
48-hour static acute lethality test using *daphnia magna*					
Tank Farm Bermed Area					
Volume (m^3)	Total batch volume released	Estimate	C		
pH	Once per batch release, prior to release to the surface water detention pond(s)	Representative Grab			
COD					
TSS					
Ammonia (expressed as nitrogen)					
Oil or other substances		Visual			

4.3.13 The monitoring and reporting required in TABLE 4.3-D for the acute lethality tests shall comply with:

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(a) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, Environment Canada, Environmental Protection Series 1/RM/13, December2000, as amended; and

(b) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia Magna*, Environment Canada, Environmental Protection Series 1/RM/14, December 2000, as amended.

4.3.14 The approval holder shall:

(a) treat any acute lethality test that deviates from the corresponding test method referred to in 4.3.13 as invalid; and

(b) repeat the test as soon as logistically possible.

4.3.15 In the event that less than 50% of the rainbow trout survived in the 100% concentration sample, the approval holder shall:

(a) implement a program immediately to identify the source of the toxicity; and

(b) submit to the Director within 90 days after the test result is available, a proposed program to reduce the toxicity of the runoff.

4.3.16 The approval holder shall submit the Monthly Runoff and Industrial Wastewater Report in TABLE 4.3-D to the Director.

4.3.17 The Monthly Runoff and Industrial Wastewater Report shall include, at a minimum, all of the following information:

(a) a monthly assessment of the monitoring results relative to the limits in TABLE 4.3-B;

(b) a monthly assessment of the monitoring results relative to the limits in TABLE 4.3-C;

(c) a monthly assessment of the performance of the:

(i) runoff control system,

(ii) pollution abatement equipment, and

(iii) monitoring equipment;

(d) a monthly summary of management and disposal of the:

(i) industrial wastewaters, and

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(ii) specified runoff

as per 4.3.6;

(e) a monthly summary of management and disposal of runoff in general;

(f) a monthly summary of runoff contraventions reported pursuant to 2.1.1; and

(g) any other information as required in writing by the Director.

4.3.18 The approval holder shall submit the Annual Runoff and Industrial Wastewater Report in TABLE 4.3-D to the Director.

4.3.19 The Annual Runoff and Industrial Wastewater Report shall include, at a minimum, all of the following information:

(a) an annual summary assessment of the monitoring results relative to the limits in TABLE 4.3-B;

(b) an annual summary assessment of the monitoring results relative to the limits in TABLE 4.3-C;

(c) an annual summary assessment of the performance of the:

(i) runoff control system,

(ii) pollution abatement equipment, and

(iii) monitoring equipment;

(d) an annual summary of management and disposal of the:

(i) industrial wastewaters, and

(ii) specified runoff

as per 4.3.6;

(e) an annual summary and evaluation of management and disposal of runoff in general;

(f) an annual summary of the results pursuant to 4.3.21;

(g) an annual summary of runoff contraventions reported pursuant to 2.1.1; and

(h) any other information as required in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.3.20 The approval holder shall:

(a) collect a representative grab sample from the old surface water detention pond at least once per year, prior to decommissioning and reclamation of the pond;

(b) collect a representative grab sample from the new surface water detention pond at least once per year; and

(c) analyze the sample(s) for all of the parameters specified in TABLE 4.3-E.

4.3.21 The approval holder shall submit the results of the analyses in 4.3.20 to the Director in the Annual Runoff and Industrial Wastewater Report.

TABLE 4.3-E: ANNUAL MONITORING OF SURFACE WATER DETENTION POND

PARAMETERS			
pH	TDS; TSS	Fluoride, dissolved	Phenols
Electrical conductivity	Metals	Cyanide (weak acid dissociable)	Total chlorinated phenols
COD	Major ions	BTEX	Polychlorinated biphenyls, total
DOC	Nutrients	Petroleum Hydrocarbons Fractions F1 and F2	Total organic halogens

SECTION 4.4: LEACHATE COLLECTION AND LEAK DETECTION

OPERATIONS

4.4.1 The approval holder shall only dispose of leachate removed from the leachate collection system by one or more of the following methods:

(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER; or

(d) as per 4.6.51.

4.4.2 The approval holder shall only dispose of liquid removed from the leak detection system by one or more of the following methods:

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(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER; or

(d) as per 4.6.51.

LIMITS

4.4.3 Subject to 4.4.4, the approval holder shall not exceed the maximum acceptable leachate head in any landfill cell.

4.4.4 Subsequent to a storm event, the leachate head in any landfill cell shall not exceed the maximum acceptable leachate head for more than fourteen (14) days, unless otherwise authorized in writing by the Director.

4.4.5 The volume of liquid in the leak detection system, as monitored in TABLE 4.6-D, shall not exceed the action leakage rate in any landfill cell.

MONITORING AND REPORTING

4.4.6 The approval holder shall monitor the leachate collection and leak detection systems as required in TABLE 4.6-D and for all parameters specified in TABLE 4.4-A, subject to 4.4.8 and 4.4.9.

4.4.7 The approval holder shall report to the Director the results of the leachate collection and leak detection systems monitoring as required in TABLE 4.6-D, including the results of the analyses for all parameters specified in TABLE 4.4-A, subject to 4.4.8 and 4.4.9.

TABLE 4.4-A: LEACHATE AND LEAK DETECTION LIQUID MONITORING

PARAMETERS		
pH (field and laboratory)	TDS	Nutrients
Electrical conductivity (field and laboratory)	TSS	BTEX
COD	Metals	Phenols
DOC	Major Ions	Petroleum Hydrocarbons Fractions F1 and F2

4.4.8 The requirements in 4.4.6 and 4.4.7 for monitoring and reporting the parameters in TABLE 4.4-A for leachate shall not apply if insufficient leachate is available for conducting the analyses.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.4.9 The requirements in 4.4.6 and 4.4.7 for monitoring and reporting the parameters in TABLE 4.4-A for leak detection liquid shall not apply if insufficient leak detection liquid is available for conducting the analyses.

4.4.10 If the volume of liquid removed from the leak detection system exceeds the action leakage rate, in addition to reporting pursuant to 2.1.1, the approval holder shall submit a Response Action Plan to the Director within 30 days of the exceedance.

SECTION 4.5: DUGOUTS AND WATER WELLS IN SURROUNDING AREA

MONITORING AND REPORTING

4.5.1 The approval holder shall:

(a) collect a representative sample from:

(i) each of the dugouts, and

(ii) each of the water wells

within an approximate 1.6 kilometre radius around the facility; and

(b) analyze the sample for the parameters listed in TABLE 4.5-A;

unless the approval holder is not granted access by the landowner.

4.5.2 The monitoring required in 4.5.1 shall be conducted once each year in October unless otherwise authorized in writing by the Director.

4.5.3 The approval holder shall record the analytical results of the sampling information required in 4.5.1 in an Annual Dugout and Water Well Sampling Program Report.

4.5.4 The approval holder shall submit the Annual Dugout and Water Well Sampling Program Report to the Director pursuant to 4.6.58(i).

TABLE 4.5-A: DUGOUT AND WATER WELL MONITORING

PARAMETERS		
pH (field and laboratory)	TDS	Nutrients
Electrical conductivity (field and laboratory)	TSS	BTEX
COD	Metals	Phenols
DOC	Major Ions	Petroleum Hydrocarbons Fractions F1 and F2

TERMS AND CONDITIONS ATTACHED TO APPROVAL

SECTION 4.6: HWRSP FACILITY AND LANDFILL

GENERAL

4.6.1 The approval holder shall not:

(a) receive;

(b) process;

(c) dispose of; or

(d) perform any combination of the above for

any of the following wastes, individually or in any combination, at the places specified below respectively:

(i) explosives (Class 1 TDGR wastes), at the facility;

(ii) radioactive wastes (Class 7 TDGR wastes), at the facility;

(iii) radioactive wastes regulated under the *Nuclear Safety and Control Act* (Canada), at the facility;

(iv) biomedical waste, at the facility;

(v) waste containing free liquids, at the landfill, excluding the waste stabilization area;

(vi) material containing ozone depleting substances, at the landfill;

(vii) municipal solid waste, at the facility; and

(viii) NORM waste, at the facility.

4.6.2 Incompatible wastes and incompatible hazardous recyclables shall be prevented from mixing.

4.6.3 The approval holder shall dispose of wastes generated at the facility only:

(a) to facilities holding a current Act authorization;

(b) to facilities approved by a local environmental authority outside of Alberta; or

(c) as otherwise authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

HWRSP FACILITY

OPERATIONS PLAN

4.6.4 The approval holder shall:

(a) develop;

(b) keep up-to-date; and

(c) implement

an HWRSP Facility Operations Plan.

4.6.5 The approval holder shall:

(a) review the HWRSP Facility Operations Plan annually, at a minimum; and

(b) update the HWRSP Facility Operations Plan if any of the following circumstances apply:

(i) there are facility expansions or changes in site operations or equipment,

(ii) there is an applicable change to an applicable regulation, or

(iii) an update is required in writing by the Director.

4.6.6 The approval holder shall retain a copy of the most recent HWRSP Facility Operations Plan at the facility.

4.6.7 The approval holder shall submit a copy of the most recent HWRSP Facility Operations Plan to the Director upon written request from the Director within the timeline specified in writing by the Director.

4.6.8 If the HWRSP Facility Operations Plan submitted pursuant to 4.6.7 is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

4.6.9 The approval hold shall implement the latest HWRSP Facility Operations Plan, unless otherwise authorized in writing by the Director.

OPERATIONS

4.6.10 The approval holder shall only transfer wastes and hazardous recyclables at designated transfer areas designed to contain spills and leaks.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.6.11 The approval holder shall use the following when transferring substances to, from, and between containers, tanks, and trucks:

(a) couplings equipped with seals that are compatible with the substance transferred;

(b) the necessary precautions to prevent spills when the couplings are disconnected;

(c) emergency shut-off valves;

(d) established transfer areas and associated curbing, paving and catchment areas;

(e) drip trays to capture potential losses under coupling devices and other connections; and

(f) manual inspections of the transfer area for leaks and spills during and after waste transfer.

4.6.12 All wastes and all hazardous recyclables that are unloaded shall be immediately transferred to the waste storage area.

4.6.13 All containers and unrinsed empty containers shall be stored in the waste storage area.

4.6.14 The approval holder shall:

(a) provide and maintain an adequate aisle space between containers in the waste storage area to allow:

(i) inspection, and

(ii) unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of the waste storage area; and

(b) arrange inspection aisles in the waste storage area such that the identification label on each container is readable.

4.6.15 All tanks within the tank farm area shall be equipped, at a minimum, with all of the following:

(a) sensors for detecting the level in each tank;

(b) high level alarms that activate when a tank overfill is imminent;

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(c) automatic shut-off devices or sufficient free board space above the high level sensor to allow operators time to prevent overfill from occurring; and

(d) earthen dikes or equivalent secondary containment structures capable of containing 110% of the volume of the largest tank within the bermed area plus 10% of the aggregate capacity of all other tanks in the bermed area.

4.6.16 All tanks containing hazardous waste and all tanks containing hazardous recyclables in each building shall be equipped, at a minimum, with all of the following:

(a) sensors or gauges for detecting the level in each tank;

(b) a written operating procedure to prevent tank overfill; and

(c) secondary containment structures capable of containing 110% of the volume of the largest tank within the building plus 10% of the aggregate capacity of all other tanks containing hazardous waste and hazardous recyclables in the same building.

4.6.17 Hazardous waste and hazardous recyclables stored in containers and tanks shall be stored in accordance with the *Hazardous Waste Storage Guidelines*, June 1988, Alberta Environment, as amended.

4.6.18 The approval holder shall only carry out the following activities, individually or in any combination, at the HWRSP Facility in relation to hazardous waste or hazardous recyclables or both:

(a) commingling of hazardous waste or hazardous recyclables to make maximum use of available container or tank capacity, only if the resultant mixture has the same TDGR hazard classification as any one of the individual components;

(b) phase separation by gravity settling, only without the addition of any chemicals designed to accelerate settling;

(c) dispersion of solids into liquids by natural or mechanical means, only if the resultant mixture has the same TDGR hazard classification as the original waste;

(d) physical segregation of hazardous from non-hazardous articles or components from the same container, only if no process equipment is used;

(e) washing of drums or other objects, only for the purpose of removing hazardous residue;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(f) crushing or shredding of used filters, rags, absorbent materials, or empty containers, only for the purpose of volume reduction or liquid recovery, unless otherwise authorized in writing by the Director; or

(g) treatment of hazardous waste, only as authorized in writing by the Director.

4.6.19 Notwithstanding 4.6.18(g), the approval holder shall not incinerate waste at the facility.

LIMITS

4.6.20 The approval holder shall not store a total of more than 752,500 litres of hazardous waste or hazardous recyclables or both at the HWRSP Facility at any time.

4.6.21 In addition to the storage limits in 4.6.20, the approval holder shall not exceed the waste storage limits as specified in TABLE 4.6-A.

TABLE 4.6-A: STORAGE LIMITS FOR HAZARDOUS WASTE OR HAZARDOUS RECYCLABLES OR BOTH AT HWRSP FACILITY

Waste/Recyclable Type	Material	Maximum Quantity
Containers: Hazardous waste or hazardous recyclables or both	TDGR Classification 2, 3, 4, 5, 6, 8 or 9 waste type only	512,500 litres (consisting of 2,500 drum equivalents, each 205 litre capacity)
Bulk Tanks: Hazardous waste or hazardous recyclables or both	Waste flammable liquids, used oil, or wastewaters; or TDGR Classification 3, 5, 6, 8 or 9 waste type only	240,000 litres (consisting of a total of 135 m^3 in the tank farm area, and a total of 105 m^3 inside the buildings)

4.6.22 Containers other than 205 litre drums shall be prorated to 205 litre drum equivalents based on their nominal volumes, e.g., 10 X 20 litre pails = 1 X 205 litre drum.

4.6.23 The limits referred to in 4.6.20 and 4.6.21 shall be calculated based on the:

(a) total nominal volumes of all containers, treating all partially filled containers as if they were full; and

(b) total filled capacities of all tanks.

MONITORING AND REPORTING

4.6.24 The approval holder shall:

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(a) identify;

(b) characterize; and

(c) classify

all waste streams and all hazardous recyclables, generated or received at the HWRSP Facility, not including runoff, industrial wastewater streams and air effluent streams in accordance with the:

(i) *Industrial Waste Identification and Management Options*, Alberta Environment, May 1996, as amended, and

(ii) *Alberta User Guide for Waste Managers*, Alberta Environment, August 1996, as amended.

4.6.25 The approval holder shall measure or, when not feasible to measure, estimate, the quantity of each waste and hazardous recyclable identified in 4.6.24 each year.

4.6.26 The approval holder shall keep a daily:

(a) total; and

(b) inventory

of all materials being stored at the HWRSP Facility.

4.6.27 The daily total and inventory records in 4.6.26 shall be available at the facility at all times for inspection by the Director or an inspector.

4.6.28 The approval holder shall submit a Monthly Waste Management Report to the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

TABLE 4.6-B: MONTHLY WASTE INVENTORY REPORT (BY WASTE CLASS)

COMPANY NAME: _____ APPROVAL NO.: _____

REPORT PERIOD: MONTH _____ YEAR _____

CLASS	UNIT (Kg or L)	OPENING BALANCE	+ RECEIVED IN PROVINCE	+ RECEIVED OUT OF PROVINCE	- SHIPPED *		- ON-SITE DISPOSAL	+ or - ADJUSTMENT **	CLOSING BALANCE	APPROVAL LIMIT
					RECYCLING / PRODUCT	OFF-SITE DISPOSAL				
2										
3										
4										
5										
6.1										
8										
9.1										
9.2										
9.3										
PCB										
NR										
TOTAL										XXXXX
							No. of Containers On site			XXXXX
							Total Litres in Bulk Tanks			XXXXX

Name of Company Official: _____ Title: _____ Signature: _____

Report Date: _____

* Provide a list of the recycling and disposal locations.

** Identity the amount and reason for each adjustment.
Adjustments include consolidation/reclassification, losses to processing, spills, volume miscalculations, or any other circumstances, which would affect the mass balance of the monthly inventory report.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.6.29 The approval holder shall compile all of the information indicated in TABLE 4.6-B in the Monthly Waste Management Report which shall contain, at minimum, all of the following information:

(a) an opening waste and hazardous recyclables inventory balance in kilograms or litres by waste class or material type;

(b) the amount and type of waste and hazardous recyclables received:

(i) within the province, and

(ii) from outside the province;

(c) the amount and type of waste and hazardous recyclables:

(i) shipped for recycling or product,

(ii) shipped off-site for disposal, and

(iii) disposed on-site;

(d) any adjustments, including but not limited to, consolidation, reclassification, losses to processing, spills, volume miscalculations, or any other circumstances, which would affect the mass balance of the monthly inventory report;

(e) closing balance in kilograms or litres;

(f) a summary of contraventions reported pursuant to 2.1.1 related to waste and hazardous recyclables; and

(g) any other information as required in writing by the Director.

4.6.30 The approval holder shall compile all the information required by 4.6.24 and 4.6.25 in an Annual Waste Management Summary Report:

(a) as specified in TABLE 4.6-C; and

(b) in accordance with the:

(i) *Industrial Waste Identification and Management Options*, Alberta Environment, May 1996, as amended, and

(ii) *Alberta User Guide for Waste Managers*, Alberta Environment, August 1996, as amended.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

TABLE 4.6-C: ANNUAL WASTE MANAGEMENT SUMMARY

Waste or Hazardous Recyclable Name	Uniform Waste Code				Quantity (kg or L)		Stored	Recycled		Disposed	
	WC	PIN	Class	Mgmt	Hazardous	Non-hazardous	On-site	On-site	Off-site	On-site	Off-site
TOTAL											

4.6.31 The approval holder shall submit the Annual Waste Management Summary Report to the Director.

LANDFILL

OPERATIONS PLAN

4.6.32 The approval holder shall:

(a) develop;

(b) keep up-to-date; and

(c) implement

a Landfill Operations Plan that does not contravene with the requirements of this approval.

4.6.33 The approval holder shall:

(a) review the Landfill Operations Plan annually, at a minimum; and

(b) update the Landfill Operations Plan if any of the following circumstances apply:

(i) there are facility expansions or changes in site operations or equipment,

(ii) there is an applicable change to the *Standards for Landfills in Alberta,* as amended,

(iii) an update is required in writing by the Director, or

(iv) there is an update to an applicable regulation.

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4.6.34 The Landfill Operations Plan shall include, at a minimum, all of the following:

(a) SOP for keeping and maintaining an Operating Record;

(b) SOP for waste control, run-on and runoff controls, and nuisance controls;

(c) SOP for the waste stabilization area operations;

(d) SOP for the acceptance, handling and disposal of wastes, including;

(i) waste characterization and classification at source,

(ii) waste manifesting and tracking,

(iii) QA/QC waste acceptance procedures, and

(iv) waste sampling;

(e) SOP for detecting, preventing and disposal of unauthorized wastes;

(f) SOP for placing waste in a landfill cell including;

(i) working face width,

(ii) lift depth,

(iii) compaction, and

(iv) waste placement location using a grid system;

(g) SOP for managing contaminated sulphur and sulphur containing wastes;

(h) SOP for managing asbestos wastes;

(i) SOP for placing leachate, leak detection liquid, or other authorized wastes and liquids over the surface of the active landfill area for the purpose of evaporation or dust suppression;

(j) an Odour and Fugitive Dust Response Program;

(k) a Fugitive Dust and Odour Best Management Plan;

(l) a runoff and industrial wastewater monitoring and management program;

(m) a leachate monitoring and management program;

(n) a leak detection liquid monitoring and management program;

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(o) a groundwater monitoring program;

(p) a Remediation Plan to deal with groundwater quality deterioration;

(q) a soil monitoring program;

(r) a soil management program;

(s) a landfill cell cover system;

(t) a monitoring and maintenance program for the scale house and heavy operational equipment;

(u) a health and safety program;

(v) an emergency response program, including SOP for handling fires, substance releases to the environment, and health concerns; and

(w) an up-to-date plan of the landfill layout with survey records showing the location of all infrastructure components of the landfill including final cover elevations and contours.

4.6.35 The approval holder shall retain a copy of the most recent Landfill Operations Plan at the facility.

4.6.36 The approval holder shall submit to the Director the most recent Landfill Operations Plan when requested in writing by the Director within the timeline specified in writing by the Director.

4.6.37 The approval holder shall correct all deficiencies in the Landfill Operations Plan submitted pursuant to 4.6.36, as outlined in writing by the Director, within the timeline specified in writing by the Director.

4.6.38 The approval holder shall implement the latest Landfill Operations Plan, unless otherwise authorized in writing by the Director.

OPERATIONS

4.6.39 The approval holder shall classify all materials entering the landfill in accordance with the:

(a) *Waste Control Regulation (AR 192/96)*;

(b) *Industrial Waste Identification and Management Options*, Alberta Environment, May 1996, as amended; and

(c) *Alberta User Guide for Waste Managers*, May 1995, as amended.

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4.6.40 The approval holder shall obtain a detailed representative physical and chemical analysis of a waste prior to disposal of the waste into the landfill at the following times, at a minimum:

(a) the first time a waste is received from a new generator;

(b) the first time a delivery is received from a different process associated with a known waste generator;

(c) the first time a waste is received from a different location associated with a known waste generator; and

(d) when the nature or composition of the waste that was previously characterized by the generator changes.

4.6.41 The approval holder shall not dispose of hazardous waste in any Class II landfill cell.

4.6.42 The approval holder shall:

(a) only carry out waste stabilization or solidification or both within the waste stabilization area; and

(b) not transfer waste from the waste stabilization area to the Class I landfill cell before the waste stabilization or solidification or both have completed.

4.6.43 The approval holder shall only dispose of any liquid collected within the waste stabilization area by one or more of the following methods:

(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER; or

(d) as otherwise authorized in writing by the Director.

4.6.44 The approval holder shall conduct:

(a) annually, in-house visual inspections for corrosion; and

(b) biennially, ultrasonic testing to monitor thickness

of the steel plate liner of the stabilization pits in the waste stabilization area, unless otherwise authorized in writing by the Director.

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4.6.45 The approval holder shall dispose of asbestos wastes in accordance with *"Guidelines for the Disposal of Asbestos Waste"*, Environmental Protection Services, Alberta Environment, 1989, as amended.

4.6.46 The approval holder shall dispose of sulphur waste in accordance with *"Guidelines for Landfill Disposal of Sulphur Wastes and Remediation of Sulphur Containing Soils"*, Alberta Environment, 2011, as amended.

4.6.47 The approval holder shall only dispose of wastes that the landfill is not authorized to dispose of:

(a) to facilities holding a current Act authorization;

(b) to facilities approved by a local environmental authority outside of Alberta; or

(c) as otherwise authorized in writing by the Director.

4.6.48 If an unauthorized waste is received at the landfill, the approval holder shall remove the waste from the landfill within seven (7) days of the receipt, unless otherwise authorized in writing by the Director.

4.6.49 The approval holder shall restrict the working face of each landfill cell to the smallest practical area.

4.6.50 For any waste disposed of at the landfill that is subject to wind dispersal, the approval holder shall:

(a) wet the waste to prevent dispersal of particulate matter; or

(b) immediately apply cover on top of the waste to minimize entrainment of particulate matter.

4.6.51 Notwithstanding 4.6.1(v), the approval holder may place any of the following wastes over the surface of the active landfill area for the purpose of dust suppression:

(a) specified runoff;

(b) leachate;

(c) leak detection liquid;

(d) sump waste of car wash bays or similar operations;

(e) waste from hydrovac excavation operations; or

(f) any other waste authorized by t*he Alberta User Guide for Waste Managers*, May 1995, as amended;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

provided that placement of such wastes will not cause offensive odours.

4.6.52 The approval holder shall inspect the landfill, at a minimum:

(a) weekly; and

(b) immediately after each storm event to:

(i) detect evidence of deterioration of any infrastructure components, including the composite liner,

(ii) detect any malfunction or improper operation of the run-on and runoff control systems, leachate collection system, or leak detection system, and

(iii) take corrective measures to repair any damage to infrastructure components, including the composite liner.

4.6.53 The approval holder shall:

(a) keep a record of inspections conducted pursuant to 4.6.52;

(b) have the record of inspections available for review upon written request from the Director; and

(c) immediately report any deficiencies detected by the inspection in 4.6.52 to the Director in writing along with any corrective measures taken or proposed.

4.6.54 The approval holder shall not stockpile waste exceeding the maximum designated waste elevation of the landfill for a period of more than two (2) weeks, unless otherwise authorized in writing by the Director.

4.6.55 The approval holder shall take all practical measures to prevent off-site tracking of waste from vehicles and equipment leaving the facility.

MONITORING AND REPORTING

4.6.56 The approval holder shall monitor the landfill operations as required in TABLE 4.6-D.

4.6.57 The approval holder shall report to the Director the results of the landfill operations monitoring as required in TABLE 4.6-D.

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TABLE 4.6-D: LANDFILL OPERATIONS MONITORING AND REPORTING REQUIREMENTS

MONITORING AND REPORTING				
Parameter	**Frequency**	**Sample Type**	**Sampling Location**	**Reporting**
Quantity and type of waste received	Continuously, When operating	Measured or estimated	At entrance to landfill	Annual Landfill Operations Report
Quantity and type of material removed	Continuously, when operating	Measured or estimated	At entrance to landfill	
General location of waste deposited	Continuously, when operating	As per survey, or using grid system	At active landfill area, or survey coordinates	
Leachate head	at least: - once every three working days; - after storm event; and - immediately prior to leachate removal	Calculated	At primary leachate collection system sumps for existing landfill Cell 1	
		Measured	At primary leachate collection system sumps for all other landfill cells	
Leachate analysis, as per TABLE 4.4-A	At least once every quarter year, unless insufficient sample volume is available	Grab sample	At each primary leachate collection system sump	
Volume of leachate removed from the leachate collection system	As removed	Measured or calculated	At leachate collection system sumps	
Leak detection liquid analysis, as per TABLE 4.4-A	At least once every quarter year, unless insufficient sample volume is available	Grab sample	At each leak detection system sump	
Volume of leak detection liquid removed from the leak detection system	At least once every working day, as removed	Measured or calculated	At leak detection system sumps	
Final cover	When final cover is applied	Final cover by survey cores or test pits or both	On each completed landfill cell	

4.6.58 The Annual Landfill Operations Report required in TABLE 4.6-D shall include, at a minimum, all of the following:

(a) the name and contact information of the person responsible for the facility;

(b) a summary of all information collected as required in TABLE 4.6-D;

(c) a summary of the results of any audit conducted in accordance with 4.1.7;

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(d) a summary of the operations of the waste stabilization area;

(e) a summary of the performance of the run-on and runoff control systems, including a comparison to the limits in TABLES 4.3-B and 4.3-C;

(f) a summary of the performance of the leachate collection system, including a comparison to the maximum acceptable leachate head;

(g) a summary of the performance of the leak detection system, including a comparison to the action leakage rate limit;

(h) the Response Action Plan for the leak detection system pursuant to 4.4.10;

(i) the Annual Dugout and Water Well Sampling Program Report pursuant to 4.5.4;

(j) a summary of all revisions to the Landfill Operations Plan pursuant to 4.6.33(b);

(k) any groundwater remedial action taken pursuant to 4.6.34(p);

(l) a summary of records of landfill inspections pursuant to 4.6.53;

(m) a summary of:

  (i) operational issues encountered,

  (ii) emergencies occurred, and

  (iii) measures or actions taken;

(n) a summary of records of:

  (i) public complaints, and

  (ii) the approval holder's responses;

(o) an up-to-date financial security estimate pursuant to 5.1.2;

(p) an updated site development plan showing the status of the landfill progression at the end of the operating year, including but not limited to:

  (i) contour mapping,

  (ii) the location of active and inactive disposal areas,

  (iii) areas where a final cover has been placed, and

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(iv) the location of new landfill cell(s) constructed;

(q) the Annual Landfill Cell Closure Report pursuant to 7.1.7;

(r) a summary of contraventions reported pursuant to 2.1.1 related to landfill operations; and

(s) any other information as required in writing by the Director.

4.6.59 The approval holder shall submit the Annual Landfill Operations Report to the Director.

SECTION 4.7: DOMESTIC WASTEWATER

OPERATIONS

4.7.1 The approval holder shall not release any substances from the domestic wastewater system to the surrounding watershed except as authorized by this approval.

4.7.2 The approval holder shall direct all domestic wastewater to the domestic wastewater system.

4.7.3 The approval holder shall only dispose of substances from the domestic wastewater system:

(a) to facilities holding a current Act authorization;

(b) to facilities approved by a local environmental authority outside of Alberta; or

(c) as otherwise authorized in writing by the Director.

SECTION 4.8: WATERWORKS

Not used at this time.

SECTION 4.9: GROUNDWATER

MONITORING

4.9.1 The approval holder shall continue to implement the existing Groundwater Monitoring Program as authorized in writing by the Director, unless and until otherwise authorized in writing by the Director pursuant to 4.9.4.

4.9.2 The approval holder shall submit a revised Groundwater Monitoring Program to the Director on or before September 30, 2017, unless otherwise authorized in writing by the Director.

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4.9.3 If the revised Groundwater Monitoring Program submitted pursuant to 4.9.2 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

4.9.4 The approval holder shall implement the revised Groundwater Monitoring Program submitted pursuant to 4.9.2 as authorized in writing by the Director within the timeline specified in writing by the Director.

4.9.5 The approval holder shall:

(a) collect a representative groundwater sample from each of the groundwater monitor wells specified in the Groundwater Monitoring Program, including the groundwater monitoring wells designated as points of compliance; and

(b) analyze each sample for the parameters listed in TABLE 4.9-A.

TABLE 4.9-A: GROUNDWATER MONITORING PROGRAM

PARAMETERS	
pH	Metals
Electrical conductivity	Major ions
COD	Nutrients
DOC	BTEX
TDS	Petroleum Hydrocarbons Fractions F1 and F2

4.9.6 The monitoring required in 4.9.5 shall be conducted at the following frequencies, unless otherwise authorized in writing by the Director:

(a) a minimum of once per year during each of the active landfill life, landfill cell closure, final landfill closure, and post-closure periods; and

(b) a minimum of four times per year following detection of leachate constituents in groundwater at levels above those specified in 4.9.7, and until the levels specified in 4.9.7 have been met.

4.9.7 The groundwater quality in the monitoring wells, designated as points of compliance in the Groundwater Monitoring Program, shall not exceed the higher of:

(a) the objectives established in the water quality objectives in the *Canadian Environmental Quality Guidelines (CEQG)* for drinking water published by the Canadian Council of Ministers of the Environment (CCME), as amended; or

(b) background groundwater chemistry as determined through a statistical analysis, as a derived alternate groundwater performance standard.

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4.9.8 The approval holder shall implement the Remediation Plan as specified in the Landfill Operations Plan, when groundwater quality exceeds the groundwater performance criteria in 4.9.7.

4.9.9 The samples extracted from the groundwater monitor wells shall be collected using scientifically acceptable purging, sampling and preservation procedures so that a representative groundwater sample is obtained.

4.9.10 The approval holder shall:

(a) protect from damage; and

(b) keep locked except when being sampled

all groundwater monitoring wells unless otherwise authorized in writing by the Director.

4.9.11 If a representative groundwater sample cannot be collected because the groundwater monitoring well is damaged or is no longer capable of producing a representative groundwater sample, the approval holder shall:

(a) clean, repair or replace the groundwater monitoring well; and

(b) collect and analyse a representative groundwater sample prior to the next scheduled sampling event;

unless otherwise authorized in writing by the Director.

4.9.12 In addition to the sampling information recorded in 2.2.1, the approval holder shall record the following sampling information for all groundwater samples collected:

(a) a description of purging and sampling procedures;

(b) the static elevations above sea level, and depth below ground surface of fluid phases in the groundwater monitoring well prior to purging;

(c) the temperature of each sample at the time of sampling;

(d) the pH of each sample at the time of sampling; and

(e) the specific conductance of each sample at the time of sampling.

4.9.13 The approval holder shall carry out remediation of the groundwater in accordance with the following:

(a) *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended; and

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(b) *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended.

REPORTING

4.9.14 The approval holder shall compile an Annual Groundwater Monitoring Program Report which shall include, at a minimum, all of the following information:

(a) a completed *Record of Site Condition Form*, Alberta Environment, 2009, as amended;

(b) a legal land description of the facility and a map illustrating the facility boundaries;

(c) a topographic map of the facility;

(d) a description of the industrial activity and processes;

(e) a map showing the location of all surface and groundwater users, and a listing describing surface water and water well use details, within at least a 1.6 kilometre radius of the facility;

(f) a general hydrogeological characterization of the region within a five kilometre radius of the facility;

(g) a detailed hydrogeological characterization of the facility, including an interpretation of groundwater flow patterns;

(h) cross-sections showing depth to water table, patterns of groundwater movement and hydraulic gradients at the facility;

(i) borehole logs and completion details for groundwater monitoring wells;

(j) a map showing locations of all known buried channels within at least five kilometre of the facility;

(k) a map of surface drainage within the facility and surrounding area to include nearby water bodies;

(l) a map of groundwater monitoring well locations and a table summarizing the existing groundwater monitoring program for the facility;

(m) a summary of any changes to the groundwater monitoring program made since the last groundwater monitoring report;

(n) analytical data recorded as required in 4.9.5 and 4.9.11(b);

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(o) a summary of fluid elevations recorded as required in 4.9.12(b) and an interpretation of changes in fluid elevations;

(p) an interpretation of QA/QC program results;

(q) an interpretation of all the data in this report, including the following:

  (i) diagrams indicating the location and extent of any contamination,

  (ii) a description of probable sources of contamination, and

  (iii) a site map showing the location and type of current and historical potential sources of groundwater contamination;

(r) a summary and interpretation of the data collected since the groundwater monitoring program began including:

  (i) control charts which indicate trends in concentrations of parameters, and

  (ii) the migration of contaminants;

(s) a description of the following:

  (i) contaminated groundwater remediation techniques employed,

  (ii) source elimination measures employed,

  (iii) risk assessment studies undertaken, and

  (iv) risk management studies undertaken;

(t) a proposed sampling schedule for the following year(s);

(u) a description of any contaminant remediation, risk assessment or risk management action conducted at the facility; and

(v) recommendations for:

  (i) changes to the groundwater monitoring program to make it more effective, and

  (ii) remediation, risk assessment or risk management of contamination identified.

4.9.15 The approval holder shall submit the Annual Groundwater Monitoring Program Report to the Director.

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4.9.16 If the Annual Groundwater Monitoring Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, within the timeline specified in writing by the Director.

SECTION 4.10: SOIL

4.10.1 In addition to any other requirements specified in this approval, the approval holder shall conduct all of the following activities related to soil monitoring and soil management required by this approval in accordance with the *Soil Monitoring Directive,* Alberta Environment, 2009, as amended:

(a) designing and developing proposals for the Soil Monitoring Program;

(b) designing and developing proposals for the Soil Management Program;

(c) all other actions, including sampling, analysing, and reporting, associated with the Soil Monitoring Program; and

(d) all other actions, including sampling, analysing and reporting, associated with the Soil Management Program.

MONITORING AND REPORTING

4.10.2 The approval holder shall submit the Soil Monitoring Program proposal to the Director according to the following schedule:

(a) for the first soil monitoring event on or before January 31, 2019; and

(b) for the second soil monitoring event on or before January 31, 2024;

unless otherwise authorized in writing by the Director.

4.10.3 If any Soil Monitoring Program proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

4.10.4 Subject to 4.10.3, the approval holder shall implement the Soil Monitoring Program as authorized in writing by the Director.

4.10.5 If an authorization or a deficiency letter is not issued within 120 days of the applicable date required by 4.10.2, the approval holder shall implement the Soil Monitoring Program:

(a) in accordance with the program as set out in the proposal submitted by the approval holder; and

(b) within 270 days after the applicable date required by 4.10.2.

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4.10.6 The approval holder shall submit to the Director each Soil Monitoring Program Report obtained from the soil monitoring referred to in 4.10.4 and 4.10.5 according to the following schedule:

(a) for the first Soil Monitoring Program Report on or before January 31, 2020; and

(b) for the second Soil Monitoring Program Report on or before January 31, 2025;

unless otherwise authorized in writing by the Director.

4.10.7 If any Soil Monitoring Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

SOIL MANAGEMENT PROGRAM

4.10.8 If the Soil Monitoring Program, or any other soil monitoring, reveals that there are substances present in the soil at concentrations greater than any of the applicable concentrations set out in the standards in the *Soil Monitoring Directive*, Alberta Environment, 2009, as amended, the approval holder shall develop a Soil Management Program Proposal.

4.10.9 If a Soil Management Program Proposal is required pursuant to 4.10.8, the approval holder shall submit a Soil Management Program Proposal to the Director according to the following schedule:

(a) for Soil Management Program Proposal that is triggered by the findings from the first soil monitoring event on or before the date in 4.10.6(a);

(b) for Soil Management Program Proposal that is triggered by the findings from a second soil monitoring event on or before the date in 4.10.6(b); or

(c) for any other soil monitoring event not specified in this approval within six months of completion of the soil monitoring event.

4.10.10 If any Soil Management Program Proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

4.10.11 The approval holder shall implement the Soil Management Program as authorized in writing by the Director.

4.10.12 If the approval holder is required to implement a Soil Management Program pursuant to 4.10.11, the approval holder shall submit a written Soil Management Program

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Report to the Director on or before March 31 of each year following the year in which the information was collected.

4.10.13 If any Soil Management Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified by the Director by the date specified in writing by the Director.

PART 5: FINANCIAL SECURITY REQUIREMENTS

5.1.1 The approval holder shall annually review and revise the cost estimate for reclamation of the facility including decommissioning and land reclamation.

5.1.2 The annual revised cost estimate for the facility shall be submitted to the Director by March 31 of each year.

5.1.3 The approval holder shall review and revise the cost estimate for reclamation of the facility when one or more of the following occurs:

(a) the cost estimate of future conservation and reclamation of the facility changes;

(b) the extent of the operation of the facility is increased or reduced;

(c) the facility or any portion of it is conserved and reclaimed;

(d) the conservation and reclamation plan required by this approval is changed; or

(e) the activities conducted at the facility for which security is required is increased or decreased.

5.1.4 The approval holder shall submit the revised cost estimate arising from 5.1.3 to the Director within 30 days after the occurrence of any of the circumstances described in 5.1.3.

5.1.5 The approval holder shall provide additional financial security as required in writing by the Director.

5.1.6 The approval holder shall renew the financial security for the facility at least 30 days prior to the date it expires.

5.1.7 The approval holder shall maintain the financial security for the facility until returned in accordance with the Act or the regulations.

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PART 6: DECOMMISSIONING AND LAND RECLAMATION OF HWRSP FACILITY

SECTION 6.1: GENERAL

6.1.1 The approval holder shall apply for an amendment to this approval to reclaim the HWRSP Facility by submitting to the Director:

(a) a Decommissioning Plan; and

(b) a Land Reclamation Plan.

6.1.2 The approval holder shall submit the:

(a) Decommissioning Plan; and

(b) Land Reclamation Plan

referred to in 6.1.1 within six (6) months of the HWRSP Facility ceasing operation, except for repairs and maintenance, unless otherwise authorized in writing by the Director.

SECTION 6.2: DECOMMISSIONING

6.2.1 The Decommissioning Plan referred to in 6.1.1 shall include, at a minimum, all of the following:

(a) a plan for dismantling the HWRSP Facility;

(b) a comprehensive study to determine the nature, degree and extent of contamination at the HWRSP Facility and affected lands;

(c) a plan to manage all wastes at the HWRSP Facility;

(d) evaluation of remediation technologies proposed to be used at the HWRSP Facility and affected lands;

(e) a plan for decontamination of the HWRSP Facility and affected lands in accordance with the following:

(i) for soil or groundwater, *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,

(ii) for soil or groundwater, *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,

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(iii) for drinking water, *Canadian Environmental Quality Guidelines*, Canadian Council of Ministers of the Environment, PN 1299, 1999, as amended, and

(iv) for surface water, *Surface Water Quality Guidelines for Use in Alberta*, Alberta Environment, November 1999, as amended;

(f) confirmatory testing to indicate compliance with the remediation objectives;

(g) a plan for maintaining and operating contaminant monitoring systems;

(h) a schedule for activities (a) through (g) above; and

(i) any other information as required in writing by the Director.

6.2.2 If the Decommissioning Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

SECTION 6.3: LAND RECLAMATION

6.3.1 The Land Reclamation Plan referred to in 6.1.1 shall include, at a minimum, all of the following:

(a) the final use of the reclaimed area and how equivalent land capability will be achieved;

(b) removal of infrastructure;

(c) restoration of drainage;

(d) soil replacement;

(e) erosion control;

(f) revegetation and conditioning of the HWRSP Facility including:

(i) species list, seed source and quality, seeding rates and methods,

(ii) fertilization rates and methods, and

(iii) wildlife habitat plans where applicable;

(g) reclamation schedule; and

(h) any other information as required in writing by the Director.

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6.3.2 If the Land Reclamation Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

PART 7: FINAL LANDFILL CLOSURE AND POST-CLOSURE

SECTION 7.1: LANDFILL CELL CLOSURE AND MAINTENANCE

7.1.1 The approval holder shall submit a Landfill Cell Closure Plan for individual landfill cell closure to the Director on or before September 30, 2017, unless otherwise authorized in writing by the Director.

7.1.2 The Landfill Cell Closure Plan submitted pursuant to 7.1.1 shall be signed and stamped by a professional registered with APEGA.

7.1.3 If the Landfill Cell Closure Plan submitted pursuant to 7.1.1 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

7.1.4 The approval holder shall implement the Landfill Cell Closure Plan submitted pursuant to 7.1.1 as authorized in writing by the Director.

7.1.5 The approval holder shall maintain the closed landfill cells to:

(a) protect and maintain the integrity of the final cover and surface water drainage systems;

(b) prevent erosion;

(c) prevent surface water ponding;

(d) remediate areas affected by subsidence and differential settlement; and

(e) prevent leachate break out.

7.1.6 If the approval holder completes landfill cell closure in a year, the approval holder shall prepare an Annual Landfill Cell Closure Report, and include, at a minimum, all of the following information in the Report:

(a) as-built plans and details on the location of landfill cells that have been closed;

(b) certified construction QA/QC procedures employed during cover construction and installation; and

(c) survey reports showing the final cover depths.

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7.1.7 The approval holder shall submit the Annual Landfill Cell Closure Report with the Annual Landfill Operations Report required in 4.6.58.

SECTION 7.2: FINAL LANDFILL CLOSURE AND POST-CLOSURE

7.2.1 The approval holder shall apply for an amendment to this approval for final landfill closure by submitting to the Director:

(a) a Detailed Final Landfill Closure Plan ; and

(b) a Landfill Post-Closure Plan.

7.2.2 The approval holder shall submit the:

(a) Detailed Final Landfill Closure Plan; and

(b) Landfill Post-Closure Plan

referred to in 7.2.1 within six (6) months of the landfill ceasing operations, unless otherwise authorized in writing by the Director.

DETAILED FINAL LANDFILL CLOSURE PLAN

7.2.3 The Detailed Final Landfill Closure Plan shall be developed in accordance with sections 6.1(b) and 6.1(c) of the *Standards for Landfills in Alberta*, as amended.

7.2.4 In addition to 7.2.3, the Detailed Final Landfill Closure Plan shall include, at a minimum, all of the following:

(a) a plan for replacement of soil;

(b) a QA/QC Program; and

(c) any deviations from the most recently submitted closure plan.

7.2.5 The Detailed Final Landfill Closure Plan shall be signed and stamped by a professional registered with APEGA.

7.2.6 If the Detailed Final Landfill Closure Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

7.2.7 The approval holder shall implement the Detailed Final Landfill Closure Plan as authorized in writing by the Director.

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LANDFILL POST-CLOSURE PLAN

7.2.8 The Landfill Post-Closure Plan shall be developed in accordance with sections 6.2 and 6.3 of the *Standards for Landfills in Alberta*, as amended.

7.2.9 In addition to 7.2.8, the Landfill Post-Closure Plan shall include, at a minimum, all of the following:

(a) the groundwater monitoring program including performance standards and points of compliance;

(b) the subsurface landfill gas monitoring program and performance standards at points of compliance;

(c) a plan for erosion control;

(d) a plan for maintaining vegetative cover; and

(e) any other information requested in writing by the Director.

7.2.10 The Landfill Post-Closure Plan shall be signed and stamped by a professional registered with APEGA.

7.2.11 If the Landfill Post-Closure Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

7.2.12 The approval holder shall implement the Landfill Post-Closure Plan as authorized in writing by the Director.

PART 8: DECOMMISSIONING AND LAND RECLAMATION OF OLD SURFACE WATER DETENTION POND

8.1.1 The approval holder shall:

(a) decommission; and

(b) reclaim

the old surface water detention pond prior to construction of Cell 4.

8.1.2 The approval holder shall submit a Decommissioning and Land Reclamation Plan for the old surface water detention pond to the Director a minimum of six (6) months prior to decommissioning and land reclamation of the pond.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

8.1.3 If the Decommissioning and Land Reclamation Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

DATED March 31, 2017

DESIGNATED DIRECTOR UNDER THE ACT
Mohammad Habib, P. Eng.

APPENDIX B

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, is in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by persons other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX C

ALS CHEMICAL ANALYSIS REPORT

ALS Canada Ltd.

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CERTIFICATE OF ANALYSIS

Work Order	: **EO2209060**	Page	: 1 of 7
Client	: **Tetra Tech Canada Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Brent Finnestad	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780-718-9317	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04592-01	Date Samples Received	: 18-Oct-2022 15:43
PO	: ----	Date Analysis Commenced	: 19-Oct-2022
C-O-C number	: ----	Issue Date	: 02-Nov-2022 15:18
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Brandon Green	Lab Assistant	Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Jessica Maitland	Lab Assistant	Inorganics, Edmonton, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Michelle Schroder	Lab Assistant	Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Metals, Edmonton, Alberta
Ryan Huynh	Lab Assistant	Inorganics, Edmonton, Alberta
Sobhithan Pillay		Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	Lysons D.1	Lysons D.2	Lysons D.3	Lysons D.4	Magneson D.3
					Client sampling date / time	18-Oct-2022 12:00	18-Oct-2022 12:20	18-Oct-2022 10:40	18-Oct-2022 11:10	18-Oct-2022 09:50
						EO2209060-001	EO2209060-002	EO2209060-003	EO2209060-004	EO2209060-005
						Result	Result	Result	Result	Result
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		96.5	91.8	182	174	158
solids, total suspended [TSS]	----	E160	3.0	mg/L		16.6	8.6	56.2	40.4	39.0
conductivity	----	E100	2.0	µS/cm		535	549	1240	1040	992
pH	----	E108	0.10	pH units		8.72	8.06	8.61	8.58	8.39
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L		228	270	481	633	261
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L		9.7	<1.0	15.6	17.2	3.4
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L		203	222	420	548	219
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L		331	346	824	715	656
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0210	1.33	0.0994	0.134	0.0335
phosphorus, total	7723-14-0	E372-S	0.0010	mg/L		1.15	1.20	0.251	0.885	0.122
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L		2.44	3.66	4.04	6.67	2.37
chloride	16887-00-6	E235.Cl	0.50	mg/L		24.2	21.6	26.5	20.2	12.9
fluoride	16984-48-8	E235.F	0.020	mg/L		0.201	0.233	0.876	0.707	0.825
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L		<0.020	0.045	<0.020	<0.020	<0.020
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L		<0.010	0.020	<0.010	<0.010	<0.010
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		30.4	22.6	200	3.80	252
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L		<0.0500	0.0650	<0.0500	<0.0500	<0.0500
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		27.1	33.5	45.7	79.1	23.3
Ion Balance										
anion sum	----	EC101	0.10	meq/L		5.38	5.53	13.4	11.6	10.0
cation sum	----	EC101	0.10	meq/L		5.71	5.68	13.7	12.5	10.6
ion balance (APHA)	----	EC101	0.010	%		2.98	1.34	1.11	3.73	2.91
ion balance (cations/anions)	----	EC101	0.010	%		106	103	102	108	106
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0023	0.0049	0.0064	0.0145	0.0024
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		0.00015	0.00014	0.00052	0.00052	0.00036

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	Lysons D.1	Lysons D.2	Lysons D.3	Lysons D.4	Magneson D.3
					Client sampling date / time	18-Oct-2022 12:00	18-Oct-2022 12:20	18-Oct-2022 10:40	18-Oct-2022 11:10	18-Oct-2022 09:50
						EO2209060-001	EO2209060-002	EO2209060-003	EO2209060-004	EO2209060-005
						Result	Result	Result	Result	Result
Dissolved Metals										
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.00591	0.00513	0.00575	0.0122	0.00256
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.0286	0.0340	0.0423	0.0520	0.0954
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L		0.056	0.050	0.033	0.045	0.084
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		<0.0000050	<0.0000050	0.0000081	0.0000157	0.0000201
calcium, dissolved	7440-70-2	E421	0.050	mg/L		23.6	22.5	34.4	37.8	35.5
cesium, dissolved	7440-46-2	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		0.00057	0.00069	0.00136	0.00161	0.00028
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.00044	0.00046	0.00280	0.00299	0.00121
iron, dissolved	7439-89-6	E421	0.030	mg/L		0.042	0.145	<0.030	0.121	<0.030
lead, dissolved	7439-92-1	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	0.000076	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		0.0103	0.0101	0.0213	0.0266	0.0498
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		9.12	8.64	23.4	19.4	16.8
manganese, dissolved	7439-96-5	E421	0.00500	mg/L		0.0169	0.162	0.00573	<0.00500	<0.00500
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.000992	0.000826	0.0103	0.00296	0.0434
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		0.00338	0.00279	0.0136	0.0105	0.0171
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		0.972	1.16	0.108	0.654	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L		17.4	19.7	24.4	32.4	14.6
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L		0.00166	0.00203	0.00109	0.00153	0.00167
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.000256	0.000192	0.00100	0.000688	0.000414
silicon, dissolved	7440-21-3	E421	0.050	mg/L		<0.050	2.54	0.261	1.57	2.66
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, dissolved	7440-23-5	E421	0.050	mg/L		76.7	74.4	216	188	162
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		0.169	0.170	0.391	0.257	0.440
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		13.2	10.7	77.4	4.96	90.6
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	Lysons D.1	Lysons D.2	Lysons D.3	Lysons D.4	Magneson D.3
					Client sampling date / time	18-Oct-2022 12:00	18-Oct-2022 12:20	18-Oct-2022 10:40	18-Oct-2022 11:10	18-Oct-2022 09:50
						EO2209060-001	EO2209060-002	EO2209060-003	EO2209060-004	EO2209060-005
						Result	Result	Result	Result	Result
Dissolved Metals										
thorium, dissolved	7440-29-1	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		<0.00030	0.00062	0.00081	0.00200	<0.00030
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	0.00016
uranium, dissolved	7440-61-1	E421	0.000010	mg/L		0.000393	0.000342	0.00628	0.00227	0.00322
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L		0.00245	0.00210	0.00182	0.00652	0.00240
zinc, dissolved	7440-66-6	E421	0.0010	mg/L		0.0014	<0.0010	<0.0010	<0.0010	0.0012
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L		0.00044	0.00039	0.00123	0.00203	<0.00030
dissolved mercury filtration location	----	EP509	-	-		Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L		95	87	125	236	74
phenols, total (4AAP)	----	E562	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Volatile Organic Compounds										
benzene	71-43-2	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
ethylbenzene	100-41-4	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
styrene	100-42-5	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
toluene	108-88-3	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
xylene, m+p-	179601-23-1	E611A	0.00040	mg/L		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
xylene, o-	95-47-6	E611A	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
xylenes, total	1330-20-7	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hydrocarbons										
F1 (C6-C10)	----	E581.F1	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580	0.100	mg/L		<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%		106	102	100	84.9	86.0
dichlorotoluene, 3,4-	97-75-0	E581.F1	1.0	%		99.4	113	112	110	100
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%		85.1	87.1	84.1	84.9	82.7

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	Lysons D.1	Lysons D.2	Lysons D.3	Lysons D.4	Magneson D.3
					Client sampling date / time	18-Oct-2022 12:00	18-Oct-2022 12:20	18-Oct-2022 10:40	18-Oct-2022 11:10	18-Oct-2022 09:50
						EO2209060-001	EO2209060-002	EO2209060-003	EO2209060-004	EO2209060-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates										
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%		102	103	82.4	106	104

Please refer to the General Comments section for an explanation of any qualifiers detected.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2209060**	Page	: 1 of 20
Client	: **Tetra Tech Canada Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Brent Finnestad	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780-718-9317	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04592-01	Date Samples Received	: 18-Oct-2022 15:43
PO	: ----	Issue Date	: 02-Nov-2022 15:18
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Lysons D.1	E559-L	18-Oct-2022	----	----	----		24-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Lysons D.2	E559-L	18-Oct-2022	----	----	----		24-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Lysons D.3	E559-L	18-Oct-2022	----	----	----		24-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Lysons D.4	E559-L	18-Oct-2022	----	----	----		24-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Magneson D.3	E559-L	18-Oct-2022	----	----	----		24-Oct-2022	28 days	6 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) Lysons D.1	E562	18-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	4 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) Lysons D.2	E562	18-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Lysons D.3	E562	18-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	4 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Lysons D.4	E562	18-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	4 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
Magneson D.3	E562	18-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Lysons D.1	E298	18-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Lysons D.2	E298	18-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Lysons D.3	E298	18-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Lysons D.4	E298	18-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Magneson D.3	E298	18-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
Lysons D.1	E235.Cl	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE Lysons D.2	E235.Cl	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Lysons D.3	E235.Cl	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Lysons D.4	E235.Cl	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Magneson D.3	E235.Cl	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Lysons D.1	E235.F	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Lysons D.2	E235.F	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Lysons D.3	E235.F	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Lysons D.4	E235.F	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Magneson D.3	E235.F	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE Lysons D.1	E235.NO3	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE Lysons D.2	E235.NO3	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE Lysons D.3	E235.NO3	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE Lysons D.4	E235.NO3	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE Magneson D.3	E235.NO3	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE Lysons D.1	E235.NO2	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE Lysons D.2	E235.NO2	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE Lysons D.3	E235.NO2	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE Lysons D.4	E235.NO2	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
Magneson D.3	E235.NO2	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Lysons D.1	E235.SO4	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Lysons D.2	E235.SO4	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Lysons D.3	E235.SO4	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Lysons D.4	E235.SO4	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Magneson D.3	E235.SO4	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Lysons D.1	E318	18-Oct-2022	31-Oct-2022	----	----		01-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Lysons D.2	E318	18-Oct-2022	31-Oct-2022	----	----		01-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Lysons D.3	E318	18-Oct-2022	31-Oct-2022	----	----		01-Nov-2022	28 days	14 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Lysons D.4	E318	18-Oct-2022	31-Oct-2022	----	----		01-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Magneson D.3	E318	18-Oct-2022	31-Oct-2022	----	----		01-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) Lysons D.1	E372-S	18-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	28 days	11 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) Lysons D.2	E372-S	18-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	28 days	11 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) Lysons D.3	E372-S	18-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	28 days	11 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) Lysons D.4	E372-S	18-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	28 days	11 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)										
Amber glass total (sulfuric acid) Magneson D.3	E372-S	18-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) Lysons D.1	E509	18-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) Lysons D.2	E509	18-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) Lysons D.3	E509	18-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) Lysons D.4	E509	18-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) Magneson D.3	E509	18-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) Lysons D.1	E421	18-Oct-2022	23-Oct-2022	----	----		24-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) Lysons D.2	E421	18-Oct-2022	23-Oct-2022	----	----		24-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) Lysons D.3	E421	18-Oct-2022	23-Oct-2022	----	----		24-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) Lysons D.4	E421	18-Oct-2022	23-Oct-2022	----	----		24-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) Magneson D.3	E421	18-Oct-2022	23-Oct-2022	----	----		24-Oct-2022	180 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Lysons D.1	E581.F1	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Lysons D.2	E581.F1	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Lysons D.3	E581.F1	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Lysons D.4	E581.F1	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Magneson D.3	E581.F1	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Lysons D.1	E601	18-Oct-2022	20-Oct-2022	14 days	2 days	✓	21-Oct-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Lysons D.2	E601	18-Oct-2022	20-Oct-2022	14 days	2 days	✓	21-Oct-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Lysons D.3	E601	18-Oct-2022	20-Oct-2022	14 days	2 days	✓	21-Oct-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Lysons D.4	E601	18-Oct-2022	21-Oct-2022	14 days	3 days	✓	22-Oct-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Magneson D.3	E601	18-Oct-2022	21-Oct-2022	14 days	3 days	✓	22-Oct-2022	40 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) Lysons D.1	E358-L	18-Oct-2022	29-Oct-2022	3 days	11 days	× EHT	29-Oct-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) Lysons D.2	E358-L	18-Oct-2022	29-Oct-2022	3 days	11 days	× EHT	29-Oct-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) Lysons D.3	E358-L	18-Oct-2022	29-Oct-2022	3 days	11 days	× EHT	29-Oct-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) Lysons D.4	E358-L	18-Oct-2022	29-Oct-2022	3 days	11 days	× EHT	29-Oct-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) Magneson D.3	E358-L	18-Oct-2022	29-Oct-2022	3 days	11 days	× EHT	29-Oct-2022	28 days	0 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Lysons D.1	E290	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Lysons D.2	E290	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Lysons D.3	E290	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Lysons D.4	E290	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE Magneson D.3	E290	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Lysons D.1	E100	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE Lysons D.2	E100	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE Lysons D.3	E100	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE Lysons D.4	E100	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Magneson D.3	E100	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE Lysons D.1	E108	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	0.25 hrs	1.28 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Lysons D.2	E108	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	0.25 hrs	1.28 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Lysons D.3	E108	18-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	0.25 hrs	1.28 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE Lysons D.4	E108	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	0.25 hrs	3.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Magneson D.3	E108	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	0.25 hrs	3.25 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE Lysons D.1	E160	18-Oct-2022	----	----	----		24-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Lysons D.2	E160	18-Oct-2022	----	----	----		24-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Lysons D.3	E160	18-Oct-2022	----	----	----		24-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Lysons D.4	E160	18-Oct-2022	----	----	----		24-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Magneson D.3	E160	18-Oct-2022	----	----	----		24-Oct-2022	7 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Lysons D.1	E611A	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Lysons D.2	E611A	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Lysons D.3	E611A	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Lysons D.4	E611A	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Magneson D.3	E611A	18-Oct-2022	20-Oct-2022	----	----		20-Oct-2022	14 days	2 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	703997	2	21	9.5	5.0	✓
Ammonia by Fluorescence	E298	711934	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	705101	1	5	20.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	705102	1	5	20.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	710970	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	704066	1	20	5.0	5.0	✓
Conductivity in Water	E100	703998	2	33	6.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	707419	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	710312	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	721525	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	704065	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	704062	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	704063	1	10	10.0	5.0	✓
pH by Meter	E108	703999	2	29	6.9	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	710007	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	704064	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	723015	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	720352	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	711895	2	38	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	703997	2	21	9.5	5.0	✓
Ammonia by Fluorescence	E298	711934	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	705101	1	5	20.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	705102	1	5	20.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	706638	2	40	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	710970	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	704066	1	20	5.0	5.0	✓
Conductivity in Water	E100	703998	2	33	6.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	707419	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	710312	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	721525	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	704065	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	704062	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	704063	1	10	10.0	5.0	✓
pH by Meter	E108	703999	2	29	6.9	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	710007	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Sulfate in Water by IC	E235.SO4	704064	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	723015	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	720352	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	711895	2	38	5.2	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	703997	2	21	9.5	5.0	✓
Ammonia by Fluorescence	E298	711934	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	705101	1	5	20.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	705102	1	5	20.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	706638	2	40	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	710970	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	704066	1	20	5.0	5.0	✓
Conductivity in Water	E100	703998	2	33	6.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	707419	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	710312	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	721525	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	704065	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	704062	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	704063	1	10	10.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	710007	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	704064	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	723015	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	720352	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	711895	2	38	5.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	711934	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	705101	1	5	20.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	710970	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	704066	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	707419	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	710312	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	721525	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	704065	1	10	10.0	5.0	✓
Nitrate in Water by IC	E235.NO3	704062	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	704063	1	10	10.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	710007	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	704064	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	723015	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	720352	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Edmonton - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Edmonton - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically after heated persulfate digestion of the sample.
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Mercury in Water by CVAAS	E509 Edmonton - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
CCME PHC - F1 by Headspace GC-FID	E581.F1 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
BTEX by Headspace GC-MS	E611A Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Edmonton - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Edmonton - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals Water Filtration	EP421 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Edmonton - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Edmonton - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

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QUALITY CONTROL REPORT

Work Order	: **EO2209060**	Page	: 1 of 15
Client	: Tetra Tech Canada Inc.	Laboratory	: Edmonton - Environmental
Contact	: Brent Finnestad	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	:	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04592-01	Date Samples Received	: 18-Oct-2022 15:43
PO	: ----	Date Analysis Commenced	: 19-Oct-2022
C-O-C number	: ----	Issue Date	: 02-Nov-2022 15:18
Sampler	: ---- 780-718-9317		
Site	: ----		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Brandon Green	Lab Assistant	Edmonton Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Edmonton Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Jessica Maitland	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Jing Liu	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Edmonton Organics, Edmonton, Alberta
Michelle Schroder	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Edmonton Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Ryan Huynh	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Sobhithan Pillay		Edmonton Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Edmonton Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 703997)											
EO2209072-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	129	133	2.67%	20%	----
Physical Tests (QC Lot: 703998)											
EO2209072-001	Anonymous	conductivity	----	E100	1.0	µS/cm	506	504	0.396%	10%	----
Physical Tests (QC Lot: 703999)											
EO2209072-001	Anonymous	pH	----	E108	0.10	pH units	7.97	7.97	0.00%	3%	----
Physical Tests (QC Lot: 705376)											
EO2209060-004	Lysons D.4	pH	----	E108	0.10	pH units	8.58	8.59	0.116%	3%	----
Physical Tests (QC Lot: 705377)											
EO2209060-004	Lysons D.4	conductivity	----	E100	2.0	µS/cm	1040	1020	0.971%	10%	----
Physical Tests (QC Lot: 705378)											
EO2209060-004	Lysons D.4	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	548	547	0.0548%	20%	----
Physical Tests (QC Lot: 711895)											
EO2209019-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	26.4	22.4	4.0	Diff <2x LOR	----
Physical Tests (QC Lot: 713784)											
EO2208840-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	15.6	14.6	1.0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 704062)											
EO2208850-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 704063)											
EO2208850-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 704064)											
EO2208850-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 704065)											
EO2208850-004	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 704066)											
EO2208850-004	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 711934)											
EO2209060-005	Magneson D.3	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0335	0.0350	0.0015	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 720352)											
EO2208924-028	Anonymous	phosphorus, total	7723-14-0	E372-S	0.0010	mg/L	0.0164	0.0175	6.49%	20%	----
Anions and Nutrients (QC Lot: 723015)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 723015) - continued											
EO2209040-006	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.108	0.121	0.014	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 721525)											
EO2208726-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	17.7	18.8	6.02%	20%	----
Organic / Inorganic Carbon (QC Lot: 721526)											
EO2209060-002	Lysons D.2	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	33.5	33.8	0.824%	20%	----
Dissolved Metals (QC Lot: 707419)											
EO2209060-001	Lysons D.1	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 710312)											
EO2209006-006	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0020	mg/L	2.20	2.16	1.90%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00020	mg/L	0.00101	0.00121	0.00020	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00020	mg/L	0.0122	0.0118	2.66%	20%	----
		barium, dissolved	7440-39-3	E421	0.00020	mg/L	0.0296	0.0285	3.84%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000040	mg/L	0.000323	0.000376	0.000053	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.020	mg/L	2.93	2.96	0.858%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000100	mg/L	0.000129	0.000123	4.56%	20%	----
		calcium, dissolved	7440-70-2	E421	0.100	mg/L	105	127	19.2%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000020	mg/L	0.000234	0.000286	19.7%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00100	mg/L	0.00199	0.00197	0.00002	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00020	mg/L	0.00341	0.00342	0.271%	20%	----
		copper, dissolved	7440-50-8	E421	0.00040	mg/L	0.0120	0.0118	2.04%	20%	----
		iron, dissolved	7439-89-6	E421	0.060	mg/L	3.06	3.08	0.815%	20%	----
		lead, dissolved	7439-92-1	E421	0.000100	mg/L	0.00153	0.00181	16.4%	20%	----
		lithium, dissolved	7439-93-2	E421	0.0020	mg/L	0.181	0.219	19.2%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	20.4	19.5	4.46%	20%	----
		manganese, dissolved	7439-96-5	E421	0.0100	mg/L	0.427	0.418	2.14%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000100	mg/L	0.00119	0.00138	14.8%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00100	mg/L	0.00713	0.00694	0.00019	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.100	mg/L	0.941	0.920	0.020	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.100	mg/L	3.90	3.78	3.18%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00040	mg/L	0.00829	0.00821	1.06%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000100	mg/L	0.000491	0.000490	0.0000002	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.100	mg/L	44.0	43.9	0.122%	20%	----
		silver, dissolved	7440-22-4	E421	0.000020	mg/L	0.000073	0.000078	0.000004	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 710312) - continued											
EO2209006-006	Anonymous	sodium, dissolved	7440-23-5	E421	0.100	mg/L	344	342	0.518%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00040	mg/L	0.994	1.19	17.8%	20%	----
		sulfur, dissolved	7704-34-9	E421	1.00	mg/L	273	262	4.09%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000020	mg/L	0.000074	0.000101	0.000027	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00020	mg/L	0.00051	0.00060	0.00008	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00060	mg/L	0.0782	0.0779	0.380%	20%	----
		tungsten, dissolved	7440-33-7	E421	0.00020	mg/L	0.00075	0.00090	0.00016	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000020	mg/L	0.00107	0.00129	18.8%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00100	mg/L	0.0139	0.0139	0.435%	20%	----
		zinc, dissolved	7440-66-6	E421	0.0020	mg/L	0.0073	0.0077	0.0004	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00040	mg/L	0.0318	0.0382	18.4%	20%	----
Aggregate Organics (QC Lot: 710007)											
EO2209031-008	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 710970)											
EO2208726-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	200	mg/L	18000	19900	10.3%	20%	----
Volatile Organic Compounds (QC Lot: 705101)											
EO2209060-001	Lysons D.1	benzene	71-43-2	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.00040 mg/L	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 705102)											
EO2209060-001	Lysons D.1	F1 (C6-C10)	----	E581.F1	100	µg/L	<0.10 mg/L	<100	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 703997)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 703998)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 705377)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 705378)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 711895)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 713784)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 704062)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 704063)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 704064)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 704065)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 704066)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 711934)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 720352)						
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 723015)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Organic / Inorganic Carbon (QCLot: 721525)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 721526)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 707419)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 707419) - continued						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 710312)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 710312) - continued						
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Aggregate Organics (QCLot: 710007)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 710970)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 705101)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 705102)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 706638)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 707775)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 703997)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	110	85.0	115	----
Physical Tests (QCLot: 703998)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	97.7	90.0	110	----
Physical Tests (QCLot: 703999)									
pH	----	E108	----	pH units	6 pH units	100	97.0	103	----
Physical Tests (QCLot: 705376)									
pH	----	E108	----	pH units	6 pH units	100	97.0	103	----
Physical Tests (QCLot: 705377)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	97.7	90.0	110	----
Physical Tests (QCLot: 705378)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	106	85.0	115	----
Physical Tests (QCLot: 711895)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	95.9	85.0	115	----
Physical Tests (QCLot: 713784)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	95.6	85.0	115	----
Anions and Nutrients (QCLot: 704062)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 704063)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	93.4	90.0	110	----
Anions and Nutrients (QCLot: 704064)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	96.7	90.0	110	----
Anions and Nutrients (QCLot: 704065)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 704066)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	97.5	90.0	110	----
Anions and Nutrients (QCLot: 711934)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	112	85.0	115	----
Anions and Nutrients (QCLot: 720352)									
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	0.05 mg/L	111	80.0	120	----
Anions and Nutrients (QCLot: 723015)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	97.4	75.0	125	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Organic / Inorganic Carbon (QCLot: 721525)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Organic / Inorganic Carbon (QCLot: 721526)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	106	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	96.5	80.0	120	----
Dissolved Metals (QCLot: 710312)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	99.2	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	95.1	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	98.2	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	103	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	91.0	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	96.2	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.6	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	95.8	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	95.8	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	96.9	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	98.2	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	96.2	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	101	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	97.5	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	99.2	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	97.0	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	98.7	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	95.0	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.2	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	103	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	94.5	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	98.7	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	95.7	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	98.8	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	88.4	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	94.0	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	90.9	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 710312) - continued									
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	92.7	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.2	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	95.0	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	95.8	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	97.7	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	98.3	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	99.0	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	98.9	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	95.2	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	97.4	80.0	120	----
Aggregate Organics (QCLot: 710007)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	96.4	85.0	115	----
Aggregate Organics (QCLot: 710970)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	102	85.0	115	----
Volatile Organic Compounds (QCLot: 705101)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	80.8	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	94.8	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	109	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	80.2	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	98.9	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	104	70.0	130	----
Hydrocarbons (QCLot: 705102)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	101	70.0	130	----
Hydrocarbons (QCLot: 706638)									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	102	70.0	130	----
Hydrocarbons (QCLot: 707775)									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	97.0	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 704062)										
EO2208850-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3	2.40 mg/L	2.5 mg/L	96.1	75.0	125	----
Anions and Nutrients (QCLot: 704063)										
EO2208850-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2	0.463 mg/L	0.5 mg/L	92.6	75.0	125	----
Anions and Nutrients (QCLot: 704064)										
EO2208850-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	95.1 mg/L	100 mg/L	95.1	75.0	125	----
Anions and Nutrients (QCLot: 704065)										
EO2208850-004	Anonymous	fluoride	16984-48-8	E235.F	0.967 mg/L	1 mg/L	96.7	75.0	125	----
Anions and Nutrients (QCLot: 704066)										
EO2208850-004	Anonymous	chloride	16887-00-6	E235.Cl	96.3 mg/L	100 mg/L	96.3	75.0	125	----
Anions and Nutrients (QCLot: 711934)										
EO2209060-005	Magneson D.3	ammonia, total (as N)	7664-41-7	E298	0.116 mg/L	0.1 mg/L	116	75.0	125	----
Anions and Nutrients (QCLot: 720352)										
EO2208924-032	Anonymous	phosphorus, total	7723-14-0	E372-S	ND mg/L	0.067 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 723015)										
EO2209040-007	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.60 mg/L	2.5 mg/L	104	70.0	130	----
Organic / Inorganic Carbon (QCLot: 721525)										
EO2208726-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 721526)										
EO2209060-003	Lysons D.3	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 707419)										
EO2209060-002	Lysons D.2	mercury, dissolved	7439-97-6	E509	0.000106 mg/L	0.0001 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 710312)										
EO2209006-007	Anonymous	aluminum, dissolved	7429-90-5	E421	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0432 mg/L	0.04 mg/L	108	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00821 mg/L	0.01 mg/L	82.1	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 710312) - continued										
EO2209006-007	Anonymous	boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00398 mg/L	0.004 mg/L	99.5	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00983 mg/L	0.01 mg/L	98.3	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0395 mg/L	0.04 mg/L	98.7	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0194 mg/L	0.02 mg/L	97.1	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0189 mg/L	0.02 mg/L	94.4	70.0	130	----
		iron, dissolved	7439-89-6	E421	2.00 mg/L	2 mg/L	99.9	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0186 mg/L	0.02 mg/L	93.2	70.0	130	----
		lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0201 mg/L	0.02 mg/L	101	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0375 mg/L	0.04 mg/L	93.7	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	10.8 mg/L	10 mg/L	108	70.0	130	----
		potassium, dissolved	7440-09-7	E421	3.79 mg/L	4 mg/L	94.7	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0190 mg/L	0.02 mg/L	95.2	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0418 mg/L	0.04 mg/L	104	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00426 mg/L	0.004 mg/L	106	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	22.1 mg/L	20 mg/L	110	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0354 mg/L	0.04 mg/L	88.6	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00368 mg/L	0.004 mg/L	92.0	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0188 mg/L	0.02 mg/L	94.3	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0420 mg/L	0.04 mg/L	105	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00390 mg/L	0.004 mg/L	97.6	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.103 mg/L	0.1 mg/L	103	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.389 mg/L	0.4 mg/L	97.3	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0422 mg/L	0.04 mg/L	106	70.0	130	----
Aggregate Organics (QCLot: 710007)										
EO2209031-008	Anonymous	phenols, total (4AAP)	----	E562	0.0186 mg/L	0.02 mg/L	93.0	75.0	125	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Aggregate Organics (QCLot: 710970)										
EO2208726-002	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Volatile Organic Compounds (QCLot: 705101)										
EO2209060-002	Lysons D.2	benzene	71-43-2	E611A	97.9 µg/L	100 µg/L	97.9	50.0	140	----
		ethylbenzene	100-41-4	E611A	77.1 µg/L	100 µg/L	77.1	50.0	140	----
		styrene	100-42-5	E611A	96.7 µg/L	100 µg/L	96.7	50.0	140	----
		toluene	108-88-3	E611A	86.0 µg/L	100 µg/L	86.0	50.0	140	----
		xylene, m+p-	179601-23-1	E611A	197 µg/L	200 µg/L	98.5	50.0	140	----
		xylene, o-	95-47-6	E611A	91.3 µg/L	100 µg/L	91.3	50.0	140	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 21 -

Page of

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Environmental Division
Edmonton
Work Order Reference
EO2209060

Telephone: +1 780 413 5227

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech Canada Inc.
Contact:	Brent Finnestad
Phone:	780.451.2121
	Company address below will appear on the final report
Street:	14940 - 123 Ave NW
City/Province:	Edmonton
Postal Code:	T5V 1B4
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: Brent.Finnestad@TetraTech.com
Email 2: Fahim.Nazari@TetraTech.com
Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: Brent.Finnestad@TetraTech.com
Email 2: Fahim.Nazari@TetraTech.com

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.
Additional fees may apply to rush requests on weekends, s
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested, please conta

Project Information

ALS Account # / Quote #: Q79533
Job #: SWM.SWOP04592-01
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (ALS use only): EO2209060
ALS Contact: Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	BTX, F1, F2 - ED	C-DIS-ORG-CL	COD-T-COL-ED	MET_R-DIS-CCME-ED	NH3-COL-ED	P-T-COL-ED	PHENOLS-4AAP-ED	ROU-ED	SOLIDS-TOTSUS-ED	TKN-F-ED	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~Booth D.1~~			Water														
	~~Ewert D.1~~			Water														
	~~Ewert D.2~~			Water														
	~~Ewert D.3~~			Water														
	~~Ewert D.4~~		12:00	Water														
	Lysons D.1	OCT 19/22	~~10:40~~	Water	10	X	X	X	X	X	X	X	X	X	X			
	Lysons D.2	OCT 19/22	12:20	Water	10	X	X	X	X	X	X	X	X	X	X			
	Lysons D.3	OCT 19/22	10:40	Water	10	X	X	X	X	X	X	X	X	X	X			
	Lysons D.4	OCT 19/22	11:10	Water	10	X	X	X	X	X	X	X	X	X	X			
	~~Magneson D.1~~			Water														
	~~Magneson D.2~~			Water														
	Magneson D.3	OCT 19/22	9:50	Water	10	X	X	X	X	X	X	X	X	X	X			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO
Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

ESDAT format

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☑ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
7.9							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
BX 2	OCT 19/22	1740

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	19-Oct-2022	3:49

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

ALIG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

ALS Canada Ltd.

right solutions.
right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **EO2209152**	Page	: 1 of 19
Client	: **Tetra Tech Canada Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Brent Finnestad	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780-718-9317	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04592-01	Date Samples Received	: 20-Oct-2022 11:30
PO	: ----	Date Analysis Commenced	: 21-Oct-2022
C-O-C number	: ----	Issue Date	: 07-Nov-2022 09:31
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 17		
No. of samples analysed	: 17		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Alex Drake	Lab Analyst	Metals, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Metals, Edmonton, Alberta
Jessica Maitland	Lab Assistant	Inorganics, Edmonton, Alberta
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Ryan Huynh	Lab Assistant	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Sobhithan Pillay		Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
IB:INT	*Ion Balance Reviewed: Imbalance is due to interference or non-measured component.*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BOOTH D.1	EWERT D.1	EWERT D.2	EWERT D.3	EWERT D.4
					Client sampling date / time	19-Oct-2022 09:10	19-Oct-2022 10:00	19-Oct-2022 10:30	19-Oct-2022 10:15	19-Oct-2022 09:30
						EO2209152-001	EO2209152-002	EO2209152-003	EO2209152-004	EO2209152-005
						Result	Result	Result	Result	Result
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		96.8	114	127	96.6	118
solids, total suspended [TSS]	----	E160	3.0	mg/L		24.2	35.8	53.8	37.8	40.2
conductivity	----	E100	2.0	µS/cm		803	1340	922	696	718
pH	----	E108	0.10	pH units		8.26	9.75	8.92	8.38	8.75
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L		389	375	393	291	364
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L		<1.0	135	23.8	2.5	14.9
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L		319	532	362	243	324
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L		496	897	617	457	472
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		1.87	0.0625	0.0393	0.0730	0.0678
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.525 DLHC	0.578 DLHC	1.43 DLHC	1.46 DLHC	0.301 DLHC
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L		7.30	3.80	4.24	4.87	4.27
chloride	16887-00-6	E235.Cl	0.50	mg/L		43.6	60.1	40.2	68.0	15.2
fluoride	16984-48-8	E235.F	0.020	mg/L		0.295	0.435	0.305	0.249	0.481
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L		<0.020	<0.020	<0.020	<0.020	0.032
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	0.013
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		34.0	118	80.2	17.2	42.3
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L		<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		28.6	45.3	37.8	45.9	28.3
Ion Balance										
anion sum	----	EC101	0.10	meq/L		8.33	14.8	10.0	7.14	7.81
cation sum	----	EC101	0.10	meq/L		8.82	15.7	10.9	7.84	8.72
ion balance (APHA)	----	EC101	0.010	%		2.86	2.95	4.31	4.67	5.50
ion balance (cations/anions)	----	EC101	0.010	%		106	106	109	110	112
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0025	0.0179	0.0091	0.0111	0.0645
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		0.00020	0.00051	0.00022	0.00016	0.00031

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BOOTH D.1	EWERT D.1	EWERT D.2	EWERT D.3	EWERT D.4
					Client sampling date / time	19-Oct-2022 09:10	19-Oct-2022 10:00	19-Oct-2022 10:30	19-Oct-2022 10:15	19-Oct-2022 09:30
						EO2209152-001	EO2209152-002	EO2209152-003	EO2209152-004	EO2209152-005
						Result	Result	Result	Result	Result
Dissolved Metals										
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.00780	0.0164	0.0113	0.00691	0.00625
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.0590	0.0401	0.0252	0.0208	0.0589
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L		0.037	0.041	0.030	0.039	0.042
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
calcium, dissolved	7440-70-2	E421	0.050	mg/L		19.8	19.0	28.3	20.7	22.2
cesium, dissolved	7440-46-2	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		0.00033	0.00067	0.00088	0.00106	0.00093
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.00020	0.00143	0.00088	0.00091	0.00078
iron, dissolved	7439-89-6	E421	0.030	mg/L		0.192	0.063	0.112	0.586	0.113
lead, dissolved	7439-92-1	E421	0.000050	mg/L		0.000077	0.000097	0.000089	0.000136	0.000093
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		0.0351	0.0366	0.0232	0.0116	0.0162
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		11.5	16.1	13.6	10.9	15.2
manganese, dissolved	7439-96-5	E421	0.00500	mg/L		0.0514	0.0287	0.0343	0.146	0.0131
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.00105	0.00196	0.000878	0.000938	0.00205
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		0.00273	0.00434	0.00503	0.00468	0.00442
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		0.540	0.545	1.60	1.24	0.105
potassium, dissolved	7440-09-7	E421	0.050	mg/L		15.4	23.5	19.3	18.9	16.7
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L		0.00143	0.00101	0.00156	0.00172	0.00170
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.000135	0.000435	0.000380	0.000277	0.000305
silicon, dissolved	7440-21-3	E421	0.050	mg/L		0.906	0.060	<0.050	1.54	0.356
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, dissolved	7440-23-5	E421	0.050	mg/L		146	295	180	124	136
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		0.220	0.223	0.273	0.165	0.231
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		15.0	46.0	31.9	8.59	17.0
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BOOTH D.1	EWERT D.1	EWERT D.2	EWERT D.3	EWERT D.4
					Client sampling date / time	19-Oct-2022 09:10	19-Oct-2022 10:00	19-Oct-2022 10:30	19-Oct-2022 10:15	19-Oct-2022 09:30
						EO2209152-001	EO2209152-002	EO2209152-003	EO2209152-004	EO2209152-005
						Result	Result	Result	Result	Result
Dissolved Metals										
thorium, dissolved	7440-29-1	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		0.00075	0.00229	0.00114	0.00124	0.00314
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, dissolved	7440-61-1	E421	0.000010	mg/L		0.000532	0.00253	0.000777	0.000332	0.00130
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L		0.00088	0.00499	0.00363	0.00290	0.00153
zinc, dissolved	7440-66-6	E421	0.0010	mg/L		0.0012	<0.0010	<0.0010	0.0012	<0.0010
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L		0.00059	0.00143	0.00136	0.00115	0.00056
dissolved mercury filtration location	----	EP509	-	-		Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-		Field	Field	Field	Field	Field
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L		109	153	124	164	114
phenols, total (4AAP)	----	E562	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Volatile Organic Compounds										
benzene	71-43-2	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
ethylbenzene	100-41-4	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
styrene	100-42-5	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
toluene	108-88-3	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
xylene, m+p-	179601-23-1	E611A	0.00040	mg/L		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
xylene, o-	95-47-6	E611A	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
xylenes, total	1330-20-7	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hydrocarbons										
F1 (C6-C10)	----	E581.F1	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580	0.100	mg/L		<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%		95.0	96.7	99.0	96.7	97.0
dichlorotoluene, 3,4-	97-75-0	E581.F1	1.0	%		91.9	91.1	96.3	88.5	90.0
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%		92.0	96.6	93.6	96.9	94.3

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BOOTH D.1	EWERT D.1	EWERT D.2	EWERT D.3	EWERT D.4
					Client sampling date / time	19-Oct-2022 09:10	19-Oct-2022 10:00	19-Oct-2022 10:30	19-Oct-2022 10:15	19-Oct-2022 09:30
						EO2209152-001	EO2209152-002	EO2209152-003	EO2209152-004	EO2209152-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates										
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%		89.0	90.1	87.4	86.6	88.1

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	MAGNESON D.1	MAGNESON D.2	MAGNESON D.4	MAGNESON D.5	MAGNESON D.6
					Client sampling date / time	19-Oct-2022 12:50	19-Oct-2022 12:20	19-Oct-2022 13:25	19-Oct-2022 12:35	19-Oct-2022 13:05
						EO2209152-006	EO2209152-007	EO2209152-008	EO2209152-009	EO2209152-010
						Result	Result	Result	Result	Result
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		362	143	582	248	443
solids, total suspended [TSS]	----	E160	3.0	mg/L		22.8	56.8	12.6	63.8	32.0
conductivity	----	E100	2.0	µS/cm		2810 RRV	837	5390	2500	3760
pH	----	E108	0.10	pH units		8.78 RRV	8.62	8.74	9.11	8.84
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L		650 RRV	464	1560	769	417
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L		34.6 RRV	13.2	74.9	80.5	28.1
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L		<1.0 RRV	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L		591 RRV	403	1400	765	389
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L		1980	584	4190	1760	2730
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.422	0.100	1.63	0.158	0.0747
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		6.31 DLHC	0.836 DLHC	26.2 DLHC	2.05 DLHC	0.625 DLHC
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L		8.71	7.23	42.1	9.63	4.17
chloride	16887-00-6	E235.Cl	0.50	mg/L		287 DLDS, RRV	28.7	831 DLDS	230 DLDS	358 DLDS
fluoride	16984-48-8	E235.F	0.020	mg/L		0.416 DLDS	0.482	0.940 DLDS	0.979 DLDS	0.382 DLDS
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L		<0.100 DLDS	<0.020	0.150 DLDS	<0.100 DLDS	<0.100 DLDS
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L		<0.050 DLDS	<0.010	1.73 DLDS	<0.050 DLDS	<0.050 DLDS
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		512 DLDS, RRV	9.38	715 DLDS	319 DLDS	1210 DLDS
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L		<0.112	<0.0500	1.88	<0.112	<0.112
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		80.6	67.7	277	84.6	39.7
Ion Balance										
anion sum	----	EC101	0.10	meq/L		30.6	9.08	66.5	28.5	43.1
cation sum	----	EC101	0.10	meq/L		31.0	10.1	55.7	27.9	41.3
ion balance (APHA)	----	EC101	0.010	%		0.649	5.32	8.84	1.06	2.13
ion balance (cations/anions)	----	EC101	0.010	%		101	111	83.8 IB:INT	97.9	95.8
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0607	0.0338	0.273	0.0676	0.0041
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		<0.00200 DLDS	0.00039	0.00091	0.00104	0.00088
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.0222	0.00544	0.0347	0.0242	0.0209

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	MAGNESON D.1	MAGNESON D.2	MAGNESON D.4	MAGNESON D.5	MAGNESON D.6
					Client sampling date / time	19-Oct-2022 12:50	19-Oct-2022 12:20	19-Oct-2022 13:25	19-Oct-2022 12:35	19-Oct-2022 13:05
						EO2209152-006	EO2209152-007	EO2209152-008	EO2209152-009	EO2209152-010
						Result	Result	Result	Result	Result
Dissolved Metals										
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.0332	0.0450	0.150	0.0817	0.0212
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L		<0.000400 DLDS	<0.000020	<0.000100 DLDS	<0.000040 DLDS	<0.000040 DLDS
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.00100 DLDS	<0.000050	<0.000250 DLDS	<0.000100 DLDS	<0.000100 DLDS
boron, dissolved	7440-42-8	E421	0.010	mg/L		0.226	0.030	0.211	0.031	0.239
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		<0.000100 DLDS	0.0000070	0.0000275	0.0000161	<0.0000100 DLDS
calcium, dissolved	7440-70-2	E421	0.050	mg/L		75.5	34.2	101	51.0	67.4
cesium, dissolved	7440-46-2	E421	0.000010	mg/L		<0.000200 DLDS	<0.000010	<0.000050 DLDS	<0.000020 DLDS	<0.000020 DLDS
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		<0.0100 DLDS	<0.00050	0.00337	<0.00100 DLDS	<0.00100 DLDS
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		0.00545	0.00222	0.0113	0.00241	0.00069
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.0318	0.00314	0.00685	0.00187	0.00080
iron, dissolved	7439-89-6	E421	0.030	mg/L		<0.600 DLDS	0.222	3.93	0.083	<0.060 DLDS
lead, dissolved	7439-92-1	E421	0.000050	mg/L		<0.00100 DLDS	0.000162	0.00310	0.000140	<0.000100 DLDS
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		0.0776	0.0183	0.0956	0.0597	0.128
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		42.1	14.0	80.0	29.2	66.7
manganese, dissolved	7439-96-5	E421	0.00500	mg/L		0.359	0.00785	0.771	0.0226	0.0308
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.00541	0.00643	0.00656	0.0238	0.00151
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		0.0244	0.0116	0.0435	0.0205	0.00495
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		7.13	0.342	19.8	1.61	0.472
potassium, dissolved	7440-09-7	E421	0.050	mg/L		146	48.4	696	113	33.1
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L		0.0126	0.00146	0.0995	0.00401	0.00303
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.00102	0.000663	0.00155	0.000740	0.000297
silicon, dissolved	7440-21-3	E421	0.050	mg/L		6.55	0.387	15.9	2.81	<0.100 DLDS
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000200 DLDS	<0.000010	0.000059	<0.000020 DLDS	<0.000020 DLDS
sodium, dissolved	7440-23-5	E421	0.050	mg/L		460	138	596	461	726
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		0.706	0.183	0.754	0.545	0.937
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		180	6.62	182	108	418
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L		<0.00400 DLDS	<0.00020	<0.00100 DLDS	<0.00040 DLDS	<0.00040 DLDS
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000200 DLDS	<0.000010	<0.000050 DLDS	<0.000020 DLDS	<0.000020 DLDS
thorium, dissolved	7440-29-1	E421	0.00010	mg/L		<0.00200 DLDS	<0.00010	0.00171	<0.00020 DLDS	<0.00020 DLDS

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	MAGNESON D.1	MAGNESON D.2	MAGNESON D.4	MAGNESON D.5	MAGNESON D.6
					Client sampling date / time	19-Oct-2022 12:50	19-Oct-2022 12:20	19-Oct-2022 13:25	19-Oct-2022 12:35	19-Oct-2022 13:05
						EO2209152-006	EO2209152-007	EO2209152-008	EO2209152-009	EO2209152-010
						Result	Result	Result	Result	Result
Dissolved Metals										
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00200 DLDS	<0.00010	<0.00050 DLDS	<0.00020 DLDS	<0.00020 DLDS
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		0.00841	0.00166	0.0586	0.00480	<0.00060 DLDS
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L		<0.00200 DLDS	<0.00010	<0.00050 DLDS	0.00066	<0.00020 DLDS
uranium, dissolved	7440-61-1	E421	0.000010	mg/L		0.00310	0.00497	0.00323	0.00441	0.00437
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L		0.0166	0.00476	0.0240	0.0153	0.00352
zinc, dissolved	7440-66-6	E421	0.0010	mg/L		<0.0200 DLDS	<0.0010	0.0165	<0.0020 DLDS	0.0021
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L		<0.00600 DLDS	0.00194	0.0203	0.00366	0.00094
dissolved mercury filtration location	----	EP509	-	-		Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-		Field	Field	Field	Field	Field
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L		245	224	1100 DLM	282	127
phenols, total (4AAP)	----	E562	0.0010	mg/L		<0.0010	<0.0010	0.0018	<0.0010	<0.0010
Volatile Organic Compounds										
benzene	71-43-2	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
ethylbenzene	100-41-4	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
styrene	100-42-5	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
toluene	108-88-3	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
xylene, m+p-	179601-23-1	E611A	0.00040	mg/L		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
xylene, o-	95-47-6	E611A	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
xylenes, total	1330-20-7	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hydrocarbons										
F1 (C6-C10)	----	E581.F1	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580	0.100	mg/L		<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%		99.4	95.9	96.7	96.5	97.1
dichlorotoluene, 3,4-	97-75-0	E581.F1	1.0	%		73.8	80.3	97.8	79.1	98.1
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%		97.7	97.6	95.9	93.2	95.6
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%		88.1	86.2	88.9	87.4	89.0

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BEAVER COUNTY D.1	WINSNES D.1	BALASH D.1	BALASH D.2	BALASH D.3
					Client sampling date / time	19-Oct-2022 08:30	19-Oct-2022 10:50	19-Oct-2022 11:15	19-Oct-2022 11:35	19-Oct-2022 11:50
						EO2209152-011	EO2209152-012	EO2209152-013	EO2209152-014	EO2209152-015
						Result	Result	Result	Result	Result
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		317	193	180	550	413
solids, total suspended [TSS]	----	E160	3.0	mg/L		161	20.6	41.2	55.8	32.0
conductivity	----	E100	2.0	µS/cm		1830	1070	651	2410	2350
pH	----	E108	0.10	pH units		8.52	8.86	8.24	8.73	9.04
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L		550	305	291	494	334
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L		13.3	18.4	<1.0	30.1	37.8
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L		473	280	238	456	337
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L		1180	698	423	1570	1490
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.490	0.0610 RRV	0.117	0.0622	0.109
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		2.21 DLHC	0.249 DLHC	0.463 DLHC	0.928 DLHC	0.840 DLHC
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L		8.06	3.03	3.52	5.08	5.13
chloride	16887-00-6	E235.Cl	0.50	mg/L		234	89.1	49.2	393	469
fluoride	16984-48-8	E235.F	0.020	mg/L		0.356	0.263	0.162	0.234	0.189
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L		<0.020	<0.020	<0.020	<0.020	0.024
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		170	160	42.4	300	244
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L		<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		42.7	24.1	23.5	36.7	48.0
Ion Balance										
anion sum	----	EC101	0.10	meq/L		19.6	11.4	7.04	26.4	25.0
cation sum	----	EC101	0.10	meq/L		20.5	12.1	7.22	26.4	24.9
ion balance (APHA)	----	EC101	0.010	%		2.24	2.98	1.26	<0.010	0.200
ion balance (cations/anions)	----	EC101	0.010	%		104	106	102	100	99.6
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0046	0.0037	0.0041	0.0069	0.0111
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		0.00042	0.00023	<0.00010	0.00039	<0.00020 DLDS
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.0114	0.00529	0.00297	0.00898	0.00847

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BEAVER COUNTY D.1	WINSNES D.1	BALASH D.1	BALASH D.2	BALASH D.3
					Client sampling date / time	19-Oct-2022 08:30	19-Oct-2022 10:50	19-Oct-2022 11:15	19-Oct-2022 11:35	19-Oct-2022 11:50
						EO2209152-011	EO2209152-012	EO2209152-013	EO2209152-014	EO2209152-015
						Result	Result	Result	Result	Result
Dissolved Metals										
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.0243	0.0592	0.0992	0.114	0.0503
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000040 DLDS	<0.000040 DLDS
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000100 DLDS	<0.000100 DLDS
boron, dissolved	7440-42-8	E421	0.010	mg/L		0.058	0.034	0.023	0.048	<0.020 DLDS
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000100 DLDS	<0.0000100 DLDS
calcium, dissolved	7440-70-2	E421	0.050	mg/L		73.8	35.9	45.5	105	70.7
cesium, dissolved	7440-46-2	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000020 DLDS	<0.000020 DLDS
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00100 DLDS	<0.00100 DLDS
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		0.00111	0.00051	0.00029	0.00147	0.00085
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.00077	0.00042	0.00020	0.00158	0.00074
iron, dissolved	7439-89-6	E421	0.030	mg/L		0.032	<0.030	<0.030	<0.060 DLDS	<0.060 DLDS
lead, dissolved	7439-92-1	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000100 DLDS	<0.000100 DLDS
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		0.0343	0.0213	0.0192	0.0490	0.0267
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		32.3	25.2	16.2	69.9	57.4
manganese, dissolved	7439-96-5	E421	0.00500	mg/L		0.409	<0.00500	0.0800	0.286	0.0551
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L		<0.0000050	<0.0000050	0.0000113	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.00168	0.000873	0.000419	0.00129	0.000922
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		0.00695	0.00290	0.00277	0.00614	0.00269
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		1.82	0.190	0.271	0.444	0.742
potassium, dissolved	7440-09-7	E421	0.050	mg/L		20.9	15.8	14.2	39.3	39.4
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L		0.00171	0.00136	0.00238	0.00272	0.00404
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.000302	0.000169	0.000170	0.000267	0.000208
silicon, dissolved	7440-21-3	E421	0.050	mg/L		2.48	<0.050	5.28	6.87	<0.100 DLDS
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000020 DLDS	<0.000020 DLDS
sodium, dissolved	7440-23-5	E421	0.050	mg/L		312	180	74.6	331	359
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		0.563	0.411	0.284	0.830	0.503
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		66.4	60.8	15.8	108	89.5
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00040 DLDS	<0.00040 DLDS
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000020 DLDS	<0.000020 DLDS
thorium, dissolved	7440-29-1	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00020 DLDS	<0.00020 DLDS

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BEAVER COUNTY D.1	WINSNES D.1	BALASH D.1	BALASH D.2	BALASH D.3
					Client sampling date / time	19-Oct-2022 08:30	19-Oct-2022 10:50	19-Oct-2022 11:15	19-Oct-2022 11:35	19-Oct-2022 11:50
						EO2209152-011	EO2209152-012	EO2209152-013	EO2209152-014	EO2209152-015
						Result	Result	Result	Result	Result
Dissolved Metals										
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00020 DLDS	<0.00020 DLDS
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		0.00052	<0.00030	<0.00030	<0.00060 DLDS	<0.00060 DLDS
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L		0.00015	<0.00010	<0.00010	<0.00020 DLDS	<0.00020 DLDS
uranium, dissolved	7440-61-1	E421	0.000010	mg/L		0.00210	0.00143	0.000245	0.00362	0.00175
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L		0.00761	0.00166	0.00092	0.00420	0.00320
zinc, dissolved	7440-66-6	E421	0.0010	mg/L		0.0011	0.0011	<0.0010	<0.0020 DLDS	<0.0020 DLDS
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L		0.00083	<0.00030	<0.00030	<0.00060 DLDS	0.00074
dissolved mercury filtration location	----	EP509	-	-		Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-		Field	Field	Field	Field	Field
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L		185	80	96	148	156
phenols, total (4AAP)	----	E562	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Volatile Organic Compounds										
benzene	71-43-2	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
ethylbenzene	100-41-4	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
styrene	100-42-5	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
toluene	108-88-3	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
xylene, m+p-	179601-23-1	E611A	0.00040	mg/L		<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
xylene, o-	95-47-6	E611A	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
xylenes, total	1330-20-7	E611A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hydrocarbons										
F1 (C6-C10)	----	E581.F1	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	----	E601	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
F1-BTEX	----	EC580	0.100	mg/L		<0.100	<0.100	<0.100	<0.100	<0.100
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%		98.0	102	105	101	100
dichlorotoluene, 3,4-	97-75-0	E581.F1	1.0	%		90.1	92.8	99.7	90.3	76.5
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%		91.6	89.6	95.7	93.6	84.8
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%		88.1	88.6	89.4	88.2	84.7

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	DUPILCATE 1	DUPILCATE 2	----	----	----
					Client sampling date / time	19-Oct-2022	19-Oct-2022	----	----	----
Analyte	CAS Number	Method	LOR	Unit		EO2209152-016	EO2209152-017	--------	--------	--------
						Result	Result	----	----	----
Physical Tests										
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		97.4	553	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L		35.2	52.6	----	----	----
conductivity	----	E100	2.0	µS/cm		692	2450 RRV	----	----	----
pH	----	E108	0.10	pH units		8.41	8.73 RRV	----	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L		292	524 RRV	----	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L		2.9	31.7 RRV	----	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L		<1.0	<1.0 RRV	----	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L		244	482 RRV	----	----	----
solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L		462	1590	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0969	0.0570	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		1.44 DLHC	0.916 DLHC	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L		4.79	5.39	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		69.1	396 DLDS	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		0.270	0.464 DLDS	----	----	----
nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L		<0.020	<0.100 DLDS	----	----	----
nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L		<0.010	<0.050 DLDS	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		17.8	299 DLDS	----	----	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0500	mg/L		<0.0500	<0.112	----	----	----
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		47.8	38.4	----	----	----
Ion Balance										
anion sum	----	EC101	0.10	meq/L		7.21	27.0	----	----	----
cation sum	----	EC101	0.10	meq/L		7.88	26.6	----	----	----
ion balance (APHA)	----	EC101	0.010	%		4.44	0.746	----	----	----
ion balance (cations/anions)	----	EC101	0.010	%		109	98.5	----	----	----
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0103	0.0099	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		0.00015	0.00037	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.00701	0.00888	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	DUPILCATE 1	DUPILCATE 2	----	----	----
					Client sampling date / time	19-Oct-2022	19-Oct-2022	----	----	----
Analyte	CAS Number	Method	LOR	Unit		EO2209152-016	EO2209152-017	--------	--------	--------
						Result	Result	----	----	----
Dissolved Metals										
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.0215	0.112	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L		<0.000020	<0.000040 DLDS	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000050	<0.000100 DLDS	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L		0.034	0.049	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		<0.0000050	<0.0000100 DLDS	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L		21.7	106	----	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L		<0.000010	<0.000020 DLDS	----	----	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		<0.00050	<0.00100 DLDS	----	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		0.00106	0.00144	----	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.00087	0.00123	----	----	----
iron, dissolved	7439-89-6	E421	0.030	mg/L		0.637	<0.060 DLDS	----	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L		0.000149	<0.000100 DLDS	----	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		0.0115	0.0505	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		10.5	70.1	----	----	----
manganese, dissolved	7439-96-5	E421	0.00500	mg/L		0.154	0.304	----	----	----
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L		<0.0000050	<0.0000050	----	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.000895	0.00123	----	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		0.00467	0.00544	----	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		1.34	0.526	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L		19.6	39.1	----	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L		0.00168	0.00292	----	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.000304	0.000328	----	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L		1.58	7.01	----	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000010	<0.000020 DLDS	----	----	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L		124	333	----	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		0.173	0.843	----	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		8.98	111	----	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L		<0.00020	<0.00040 DLDS	----	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000010	<0.000020 DLDS	----	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L		<0.00010	<0.00020 DLDS	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	DUPILCATE 1	DUPILCATE 2	----	----	----
					Client sampling date / time	19-Oct-2022	19-Oct-2022	----	----	----
Analyte	CAS Number	Method	LOR	Unit		EO2209152-016	EO2209152-017	--------	--------	--------
						Result	Result	----	----	----
Dissolved Metals										
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00010	<0.00020 DLDS	----	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		0.00124	<0.00060 DLDS	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L		<0.00010	<0.00020 DLDS	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L		0.000324	0.00369	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L		0.00295	0.00431	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L		0.0021	<0.0020 DLDS	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L		0.00122	<0.00060 DLDS	----	----	----
dissolved mercury filtration location	----	EP509	-	-		Field	Field	----	----	----
dissolved metals filtration location	----	EP421	-	-		Field	Field	----	----	----
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L		159	152	----	----	----
phenols, total (4AAP)	----	E562	0.0010	mg/L		<0.0010	<0.0010	----	----	----
Volatile Organic Compounds										
benzene	71-43-2	E611A	0.00050	mg/L		<0.00050	<0.00050	----	----	----
ethylbenzene	100-41-4	E611A	0.00050	mg/L		<0.00050	<0.00050	----	----	----
styrene	100-42-5	E611A	0.00050	mg/L		<0.00050	<0.00050	----	----	----
toluene	108-88-3	E611A	0.00050	mg/L		<0.00050	<0.00050	----	----	----
xylene, m+p-	179601-23-1	E611A	0.00040	mg/L		<0.00040	<0.00040	----	----	----
xylene, o-	95-47-6	E611A	0.00030	mg/L		<0.00030	<0.00030	----	----	----
xylenes, total	1330-20-7	E611A	0.00050	mg/L		<0.00050	<0.00050	----	----	----
Hydrocarbons										
F1 (C6-C10)	----	E581.F1	0.10	mg/L		<0.10	<0.10	----	----	----
F2 (C10-C16)	----	E601	0.10	mg/L		<0.10	<0.10	----	----	----
F1-BTEX	----	EC580	0.100	mg/L		<0.100	<0.100	----	----	----
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%		101	102	----	----	----
dichlorotoluene, 3,4-	97-75-0	E581.F1	1.0	%		88.9	87.8	----	----	----
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%		92.2	94.1	----	----	----
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%		87.8	88.2	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2209152**	Page	: 1 of 47
Client	: **Tetra Tech Canada Inc.**	Laboratory	: Edmonton - Environmental
Contact	: Brent Finnestad	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780-718-9317	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04592-01	Date Samples Received	: 20-Oct-2022 11:30
PO	: ----	Issue Date	: 07-Nov-2022 09:31
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 17		
No. of samples analysed	: 17		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) BALASH D.1	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) BALASH D.2	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) BALASH D.3	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) BEAVER COUNTY D.1	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) BOOTH D.1	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) EWERT D.1	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) EWERT D.2	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) EWERT D.3	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) EWERT D.4	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) MAGNESON D.1	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) MAGNESON D.2	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) MAGNESON D.4	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) MAGNESON D.5	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) MAGNESON D.6	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) WINSNES D.1	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	6 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) DUPILCATE 1	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid)										
DUPILCATE 2	E559-L	19-Oct-2022	----	----	----		25-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
BALASH D.1	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
BALASH D.2	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
BALASH D.3	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
BEAVER COUNTY D.1	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
BOOTH D.1	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
EWERT D.1	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
EWERT D.2	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
EWERT D.3	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
EWERT D.4	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MAGNESON D.1	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MAGNESON D.2	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MAGNESON D.4	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MAGNESON D.5	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
MAGNESON D.6	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
WINSNES D.1	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
DUPILCATE 1	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
DUPILCATE 2	E562	19-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BALASH D.1	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BALASH D.2	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BALASH D.3	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BEAVER COUNTY D.1	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BOOTH D.1	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
EWERT D.1	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
EWERT D.2	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
EWERT D.3	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
EWERT D.4	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MAGNESON D.1	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MAGNESON D.2	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MAGNESON D.4	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MAGNESON D.5	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MAGNESON D.6	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WINSNES D.1	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) DUPILCATE 1	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) DUPILCATE 2	E298	19-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE BALASH D.1	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE BALASH D.2	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE BALASH D.3	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE BEAVER COUNTY D.1	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE BOOTH D.1	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE DUPILCATE 1	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE DUPILCATE 2	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE EWERT D.1	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE EWERT D.2	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE EWERT D.3	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE EWERT D.4	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MAGNESON D.1	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MAGNESON D.2	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MAGNESON D.4	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MAGNESON D.5	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MAGNESON D.6	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE WINSNES D.1	E235.Cl	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE BALASH D.1	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE BALASH D.2	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE BALASH D.3	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE BEAVER COUNTY D.1	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE BOOTH D.1	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE DUPILCATE 1	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE DUPILCATE 2	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE EWERT D.1	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE EWERT D.2	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE EWERT D.3	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE EWERT D.4	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE MAGNESON D.1	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MAGNESON D.2	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MAGNESON D.4	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MAGNESON D.5	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MAGNESON D.6	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE WINSNES D.1	E235.F	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE BALASH D.1	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE BALASH D.2	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE BALASH D.3	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE BEAVER COUNTY D.1	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE BOOTH D.1	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE DUPILCATE 1	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE DUPILCATE 2	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE EWERT D.1	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE EWERT D.2	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE EWERT D.3	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE EWERT D.4	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MAGNESON D.1	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE MAGNESON D.2	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MAGNESON D.4	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MAGNESON D.5	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MAGNESON D.6	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE WINSNES D.1	E235.NO3	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE BALASH D.1	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE BALASH D.2	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE BALASH D.3	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE BEAVER COUNTY D.1	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE BOOTH D.1	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE DUPILCATE 1	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE DUPILCATE 2	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE EWERT D.1	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE EWERT D.2	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE EWERT D.3	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE EWERT D.4	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MAGNESON D.1	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MAGNESON D.2	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE MAGNESON D.4	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MAGNESON D.5	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MAGNESON D.6	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE WINSNES D.1	E235.NO2	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BALASH D.1	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BALASH D.2	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BALASH D.3	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BEAVER COUNTY D.1	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BOOTH D.1	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE DUPILCATE 1	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE DUPILCATE 2	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE EWERT D.1	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE EWERT D.2	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE EWERT D.3	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE EWERT D.4	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MAGNESON D.1	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MAGNESON D.2	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MAGNESON D.4	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MAGNESON D.5	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MAGNESON D.6	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
WINSNES D.1	E235.SO4	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
BALASH D.1	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
BALASH D.2	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
BALASH D.3	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
BEAVER COUNTY D.1	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
BOOTH D.1	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
EWERT D.1	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) EWERT D.2	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) EWERT D.3	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) EWERT D.4	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MAGNESON D.1	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MAGNESON D.2	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MAGNESON D.4	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MAGNESON D.5	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MAGNESON D.6	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) WINSNES D.1	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	14 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) DUPILCATE 1	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	15 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) DUPILCATE 2	E318	19-Oct-2022	01-Nov-2022	----	----		02-Nov-2022	28 days	15 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BALASH D.1	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BALASH D.2	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BALASH D.3	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BEAVER COUNTY D.1	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BOOTH D.1	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) EWERT D.1	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) EWERT D.2	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) EWERT D.3	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) EWERT D.4	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MAGNESON D.1	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MAGNESON D.2	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MAGNESON D.4	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MAGNESON D.5	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MAGNESON D.6	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) WINSNES D.1	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) DUPILCATE 1	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
DUPILCATE 2	E372-U	19-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
BALASH D.1	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
BALASH D.2	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
BALASH D.3	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
BEAVER COUNTY D.1	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
BOOTH D.1	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
DUPILCATE 1	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
DUPILCATE 2	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
EWERT D.1	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) EWERT D.2	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) EWERT D.3	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) EWERT D.4	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MAGNESON D.1	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MAGNESON D.2	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MAGNESON D.4	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MAGNESON D.5	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MAGNESON D.6	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) WINSNES D.1	E509	19-Oct-2022	22-Oct-2022	----	----		22-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) BALASH D.1	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) BALASH D.2	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) BALASH D.3	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) BEAVER COUNTY D.1	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) BOOTH D.1	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) EWERT D.1	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) EWERT D.2	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) EWERT D.3	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) EWERT D.4	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MAGNESON D.1	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MAGNESON D.2	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MAGNESON D.4	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MAGNESON D.5	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MAGNESON D.6	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) WINSNES D.1	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) DUPILCATE 1	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) DUPILCATE 2	E421	19-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) BALASH D.1	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) BALASH D.2	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) BALASH D.3	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) BEAVER COUNTY D.1	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) BOOTH D.1	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) EWERT D.1	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) EWERT D.2	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) EWERT D.3	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) EWERT D.4	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MAGNESON D.1	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MAGNESON D.2	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MAGNESON D.4	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MAGNESON D.5	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MAGNESON D.6	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) WINSNES D.1	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) DUPILCATE 1	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) DUPILCATE 2	E581.F1	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	7 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) BEAVER COUNTY D.1	E601	19-Oct-2022	21-Oct-2022	14 days	2 days	✓	24-Oct-2022	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) BOOTH D.1	E601	19-Oct-2022	21-Oct-2022	14 days	2 days	✓	24-Oct-2022	40 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) EWERT D.1	E601	19-Oct-2022	21-Oct-2022	14 days	2 days	✓	24-Oct-2022	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) EWERT D.2	E601	19-Oct-2022	21-Oct-2022	14 days	2 days	✓	24-Oct-2022	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) EWERT D.3	E601	19-Oct-2022	21-Oct-2022	14 days	2 days	✓	24-Oct-2022	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) EWERT D.4	E601	19-Oct-2022	21-Oct-2022	14 days	2 days	✓	24-Oct-2022	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MAGNESON D.1	E601	19-Oct-2022	21-Oct-2022	14 days	2 days	✓	24-Oct-2022	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MAGNESON D.2	E601	19-Oct-2022	21-Oct-2022	14 days	2 days	✓	24-Oct-2022	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MAGNESON D.4	E601	19-Oct-2022	21-Oct-2022	14 days	2 days	✓	24-Oct-2022	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MAGNESON D.5	E601	19-Oct-2022	21-Oct-2022	14 days	2 days	✓	24-Oct-2022	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MAGNESON D.6	E601	19-Oct-2022	21-Oct-2022	14 days	2 days	✓	24-Oct-2022	40 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
BALASH D.1	E601	19-Oct-2022	24-Oct-2022	14 days	5 days	✓	24-Oct-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
BALASH D.2	E601	19-Oct-2022	24-Oct-2022	14 days	5 days	✓	24-Oct-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
BALASH D.3	E601	19-Oct-2022	24-Oct-2022	14 days	5 days	✓	24-Oct-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
WINSNES D.1	E601	19-Oct-2022	24-Oct-2022	14 days	5 days	✓	24-Oct-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
DUPILCATE 1	E601	19-Oct-2022	24-Oct-2022	14 days	6 days	✓	24-Oct-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
DUPILCATE 2	E601	19-Oct-2022	24-Oct-2022	14 days	6 days	✓	24-Oct-2022	40 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
DUPILCATE 1	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	10 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
DUPILCATE 2	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	10 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
BALASH D.1	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) BALASH D.2	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) BALASH D.3	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) BEAVER COUNTY D.1	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) BOOTH D.1	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) EWERT D.1	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) EWERT D.2	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) EWERT D.3	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) EWERT D.4	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MAGNESON D.1	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MAGNESON D.2	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MAGNESON D.4	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MAGNESON D.5	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MAGNESON D.6	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) WINSNES D.1	E358-L	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BALASH D.1	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BALASH D.2	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BALASH D.3	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BEAVER COUNTY D.1	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE BOOTH D.1	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE DUPILCATE 1	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE DUPILCATE 2	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE EWERT D.1	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE EWERT D.2	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE EWERT D.3	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE EWERT D.4	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MAGNESON D.1	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MAGNESON D.2	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE MAGNESON D.4	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MAGNESON D.5	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MAGNESON D.6	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE WINSNES D.1	E290	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	14 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE BALASH D.1	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE BALASH D.2	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE BALASH D.3	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE BEAVER COUNTY D.1	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE BOOTH D.1	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE DUPILCATE 1	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE DUPILCATE 2	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE EWERT D.1	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE EWERT D.2	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE EWERT D.3	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE EWERT D.4	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE MAGNESON D.1	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE MAGNESON D.2	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE MAGNESON D.4	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE MAGNESON D.5	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE MAGNESON D.6	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE WINSNES D.1	E100	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE BALASH D.1	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE BALASH D.2	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE BALASH D.3	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE BEAVER COUNTY D.1	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE BOOTH D.1	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE DUPILCATE 1	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE DUPILCATE 2	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE EWERT D.1	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE EWERT D.2	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE EWERT D.3	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE EWERT D.4	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MAGNESON D.1	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MAGNESON D.2	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MAGNESON D.4	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MAGNESON D.5	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE MAGNESON D.6	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE WINSNES D.1	E108	19-Oct-2022	21-Oct-2022	----	----		21-Oct-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : TSS by Gravimetry										
HDPE BOOTH D.1	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE EWERT D.1	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE EWERT D.2	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE EWERT D.3	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE EWERT D.4	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MAGNESON D.1	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE BALASH D.1	E160	19-Oct-2022	----	----	----		26-Oct-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE BALASH D.2	E160	19-Oct-2022	----	----	----		26-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE BALASH D.3	E160	19-Oct-2022	----	----	----		26-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE BEAVER COUNTY D.1	E160	19-Oct-2022	----	----	----		26-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE DUPILCATE 1	E160	19-Oct-2022	----	----	----		26-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE DUPILCATE 2	E160	19-Oct-2022	----	----	----		26-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MAGNESON D.2	E160	19-Oct-2022	----	----	----		26-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MAGNESON D.4	E160	19-Oct-2022	----	----	----		26-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MAGNESON D.5	E160	19-Oct-2022	----	----	----		26-Oct-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MAGNESON D.6	E160	19-Oct-2022	----	----	----		26-Oct-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE										
WINSNES D.1	E160	19-Oct-2022	----	----	----		26-Oct-2022	7 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
BALASH D.1	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
BALASH D.2	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
BALASH D.3	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
BEAVER COUNTY D.1	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
BOOTH D.1	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
EWERT D.1	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
EWERT D.2	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
EWERT D.3	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) EWERT D.4	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MAGNESON D.1	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MAGNESON D.2	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MAGNESON D.4	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MAGNESON D.5	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MAGNESON D.6	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) WINSNES D.1	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) DUPILCATE 1	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) DUPILCATE 2	E611A	19-Oct-2022	21-Oct-2022	----	----		25-Oct-2022	14 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	707394	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	718420	2	40	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	707340	1	17	5.8	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	707341	1	17	5.8	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	713719	2	39	5.1	5.0	✓
Chloride in Water by IC	E235.Cl	707668	1	20	5.0	5.0	✓
Conductivity in Water	E100	707393	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	709326	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	713693	2	39	5.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	720570	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	707667	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	707664	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	707665	1	20	5.0	5.0	✓
pH by Meter	E108	707392	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	716367	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	707666	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	724620	3	42	7.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714235	2	39	5.1	5.0	✓
TSS by Gravimetry	E160	714307	2	40	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	707394	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	718420	2	40	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	707340	1	17	5.8	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	707341	1	17	5.8	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	707973	2	40	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	713719	2	39	5.1	5.0	✓
Chloride in Water by IC	E235.Cl	707668	1	20	5.0	5.0	✓
Conductivity in Water	E100	707393	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	709326	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	713693	2	39	5.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	720570	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	707667	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	707664	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	707665	1	20	5.0	5.0	✓
pH by Meter	E108	707392	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	716367	2	40	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Sulfate in Water by IC	E235.SO4	707666	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	724620	3	42	7.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714235	2	39	5.1	5.0	✓
TSS by Gravimetry	E160	714307	2	40	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	707394	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	718420	2	40	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	707340	1	17	5.8	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	707341	1	17	5.8	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	707973	2	40	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	713719	2	39	5.1	5.0	✓
Chloride in Water by IC	E235.Cl	707668	1	20	5.0	5.0	✓
Conductivity in Water	E100	707393	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	709326	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	713693	2	39	5.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	720570	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	707667	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	707664	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	707665	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	716367	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	707666	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	724620	3	42	7.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714235	2	39	5.1	5.0	✓
TSS by Gravimetry	E160	714307	2	40	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	718420	2	40	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	707340	1	17	5.8	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	713719	2	39	5.1	5.0	✓
Chloride in Water by IC	E235.Cl	707668	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	709326	2	40	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	713693	2	39	5.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	720570	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	707667	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	707664	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	707665	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	716367	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	707666	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	724620	2	42	4.7	5.0	×
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714235	2	39	5.1	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Edmonton - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Edmonton - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Edmonton - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Mercury in Water by CVAAS	E509 Edmonton - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
CCME PHC - F1 by Headspace GC-FID	E581.F1 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
BTEX by Headspace GC-MS	E611A Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Edmonton - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Edmonton - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Edmonton - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals Water Filtration	EP421 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Edmonton - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Edmonton - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

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QUALITY CONTROL REPORT

Work Order	: **EO2209152**	Page	: 1 of 22
Client	: Tetra Tech Canada Inc.	Laboratory	: Edmonton - Environmental
Contact	: Brent Finnestad	Account Manager	: Kieran Tordoff
Address	: North Building 14940 123 Ave NW Edmonton AB Canada T5V 1B4	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	:	Telephone	: +1 780 413 5227
Project	: SWM.SWOP04592-01	Date Samples Received	: 20-Oct-2022 11:30
PO	: ----	Date Analysis Commenced	: 21-Oct-2022
C-O-C number	: ----	Issue Date	: 07-Nov-2022 09:31
Sampler	: ---- 780-718-9317		
Site	: ----		
Quote number	: ----		
No. of samples received	: 17		
No. of samples analysed	: 17		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Alex Drake	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Edmonton Metals, Edmonton, Alberta
Jessica Maitland	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Jing Liu	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Edmonton Organics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Ryan Huynh	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Sobhithan Pillay		Edmonton Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Edmonton Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 707392)											
EO2209146-019	Anonymous	pH	----	E108	0.10	pH units	7.85	7.86	0.127%	3%	----
Physical Tests (QC Lot: 707393)											
EO2209146-019	Anonymous	conductivity	----	E100	2.0	µS/cm	2600	2630	1.15%	10%	----
Physical Tests (QC Lot: 707394)											
EO2209146-019	Anonymous	alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	1150	1140	1.13%	20%	----
Physical Tests (QC Lot: 714307)											
EO2209148-011	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	5.0	5.6	0.6	Diff <2x LOR	----
Physical Tests (QC Lot: 715337)											
EO2209152-007	MAGNESON D.2	solids, total suspended [TSS]	----	E160	3.0	mg/L	56.8	54.4	4.32%	20%	----
Anions and Nutrients (QC Lot: 707664)											
EO2209152-016	DUPILCATE 1	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 707665)											
EO2209152-016	DUPILCATE 1	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 707666)											
EO2209152-016	DUPILCATE 1	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	17.8	17.3	2.68%	20%	----
Anions and Nutrients (QC Lot: 707667)											
EO2209152-016	DUPILCATE 1	fluoride	16984-48-8	E235.F	0.020	mg/L	0.270	0.274	1.47%	20%	----
Anions and Nutrients (QC Lot: 707668)											
EO2209152-016	DUPILCATE 1	chloride	16887-00-6	E235.Cl	0.50	mg/L	69.1	68.6	0.736%	20%	----
Anions and Nutrients (QC Lot: 714235)											
EO2209146-015	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714236)											
EO2209152-014	BALASH D.2	phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	0.928	0.932	0.354%	20%	----
Anions and Nutrients (QC Lot: 718420)											
EO2209123-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0250	mg/L	1.65	1.71	3.52%	20%	----
Anions and Nutrients (QC Lot: 718428)											
EO2209153-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.399	0.416	4.05%	20%	----
Anions and Nutrients (QC Lot: 724620)											
EO2209114-003	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	0.240	0.252	0.012	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 724655)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 724655) - continued											
EO2209040-010	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.318	0.363	0.045	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 724656)											
EO2209152-017	DUPILCATE 2	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	5.39	5.05	6.41%	20%	----
Organic / Inorganic Carbon (QC Lot: 720570)											
FC2202553-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 709326)											
EO2209062-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	0.000461	0.000456	1.09%	20%	----
Dissolved Metals (QC Lot: 709327)											
EO2209152-017	DUPILCATE 2	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 713693)											
EO2209142-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0016	0.0019	0.0003	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00010	<0.00010	0.000005	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00018	0.00017	0.000003	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0732	0.0729	0.400%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000288	0.0000288	0.00000006	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	28.1	29.4	4.61%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0015	0.0015	0.00001	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	4.43	4.34	2.26%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0266	0.0254	4.57%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000198	0.000210	0.000012	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00065	0.00064	0.000006	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.608	0.600	1.42%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00052	0.00045	0.00007	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 713693) - continued											
EO2209142-001	Anonymous	silicon, dissolved	7440-21-3	E421	0.050	mg/L	9.24	9.16	0.895%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	3.03	2.91	3.87%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0460	0.0482	4.63%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00016	0.00016	0.000003	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000101	0.000097	0.000004	Diff <2x LOR	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 713694)											
EO2209152-011	BEAVER COUNTY D.1	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0046	0.0055	0.0010	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00042	0.00044	0.00001	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0114	0.0111	3.20%	20%	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0243	0.0248	2.18%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.058	0.059	0.001	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	73.8	76.1	2.96%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00111	0.00112	0.909%	20%	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00077	0.00078	0.000005	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.030	mg/L	0.032	0.033	0.001	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0343	0.0322	6.50%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	32.3	32.2	0.368%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.409	0.415	1.39%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 713694) - continued											
EO2209152-011	BEAVER COUNTY D.1	molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00168	0.00172	2.32%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00695	0.00708	1.90%	20%	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	1.82	1.73	5.14%	20%	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	20.9	20.6	1.17%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00171	0.00168	0.00003	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000302	0.000278	0.000024	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.48	2.52	1.61%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	312	324	3.57%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.563	0.552	2.01%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	66.4	67.8	2.07%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00052	0.00052	0.000003	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	0.00015	0.00014	0.000007	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00210	0.00207	1.48%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00761	0.00778	2.21%	20%	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0011	0.0013	0.0003	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	0.00083	0.00084	0.00001	Diff <2x LOR	----
Aggregate Organics (QC Lot: 713719)											
EO2209110-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	76	76	0.06	Diff <2x LOR	----
Aggregate Organics (QC Lot: 713720)											
EO2209152-010	MAGNESON D.6	chemical oxygen demand [COD]	----	E559-L	10	mg/L	127	131	3.30%	20%	----
Aggregate Organics (QC Lot: 716367)											
EO2209145-002	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0030	0.0031	0.0002	Diff <2x LOR	----
Aggregate Organics (QC Lot: 716369)											
FC2202583-002	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0050	0.0059	0.0010	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 707340)											
EO2209152-001	BOOTH D.1	benzene	71-43-2	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Volatile Organic Compounds (QC Lot: 707340) - continued											
EO2209152-001	BOOTH D.1	toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.00040 mg/L	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 707341)											
EO2209152-001	BOOTH D.1	F1 (C6-C10)	----	E581.F1	100	µg/L	<0.10 mg/L	<100	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 707393)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 707394)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 714307)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 715337)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 707664)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 707665)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 707666)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 707667)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 707668)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 714235)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 714236)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 718420)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 718428)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 724620)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 724655)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 724656)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Organic / Inorganic Carbon (QCLot: 720570)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 720570) - continued						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 709326)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 709327)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 713693)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 713693) - continued						
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 713694)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 713694) - continued						
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Aggregate Organics (QCLot: 713719)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 713720)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 716367)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 716369)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 707340)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 707341)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 707973)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 711536)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 707392)									
pH	----	E108	----	pH units	6 pH units	101	97.0	103	----
Physical Tests (QCLot: 707393)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 707394)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	110	85.0	115	----
Physical Tests (QCLot: 714307)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	98.4	85.0	115	----
Physical Tests (QCLot: 715337)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 707664)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 707665)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 707666)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	107	90.0	110	----
Anions and Nutrients (QCLot: 707667)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 707668)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	108	90.0	110	----
Anions and Nutrients (QCLot: 714235)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	96.1	80.0	120	----
Anions and Nutrients (QCLot: 714236)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	97.6	80.0	120	----
Anions and Nutrients (QCLot: 718420)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	106	85.0	115	----
Anions and Nutrients (QCLot: 718428)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	108	85.0	115	----
Anions and Nutrients (QCLot: 724620)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 724655)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 724656)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	110	75.0	125	----
Organic / Inorganic Carbon (QCLot: 720570)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	92.3	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	97.2	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	101	80.0	120	----
Dissolved Metals (QCLot: 713693)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	101	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	103	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	97.9	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	92.9	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	98.4	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	97.2	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.9	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	98.6	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	99.4	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.4	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	95.5	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	96.4	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	92.7	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.8	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	94.0	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	97.1	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.2	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	101	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	99.9	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	94.3	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	99.0	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	98.4	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	97.2	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 713693) - continued									
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	101	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	98.4	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	93.8	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	99.4	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	95.4	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	105	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	98.4	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	93.8	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	93.8	80.0	120	----
Dissolved Metals (QCLot: 713694)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	105	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	97.5	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	91.3	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	97.0	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	99.3	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	97.4	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.8	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	104	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.3	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	93.7	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	98.0	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	100	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	94.2	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.6	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	94.8	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.0	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	95.8	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	110	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	99.8	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	95.9	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 713694) - continued									
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	101	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	98.6	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	98.5	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	98.4	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	107	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	95.6	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
tin, dissolved	7440-31-5	E421	----	mg/L	0.5 mg/L	98.7	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	95.0	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	98.8	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	94.5	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
Aggregate Organics (QCLot: 713719)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	108	85.0	115	----
Aggregate Organics (QCLot: 713720)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	106	85.0	115	----
Aggregate Organics (QCLot: 716367)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	87.2	85.0	115	----
Aggregate Organics (QCLot: 716369)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	92.4	85.0	115	----
Volatile Organic Compounds (QCLot: 707340)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	112	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	83.7	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	96.2	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	109	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	104	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	84.1	70.0	130	----
Hydrocarbons (QCLot: 707341)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	87.0	70.0	130	----
Hydrocarbons (QCLot: 707973)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Hydrocarbons (QCLot: 707973) - continued									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	103	70.0	130	----
Hydrocarbons (QCLot: 711536)									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	101	70.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 707664)										
EO2209152-016	DUPILCATE 1	nitrate (as N)	14797-55-8	E235.NO3	2.68 mg/L	2.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 707665)										
EO2209152-016	DUPILCATE 1	nitrite (as N)	14797-65-0	E235.NO2	0.515 mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 707666)										
EO2209152-016	DUPILCATE 1	sulfate (as SO4)	14808-79-8	E235.SO4	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 707667)										
EO2209152-016	DUPILCATE 1	fluoride	16984-48-8	E235.F	1.04 mg/L	1 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 707668)										
EO2209152-016	DUPILCATE 1	chloride	16887-00-6	E235.Cl	98.3 mg/L	100 mg/L	98.3	75.0	125	----
Anions and Nutrients (QCLot: 714235)										
EO2209146-016	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0494 mg/L	0.05 mg/L	98.9	70.0	130	----
Anions and Nutrients (QCLot: 714236)										
EO2209152-015	BALASH D.3	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 718420)										
EO2209123-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 718428)										
EO2209153-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 724620)										
EO2209114-004	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.47 mg/L	2.5 mg/L	99.0	70.0	130	----
Anions and Nutrients (QCLot: 724655)										
EO2209040-011	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.54 mg/L	2.5 mg/L	101	70.0	130	----
Organic / Inorganic Carbon (QCLot: 720570)										
FC2202553-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	4.20 mg/L	5 mg/L	84.0	70.0	130	----
Dissolved Metals (QCLot: 709326)										
EO2209152-001	BOOTH D.1	mercury, dissolved	7439-97-6	E509	0.000112 mg/L	0.0001 mg/L	112	70.0	130	----
Dissolved Metals (QCLot: 709327)										
EO2209153-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.000104 mg/L	0.0001 mg/L	104	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 713693)										
EO2209142-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.204 mg/L	0.2 mg/L	102	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0226 mg/L	0.02 mg/L	113	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00899 mg/L	0.01 mg/L	89.9	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.108 mg/L	0.1 mg/L	108	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00411 mg/L	0.004 mg/L	103	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0107 mg/L	0.01 mg/L	107	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0406 mg/L	0.04 mg/L	102	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0197 mg/L	0.02 mg/L	98.4	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.94 mg/L	2 mg/L	96.9	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0187 mg/L	0.02 mg/L	93.4	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0216 mg/L	0.02 mg/L	108	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0389 mg/L	0.04 mg/L	97.2	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.0 mg/L	10 mg/L	110	70.0	130	----
		potassium, dissolved	7440-09-7	E421	3.83 mg/L	4 mg/L	95.8	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.52 mg/L	10 mg/L	95.2	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00430 mg/L	0.004 mg/L	107	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	20.3 mg/L	20 mg/L	102	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0440 mg/L	0.04 mg/L	110	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00393 mg/L	0.004 mg/L	98.3	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0219 mg/L	0.02 mg/L	110	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0214 mg/L	0.02 mg/L	107	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0213 mg/L	0.02 mg/L	106	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 713693) - continued										
EO2209142-002	Anonymous	uranium, dissolved	7440-61-1	E421	0.00427 mg/L	0.004 mg/L	107	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0996 mg/L	0.1 mg/L	99.6	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.398 mg/L	0.4 mg/L	99.5	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0452 mg/L	0.04 mg/L	113	70.0	130	----
Dissolved Metals (QCLot: 713694)										
EO2209152-012	WINSNES D.1	aluminum, dissolved	7429-90-5	E421	0.216 mg/L	0.2 mg/L	108	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0226 mg/L	0.02 mg/L	113	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0425 mg/L	0.04 mg/L	106	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00983 mg/L	0.01 mg/L	98.3	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00409 mg/L	0.004 mg/L	102	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0105 mg/L	0.01 mg/L	105	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0421 mg/L	0.04 mg/L	105	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0203 mg/L	0.02 mg/L	101	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0194 mg/L	0.02 mg/L	97.0	70.0	130	----
		iron, dissolved	7439-89-6	E421	2.01 mg/L	2 mg/L	100	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.106 mg/L	0.1 mg/L	106	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0393 mg/L	0.04 mg/L	98.3	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	12.5 mg/L	10 mg/L	125	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0203 mg/L	0.02 mg/L	101	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		silicon, dissolved	7440-21-3	E421	10.6 mg/L	10 mg/L	106	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00404 mg/L	0.004 mg/L	101	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0428 mg/L	0.04 mg/L	107	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 713694) - continued										
EO2209152-012	WINSNES D.1	thallium, dissolved	7440-28-0	E421	0.00392 mg/L	0.004 mg/L	98.1	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0222 mg/L	0.02 mg/L	111	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0218 mg/L	0.02 mg/L	109	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0452 mg/L	0.04 mg/L	113	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0224 mg/L	0.02 mg/L	112	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00445 mg/L	0.004 mg/L	111	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.377 mg/L	0.4 mg/L	94.4	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0449 mg/L	0.04 mg/L	112	70.0	130	----
Aggregate Organics (QCLot: 713719)										
EO2209110-002	Anonymous	chemical oxygen demand [COD]	----	E559-L	92 mg/L	100 mg/L	91.6	75.0	125	----
Aggregate Organics (QCLot: 713720)										
EO2209152-011	BEAVER COUNTY D.1	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Aggregate Organics (QCLot: 716367)										
EO2209145-002	Anonymous	phenols, total (4AAP)	----	E562	0.0176 mg/L	0.02 mg/L	88.2	75.0	125	----
Aggregate Organics (QCLot: 716369)										
FC2202583-002	Anonymous	phenols, total (4AAP)	----	E562	0.0168 mg/L	0.02 mg/L	84.2	75.0	125	----
Volatile Organic Compounds (QCLot: 707340)										
EO2209152-002	EWERT D.1	benzene	71-43-2	E611A	73.9 µg/L	100 µg/L	73.9	50.0	140	----
		ethylbenzene	100-41-4	E611A	80.4 µg/L	100 µg/L	80.4	50.0	140	----
		styrene	100-42-5	E611A	83.6 µg/L	100 µg/L	83.6	50.0	140	----
		toluene	108-88-3	E611A	92.0 µg/L	100 µg/L	92.0	50.0	140	----
		xylene, m+p-	179601-23-1	E611A	178 µg/L	200 µg/L	89.2	50.0	140	----
		xylene, o-	95-47-6	E611A	80.8 µg/L	100 µg/L	80.8	50.0	140	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 21 -

Page of

Canada Toll Free: 1 800 668 9878

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Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech Canada Inc.
Contact:	Brent Finnestad
Phone:	780.451.2121
	Company address below will appear on the final report
Street:	14940 - 123 Ave NW
City/Province:	Edmonton
Postal Code:	T5V 1B4
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: Brent.Finnestad@TetraTech.com

Email 2: Fahim.Nazari@TetraTech.com

Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: Brent.Finnestad@TetraTech.com

Email 2: Fahim.Nazari@TetraTech.com

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q79533	AFE/Cost Center:	PO#
Job #:	SWM.SWOP04592-01	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):	EO2209152	ALS Contact:	Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	P BTX_F1_F2-ED	F/P C-DISS-ORG-CL	F COD-T-COL-ED	F MET_R-DIS-COME-ED	P NH3-COL-ED	P P-T-COL-ED	P PHENOLS-4AAP-ED	P RIO-ED	P SOLIDS-TOTSUS-ED	P TKN-F-ED	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
1	Booth D.1	19-OCT-22	9:10	Surface Water	10	X	X	X	X	X	X	X	X	X	X			
2	Ewert D.1	19-OCT-22	10:00	"	10	X	X	X	X	X	X	X	X	X	X			
3	Ewert D.2	19-OCT-22	10:30	"	10	X	X	X	X	X	X	X	X	X	X			
4	Ewert D.3	19-OCT-22	10:15	"	10	X	X	X	X	X	X	X	X	X	X			
5	Ewert D.4	19-OCT-22	9:30	"	10	X	X	X	X	X	X	X	X	X	X			
	~~Lysons D.1~~																	
	~~Lysons D.2~~																	
	~~Lysons D.3~~																	
	~~Lysons D.4~~																	
6	Magneson D.1	19-OCT-22	12:50	"	10	X	X	X	X	X	X	X	X	X	X			
7	Magneson D.2	19-OCT-22	12:20	"	10	X	X	X	X	X	X	X	X	X	X			
	~~Magneson D.3~~																	

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

SAMPLE RECEIPT DETAILS

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PACKS ☐

Submission Comments identified on Sample Receipt Notifi

Cooler Custody Seals Intact: ☐ YES ☐ N/A Samp

INITIAL COOLER TEMPERATURES °C			
6.8°C	4.5°C	5.4°C	

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (ALS use only)		
Received by: JR	Date: 20-Oct 2022	Time: 11:30

FINAL SHIPMENT RECE	
Received by:	Date:

Environmental Division
Edmonton
Work Order Reference
EO2209152

Telephone : +1 780 413 5227

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

Chain of Custody (COC) / Analytical Request Form

COC Number: 21 -

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Canada Toll Free: 1 800 668 9878

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech Canada Inc.
Contact:	Brent Finnestad
Phone:	780.451.2121
	Company address below will appear on the final report
Street:	14940 - 123 Ave NW
City/Province:	Edmonton
Postal Code:	T5V 1B4
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Project Information	
ALS Account # / Quote #:	Q79533
Job #:	SWM.SWOP04592-01
PO / AFE:	
LSD:	

Reports / Recipients	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	Brent.Finnestad@TetraTech.com
Email 2	Fahim.Nazari@TetraTech.com
Email 3	

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	Brent.Finnestad@TetraTech.com
Email 2	Fahim.Nazari@TetraTech.com

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): | **ALS Contact:** | **Sampler:**

Turnaround Time (TAT) Requested

- ☑ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- ☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	BTX, F1, F2 - ED (F)	C-DIS-ORG-CL (F)	COD-T-COL-ED (P)	MET_R-DIS-CCME-ED (F)	NH3-COL-ED (P)	P-T-COL-ED (P)	PHENOLS-4AAP-ED (P)	ROU-ED (F)	SOLIDS-TOTSUS-ED (P)	TKN-F-ED (F)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
8	Magneson D.4	19 OCT 22	13:25	Water	10	X	X	X	X	X	X	X	X	X	X			
9	Magneson D.5	19 OCT 22	12:35	Water	10	X	X	X	X	X	X	X	X	X	X			
10	Magneson D.6	19 OCT 22	13:05	Water	10	X	X	X	X	X	X	X	X	X	X			
11	Beaver County D.1	19 OCT 22	8:30	Water	10	X	X	X	X	X	X	X	X	X	X			
12	Winsnes D.1	19 OCT 22	10:50	Water	10	X	X	X	X	X	X	X	X	X	X			
13	Balash D.1	19 OCT 22	11:15	Water	10	X	X	X	X	X	X	X	X	X	X			
14	Balash D.2	19 OCT 22	11:35	Water	10	X	X	X	X	X	X	X	X	X	X			
15	Balash D.3	19 OCT 22	11:50	Water	10	X	X	X	X	X	X	X	X	X	X			
16	Duplicate 1	19 OCT 22		Water	10	X	X	X	X	X	X	X	X	X	X			
17	Duplicate 2	19 OCT 22		Water	10	X	X	X	X	X	X	X	X	X	X			

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	ESDAT format
Are samples for human consumption/ use? ☐ YES ☐ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

APPENDIX D

HISTORICAL DUGOUT CHEMICAL ANALYTICAL RESULTS

Table D.1: Chemical Analytical Results

Sample ID:		Booth D.1																						
Site Number:		1																						
Date Sampled:	Units	15-Oct-1996	3-Oct-1997	8-Oct-1998	20-Oct-1999	11-Oct-2000	24-Oct-2001	8-Oct-2002	15-Oct-2003	14-Oct-2004	20-Oct-2005	13-Oct-2006	3-Oct-2007	16-Oct-2008	28-Oct-2009	18-Oct-2010	12-Oct-2011	15-Oct-2012	8-Oct-2013	15-Oct-2014	14-Oct-2015	5-Oct-2016	20-Oct-2017	16-Oct-2018	29-Oct-2019
Chem. O_2 Demand	mg/L	70	40	50	70	50	40	60	50	40	55	61	50	69	65.5	59.4	75	92	78	71	219	68	77	98	84
Ammonia-N	mg/L	<0.05	<0.05	<0.05	0.06	0.58	0.16	<0.05	<0.05	<0.05	<0.05	0.12	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.79	0.108	1.21	<0.050	0.565	<0.050
Total Kjeldahl Nitrogen	mg/L	<0.2	0.6	1.6	1.8	1.5	2.4	1.8	1.7	1.8	1.8	1.8	1.7	2.5	1.84	2.1	2.89	2.55	2.76	2.76	7.02	3.09	2.58	4.70	2.51
Total Organic Carbon	mg/L	16	15	19	17	17	16	22	17	21	21	21	19	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												18	22.5	22.2	29.4	26.8	29.0	22.7	59.9	21.4	77	29.9	22.9
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0019	0.0075
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												<0.01	0.01	<0.010	<0.010	<0.010	0.013	<0.01	0.0035	0.0016	0.0031	0.0056	0.0021
Antimony	mg/L	0.0007	0.0005	0.0009	0.0005	0.0007	0.0006	0.0009	0.0012	0.0024	0.0007	0.0009	0.0019	0.0005	<0.00040	<0.00040	<0.00040	<0.00080	0.00043	<0.0004	0.00077	0.0002	0.00024	0.00029	0.00020
Arsenic	mg/L	Not required under previous permit														-	-	-	-	-	-	-	-	0.00703	0.00484
Barium	mg/L	0.033	0.025	0.03	0.032	0.051	0.049	0.025	0.039	0.018	0.033	0.079	0.075	0.073	0.0655	0.0731	0.0674	0.0518	0.0600	0.0673	0.0421	0.0883	0.0594	0.0714	0.0614
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00020	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													<0.05	<0.050	0.054	<0.050	<0.050	<0.050	<0.05	<0.020	0.064	0.045	0.049	0.047
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	<0.000010	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00020	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00092	0.00023	0.00034	0.00045	0.00035
Copper	mg/L	0.022	0.007	0.011	0.012	0.014	0.025	0.016	0.016	0.005	<0.001	0.001	<0.001	<0.001	<0.0010	0.0046	<0.0010	<0.0010	<0.0010	<0.001	<0.00040	0.00045	0.00054	0.00049	0.00053
Iron	mg/L	0.120	0.328	0.445	0.572	0.403	0.126	0.181	0.577	0.081	0.077	0.212	0.175	0.022	0.02	0.018	0.029	<0.010	0.025	0.07	0.021	0.021	0.033	0.028	0.121
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	0.00011	<0.00010	<0.000050	0.000077	<0.000050	0.000072
Lithium	mg/L	Not required under previous permit														-	-	-	-	-	-	-	-	0.0446	0.0327
Manganese	mg/L													0.003	0.005	<0.0020	<0.0020	<0.0020	0.0025	0.0024	0.154	0.00071	0.00744	0.00864	0.00250
Mercury	mg/L	0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	0.0000095	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.00244	0.00125	0.00111	0.000989	0.000853
Nickel	mg/L	<0.002	<0.002	0.003	0.005	0.005	0.003	0.004	0.006	<0.002	<0.002	0.004	0.003	0.003	0.0035	0.0038	0.0047	0.0036	0.0035	0.0041	0.0060	0.0043	0.0034	0.00279	0.00353
Selenium	mg/L	Not required under previous permit												<0.0004	<0.00080	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00045	0.000114	0.000115	0.000143	0.000115
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000020	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													0.0002	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000020	<0.000010	<0.000010	0.000016	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00020	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L													<0.001	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	<0.001	<0.00060	<0.00030	0.00032	0.00049	0.00059
Uranium	mg/L															-	-	-	-	-	-	-	-	0.000784	0.000578
Vanadium	mg/L													0.001	<0.0010	<0.0010	<0.0010	0.0017	0.0026	0.0015	0.0053	0.00087	0.00112	0.00135	0.00076
Zinc	mg/L	0.293	0.256	0.106	0.055	0.117	0.099	0.011	0.026	0.054	0.002	0.005	0.011	0.008	<0.0020	<0.0020	<0.0020	0.0035	<0.0020	0.0119	0.0021	<0.0010	0.0021	<0.0010	<0.0010
Routine Water																									
Ion Balance	%	100	108	101	101	102	102	98.5	104	102	104	101	99.2	98.8	95	109	88	91.9	104	110	96.7	107	95.5	107	103
Bicarbonate	mg/L	299	283	324	302	330	345	210	164	215	299	311	342	340	291	334	425	383	333	342	552	357	396	345	328
Chloride	mg/L	15.8	16.1	18.1	20.0	31.0	54.0	62	43	55	52	72	65	73	76	83.2	85.6	96.9	97.1	78.4	80.3	61.7	59.7	54.6	46.3
Carbonate	mg/L	<5	<5	<5	<5	<5	<5	76	37	45	<5	<5	<5	12	29.3	15	11.7	28.7	36.1	11.2	24.6	<5.0	10.7	7.6	<5.0
Conductivity (EC)	uS/cm	1080	986	903	956	1070	1260	1500	998	1150	898	951	944	987	1010	1100	1130	1180	1100	989	1560	885	893	845	714
Calcium	mg/L	25.5	20.5	18.1	15.5	26.2	28.6	13.2	14.2	14.6	23	31.2	30.1	21.7	14.8	33.3	28	13.1	14.7	19.6	33.6	29	14.8	14.7	21.5
Potassium	mg/L	7.6	7.2	7.8	7.8	11	10.5	12.3	9.6	9.3	9.7	12.3	10.6	10.9	12.2	11.7	9.26	11.8	12.9	12.2	17.9	13.9	12.3	15.1	12.5
Magnesium	mg/L	14.0	10.8	11.3	10.4	14.3	17.1	18	11.7	12.7	11.4	12.9	12.3	14	12.2	16.9	13	13.4	15.0	13.6	20.8	13.9	12.5	11.7	10.8
Sodium	mg/L	211	198	194	175	204	250	333	194	219	178	163	153	171	182	202	178	210	217	186	254	154	167	156	128
Sulfate	mg/L	307	231	216	185	223	332	382	233	228	159	136	100	98.3	125	135	101	106	90.2	67.7	157	70.6	59.6	43.0	43.4
Phosphorus	mg/L	Not required under previous permit													0.057	0.087	0.324	0.16	0.166	0.245	1.09	0.155	0.128	0.276	0.211
pH in H_20	pH	8.4	8.4	8.0	8.3	8.0	8.1	9.5	9.4	9.3	8.3	8.1	8.4	8.6	8.84	8.6	8.48	8.93	8.96	8.6	8.63	8.37	8.53	8.49	8.36
TDS (Calculated)	mg/L	729	625	625	563	659	870	966	624	690	580	581	542	568	594	661	636	668	647	557	860	524	531	472	428
Nitrate	mg/L	Not required under previous permit												<0.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.040	0.312	<0.020	<0.020	<0.020
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	<0.020	0.026	<0.010	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.022	<0.022
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	84.9	98.2
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	295	276
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.146	0.284
Field Data																									
pH in H_20	pH	Not required under previous permit												8.41	8.19	9.03	8.56	9.36	9.5	8.35	9.21	8.7	9.1	11.1	8.4
Conductivity (EC)	uS/cm													1044	650	717	1241	1157	1127	804	1580	893	980	858	80

Table D.2: Chemical Analytical Results

Sample ID:		Ewert D.1																							
Site Number:		2																							
Date Sampled:	**Units**	**16-Oct-1996**	**7-Oct-1997**	**9-Oct-1998**	**20-Oct-1999**	**11-Oct-2000**	**4-Oct-2001**	**8-Oct-2002**	**15-Oct-2003**	**14-Oct-2004**	**20-Oct-2005**	**13-Oct-2006**	**3-Oct-2007**	**16-Oct-2008**	**28-Oct-2009**	**18-Oct-2010**	**13-Oct-2011**	**15-Oct-2012**	**8-Oct-2013**	**15-Oct-2014**	**14-Oct-2015**	**5-Oct-2016**	**20-Oct-2017**	**16-Oct-2018**	**29-Oct-2019**
Chem. O_2 Demand	mg/L	40	50	100	90	50	90	90	80	40	85	55	68	70	103	67	81	81	80	79	131	83	122	53	79
Ammonia-N	mg/L	1.65	0.36	0.8	<0.05	<0.05	0.28	<0.05	<0.05	<0.05	<0.05	1.64	<0.05	<0.05	0.207	<0.050	<0.050	0.198	<0.050	0.082	0.304	0.052	1.11	3.79	<0.050
Total Kjeldahl Nitrogen	mg/L	3.3	2.7	3	2.5	1.7	0.9	3.9	4.8	2.7	2.2	3.9	2.3	2.4	5.8	3.52	2.66	3.15	3.13	2.95	6.65	3.06	7.29	5.64	2.70
Total Organic Carbon	mg/L	17	24	23	19	19	31	37	29	23	31	20	24	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												18	29.1	31.7	20	24.8	24.9	23.4	37.2	24.3	122	21.6	22.2
Phenols	mg/L													-		-	-	-	-	-	-	-	-	0.0018	0.0101
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-		-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-		-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-		-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												<0.01	0.026	0.022	<0.010	<0.010	<0.010	<0.01	0.0167	0.0025	0.0151	0.0303	0.0349
Antimony	mg/L	<0.0004	<0.0002	0.0005	<0.0004	0.0005	0.0009	0.0015	0.0015	0.0016	0.0015	0.0012	0.002	0.0005	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00043	0.00013	0.0003	<0.00010	0.00025
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.00165	0.0137
Barium	mg/L	0.051	0.075	0.064	0.111	0.078	0.075	0.131	0.155	0.155	0.041	0.088	0.071	0.057	0.048	0.0581	0.044	0.0789	0.0584	0.0826	0.0506	0.0699	0.0642	0.118	0.0449
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													0.05	0.052	0.057	0.058	0.057	0.052	0.061	0.059	0.073	0.053	0.046	0.040
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	0.0000099	0.0000059	0.0000083	<0.0000050	0.0000070
Chromium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.00013	<0.00010	<0.00010	0.00011	<0.00010
Cobalt	mg/L	<0.002	0.005	0.018	<0.002	<0.002	0.002	0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00060	0.00025	0.00064	0.00065	0.00062
Copper	mg/L	0.132	0.008	0.014	0.016	0.011	0.028	0.021	0.027	0.007	0.004	0.003	0.005	0.001	0.0019	0.0037	<0.0010	<0.0010	<0.0010	<0.001	0.00180	0.00360	0.00193	0.00081	0.00271
Iron	mg/L	0.277	0.754	0.595	1.400	0.770	2.920	4.33	7.07	0.616	0.454	1.67	1.19	0.032	0.087	0.055	<0.030	0.027	0.098	0.031	0.062	0.012	0.052	0.166	0.077
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	0.00018	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	0.000176	<0.000050	0.000098	0.000113	0.000076
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0263	0.0222
Manganese	mg/L													0.002	0.0075	0.0096	<0.0050	<0.0020	0.0046	<0.002	0.00448	0.00161	0.0116	0.192	0.0138
Mercury	mg/L	<0.0002	<0.0004	0.0005	<0.0002	<0.0002	0.0009	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0.0000052	0.0000081	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.007	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.00252	0.00142	0.000884	0.00136	0.00198
Nickel	mg/L	<0.002	<0.002	0.018	0.01	0.004	0.004	0.01	0.013	<0.002	0.004	0.006	0.006	0.005	0.0047	0.0043	0.0026	0.0046	0.0027	0.0037	0.00581	0.00424	0.00243	0.00389	0.00321
Selenium	mg/L	Not required under previous permit												0.0005	0.00058	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000347	0.000248	0.00025	0.000169	0.000258
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	0.000017	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	0.00011	<0.00010	<0.00010
Titanium	mg/L													<0.001	0.0026	0.0027	<0.0010	<0.0010	<0.0010	<0.001	0.00118	<0.00030	0.00044	0.0029	0.00517
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.00123	0.00138
Vanadium	mg/L													<0.001	0.002	0.0012	<0.0010	<0.0010	<0.0010	<0.001	0.00286	<0.00050	0.00228	0.00067	0.00299
Zinc	mg/L	<0.051	0.038	0.078	0.018	0.009	0.085	0.02	0.043	0.037	0.003	0.006	0.007	0.009	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0074	0.0026	<0.0010	0.0057	<0.0010	0.0011
Routine Water																									
Ion Balance	%	93	108	99	99	101	92.3	101	103	99.5	103	103	98.9	103	106	108	95.5	92.4	107	109	102	111	88.7	102	100
Bicarbonate	mg/L	401	368	422	421	349	282	499	280	315	211	554	297	307	277	298	350	392	272	310	285	354	456	319	304
Chloride	mg/L	11.5	12.7	10.7	15.0	13.0	18.0	27	26	13	12	13	13	16	14.8	13	20.8	20.4	32.0	23.7	27.2	31.5	31.3	30.8	32.9
Carbonate	mg/L	<5	13	<5	<5	<5	41	41	111	<5	36	<5	12	20	32.6	18	21.2	10.3	18.6	14.3	15.8	6.6	12.7	8.2	38.3
Conductivity (EC)	uS/cm	718	889	828	1050	1140	1170	1680	1410	656	519	554	653	734	662	662	692	727	597	648	622	759	851	758	675
Calcium	mg/L	15.6	27.6	32.2	32.5	27.5	17.1	23.3	17.5	17.4	16	18.8	16.7	17.1	12.8	15.3	15.3	16.8	11.8	17.3	10.6	24.8	13.3	26.0	21.5
Potassium	mg/L	15	17.4	17.6	17	19.5	13.8	22.5	14.8	13.9	9.6	14.1	12.2	13.4	13.8	13.6	14.6	15.5	17.7	17.8	14.4	19.2	18.5	19.9	16.0
Magnesium	mg/L	8.5	14.4	12.9	14.8	14.5	9.7	18.1	11	8.7	7.0	9.4	8	9.9	7.34	8.72	10.6	9.01	10.8	10.3	5.81	12.9	12	12.8	10.2
Sodium	mg/L	122	175	145	172	203	214	388	310	110	99	88	114	135	138	129	118	124	109	111	115	134	144	109	124
Sulfate	mg/L	39.9	144	111	170	261	278	390	293	59.2	35.1	24.1	57.7	73.9	53.3	50.9	21.4	31.2	13.3	10.8	14.4	39.6	30.2	65.3	24.3
Phosphorus	mg/L	Not required under previous permit													0.451	0.332	0.244	0.219	0.207	0.158	0.559	0.28	0.403	0.065	0.628
pH in H20	pH	8.2	8.6	8.0	8.1	8.5	9.1	8.6	9.7	8.4	9.3	8.2	8.7	8.8	8.95	8.78	8.71	8.56	8.84	8.72	8.81	8.45	8.54	8.49	9.16
TDS (Calculated)	mg/L	410	586	537	629	727	729	1120	921	381	318	316	379	436	409	395	394	420	347	358	344	444	491	429	417
Nitrate	mg/L	Not required under previous permit												<0.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0.043	<0.020	0.024	0.072	0.047
Nitrite	mg/L													-	<0.0050	<0.050	<0.050	<0.050	<0.050	<0.02	0.016	<0.010	0.103	<0.010	0.013
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	0.072	0.06
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	118	95.7
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	275	313
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.154	0.372
Field Data																									
pH in H_20	pH	Not required under previous permit												8.91	8.19	9.61	9.61	8.69	9.7	8.5	9.45	8.8	9.0	8.7	2.54
Conductivity (EC)	uS/cm													857	500	846	846	748	620	464	642	778	900	776	829

Table D.3: Chemical Analytical Results

Sample ID:		Ewert D.2																							
Site Number:		3																							
Date Sampled:	Units	16-Oct-1996	7-Oct-1997	9-Oct-1998	20-Oct-1999	11-Oct-2000	4-Oct-2001	8-Oct-2002	15-Oct-2003	14-Oct-2004	20-Oct-2005	13-Oct-2006	3-Oct-2007	16-Oct-2008	28-Oct-2009	18-Oct-2010	13-Oct-2011	15-Oct-2012	8-Oct-2013	15-Oct-2014	14-Oct-2015	5-Oct-2016	20-Oct-2017	16-Oct-2018	29-Oct-2019
Chem. O_2 Demand	mg/L	40	50	70	90	50	60	70	30	30	49	53	67	65	54.7	55.2	62	77	53	61	158	61	88	127	92
Ammonia-N	mg/L	0.69	<0.05	0.06	0.05	0.05	0.15	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.613	<0.050	<0.050	0.174	<0.050	<0.05	0.127	<0.05	<0.05	0.113	0.254
Total Kjeldahl Nitrogen	mg/L	3.1	2.1	2.7	2.8	1.8	3.6	3.5	1.3	1.9	1.6	1.8	1.7	2.3	2.95	2.12	1.9	2.44	1.60	1.8	2.62	1.94	3.09	5.07	3.01
Total Organic Carbon	mg/L	19	27	31	22	21	21	32	11	21	16	23	19	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												18	19.2	22.4	18	22.9	31.7	18.2	23.4	21	88	44.0	28.2
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0018	0.0068
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-		-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												0.01	0.02	<0.010	0.01	0.055	<0.010	<0.01	0.0055	0.0011	0.0045	0.0317	0.0334
Antimony	mg/L	0.0004	<0.0002	0.0008	<0.0004	0.0005	0.0007	0.002	0.0011	0.0013	0.001	0.0010	0.0025	0.0004	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00021	0.00015	0.00017	0.00038	0.00020
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.00803	0.00619
Barium	mg/L	0.106	0.065	0.056	0.083	0.059	0.093	0.046	0.077	0.018	0.034	0.069	0.052	0.042	0.0452	0.0454	0.0361	0.0532	0.0540	0.0482	0.0511	0.041	0.0501	0.0439	0.0364
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0.038	0.05	0.039	0.039	0.034
Cadmium	mg/L	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	<0.0000050	<0.0000050	<0.0000050	0.0000154	<0.0000050
Chromium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	<0.00010	<0.00010	0.00011	0.00013
Cobalt	mg/L	0.003	0.005	0.022	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00036	0.00014	0.00053	0.00063	0.00061
Copper	mg/L	0.008	<0.001	0.01	0.004	0.006	0.011	0.012	0.009	0.004	0.001	0.003	0.001	0.001	0.0014	0.0036	<0.0010	0.0016	<0.0010	<0.001	0.00063	0.00797	0.00111	0.00234	0.00127
Iron	mg/L	7.200	1.060	1.510	1.980	1.280	4.770	1.28	3.04	0.216	0.452	1.13	0.734	0.046	0.043	0.085	0.073	0.098	0.046	0.032	0.083	0.045	0.056	0.054	0.256
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	0.000072	<0.000050	<0.000050	0.00010	0.000164
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0323	0.0261
Manganese	mg/L													0.003	<0.0020	<0.0020	<0.0050	0.0021	0.0067	<0.002	0.00205	0.00125	0.107	0.0131	0.00377
Mercury	mg/L	<0.0002	<0.0004	0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	0.0000066	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.00108	0.000744	0.000491	0.0010	0.000761
Nickel	mg/L	0.009	0.004	0.019	0.009	0.008	0.004	0.008	0.009	<0.002	0.004	0.007	0.006	0.005	0.0047	0.0065	0.0048	0.0053	0.0048	0.0034	0.0042	0.00457	0.00417	0.00423	0.00630
Selenium	mg/L	Not required under previous permit												0.0005	0.00052	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000243	0.000245	0.000184	0.000319	0.000366
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.00001	<0.000010	0.000016	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L													0.001	0.0013	<0.0010	<0.0010	0.003	<0.0010	<0.001	0.00034	<0.0003	0.00062	0.00375	0.00694
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.00159	0.000775
Vanadium	mg/L													0.001	0.0019	<0.0010	<0.0010	0.0012	<0.0010	<0.001	0.00096	0.00072	0.00136	0.00513	0.00218
Zinc	mg/L	0.028	0.025	0.027	0.019	0.014	0.039	0.011	0.016	0.066	0.002	0.006	0.008	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.006	0.0010	0.0020	0.0085	<0.0010	<0.0010
Routine Water																									
Ion Balance	%	103	109	103	100	103	92.9	101	102	99.9	103	105	99.4	103	104	109	88.3	97.3	105	109	97.5	100	96.1	107	105
Bicarbonate	mg/L	380	369	394	338	327	341	445	261	130	175	242	255	251	260	238	272	341	306	281	312	355	496	433	407
Chloride	mg/L	12.5	14.3	11.8	13.0	10.0	14.0	22	9	15	10	12	13	16	21.4	10.5	10.3	13.7	15.5	13.2	18.0	31.3	36.3	35.7	33.3
Carbonate	mg/L	<5	25	13	17	<5	14	51	17	111	15	<5	<5	19	9.4	7.9	8.7	7.5	8.8	11	8.2	5	15.8	11.9	<5.0
Conductivity (EC)	uS/cm	845	926	869	900	941	1080	1610	852	1170	430	529	639	702	602	546	571	661	580	568	614	723	964	885	844
Calcium	mg/L	15.9	19.2	29.8	16.6	29.8	27.9	16.2	17.4	13.9	17.7	22.5	21.5	17.1	13.8	20.9	15.3	12.9	21.5	19.1	16.0	28.2	28.6	17.1	25.8
Potassium	mg/L	15.1	15.5	15.8	13.4	17	16.5	23.4	13.5	12	9.8	14.1	13.9	13.2	13	12.8	10.4	12.9	15.3	14.5	15.7	15.5	21.4	20.5	19.0
Magnesium	mg/L	8.5	9.7	9.4	9.6	12.4	15.8	18.5	9.7	8.6	6.4	8.2	8.7	8.6	6.97	7.76	6.78	6.99	8.89	8.08	8.00	11.90	14.00	11.2	13.4
Sodium	mg/L	174	201	182	168	157	177	365	167	223	71	81	98	128	104	93.8	85.6	124	101	98.6	98.4	118	168	179	157
Sulfate	mg/L	122	130	125	135	187	261	370	191	248	46.9	52.9	91.2	98.3	36.8	55.1	47	44	26.8	19.9	19.0	48.4	55.8	46.2	77.3
Phosphorus	mg/L	Not required under previous permit													0.195	0.164	0.262	0.223	0.108	0.163	0.224	0.262	0.442	0.542	0.576
pH in H20	pH	8.3	8.9	8.5	8.8	8.2	8.5	9	8.8	10.0	9.0	8.2	8.3	8.8	8.53	8.58	8.61	8.53	8.52	8.65	8.50	8.41	8.56	8.57	8.29
TDS (Calculated)	mg/L	535	596	570	539	575	699	1050	553	696	263	310	372	424	333	326	318	390	348	322	337	434	584	535	531
Nitrate	mg/L	Not required under previous permit												<0.1	<0.050	<0.050	<0.050	0.12	<0.050	<0.05	<0.020	<0.02	<0.020	<0.020	0.388
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	<0.010	<0.01	<0.010	<0.010	0.029
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.022	0.416
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	88.8	120
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	375	339
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.194	0.292
Field Data																									
pH in H_20	pH	Not required under previous permit												9.06	8.79	9.03	9.79	8.8	9.9	8.29	8.94	8.9	8.8	11.3	6.49
Conductivity (EC)	uS/cm													812	450	862	382	660	596	565	624	740	1062	950	104.3

Table D.4: Chemical Analytical Results

Sample ID:		Ewert D.3																						
Site Number:		4																						
Date Sampled:	Units	16-Oct-1996	7-Oct-1997	9-Oct-1998	20-Oct-1999	11-Oct-2000	4-Oct-2001	8-Oct-2002	15-Oct-2003	14-Oct-2004	20-Oct-2005	13-Oct-2006	3-Oct-2007	16-Oct-2008	28-Oct-2009	18-Oct-2010	13-Oct-2011	15-Oct-2012	8-Oct-2013	15-Oct-2014	14-Oct-2015	5-Oct-2016	20-Oct-2017	16-Oct-2018	29-Oct-2019
Chem. O_2 Demand	mg/L	50	60	50	70	60	80	70	50	40	43	48	82	83	77	62.5	81	72	53	30	117	74	51	78	106
Ammonia-N	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.845	<0.050	<0.050	2.15	<0.050	<0.05	0.785	0.641	<0.050	0.655	<0.050
Total Kjeldahl Nitrogen	mg/L	2.7	1.8	2.1	2	1.8	3.9	4.6	3.9	3.1	1.5	1.5	2.3	2.9	3.38	2.08	2.66	4.3	2.04	1.88	5.40	3.84	2.55	3.31	3.22
Total Organic Carbon	mg/L	19	21	21	18	23	26	29	17	24	15	19	25	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												20	26.6	22.9	21	27.8	23.5	19.3	28.4	27.2	51	38.0	28.3
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0018	0.0058
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												<0.01	0.069	<0.010	<0.010	0.113	<0.010	<0.01	0.0024	0.0473	0.0052	0.0673	0.0107
Antimony	mg/L	<0.0004	<0.0002	0.0007	<0.0004	0.0005	0.0005	0.001	0.0009	0.0014	0.0006	0.0014	0.0018	<0.0004	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00018	0.0001	0.0001	0.00016	0.00016
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0032	0.0031
Barium	mg/L	0.059	0.057	0.046	0.064	0.05	0.064	0.076	0.046	0.024	0.026	0.045	0.052	0.028	0.0629	0.0431	0.0261	0.0631	0.0330	0.0302	0.0300	0.0433	0.0288	0.0656	0.0418
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0.029	0.044	0.018	0.035	0.039
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	<0.005	<0.005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	0.00014	<0.00010	0.00018	0.00017
Cobalt	mg/L	<0.002	0.004	0.025	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00039	0.00024	0.00046	0.00095	0.00036
Copper	mg/L	0.002	<0.001	0.011	0.003	0.002	0.006	0.009	0.004	0.002	<0.001	<0.001	0.002	<0.001	<0.0010	0.0023	<0.0010	0.0012	<0.0010	<0.001	<0.00020	0.00661	0.0013	0.00163	0.00163
Iron	mg/L	0.951	0.987	0.462	1.770	0.671	1.870	3.11	0.793	0.666	0.328	0.561	1.82	0.181	0.455	0.05	0.194	0.236	0.037	0.247	0.089	1.79	0.659	0.848	1.01
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	0.00019	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000050	0.000132	0.000168	0.000389	0.000211
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0153	0.0125
Manganese	mg/L													0.008	0.0812	<0.0020	<0.0050	0.082	0.0027	<0.002	0.0025	0.00451	0.0477	0.194	0.00879
Mercury	mg/L	<0.0002	0.0012	0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	0.0000069	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.000746	0.000389	0.00046	0.000956	0.000489
Nickel	mg/L	<0.002	0.003	0.016	0.006	0.004	<0.002	0.006	0.005	<0.002	0.003	0.003	0.004	0.002	0.0039	0.0043	0.0025	0.0047	0.0024	<0.002	0.00122	0.00222	0.00281	0.00396	0.00281
Selenium	mg/L	Not required under previous permit												<0.0004	<0.00080	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000135	0.000153	0.000151	0.000192	0.000188
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	0.000032	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L													<0.001	0.0031	<0.0010	<0.0010	0.004	<0.0010	<0.001	<0.00030	0.00264	0.00083	0.00499	0.00168
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.000531	0.000262
Vanadium	mg/L													<0.001	<0.0010	<0.0010	<0.0010	0.0013	<0.0010	<0.001	0.00099	0.00102	0.00102	0.00193	0.00144
Zinc	mg/L	0.011	0.02	0.019	0.007	0.002	0.043	0.017	0.007	0.036	0.002	0.004	0.007	0.015	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0089	<0.0010	0.0024	0.0151	<0.0010	<0.0010
Routine Water																									
Ion Balance	%	106	108	107	98	102	96.1	101	103	99.6	103	104	99	96.9	114	104	93.9	94.1	104	106	98.3	106	95.1	105	103
Bicarbonate	mg/L	250	232	244	232	255	265	381	234	272	153	179	207	232	289	241	259	298	245	200	205	247	326	308	290
Chloride	mg/L	9.7	15.2	9.8	13.0	12.0	13.0	20	7	11	14	21	25	30	33.3	25.4	52.2	63.1	51.5	32.9	65.3	51	55.8	64.6	56.2
Carbonate	mg/L	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	12	<5.0	7.2	<5.0	<5.0	<5.0	<5	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (EC)	uS/cm	462	480	476	488	523	543	860	403	545	277	363	460	488	577	506	608	682	547	448	568	549	679	708	622
Calcium	mg/L	17.3	19.4	19.9	15.8	20.7	17.3	18.5	21.4	16.6	16.9	17.8	19.4	19.6	20.9	20.2	23.2	19.4	22.2	18.8	15.0	25.7	21.5	23.4	22.5
Potassium	mg/L	16.2	13.4	15	12.9	16.3	15	18.6	13.1	12.9	9.8	13.0	12.9	13.1	14.9	14	12.7	15.7	16.4	15.8	17.1	15	14.9	22.0	14.2
Magnesium	mg/L	6.8	8.1	8.6	7.7	8.9	9.5	10.7	7.6	6.9	5.8	7.2	7.8	8.7	9.31	7.68	9.81	9.67	10.3	7.96	8.28	10.5	9.48	10.9	10.7
Sodium	mg/L	70	77	75	69	74	73	186	64	89	37	46	62	71	109	78.6	76.2	96.1	79.4	57.1	75.5	76.3	108	114	103
Sulfate	mg/L	12.2	33.9	34.2	33.2	37.9	45	118	30.1	41	9.4	7.4	28.1	11.2	20.2	13.4	11.8	10.4	6.55	1.09	4.24	3.93	11.9	19.1	14.3
Phosphorus	mg/L	Not required under previous permit												-	0.25	0.12	0.639	0.203	0.224	0.18	0.317	0.596	0.437	0.523	0.605
pH in H_20	pH	8.1	8.4	7.9	8.3	7.9	8.3	8.1	8.2	8.3	8.2	7.9	8.3	8.7	8.18	8.56	8.41	8.37	8.32	8.45	8.21	8.23	8.37	8.05	7.98
TDS (Calculated)	mg/L	255	282	283	266	295	309	536	258	312	168	201	257	280	353	285	316	365	309	236	286	304	391	406	364
Nitrate	mg/L	Not required under previous permit												<0.1	0.692	<0.050	0.06	0.309	<0.050	<0.05	<0.020	0.083	<0.020	0.198	0.027
Nitrite	mg/L													-	<0.050	<0.050	<0.050	0.083	<0.050	<0.02	<0.010	0.039	<0.010	<0.010	0.010
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	0.198	0.037
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	103	100
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	252	238
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.102	0.169
Field Data																									
pH in H_20	pH	Not required under previous permit												8.28	8.63	9.25	8.34	8.41	8.8	8.1	9.27	8.4	8.6	9.9	14.47
Conductivity (EC)	uS/cm													588	588	726	422	681	564	521	588	522	754	971	803

Table D.5: Chemical Analytical Results

Sample ID:		Ewert D.4																						
Site Number:		**5**																						
Date Sampled:	**Units**	**16-Oct-1996**	**7-Oct-1997**	**9-Oct-1998**	**20-Oct-1999**	**11-Oct-2000**	**4-Oct-2001**	**8-Oct-2002**	**15-Oct-2003**	**14-Oct-2004**	**20-Oct-2005**	**13-Oct-2006**	**3-Oct-2007**	**16-Oct-2008**	**28-Oct-2009**	**18-Oct-2010**	**12-Oct-2011**	**15-Oct-2012**	**8-Oct-2013**	**15-Oct-2014**	**14-Oct-2015**	**5-Oct-2016**	**20-Oct-2017**	**16-Oct-2018**	**29-Oct-2019**
Chem. O_2 Demand	mg/L	30	40	50	80	60	60	60	50	40	103	123	82	78	98.5	69.6	66	95	67	79	109	30	102	86	92
Ammonia-N	mg/L	<0.05	<0.05	0.042	<0.05	<0.05	0.06	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	0.12	0.124	<0.050	0.055	0.103	0.098	<0.05	0.059	<0.050	<0.050	0.120	<0.050
Total Kjeldahl Nitrogen	mg/L	1.5	1.2	2.7	2.3	1.7	3.1	3.4	2.1	3.1	4	5	6	2.9	4.74	3.2	2.8	3.17	2.82	2.25	3.33	2.88	3.48	2.91	3.61
Total Organic Carbon	mg/L	16	17	21	19	18	23	31	20	23	35	48	26	-	-	-	-	-	-		-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												22	31.2	28	27.2	30.6	26.6	23	31.9	29.4	102	38.0	22.7
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0015	0.0076
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	0.77
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												0.02	0.033	0.053	0.011	<0.010	<0.010	<0.01	0.0238	0.0013	0.0062	0.0194	0.0015
Antimony	mg/L	<0.0004	<0.0002	0.0009	0.0004	0.0005	0.0006	0.0011	0.0011	0.0019	0.0011	0.002	0.003	0.0005	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00031	0.00018	0.00022	0.00025	0.00015
Arsenic	mg/L	Not required under previous permit														-	-	-	-	-	-	-	-	0.0114	0.00313
Barium	mg/L	0.054	0.058	0.058	0.135	0.083	0.056	0.203	0.069	0.054	0.126	0.1	0.1	0.127	0.0772	0.0843	0.0335	0.0722	0.148	0.0639	0.0651	0.0524	0.0903	0.0588	0.0528
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0.035	0.046	0.04	0.050	0.042
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	<0.0000050	<0.0000050	<0.0000050	0.0000196	<0.0000050
Chromium	mg/L	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt	mg/L	<0.002	0.003	0.021	0.002	<0.002	<0.002	0.003	<0.002	<0.002	0.003	0.003	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.0010	0.00035	0.00051	0.00094	0.00043
Copper	mg/L	0.003	<0.001	0.01	0.005	0.004	0.006	0.011	0.005	0.002	0.004	0.002	0.002	0.001	0.0017	0.0042	<0.0010	0.0017	0.0011	<0.001	0.00139	0.00084	0.00095	0.00102	0.00054
Iron	mg/L	1.310	1.180	1.100	4.150	2.190	0.964	9.66	1.32	0.463	2.31	3.8	1.92	0.058	0.083	0.171	0.044	0.152	0.044	0.043	0.111	0.04	0.12	0.087	0.026
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	<0.00010	0.00019	<0.00010	<0.0050	<0.00010	<0.0001	0.000119	<0.000050	0.000096	0.00010	<0.000050
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0247	0.016
Manganese	mg/L													0.004	0.0021	0.007	<0.0020	0.0024	<0.0020	<0.002	0.0038	0.00066	0.00532	0.00626	0.00080
Mercury	mg/L	<0.0002	0.0009	0.0009	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	0.0000108	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.00329	0.00216	0.00196	0.0019	0.00118
Nickel	mg/L	0.003	<0.002	0.014	0.01	0.008	0.004	0.013	0.009	0.003	0.011	0.01	0.008	0.009	0.0066	0.0063	0.0056	0.0066	0.0079	0.0052	0.00487	0.00606	0.00687	0.00569	0.00406
Selenium	mg/L	Not required under previous permit												0.0006	0.00056	0.00046	<0.00040	<0.00080	<0.00040	<0.0004	0.000372	0.000302	0.000271	0.000299	0.000217
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	0.000015	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L													0.001	0.002	0.0037	<0.0010	0.0025	<0.0010	<0.001	0.00345	<0.00030	0.00069	0.00219	<0.00030
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.001	0.000602
Vanadium	mg/L													<0.001	0.001	0.0013	<0.0010	0.0014	<0.0010	<0.001	0.00294	<0.00050	<0.00050	0.00251	<0.00050
Zinc	mg/L	0.007	0.018	0.023	0.012	0.007	0.052	0.023	0.004	0.05	0.02	0.005	0.009	0.003	<0.0020	<0.0020	<0.0020	0.002	<0.0020	0.0087	<0.0010	0.001	0.0031	<0.0010	<0.0010
Routine Water																									
Ion Balance	%	109	109	100	99	103	93.5	99.1	97	97	102	102	97.4	99.2	99.1	106	92	93.1	106	108	96.2	114	92.9	115	102
Bicarbonate	mg/L	286	294	338	360	352	342	485	289	274	317	407	348	357	337	313	336	369	357	303	280	324	442	398	356
Chloride	mg/L	4.2	4.3	3.4	6.0	6.0	9.0	14	12	16	18	28	20	23	21.7	19.7	15.2	19.4	21.4	15.2	18.5	17.5	19.4	21.7	18
Carbonate	mg/L	25	17	<5	24	7	42	46	56	65	30	<5	<5	10	21.8	14.9	7	13.9	10.0	12.2	38.0	<5.0	7.2	<5.0	6.6
Conductivity (EC)	uS/cm	645	601	565	682	658	735	974	735	711	598	700	602	637	627	606	613	666	668	587	627	599	742	713	624
Calcium	mg/L	14	12.8	14.3	18.1	16.4	10.7	13.7	14.5	10.5	18.7	21.4	18.7	19.5	11.8	15.4	15.9	12.8	27.7	19.4	10.7	21.9	22	19.1	23.9
Potassium	mg/L	6.7	5.6	7	7.2	7.6	7.2	8.1	6.4	9.7	11.2	17.6	12.8	11.4	10.4	9.43	10.2	10.1	14.3	12.8	13.4	13.3	15.5	14.8	14.5
Magnesium	mg/L	6.8	7.5	7.4	9.0	9.0	10.0	11.9	7.6	8.5	10.4	12.5	10.2	10.8	9.7	8.85	10	7.97	13.1	11.1	9.75	12	13.4	13.3	13.3
Sodium	mg/L	133	130	109	126	117	131	259	149	139	115	118	96	111	122	116	95	122	114	98.6	106	105	125	141	103
Sulfate	mg/L	47.4	47.8	27.7	27.7	35	42	67	62.5	26.8	9.6	5.4	8.5	10.2	8.19	11.7	17.8	15.1	28.1	9.27	6.33	15.1	26.8	15.1	20.2
Phosphorus	mg/L	Not required under previous permit												-	0.253	0.271	0.2	0.265	0.129	0.178	0.239	0.248	0.251	0.493	0.225
pH in H_20	pH	8.9	8.9	8.1	8.8	8.5	9.1	8.9	9.3	9.5	9.0	8.2	8.3	8.5	8.71	8.7	8.46	8.68	8.50	8.64	9.14	8.38	8.4	8.32	8.44
TDS (Calculated)	mg/L	377	369	335	395	377	427	614	450	407	370	403	339	371	372	350	336	383	404	327	341	349	448	424	375
Nitrate	mg/L	Not required under previous permit												<0.1	<0.050	<0.050	<0.050	<0.050	0.056	<0.05	<0.020	<0.020	<0.020	<0.020	<0.020
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.022	<0.022
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	102	114
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	331	303
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.396	0.499
Field Data																									
pH in H_20	pH	Not required under previous permit												8.34	8.79	9.06	8.99	9.18	8.9	8.57	9.66	8.5	8.9	10.4	14.36
Conductivity (EC)	uS/cm													770	460	744	1000	664	691	424	650	623	810	780	803

Table D.6: Chemical Analytical Results

Sample ID:		Lyons D.1																						
Site Number:		6																						
Date Sampled:	**Units**	**15-Oct-1996**	**3-Oct-1997**	**8-Oct-1998**	**20-Oct-1999**	**10-Oct-2000**	**5-Oct-2001**	**8-Oct-2002**	**15-Oct-2003**	**14-Oct-2004**	**20-Oct-2005**	**13-Oct-2006**	**3-Oct-2007**	**16-Oct-2008**	**28-Oct-2009**	**18-Oct-2010**	**13-Oct-2011**	**15-Oct-2012**	**8-Oct-2013**	**15-Oct-2014**	**14-Oct-2015**	**5-Oct-2016**	**20-Oct-2017**	**16-Oct-2018**	**29-Oct-2019**
Chem. O_2 Demand	mg/L	50	50	80	90	80	80	160	60	60	56	61	84	71	91.1	59.8	63	83	75	71	101	71	70	78	89
Ammonia-N	mg/L	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.0021	<0.05	<0.05	<0.050	0.155	0.202	0.252	<0.050	<0.05	0.053	1.35	<0.050	0.063	0.575
Total Kjeldahl Nitrogen	mg/L	1.2	2	3.7	2.9	2.9	3.5	5.8	1.7	3.2	2	1.7	3.8	2.4	4.73	2.91	2.19	2.81	2.59	1.95	3.63	3.62	2.55	2.89	3.01
Total Organic Carbon	mg/L	19	20	26	24	27	31	40	22	26	21	20	36	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												21	27.4	22.9	28.6	26.8	27.1	19.8	26.8	25	70	28.0	24.7
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0013	0.0087
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												<0.01	0.012	<0.010	<0.010	<0.010	<0.010	<0.01	0.0040	0.0962	0.0097	0.015	0.0306
Antimony	mg/L	<0.0004	0.0006	0.0006	<0.0004	0.0006	0.0006	0.0008	0.001	0.0012	0.0012	0.0021	0.0012	<0.0004	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00025	0.00013	0.00014	0.00022	0.00017
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.00522	0.00531
Barium	mg/L	0.052	0.058	0.066	0.085	0.078	0.082	0.105	0.015	0.046	0.023	0.044	0.075	0.053	0.0369	0.0554	0.0296	0.033	0.0623	0.0417	0.0472	0.0448	0.032	0.0495	0.0421
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													0.05	0.056	<0.050	<0.050	0.078	0.065	0.055	0.052	0.042	0.04	0.050	0.029
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	<0.0000050	<0.0000050	<0.0000050	0.0000172	<0.0000050
Chromium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	0.0002	<0.00010	0.00011	0.0002
Cobalt	mg/L	<0.002	<0.002	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00050	0.0003	0.0004	0.00063	0.00038
Copper	mg/L	0.002	<0.001	<0.001	0.003	0.002	0.004	0.009	0.023	0.002	0.002	0.001	0.003	<0.001	<0.0010	0.0073	0.0011	0.0013	<0.0010	<0.001	0.00065	0.00066	0.0006	0.00071	0.00063
Iron	mg/L	<0.005	0.377	0.854	1.910	1.640	1.020	2.28	0.642	0.418	0.145	0.141	2.57	0.026	0.071	0.015	0.089	0.03	0.094	0.024	0.040	0.629	0.121	0.136	0.958
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000050	0.000189	0.000056	0.000112	0.000229
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0136	0.0074
Manganese	mg/L													0.002	0.033	<0.0020	<0.0050	0.0023	0.0127	<0.002	0.0052	0.00338	0.00586	0.0135	0.00866
Mercury	mg/L	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.000878	0.000596	0.000817	0.00112	0.00076
Nickel	mg/L	0.002	<0.002	0.01	0.009	0.012	0.007	0.007	0.005	<0.002	0.003	0.005	0.009	0.006	0.004	0.0035	0.0035	0.0035	0.0038	0.0029	0.00278	0.00337	0.00397	0.00414	0.00361
Selenium	mg/L	Not required under previous permit												0.0004	0.00042	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000202	0.000194	0.000194	0.000273	0.000212
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	0.000017	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L													<0.001	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	<0.001	0.00047	0.00568	0.00088	0.00113	0.00329
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.000909	0.000234
Vanadium	mg/L													0.001	0.0018	<0.0010	0.0016	0.0026	0.0023	0.0011	0.00334	0.00241	0.0021	0.00256	0.00205
Zinc	mg/L	0.007	0.038	0.028	0.01	0.017	0.038	0.008	0.006	0.053	0.001	0.005	0.012	0.002	<0.0020	<0.0020	0.0027	<0.0020	<0.0020	0.0052	<0.0010	0.0012	0.0021	<0.0010	0.0016
Routine Water																									
Ion Balance	%	98	106	108	100	109	106	99.9	106	103	105	103	104	104	91.6	103	96.2	94.4	97.3	106	96.3	104	94.3	110	101
Bicarbonate	mg/L	334	314	361	359	338	427	510	281	452	211	259	207	271	287	257	304	291	311	224	213	277	281	270	217
Chloride	mg/L	7.5	8.3	11.5	12.0	12.0	17.0	24	14	35	21	23	15	19	25.1	21.3	19.9	18.4	29.2	22.1	20.9	19.4	17.7	20.6	12.9
Carbonate	mg/L	<5	<5	<5	5	5	17	25	48	8	<5	<5	<5	<5	5.4	5.7	5.1	5.4	7.9	6.7	22.2	<5.0	<5.0	<5.0	<5.0
Conductivity (EC)	uS/cm	844	734	735	900	887	1110	1980	1450	1680	504	612	455	594	612	591	649	605	595	490	526	523	510	519	405
Calcium	mg/L	33.8	29.3	30.1	29	29.8	47.8	33.3	44.6	44.9	28.3	29	18.8	27.1	18.6	22.1	22.5	17.5	23.4	22.4	16.7	21.2	20.1	22.3	18.6
Potassium	mg/L	11.6	12.5	16.1	14.6	17.8	20.9	24.1	19.3	23.6	15.5	17.1	18	17.3	16.3	15.5	16.2	16	17.3	14.6	15.3	19.3	17.5	21.7	17.1
Magnesium	mg/L	13.5	11.3	12.5	13.4	14.0	20.3	30.2	26.3	24.5	9.4	10.9	7.4	10.4	9.16	9.15	8.76	8.54	10.7	7.78	7.64	8.52	7.74	8.55	8.46
Sodium	mg/L	140	123	153	147	151	230	455	292	281	71	83	65	86	89.3	91.7	96.2	92.9	96.2	69.2	75.3	75.3	75.3	84.3	51
Sulfate	mg/L	176	107	126	143	165	204	561	481	429	65.7	64	40.2	56.5	45.3	50.2	47.1	45	32.4	14.9	23.9	11.6	27.2	22.3	15
Phosphorus	mg/L	Not required under previous permit												-	0.43	0.245	0.846	0.394	0.346	0.417	0.344	0.931	0.555	0.520	1.38
pH in H_20	pH	8.2	8.4	7.9	8.5	8.5	8.5	8.4	9.1	8.4	8.2	8.1	7.8	8.4	8.41	8.49	8.44	8.48	8.50	8.53	9.00	8.26	8.31	8.17	7.91
TDS (Calculated)	mg/L	547	449	527	541	574	732	1340	1060	1090	315	355	266	353	350	342	366	347	370	268	287	295	307	313	232
Nitrate	mg/L	Not required under previous permit												<0.1	<0.050	<0.050	0.235	<0.050	<0.050	<0.05	<0.020	0.588	<0.020	<0.020	0.429
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	<0.010	0.077	<0.010	<0.010	0.045
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.022	0.474
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	90.9	81.3
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	222	178
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.104	0.155
Field Data																									
pH in H_20	pH	Not required under previous permit												8.15	8.17	8.90	8.11	9.10	9.1	8.42	9.51	8.2	8.7	10.4	2.59
Conductivity (EC)	uS/cm													704	330	886	300	604	609	491	547	517	568	566	496

Table D.7: Chemical Analytical Results

Sample ID:		Lyons D.2																						
Site Number:		**7**																						
Date Sampled:	**Units**	**15-Oct-1996**	**3-Oct-1997**	**8-Oct-1998**	**20-Oct-1999**	**10-Oct-2000**	**5-Oct-2001**	**8-Oct-2002**	**15-Oct-2003**	**14-Oct-2004**	**20-Oct-2005**	**13-Oct-2006**	**3-Oct-2007**	**16-Oct-2008**	**28-Oct-2009**	**18-Oct-2010**	**13-Oct-2011**	**15-Oct-2012**	**8-Oct-2013**	**15-Oct-2014**	**14-Oct-2015**	**5-Oct-2016**	**20-Oct-2017**	**16-Oct-2018**	**29-Oct-2019**
Chem. O_2 Demand	mg/L	60	70	80	110	70	90	100	60	60	56	95	80	72	75	55.6	77	71	71	84	103	80	64	70	83
Ammonia-N	mg/L	<0.05	0.48	0.16	0.15	<0.05	<0.05	<0.05	0.51	0.24	<0.05	<0.05	<0.05	<0.05	0.267	<0.050	0.663	<0.050	<0.050	<0.05	0.051	0.685	<0.050	1.17	0.414
Total Kjeldahl Nitrogen	mg/L	2.5	2.8	2.8	3.8	2.7	4.9	5.2	3.5	4.2	2	2.9	3.4	2.7	3.27	2.53	3.15	2.56	3.83	2.62	3.75	3.69	2.45	4.37	2.58
Total Organic Carbon	mg/L	24	23	25	24	23	26	30	25	35	23	29	30	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												20	25.9	20.5	30.4	25	25.2	21.5	27.4	26.9	64	25.0	23.4
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0018	0.0075
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												<0.01	<0.010	<0.010	0.027	<0.010	0.015	<0.01	0.0070	0.0058	0.0096	0.0643	0.0613
Antimony	mg/L	<0.0004	<0.0004	0.0037	<0.0004	0.0005	0.0005	0.0013	0.0013	0.0014	0.0017	0.0013	0.002	<0.0004	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00023	0.00013	0.00015	0.00021	0.00012
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.00407	0.00497
Barium	mg/L	0.057	0.073	0.049	0.095	0.071	0.08	0.068	0.069	0.047	0.031	0.039	0.045	0.044	0.0588	0.041	0.0504	0.0469	0.0291	0.0503	0.0403	0.0263	0.0364	0.0655	0.0649
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													<0.05	<0.050	<0.050	0.056	<0.050	<0.050	<0.05	0.053	0.026	0.037	0.044	0.022
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	<0.0000050	<0.0000050	0.0000098	<0.0000050	<0.0000050
Chromium	mg/L	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	0.00017	<0.00010	0.00028	0.00018
Cobalt	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00026	0.00029	0.00048	0.00079	0.00049
Copper	mg/L	0.004	0.004	0.003	0.009	0.004	0.008	0.013	0.035	0.004	0.003	0.002	0.001	0.001	0.0018	0.0034	<0.0010	0.0013	0.0012	<0.001	0.00071	0.00073	0.00091	0.00116	0.00083
Iron	mg/L	<0.005	0.837	0.680	2.430	0.680	1.480	1.64	0.601	0.113	0.122	0.215	0.547	0.056	0.044	0.023	0.839	0.016	0.028	0.036	0.013	0.268	0.083	0.275	1.51
Lead	mg/L	<0.005	<0.005	<0.005	0.95	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	<0.00010	<0.00010	0.00032	<0.0050	<0.00010	<0.0001	<0.000050	<0.000050	0.00015	0.000218	0.000281
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0137	0.0071
Manganese	mg/L													0.02	0.0318	<0.0020	0.0075	0.0055	0.0028	0.0026	0.0031	0.00297	0.0198	0.122	0.0361
Mercury	mg/L	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	0.000007	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.000755	0.000696	0.000893	0.00102	0.00063
Nickel	mg/L	0.003	<0.002	0.007	0.007	0.005	0.005	0.006	0.006	<0.002	0.004	0.005	0.004	0.004	0.0042	0.0038	0.0043	0.0034	0.0030	0.0027	0.00223	0.00433	0.00483	0.00453	0.00341
Selenium	mg/L	Not required under previous permit												0.0005	0.00041	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000175	0.000252	0.000205	0.00023	0.000212
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	0.000018	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.0001	0.00018	<0.00010	<0.00010
Titanium	mg/L													0.001	<0.0010	<0.0010	0.0028	<0.0010	<0.0010	<0.001	<0.00030	0.0013	0.00052	0.00545	0.00488
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.000787	0.000266
Vanadium	mg/L													0.002	0.0027	0.0022	0.0022	0.002	0.0022	0.001	0.00394	0.00253	0.00196	0.0023	0.00206
Zinc	mg/L	0.012	0.033	0.03	0.007	0.009	0.068	0.009	0.017	0.046	0.002	0.007	0.006	0.014	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0054	<0.0010	0.0026	0.0122	<0.0010	0.0018
Routine Water																									
Ion Balance	%	107	104	107	99	104	96.7	99.9	106	101	103	103	95.9	102	104	106	96.6	98.5	108	106	96.6	101	94.1	109	97.4
Bicarbonate	mg/L	300	318	351	326	348	372	406	386	346	308	288	250	289	318	257	254	354	300	270	279	222	296	278	232
Chloride	mg/L	9.9	11.7	15.3	15.0	15.0	20.0	23	24	30	27	28	19	24	23.7	25	14.1	24.3	32.8	26.9	28.6	11.8	20	21.4	15.6
Carbonate	mg/L	<5	<5	<5	7	7	35	48	38	58	5	13	<5	13	21.5	33.7	<5.0	12.3	10.9	13.8	14.6	<5.0	<5.0	<5.0	<5.0
Conductivity (EC)	uS/cm	600	650	643	721	791	963	1120	1120	1300	772	738	478	657	759	799	505	737	653	590	604	408	525	536	435
Calcium	mg/L	25.6	25.7	25.6	23.8	30.5	43.6	25.4	30.4	28.6	29	25.9	19	28.4	32.7	26.1	20.6	25.6	19.1	22.2	15.5	19.3	22.5	24.9	17.4
Potassium	mg/L	20	18.5	23.1	20.5	23.1	26.3	29.9	28.2	26	22.1	22.3	19.7	20.7	23.4	22.7	14.1	21.5	18.6	17	19.0	15.2	18.9	21.8	18.5
Magnesium	mg/L	8.3	9.1	9.4	9.0	11.0	15.4	16.6	16.2	15.0	11.3	11.1	7.2	10.6	11.3	11.6	7.82	10.7	10.5	8.17	7.80	7.55	7.81	8.34	7.74
Sodium	mg/L	97	105	125	112	132	192	239	228	214	131	118	74	98	124	137	67.8	117	116	94.8	93.0	51.6	76.2	79.7	56.5
Sulfate	mg/L	49.8	60.6	65	68	102	121	185	217	236	114	82	41.2	53.6	79.1	108	29.8	48.8	28.4	15.6	13.3	12.5	23	15.7	14.5
Phosphorus	mg/L	Not required under previous permit													0.427	0.372	0.994	0.346	0.523	0.484	0.392	0.954	0.351	0.580	1.13
pH in H_20	pH	7.8	8.2	7.6	8.6	8.5	8.8	8.9	9	9.2	8.4	8.4	8	8.7	8.65	9.05	8.33	8.64	8.57	8.73	8.75	8.15	8.22	8.24	8.11
TDS (Calculated)	mg/L	358	387	436	419	494	599	742	774	795	491	442	303	391	472	491	282	435	384	332	329	227	315	310	246
Nitrate	mg/L	Not required under previous permit												<0.1	0.082	<0.050	0.373	<0.050	<0.050	<0.05	<0.020	0.02	<0.020	0.316	0.396
Nitrite	mg/L													-	-	<0.050	<0.050	<0.050	<0.050	<0.02	<0.010	0.017	<0.010	<0.010	0.042
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	0.316	0.437
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	96.5	75.3
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	228	190
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.118	0.176
Field Data																									
pH in H_20	pH	Not required under previous permit												8.51	8.21	9.98	8.06	9.17	9.0	8.78	9.53	8.2	8.6	9.3	10.73
Conductivity (EC)	uS/cm													731	560	884	375	721	670	579	617	397	581	589	529

Table D.8: Chemical Analytical Results

Sample ID:		Lyons D.3																						
Site Number:		8																						
Date Sampled:	**Units**	**15-Oct-1996**	**3-Oct-1997**	**8-Oct-1998**	**20-Oct-1999**	**10-Oct-2000**	**5-Oct-2001**	**8-Oct-2002**	**15-Oct-2003**	**14-Oct-2004**	**20-Oct-2005**	**13-Oct-2006**	**3-Oct-2007**	**16-Oct-2008**	**28-Oct-2009**	**18-Oct-2010**	**13-Oct-2011**	**15-Oct-2012**	**8-Oct-2013**	**15-Oct-2014**	**14-Oct-2015**	**5-Oct-2016**	**20-Oct-2017**	**16-Oct-2018**	**29-Oct-2019**
Chem. O_2 Demand	mg/L	40	100	70	100	90	110	230	80	60	66	92	78	105	110	64.1	86	108	67	127	150	149	232	171	105
Ammonia-N	mg/L	0.05	0.74	<0.05	<0.05	0.31	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	0.14	<0.05	<0.050	0.133	0.264	0.434	<0.050	0.08	0.256	0.099	0.082	0.186	<0.050
Total Kjeldahl Nitrogen	mg/L	2.7	4.7	2.7	3	3.2	6.5	22.2	2.8	2.7	2.4	2.9	3.5	3.9	5.64	2.98	3.48	4.78	2.39	5.93	5.61	6.45	9.34	8.83	3.66
Total Organic Carbon	mg/L	19	36	27	30	34	42	151	27	29	26	32	33	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												31	41.8	24.5	30.4	34.9	29.5	27.6	47.3	35.8	232	41.4	30.9
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0021	0.0137
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												0.82	0.104	<0.010	0.471	0.095	0.036	0.014	0.0507	0.0166	0.0196	0.0563	0.0192
Antimony	mg/L	0.0006	0.0006	0.0008	<0.0004	0.0006	0.0006	0.0021	0.0011	0.0014	0.001	0.0014	0.0033	0.0007	0.00046	<0.00040	<0.00040	<0.00080	<0.00040	0.00052	0.00076	0.00043	0.00054	0.00096	0.0003
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.00277	0.00261
Barium	mg/L	0.117	0.136	<0.003	0.095	0.116	0.159	0.26	0.091	0.077	0.085	0.111	0.146	0.058	0.0635	0.0733	0.0607	0.105	0.0416	0.0408	0.119	0.0567	0.0797	0.108	0.0461
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													<0.05	<0.050	0.055	<0.050	<0.050	<0.050	0.061	0.052	0.068	0.079	0.035	0.027
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	0.0000062	0.0000078	0.0000064	0.000031	0.0000068
Chromium	mg/L	0.012	0.006	<0.005	<0.005	<0.005	<0.005	0.017	<0.005	<0.005	<0.005	<0.005	0.011	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	0.00015	<0.00010	0.00058	0.00010
Cobalt	mg/L	0.003	<0.002	<0.002	<0.002	0.003	0.003	0.01	<0.002	<0.002	<0.002	<0.002	0.004	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0023	0.00100	0.00123	0.00182	0.00183	0.00161
Copper	mg/L	0.008	0.004	0.001	0.004	0.004	0.009	0.032	0.016	0.004	0.004	0.004	0.01	0.003	0.0031	0.0062	0.0033	0.0033	0.0028	0.0031	0.00334	0.0046	0.00427	0.00582	0.00484
Iron	mg/L	8.390	8.430	0.006	1.530	3.600	4.340	15.9	1.56	1.46	2.32	1.6	9.23	0.653	0.194	0.057	0.537	0.114	0.032	0.039	0.030	0.025	0.021	0.046	0.064
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	0.0004	0.00015	<0.00010	0.00029	<0.0050	<0.00010	<0.0001	<0.000050	<0.000005	<0.000050	0.000076	0.000051
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.028	0.0166
Manganese	mg/L													0.035	0.0062	0.0089	0.0088	0.0195	0.0021	0.0174	0.00259	0.00127	0.00254	0.00185	0.00279
Mercury	mg/L	0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	0.0000051	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	0.023	<0.005	<0.005	<0.005	<0.005	0.006	0.006	<0.0050	<0.0050	<0.0050	0.0087	0.0062	0.007	0.0116	0.00669	0.00966	0.0144	0.00452
Nickel	mg/L	0.01	0.012	<0.002	0.01	0.015	0.017	0.04	0.013	0.004	0.008	0.011	0.021	0.012	0.0093	0.0106	0.0093	0.0128	0.0089	0.0128	0.0135	0.0135	0.0133	0.0151	0.0112
Selenium	mg/L	Not required under previous permit												0.0012	0.00117	0.00072	0.00067	0.00085	0.00067	0.00084	0.00141	0.000916	0.00106	0.00113	0.000684
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000001	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000001	<0.000010	0.000021	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L													0.032	0.0065	<0.0010	0.0168	0.0057	0.0022	0.0019	0.00143	0.00098	0.00045	0.0040	0.00244
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.01	0.00318
Vanadium	mg/L													0.003	0.0035	<0.0010	0.0034	<0.0010	0.0018	0.0028	0.00110	0.0016	0.00149	0.00126	0.00110
Zinc	mg/L	0.037	0.036	0.005	0.006	0.034	0.098	0.049	0.013	0.061	0.007	0.007	0.032	0.017	<0.0020	<0.0020	0.0024	<0.0020	<0.0020	0.0069	<0.0010	<0.0010	<0.0010	<0.0010	0.0017
Routine Water																									
Ion Balance	%	99	106	110	101	104	109	101	103	98.4	106	103	102	94.6	98.4	108	95	96.9	102	110	95.3	112	95.2	113	103
Bicarbonate	mg/L	335	383	391	405	446	503	872	387	329	339	314	357	393	366	329	380	389	376	339	474	353	516	409	413
Chloride	mg/L	11.7	22.5	14.0	16.0	19.0	32.0	120	29	21	17	23	23	29	25.1	27.4	20.8	37.8	21.5	20.4	34.0	25.7	34.7	48.4	22.3
Carbonate	mg/L	<5	<5	<5	19	<5	27	196	13	17	<5	<5	<5	13	32.3	17.2	7.4	7.8	20.4	25.8	13.5	7.7	24.6	12.7	14.5
Conductivity (EC)	uS/cm	810	689	717	897	998	1440	2980	913	760	628	693	673	781	782	807	733	948	815	937	1210	855	1230	1420	978
Calcium	mg/L	17.7	22.5	20.8	19.6	30.1	30.6	12.8	32.3	18.3	20.8	25.4	26	24.4	17.6	42.4	24.2	17	28.6	33.2	24.4	42.4	33.3	37.6	41.3
Potassium	mg/L	7.3	20.6	11	10.8	16.1	18.9	21.1	19.1	18	15.3	17.9	18.8	16.8	17.5	22.7	15.8	17	21.2	22	20.9	27.6	30.2	29.2	22.2
Magnesium	mg/L	8.9	10.9	10.0	11.2	15.4	22.8	30.2	16.8	13.1	13.8	13.2	14	15.7	14.5	18.3	13.6	12.4	18.2	18.5	14.6	21.2	25.8	23.1	24.6
Sodium	mg/L	146	122	166	169	180	290	752	168	122	110	107	116	123	140	115	108	168	136	154	207	118	198	270	149
Sulfate	mg/L	116	22.6	83.3	85.1	145	264	421	137	69.4	43.6	68.3	62.1	51.4	46.3	87.4	36.6	108	85.6	122	160	89.4	167	280	138
Phosphorus	mg/L	Not required under previous permit												-	0.426	0.208	0.518	0.503	0.101	0.472	0.620	0.721	0.741	0.737	0.290
pH in H_20	pH	8.4	8.2	7.8	8.7	7.8	8.6	9.3	8.6	8.7	8.4	8.2	8.2	8.5	8.82	8.63	8.48	8.49	8.68	8.89	8.54	8.45	8.73	8.57	8.60
TDS (Calculated)	mg/L	476	411	497	529	631	942	1920	606	443	392	409	435	467	473	492	414	559	517	563	709	507	771	906	615
Nitrate	mg/L	Not required under previous permit												<0.1	<0.050	<0.050	0.211	<0.050	<0.050	<0.05	<0.020	<0.020	<0.020	0.689	<0.020
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	0.689	<0.022
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	189	204
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	357	362
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.478	0.472
Field Data																									
pH in H_20	pH	Not required under previous permit												8.36	8.22	9.22	8.26	8.45	9.1	9.32	8.68	9.0	9.2	10.1	-0.24
Conductivity (EC)	uS/cm													886	590	627	200	940	825	943	1233	876	1346	1488	1198

Table D.9: Chemical Analytical Results

Sample ID:		Lyons D.4																						
Site Number:		9																						
Date Sampled:	Units	15-Oct-1996	3-Oct-1997	8-Oct-1998	20-Oct-1999	10-Oct-2000	5-Oct-2001	8-Oct-2002	15-Oct-2003	15-Oct-2004	20-Oct-2005	13-Oct-2007	3-Oct-2007	16-Oct-2008	28-Oct-2009	18-Oct-2010	12-Oct-2011	15-Oct-2012	8-Oct-2013	15-Oct-2014	14-Oct-2015	5-Oct-2016	20-Oct-2017	16-Oct-2018	29-Oct-2019
Chem. O_2 Demand	mg/L	60	50	190	730	250	290	EMPTY	90	90	126	112	130	132	131	84.4	165	149	95	132	155	120	202	221	137
Ammonia-N	mg/L	<0.05	<0.05	0.06	1.59	0.89	5.69		0.16	0.73	0.42	0.68	<0.05	<0.05	0.065	<0.050	0.143	0.491	<0.050	0.055	0.137	0.111	3.04	1.82	0.397
Total Kjeldahl Nitrogen	mg/L	3.9	2.5	5	19.6	2.6	20.2		3.8	3.8	5.1	7.3	5.9	5.1	6.39	4.36	6.18	4.78	3.71	4.04	6.38	6.87	11.1	10.3	4.26
Total Organic Carbon	mg/L	33	20	47	184	156	26		33	33	47	48	51	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required by previous permit							Not required by previous permit					35	54	33.6	69.2	56.5	37.8	42	47.7	49.2	202	74.0	42.9
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0019	0.0088
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required by previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required by previous permit						EMPTY	Not required by previous permit					0.23	0.129	0.069	0.03	0.045	0.066	0.032	0.0313	0.0755	0.0785	0.0911	0.0764
Antimony	mg/L	0.0009	0.0009	0.003	<0.0004	0.0021	0.0011		0.0014	0.0021	0.0012	0.0016	0.0012	0.0006	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00069	0.00024	0.00047	0.00058	0.00024
Arsenic	mg/L	Not required by previous permit							Not required by previous permit					-	-	-	-	-	-	-	-	-	-	0.00685	0.00314
Barium	mg/L	0.097	0.106	0.143	0.677	0.388	0.399		0.181	0.245	0.136	0.297	0.133	0.057	0.0671	0.0785	0.0171	0.0556	0.0851	0.0658	0.124	0.0338	0.0643	0.0935	0.0406
Beryllium	mg/L	Not required by previous permit							Not required by previous permit					<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0.052	<0.010	0.026	0.040	0.024
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	0.0000103	0.0000097	0.0000079	0.0000297	0.0000099
Chromium	mg/L	0.008	<0.005	0.007	0.032	0.028	0.017		0.01	0.016	0.008	0.025	0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.00011	0.00042	0.00025	0.00033	0.00031
Cobalt	mg/L	<0.002	<0.002	<0.002	0.011	0.011	0.011		0.005	0.006	0.004	0.010	0.003	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00133	0.00063	0.00197	0.0022	0.00060
Copper	mg/L	0.004	0.004	0.007	0.024	0.027	0.02		0.055	0.015	0.008	0.02	0.006	0.004	0.002	0.004	<0.0010	0.0013	0.0012	0.0015	0.00181	0.00152	0.00243	0.00383	0.00123
Iron	mg/L	1.830	4.620	7.320	27.800	15.300	27.400		8.99	13.9	7.47	20.6	4.71	0.142	0.3	2.12	0.998	0.268	0.067	1.18	0.216	0.995	0.108	0.168	0.922
Lead	mg/L	<0.005	<0.005	<0.005	0.016	0.016	0.01		0.006	0.008	<0.005	0.012	<0.005	0.0001	0.0003	0.00065	<0.00010	<0.0050	<0.00010	0.00054	0.000267	0.00028	0.000059	0.000125	0.000283
Lithium	mg/L	Not required by previous permit							Not required by previous permit					-	-	-	-	-	-	-	-	-	-	0.0339	0.016
Manganese	mg/L													0.001	0.004	0.03	0.0484	0.0031	0.0022	0.0062	0.00197	0.00355	0.147	0.0927	0.00266
Mercury	mg/L	0.0004	<0.0002	<0.0002	<0.0002	0.0005	<0.0005		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	0.007	<0.005	0.008	0.01		0.007	0.008	<0.005	0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.00953	0.00113	0.00311	0.00662	0.00164
Nickel	mg/L	0.003	0.003	0.014	0.039	0.056	0.039		0.021	0.023	0.013	0.030	0.013	0.008	0.0079	0.0057	<0.0020	0.0092	0.0072	0.0062	0.0126	0.00526	0.00965	0.0132	0.00455
Selenium	mg/L	Not required by previous permit							Not required by previous permit					0.0007	0.00095	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000626	0.000393	0.000497	0.000795	0.000262
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	0.000019	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L													0.01	0.008	0.0092	0.0024	0.0083	0.0026	0.0109	0.00518	0.0061	0.00269	0.0104	0.00661
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.00446	0.000924
Vanadium	mg/L													0.006	0.0025	0.003	0.0014	0.0051	0.0018	0.0022	0.00199	0.00334	0.00415	0.00393	0.00222
Zinc	mg/L	0.038	0.025	0.058	0.029	0.605	0.088		0.032	0.143	0.063	0.079	0.021	0.012	<0.0020	<0.0020	<0.0020	0.0035	<0.0020	0.0066	<0.0010	0.0027	0.0017	<0.0010	0.0024
Routine Water																									
Ion Balance	%	98	108	100	99	114	105	EMPTY	104	103	105	102	98.1	98.6	99.9	109	92.8	94.8	110	104	98.9	110	97.7	112	101
Bicarbonate	mg/L	385	331	459	705	650	636		402	411	429	459	428	343	405	318	470	599	425	297	413	356	619	564	442
Chloride	mg/L	18.2	10.2	21.9	181.0	120.0	173.0		40	41	37	45	38	38	31.2	13.6	33.7	48.4	19.1	16.1	32.3	29.8	47.5	48.6	22.9
Carbonate	mg/L	<5	<5	<5	<5	<5	<5		9	<5	<5	<5	<5	42	17.4	6.4	<5.0	17.3	7.5	9.8	10.6	<5	<5.0	<5.0	<5.0
Conductivity (EC)	uS/cm	742	713	745	1740	1390	1840		887	891	730	879	760	774	758	553	921	1090	730	559	834	675	1050	1050	734
Calcium	mg/L	23.1	20.5	21.9	39.5	45.9	56.6		39.1	29.5	27	28.2	24.4	22.7	20.5	27.7	29.4	31.9	36.6	25.3	28.7	23.5	28.8	28.6	22.2
Potassium	mg/L	12.5	9.2	20.9	93.4	75.8	54.1		28.9	28.9	32.8	34.9	32.8	23.5	25.6	21.5	38.7	39.3	35.4	28.5	36.0	35.6	45.2	43.5	26.8
Magnesium	mg/L	10.1	9.5	11.4	21.1	22.3	29.8		16.9	14.7	13.9	14.9	13.1	12.9	12	12.2	12.3	15.3	16.2	10.9	12.9	12.4	16.1	16.5	12.7
Sodium	mg/L	125	139	149	254	208	373		151	140	123	141	116	130	132	81.4	121	174	106	71.7	117	101	175	197	121
Sulfate	mg/L	51.7	83.2	38.9	36.2	37.4	224		105	73.1	10.7	34.3	12.3	22.8	15.3	6.13	36.5	15.7	6.24	5.18	25.8	6.68	14.9	28.9	5.32
Phosphorus	mg/L	Not required by previous permit							Not required by previous permit					-	0.507	1.39	5.07	1.48	0.361	1.88	0.531	2.2	0.98	1.89	0.614
pH in H_20	pH	8.2	8.4	7.7	8.4	7.7	8.2		8.5	8.4	8.4	8.2	8.1	9	8.59	8.43	8.37	8.56	8.41	8.57	8.50	8.4	8.06	8.29	8.23
TDS (Calculated)	mg/L	430	437	493	975	874	1180		591	540	460	524	447	461	453	325	507	637	436	314	467	389	640	644	431
Nitrate	mg/L	Not required by previous permit							Not required by previous permit					<0.1	<0.050	<0.050	0.092	<0.050	<0.050	<0.05	<0.020	<0.020	0.243	0.157	0.336
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	<0.010	<0.010	0.086	<0.010	0.030
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	0.157	0.365
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	139	108
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	466	363
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.39	0.369
Field Data																									
pH in H_20	pH	Not required by previous permit						EMP	Not required by previous permit					9.08	8.19	9.24	7.94	8.33	8.6	8.16	8.86	8.5	8.6	10.2	6.14
Conductivity (EC)	uS/cm													919	580	867	300	1093	750	408	846	703	1170	1133	897

Table D.10: Chemical Analytical Results

Sample ID:		Magneson D.1																						
Site Number:		**10**																						
Date Sampled:	**Units**	**17-Oct-1996**	**3-Oct-1997**	**8-Oct-1998**	**19-Oct-1999**	**10-Oct-2000**	**5-Oct-2001**	**8-Oct-2002**	**21-Oct-2003**	**15-Oct-2004**	**20-Oct-2005**	**13-Oct-2006**	**3-Oct-2007**	**17-Oct-2008**	**28-Oct-2009**	**18-Oct-2010**	**12-Oct-2011**	**16-Oct-2012**	**8-Oct-2013**	**15-Oct-2014**	**14-Oct-2015**	**5-Oct-2016**	**20-Oct-2017**	**16-Oct-2018**	**29-Oct-2019**
Chem. O_2 Demand	mg/L	50	70	110	90	130	80	140	120	120	88	126	244	186	96.3	134	280	211	149	257	197	320	323	268	339
Ammonia-N	mg/L	<0.05	0.27	0.85	1.6	1.42	0.36	0.53	0.21	0.79	0.13	0.13	0.13	<0.05	<0.050	0.167	0.134	0.138	0.086	0.157	0.215	0.571	0.200	0.123	0.104
Total Kjeldahl Nitrogen	mg/L	2.5	2.8	4.7	5.2	5.5	8.6	6.2	4.2	4.8	3.7	4.5	7.6	6.7	5.59	10.2	9.14	7.93	3.88	8.78	8.94	12.3	11.7	10.4	11.0
Total Organic Carbon	mg/L	20	24	38	32	44	53	55	43	43	37	45	54	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												55	34.7	72.3	85.5	64	77.4	58.1	93.9	106	323	91.0	102
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0017	0.0084
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.20	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												2.43	0.075	0.866	0.59	1.63	1.84	<0.01	0.326	0.168	0.0146	0.302	0.039
Antimony	mg/L	0.0005	0.001	0.0012	<0.0004	0.0008	0.0008	0.0012	0.0013	0.0013	0.001	0.0010	0.002	0.0009	<0.00040	0.00067	<0.00040	<0.00080	0.00049	<0.0004	0.00044	0.00045	0.00057	0.00059	0.0005
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0181	0.0175
Barium	mg/L	0.03	0.036	0.042	0.052	0.06	0.055	0.041	0.038	0.045	0.058	0.06	0.104	0.062	0.0618	0.0474	0.031	0.0645	0.0712	0.0308	0.0376	0.0623	0.0562	0.0720	0.0701
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Boron	mg/L													0.11	<0.050	0.115	0.072	0.086	0.085	0.087	0.087	0.107	0.091	0.091	0.091
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0003	<0.000050	0.000055	0.000055	<0.0010	0.000074	<0.00005	0.000043	0.00005	0.000038	0.000056	0.00005
Chromium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.00104	0.00114	0.00096	0.00115	0.00092
Cobalt	mg/L	<0.002	<0.002	0.021	0.002	0.003	0.002	<0.002	<0.002	<0.002	0.002	0.002	0.005	<0.002	<0.0020	0.0026	0.0033	0.0044	0.0042	<0.002	0.00336	0.00442	0.00637	0.00608	0.0051
Copper	mg/L	0.004	0.002	0.011	0.006	0.014	0.009	0.012	0.005	0.005	0.096	0.226	0.162	0.139	0.0014	0.0922	0.169	0.198	0.107	0.484	0.309	0.094	0.0532	0.0521	0.0255
Iron	mg/L	<0.005	0.549	1.100	1.680	1.560	1.500	0.37	0.455	0.53	3.65	3.4	6.6	1.93	0.309	0.861	0.864	1.37	2.09	0.42	0.784	1.41	0.822	1.41	1.08
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0014	0.00032	0.00083	0.0006	<0.0050	0.00284	0.00039	0.00053	0.00134	0.00076	0.00118	0.00105
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0639	0.0537
Manganese	mg/L													0.029	0.0223	0.079	0.0699	0.232	0.440	0.0279	0.280	0.179	0.451	0.333	0.587
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0.0000205	<0.0000050	<0.0000050	<0.0000050	0.0000086
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	0.0054	<0.0050	0.005	<0.0050	<0.005	0.00595	0.00523	0.00447	0.00457	0.00327
Nickel	mg/L	0.007	0.01	0.016	0.012	0.014	0.011	0.013	0.013	0.01	0.015	0.02	0.022	0.022	0.0058	0.0239	0.0214	0.0316	0.0283	0.0226	0.0261	0.0287	0.0288	0.0293	0.0243
Selenium	mg/L	Not required under previous permit												0.0021	<0.00040	<0.0020	0.00069	0.00084	0.00067	0.00051	0.00076	0.00077	0.00096	0.00099	0.00080
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000020	0.000034	<0.000020	<0.000020	<0.000020
Thallium	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000020	<0.000020	<0.000020	0.000023	<0.000020
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Titanium	mg/L													0.119	0.006	0.0546	0.0342	0.0754	0.0836	0.0031	0.0226	0.0135	0.00819	0.0552	0.00886
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.00196	0.00185
Vanadium	mg/L													0.016	0.0034	0.0121	0.0106	0.0246	0.0201	0.0108	0.0139	0.0152	0.0155	0.0154	0.0131
Zinc	mg/L	0.023	0.017	0.014	0.01	0.021	0.062	0.008	0.008	0.049	0.08	0.021	0.051	0.015	<0.0020	0.0065	0.0103	0.0143	0.0174	0.0304	0.0055	0.0123	0.0091	0.0071	0.0076
Routine Water																									
Ion Balance	%	102	102	94	103	108	105	103	106	102	105	96.5	100	101	105	94.5	91.6	97.4	106	109	102	108	91.7	103	102
Bicarbonate	mg/L	346	328	465	360	646	590	675	746	717	434	483	471	516	251	481	440	482	453	434	474	540	688	617	609
Chloride	mg/L	73.1	70.5	96.1	97.0	110.0	159.0	161	149	158	94	101	123	157	12.2	149	126	142	136	151	147	174	200	197	202
Carbonate	mg/L	19	16	<5	48	<5	64	86	60	90	16	30	10	19	53.6	28.4	7.9	15.5	14.0	19.7	12.5	15	<5.0	17.9	16.1
Conductivity (EC)	uS/cm	1490	1150	1200	1420	1900	2160	2370	2500	2430	1410	1580	1430	1850	569	1930	1590	1750	1680	1830	1870	2030	2190	2150	2150
Calcium	mg/L	28.4	27	28.6	28.3	40.7	40.3	40.6	44.4	48.9	32.3	35.0	38.2	45.5	19.8	44.3	32.8	40.3	45.7	42.9	43.1	48.8	46.1	51.1	51.7
Potassium	mg/L	22.9	33.4	46.2	45.7	49.1	55.8	68	61.8	62.7	48.5	62.6	76.7	79.4	15.7	80.2	82.7	99.4	96.0	113	111	131	132	127	135
Magnesium	mg/L	13.0	11.5	11.2	12.3	20.5	22.0	26.1	24.7	25.5	16.0	17.5	18.9	23.2	7.6	20.2	14.3	19.7	19.9	19.3	18.9	25.1	24	26.9	31
Sodium	mg/L	280	211	222	250	357	404	495	520	528	280	270	245	302	110	288	208	251	263	284	250	304	305	327	326
Sulfate	mg/L	314	199	176	186	322	349	361	402	447	249	256	209	263	9.83	312	202	245	241	260	228	250	250	252	284
Phosphorus	mg/L	Not required under previous permit												-	0.8	5.38	5.26	4.69	4.29	6.43	5.71	7.1	7.43	8.88	8.91
pH in H_20	pH	8.8	8.7	7.8	9.1	8.2	8.9	9	8.9	9.0	8.6	8.6	8.4	8.5	9.24	8.72	8.47	8.6	8.53	8.7	8.50	8.54	8.3	8.54	8.52
TDS (Calculated)	mg/L	920	730	809	843	1250	1430	1550	1630	1710	952	1010	961	1150	352	1160	892	1050	1040	1110	1050	1220	1330	1310	1350
Nitrate	mg/L	Not required under previous permit												2	<0.050	0.138	0.419	0.517	0.882	0.473	0.662	0.43	1.4	0.958	1.12
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	<0.020	0.034	<0.050	<0.020	<0.020
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	0.958	1.12
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	238	257
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	536	526
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.129	0.297
Field Data																									
pH in H_20	pH	Not required under previous permit												8.62	8.73	9.92	8.65	8.73	8.8	8.21	8.34	8.8	8.1	10.2	9.73
Conductivity (EC)	uS/cm													1738	500	2080	450	1772	1720	1872	1951	2030	2360	2290	2.66

Table D.11: Chemical Analytical Results

Sample ID:		Magneson D.2																						
Site Number:		11																						
Date Sampled:	**Units**	**17-Oct-1996**	**3-Oct-1997**	**8-Oct-1998**	**19-Oct-1999**	**10-Oct-2000**	**5-Oct-2001**	**8-Oct-2002**	**15-Oct-2003**	**15-Oct-2004**	**20-Oct-2005**	**13-Oct-2006**	**3-Oct-2007**	**17-Oct-2008**	**28-Oct-2009**	**18-Oct-2010**	**12-Oct-2011**	**15-Oct-2012**	**8-Oct-2013**	**15-Oct-2014**	**14-Oct-2015**	**5-Oct-2016**	**20-Oct-2017**	**16-Oct-2018**	**29-Oct-2019**
Chem. O_2 Demand	mg/L	250	220	370	590	260	550	EMPTY	340	160	395	165	349	231	EMPTY	124	185	EMPTY	298	215	267	126	188	160	114
Ammonia-N	mg/L	4.6	2.09	4.98	4.83	5	2.31		6.22	10.5	6.03	2.71	0.19	6.04		0.605	0.82		0.187	0.094	0.241	0.076	0.749	0.137	0.063
Total Kjeldahl Nitrogen	mg/L	20.5	18.8	23.3	19.4	3.6	30.1		31.8	17.2	22	12.0	16.7	23.7		16.7	11.5		4.11	8.76	13.6	4.64	8.26	6.13	3.46
Total Organic Carbon	mg/L	96	88	183	154	100	144		170	66	114	61	125	-		-	-		-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit							Not required under previous permit					117		51.2	77		51.9	39.3	35.6	41.3	188	60.0	33.5
Phenols	mg/L													-		-	-		-	-	-	-	-	0.0028	0.0142
BTEX, F1 (C6-C10) and F2 (>C10-C16)																								
Benzene	mg/L	Not required under previous permit						EMPTY	Not required under previous permit					<0.0005	EMPTY	<0.00050	<0.00050	EMPTY	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005		<0.00050	<0.00050		<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005		<0.00050	<0.00050		<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-		-	-		-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-		-	-		-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005		<0.00071	<0.00071		<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-		-	-		-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1		<0.10	<0.10		<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1		<0.10	<0.10		<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.2		<0.25	<0.25		0.44	<0.25	<0.20	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																								
Aluminium	mg/L	Not required under previous permit						EMPTY	Not required under previous permit					0.33	EMPTY	0.021	0.095	EMPTY	0.016	0.018	0.0069	0.132	0.0858	0.217	0.168
Antimony	mg/L	0.0005	0.0007	0.0014	0.0004	0.0008	0.0007		0.0026	0.0021	0.0013	0.0020	0.0015	0.0011		0.00044	0.00047		<0.00040	<0.0004	0.00040	0.00021	0.00034	0.00024	0.00018
Arsenic	mg/L	Not required under previous permit							Not required under previous permit							-	-		-	-	-	-	-	0.0137	0.00332
Barium	mg/L	0.726	1.28	0.967	1.3	1.03	1.04		1.9	0.343	0.967	0.394	1.08	0.147		0.0544	0.0685		0.124	0.0733	0.0963	0.0276	0.0547	0.0136	0.0524
Beryllium	mg/L	Not required under previous permit							Not required under previous permit					<0.001		<0.0010	<0.0010		<0.0010	<0.001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Boron	mg/L													0.07		0.058	<0.050		0.058	<0.05	0.038	0.038	0.028	0.036	0.024
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001		<0.000050	<0.000050		<0.000050	<0.00005	0.0000095	0.0000108	0.0000207	0.0000249	0.0000153
Chromium	mg/L	0.019	0.052	0.047	0.085	0.07	0.096		0.147	0.022	0.059	0.033	0.075	<0.005		<0.0050	<0.0050		<0.0050	<0.005	0.00013	0.00034	0.00027	0.00053	0.00034
Cobalt	mg/L	0.008	<0.002	0.044	0.018	0.016	0.031		0.042	0.008	0.019	0.011	0.021	0.003		0.002	<0.0020		0.0024	0.0028	0.00197	0.00079	0.00164	0.00070	0.00057
Copper	mg/L	0.015	0.04	0.037	0.031	0.033	0.052		0.102	0.016	0.035	0.026	0.045	0.01		0.0091	0.0044		<0.0010	<0.001	0.00078	0.00204	0.00454	0.00276	0.00211
Iron	mg/L	22.7	67.4	56.8	76.8	56.6	120		130	18.2	65.4	30.3	71.7	0.24		0.11	0.159		0.725	0.987	0.592	0.7	0.134	0.197	1.43
Lead	mg/L	0.017	0.009	<0.005	0.031	0.032	0.054		0.07	0.011	0.043	0.019	0.045	0.0002		<0.00010	0.00014		0.00014	0.00034	0.000141	0.000212	0.000154	0.000151	0.000582
Lithium	mg/L	Not required under previous permit							Not required under previous permit					-		-	-		-	-	-	-	-	0.0124	0.0104
Manganese	mg/L													0.197		0.0342	0.0063		0.424	0.344	0.384	0.00264	0.0402	0.0111	0.00213
Mercury	mg/L	0.0002	0.0002	<0.0002	<0.0002	0.0002	<0.0002		<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0001		<0.00010	<0.00010		<0.00010	<0.0001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000005
Molybdenum	mg/L	<0.005	<0.005	0.005	<0.005	<0.005	0.007		0.01	0.018	0.007	0.009	<0.005	0.021		<0.0050	<0.0050		0.0129	<0.005	0.0162	0.00198	0.00451	0.00352	0.00111
Nickel	mg/L	0.022	0.086	0.07	0.052	0.077	0.079		0.111	0.028	0.049	0.033	0.055	0.019		0.0149	0.014		0.0118	0.0104	0.0129	0.00687	0.0105	0.00544	0.00512
Selenium	mg/L	Not required under previous permit							Not required under previous permit					0.002		<0.0020	0.00074		0.00051	<0.0004	0.000899	0.000297	0.000603	0.000474	0.000263
Silver	mg/L													<0.0001		<0.00010	<0.00010		<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001		<0.00010	<0.00010		<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	0.000018	<0.000010
Tin	mg/L													<0.05		<0.050	<0.050		<0.050	<0.05	<0.00010	<0.00010	0.00025	<0.00010	<0.00010
Titanium	mg/L													0.025		0.0027	0.0065		0.0019	0.0018	0.00171	0.0056	0.00306	0.0158	0.0141
Uranium	mg/L															-	-		-	-	-	-	-	0.00188	0.000954
Vanadium	mg/L													0.008		0.0074	0.0069		0.0075	0.0019	0.00533	0.00443	0.0038	0.0122	0.00364
Zinc	mg/L	0.068	0.232	0.188	0.109	0.381	0.274		0.384	0.126	0.198	0.125	0.192	0.01		<0.0020	0.0024		<0.0020	0.0065	0.0013	0.0019	0.0037	<0.0010	0.0015
Routine Water																								
Ion Balance	%	101	97	105	107	112	107	EMPTY	101	104	102	100	98.7	96	EMPTY	110	91.3	EMPTY	102	107	97	114	92.1	107	102
Bicarbonate	mg/L	597	520	514	562	541	521		847	495	598	318	592	745		335	501		457	297	409	241	527	332	296
Chloride	mg/L	94.2	64.0	71.3	97.0	71.0	145.0		187	109	102	80	72	168		56.9	42.7		41.8	25.6	63.5	22.4	54.4	48.5	19.2
Carbonate	mg/L	<5	<5	<5	<5	<5	<5		<5	<5	6	<5	7	<5		9.9	11.5		14.5	11.8	6.0	<5	<5.0	12.7	<5.0
Conductivity (EC)	uS/cm	1310	998	922	1190	1070	1350		1600	1350	1160	904	1120	1780		832	946		853	590	904	499	967	760	516
Calcium	mg/L	42.4	27.1	31.9	34.2	47.8	88.6		84.5	55.7	47.1	24.4	37.5	54.6		38.1	30.7		44.8	34.4	40.5	22.8	26.1	19.9	20.8
Potassium	mg/L	75	68.8	58.1	66.3	73.6	94.8		101	69.4	74.6	48.9	71.2	79.8		47.8	45.3		57.6	38.3	51.5	34	45.8	39.1	32.9
Magnesium	mg/L	19.0	12.7	13.5	15.5	23.4	38.7		33.1	19.8	19.9	10.3	17.8	24.6		15.8	12.2		16.9	12.6	13.7	9.57	12.2	8.43	9.31
Sodium	mg/L	187	148	172	199	166	231		251	185	173	128	169	262		110	121		98.3	61.5	99.8	58.6	143	128	69.1
Sulfate	mg/L	53	26	35.5	27.5	23	74		62.7	157	32.4	73.3	28.1	116		45.2	3.76		3.38	0.8	16.6	2.91	14.1	21.6	5.44
Phosphorus	mg/L	Not required under previous permit							Not required under previous permit					-		4.56	2.48		1.69	2.42	1.35	1.93	0.622	2.28	1.21
pH in H_20	pH	8.2	8.0	7.5	8.2	7.7	8.0		8.3	8.3	8.4	7.9	8.3	8.2		8.49	8.5		8.53	8.64	8.40	8.28	8.26	8.68	8.19
TDS (Calculated)	mg/L	765	602	636	716	650	603		1140	841	752	525	702	1070		491	514		502	331	494	270	559	442	303
Nitrate	mg/L	Not required under previous permit							Not required under previous permit					0.2		0.574	0.06		<0.050	<0.05	<0.020	0.248	0.176	<0.020	0.253
Nitrite	mg/L													-		<0.050	<0.050		<0.050	<0.02	<0.010	<0.010	0.017	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L													-		-	-		-	-	-	-	-	<0.022	0.253
Hardness as $CaCO_3$	mg/L													-		-	-		-	-	-	-	-	84.4	90.3
Alkalinity (total as $CaCO_3$)	mg/L													-		-	-		-	-	-	-	-	293	242
Hydroxide	mg/L													-		-	-		-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-		-	-		-	-	-	-	-	0.284	0.228
Field Data																								
pH in H_20	pH	Not required under previous permit												na	EMPTY	9.95	8.45	EMPTY	8.6	8.45	9.09	8.8	8.8	11.4	10.3
Conductivity (EC)	uS/cm													na		997	300		864	433	931	508	1052	786	650

Table D.12: Chemical Analytical Results

Sample ID:		Magneson D.3																						
Site Number:		12																						
Date Sampled:	Units	17-Oct-1996	Oct. 3, 97	8-Oct-1998	19-Oct-1999	10-Oct-2000	5-Oct-2001	8-Oct-2002	15-Oct-2003	15-Oct-2004	20-Oct-2005	13-Oct-2006	3-Oct-2007	17-Oct-2008	28-Oct-2009	19-Oct-2010	12-Oct-2011	15-Oct-2012	8-Oct-2013	15-Oct-2014	14-Oct-2015	5-Oct-2016	20-Oct-2017	16-Oct-2018	29-Oct-2019
Chem. O_2 Demand	mg/L	10	30	30	50	40	40	30	30	30	40	39	49	53	57.2	45.1	42	49	37	59	49	37	57		119
Ammonia-N	mg/L	0.06	<0.05	0.05	<0.05	<0.05	<0.05	0.12	<0.05	0.38	<0.05	<0.05	0.1	<0.05	<0.050	<0.050	<0.050	0.116	<0.050	<0.05	0.252	<0.050	<0.050		<0.050
Total Kjeldahl Nitrogen	mg/L	1.3	<0.2	1.1	1	0.9	2.9	1.1	1.3	1.5	1	0.9	1.2	1.5	1.86	1.65	1.22	1.77	1.44	1.48	1.97	1.29	1.79	Not analyzed	3.49
Total Organic Carbon	mg/L	9	12	13	13	12	13	14	12	16	14	14	17	-	-	-	-	-	-	-	-	-	-		-
Dissolved Organic Carbon	mg/L	Not required under previous permit												18	20.1	15.1	17.8	19.1	19.5	15.5	17.6	17.3	57		17.9
Phenols	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		0.0136
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	Not analyzed	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050		<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050		<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-		<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-		<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071		<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-		<0.00050
F1 (C6-C10)	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10		<0.10
F1 - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10		<0.10
F2 - (>C10-C16)	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.20	<0.13	<0.10		<0.10
Dissolved Metals																									
Antimony	mg/L	0.0004	0.0008	0.0012	<0.0004	0.0006	0.0005	0.0011	0.0011	0.0012	0.0014	0.0011	0.0018	0.0005	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00054	0.00031	0.00027		0.00029
Arsenic	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		0.00194
Barium	mg/L	0.039	0.041	0.039	0.069	0.053	0.058	0.082	0.058	0.079	0.047	0.047	0.071	0.066	0.0646	0.0455	0.0687	0.0798	0.0262	0.0425	0.0968	0.0264	0.0913		0.0773
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	0.0000084	0.0000249	0.0000585		0.0000188
Chromium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	<0.00010	<0.00010		0.00016
Cobalt	mg/L	0.002	0.002	0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00024	0.00018	0.00039		0.00052
Copper	mg/L	0.006	0.002	0.009	0.002	0.004	0.004	0.007	0.005	0.007	0.003	0.003	0.002	0.002	0.0022	0.0087	0.0011	0.0015	0.0016	0.0014	0.00136	0.0013	0.00283		0.00242
Iron	mg/L	<0.005	0.982	0.603	0.977	0.266	0.810	2.36	1.48	3.32	0.437	1.07	0.872	0.032	0.071	0.014	0.102	0.047	0.036	<0.01	0.018	<0.010	0.019		0.015
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000050	<0.000050	0.000087		<0.000050
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		0.0409
Molybdenum	mg/L	0.008	<0.005	0.007	0.006	<0.005	0.006	0.007	0.008	0.007	0.006	0.006	<0.005	0.007	0.0072	0.0217	0.0146	0.0169	0.0225	0.0212	0.0302	0.0302	0.0206		0.0254
Nickel	mg/L	0.013	0.009	0.015	0.008	0.01	0.008	0.011	0.009	0.012	0.007	0.007	0.007	0.007	0.0081	0.0105	0.0113	0.0116	0.0127	0.013	0.0191	0.0172	0.0121		0.0203
Zinc	mg/L	0.016	0.015	0.031	0.009	<0.001	0.032	0.01	0.009	0.066	0.004	0.009	0.009	0.009	<0.0020	<0.0020	0.0021	<0.0020	<0.0020	0.0079	0.0021	0.0015	0.0057	Not analyzed	0.0028
Mercury	mg/L	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	<0.0000050	<0.0000050		<0.0000050
Aluminium	mg/L	Not required under previous permit												0.02	0.082	0.011	0.012	0.031	0.039	<0.01	0.0233	0.0023	0.0149		0.0033
Beryllium	mg/L													<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010		<0.00010
Boron	mg/L													<0.05	<0.050	<0.050	0.058	0.055	0.055	0.053	0.065	0.061	0.071		0.060
Manganese	mg/L													0.002	0.0026	<0.0020	<0.0020	<0.0020	0.0020	<0.002	0.0009	0.00027	0.0211		0.00123
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010		<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	0.00033		<0.00010
Selenium	mg/L													0.0007	0.00054	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000412	0.000322	0.000233		0.000304
Titanium	mg/L													0.001	0.0037	<0.0010	<0.0010	0.0023	0.0025	<0.001	0.00114	<0.00030	0.00144		<0.00030
Thallium	mg/L													0.0002	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010		<0.000010
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-		0.00247
Vanadium	mg/L													0.001	<0.0010	0.0015	0.0034	0.005	0.0127	0.0096	0.00866	0.0164	0.00285		0.00262
Routine Water																									
Ion Balance	%	103	106	109	103	105	108	97.6	104	102	109	104	103	99.5	92.3	95.7	93.6	94.2	104	104	94.5	99.8	94.8		102
Bicarbonate	mg/L	237	198	227	222	222	246	247	200	261	225	224	256	268	228	189	267	290	253	230	251	256	334		268
Chloride	mg/L	4.4	3.9	4.4	5.0	4.0	6.0	7	6	8	6	7	6	12	10.6	24	19.2	24.5	24.4	21.3	20.9	18.2	18.3		14.7
Carbonate	mg/L	<5	<5	<5	5	<5	<5	13	9	<5	<5	<5	<5	14	7.1	<5.0	7.1	6	6.7	8.4	<5.0	<5.0	6.4		<5.0
Conductivity (EC)	uS/cm	876	603	632	745	789	918	1050	909	1110	779	790	683	831	918	989	928	1060	993	957	987	943	1020		960
Calcium	mg/L	21.8	24.9	21.1	23	24.3	28.7	22.8	21.6	35.6	37.5	26.3	27.5	25.7	19	25.5	34.4	27.4	26.4	24.4	31.3	27.9	29.1		49.1
Potassium	mg/L	6.9	6.6	7.3	7.3	7.8	8.4	9.5	7.1	7.7	7.1	8.4	8.5	8.6	8.39	8.8	8.06	10.9	11.6	10.7	11.5	10.4	11.1		13.6
Magnesium	mg/L	8.0	6.4	7.9	8.8	10.2	12.0	13	10	11.0	10.6	10.4	9.9	12.4	12.4	13.1	13.5	14.2	16.0	14.7	11.8	15.5	15.3		17.4
Sodium	mg/L	168	100	130	129	139	181	213	174	201	145	140	107	140	154	153	132	171	172	162	142	153	162		139
Sulfate	mg/L	238	124	149	168	198	246	331	267	333	220	205	119	166	257	282	203	252	239	229	231	234	209	Not analyzed	252
Phosphorus	mg/L	Not required under previous permit													0.055	0.161	0.118	0.091	0.051	0.132	0.134	0.038	0.051		0.185
pH in H_20	pH	8.4	8.4	7.9	8.6	8.4	8.3	8.3	8.7	8.3	8.4	8.3	8.5	8.7	8.51	8.44	8.51	8.49	8.46	8.62	8.36	8.23	8.44		8.38
TDS (Calculated)	mg/L	565	365	431	456	493	595	722	593	725	540	508	409	511	581	603	549	649	620	583	576	585	616		623
Nitrate	mg/L	Not required under previous permit												<0.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.020	<0.020	<0.020		0.029
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	<0.010	<0.010	<0.010		<0.010
Nitrate and Nitrite (as N)	mg/L	Not analyzed																							0.029
Hardness as CaCO3	mg/L																								194
Alkalinity (total as CaCO3)	mg/L																								227
Hydroxide	mg/L																								<5.0
Fluoride	mg/L																								0.465
Field Data																									
pH in H_20	pH	Not required under previous permit												8.72	8.24	8.85	8.57	8.86	9.2	8.68	8.57	8.8	8.8	Not analyzed	11.68
Conductivity (EC)	uS/cm													867	750	1055	689	1053	1007	693	996	930	1116		1203

Table D.13: Chemical Analytical Results

Sample ID:		Magneson D.4																				
Site Number:		13																				
Date Sampled:	Units	7-Oct-1997	8-Oct-1998	19-Oct-1999	10-Oct-2000	5-Oct-2001	8-Oct-2002	15-Oct-2003	14-Oct-2004	20-Oct-2005	13-Oct-2006	3-Oct-2007	17-Oct-2008	28-Oct-2009	18-Oct-2010	12-Oct-2011	16-Oct-2012	8-Oct-2013	15-Oct-2014	14-Oct-2015	5-Oct-2016	20-Oct-2017	16-Oct-2018	29-Oct-2019
Chem. O_2 Demand	mg/L	350	1430	680	1450	5260	EMPTY	1270	EMPTY	259	1120	1070	1440	EMPTY	4810	1220	1550	1560	1580	1190	1300	1930	960	1370
Ammonia-N	mg/L	9.72	2.35	2.41	14.6	1.73		0.77		0.26	1.48	1.37	0.67		5.11	4.39	2.04	2.24	0.828	1.37	3.13	1.37	0.409	2.85
Total Kjeldahl Nitrogen	mg/L	27.8	86.2	30.7	<3	91.2		58.2		11.9	45.1	44.4	71		128	44.6	63.8	49.7	54.7	52.8	56.1	62	39.4	43.7
Total Organic Carbon	mg/L	168	714	187	813	1690		356		105	271	251	-		-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit						ired under previou		Not required under previous permit			527		1430	554	392	756	609	531	507	1930	329	415
Phenols	mg/L												-		-	-	-	-	-	-	-	-	<0.01	0.0116
BTEX, F1 (C6-C10) and F2 (>C10-C16)																								
Benzene	mg/L	Not required under previous permit					EMPTY	ired under previou	EMPTY	Not required under previous permit			<0.0005	EMPTY	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L												<0.0005		0.00318	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L												<0.0005		0.00107	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L												-		-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L												-		-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L												<0.0005		0.00825	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L												-		-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L												<0.1		<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L												<0.1		<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L												<0.2		<0.625	<0.25	<0.25	<0.25	<0.25	<0.20	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																								
Aluminium	mg/L	Not required under previous permit					EMPTY	ired under previou	EMPTY	Not required under previous permit			<0.2	EMPTY	0.23	0.617	1.09	0.45	0.075	5.79	0.273	0.149	0.145	0.080
Antimony	mg/L	<0.0002	0.003	<0.0004	0.0034	0.0021		0.0007		0.0019	<0.0004	0.0012	<0.008		<0.0080	<0.00080	0.00121	<0.01	<0.001	0.0013	0.00082	0.00088	0.00082	0.00064
Arsenic	mg/L	Not required under previous permit						ired under previou		Not required under previous permit			-		-	-	-	-	-	-	-	-	0.0327	0.0275
Barium	mg/L	0.383	1.09	0.208	1.29	0.998		0.137		0.083	0.03	0.736	<0.06		0.317	0.0722	0.305	0.113	0.137	0.330	0.188	0.236	0.383	0.166
Beryllium	mg/L	Not required under previous permit						ired under previou		Not required under previous permit			<0.02		<0.010	<0.0020	<0.0010	<0.050	<0.001	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050
Boron	mg/L												<1		0.48	<0.10	0.318	<1.0	0.28	0.270	0.289	0.302	0.267	0.204
Cadmium	mg/L	<0.001	<0.001	<0.001	0.002	<0.001		<0.001		<0.001	<0.001	<0.001	<0.002		<0.0010	<0.00010	<0.0010	<0.0010	0.00017	0.000114	0.000094	0.000061	0.000064	0.000079
Chromium	mg/L	0.039	0.079	0.026	0.114	0.055		0.018		0.005	<0.005	0.07	<0..1		<0.0080	<0.010	0.0057	<0.010	<0.005	0.0119	0.00483	0.00492	0.00482	0.00285
Cobalt	mg/L	0.024	0.063	0.011	0.069	0.061		0.008		0.006	0.003	0.036	<0.04		0.0218	<0.0040	0.013	0.014	0.0144	0.0154	0.0128	0.0108	0.00594	0.00794
Copper	mg/L	0.017	0.084	0.017	0.136	0.188		0.018		0.0011	0.008	0.078	0.02		0.016	0.0031	0.0283	0.024	0.0335	0.0263	0.0138	0.0093	0.0069	0.0093
Iron	mg/L	29.100	80.000	14.900	93.800	98.300	EMPTY	113	EMPTY	5.19	5.76	62.7	0.43	EMPTY	4.93	5.83	6.3	2.3	3.64	9.88	3.92	2.86	3.26	1.99
Lead	mg/L	0.011	0.009	0.005	0.048	0.043		0.007		<0.005	<0.005	0.033	<0.002		0.003	0.00103	<0.0050	<0.0050	0.0044	0.00689	0.00385	0.00305	0.00422	0.00304
Lithium	mg/L	Not required under previous permit						ired under previou		Not required under previous permit			-		-	-	-	-	-	-	-	-	0.128	0.0902
Manganese	mg/L												0.3		1.83	1.18	1.18	0.649	0.615	1.15	0.945	1.06	1.39	0.748
Mercury	mg/L	0.0009	<0.0002	<0.0002	0.0008	<0.0002		<0.0002		<0.0002	<0.0002	<0.0002	<0.0001		<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0.0000184	<0.000050	<0.0000050	<0.000050	<0.000050
Molybdenum	mg/L	0.006	0.019	0.006	0.036	0.017		0.005		0.021	<0.005	0.005	0.03		<0.0050	<0.010	0.0189	0.0409	0.0078	0.0179	0.00911	0.00492	0.00333	0.00193
Nickel	mg/L	0.059	0.18	0.047	0.212	0.201		0.029		0.024	0.011	0.099	0.07		0.0998	0.0122	0.0658	0.085	0.0507	0.0553	0.0497	0.045	0.0350	0.0350
Selenium	mg/L	Not required under previous permit						ired under previou		Not required under previous permit			0.014		<0.040	<0.00080	0.00225	<0.010	0.0016	0.00339	0.00192	0.00218	0.00159	0.00142
Silver	mg/L												<0.002		<0.0020	<0.00020	<0.0050	<0.0010	<0.0001	0.00014	0.000092	0.000075	0.00009	<0.000050
Thallium	mg/L												<0.002		<0.0010	<0.00020	<0.050	<0.0050	<0.0001	<0.00010	<0.000050	<0.000050	<0.000050	<0.000050
Tin	mg/L												<1		<0.050	<0.10	<0.050	<0.050	<0.05	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050
Titanium	mg/L												<0.02		0.128	0.0338	0.0989	0.083	0.0437	0.334	0.0677	0.0592	0.0716	0.0444
Uranium	mg/L												-		-	-	-	-	-	-	-	-	0.00295	0.00214
Vanadium	mg/L												0.06		0.0793	0.0072	0.0345	0.055	0.033	0.0481	0.0336	0.0351	0.0277	0.0286
Zinc	mg/L	0.149	0.424	0.027	0.505	1.92		0.067		0.073	0.015	0.261	<0.04		0.094	0.0106	0.0284	<0.10	0.053	0.047	0.0421	0.0297	0.0247	0.032
Routine Water																								
Ion Balance	%	104	102	105	107	107	EMPTY	103	EMPTY	102	111	98.1	95	EMPTY	115	91.8	96.1	96.8	101	97.9	114	98.6	101	110
Bicarbonate	mg/L	1240	1650	1450	2200	2500		1890		883	1570	1470	2830		2220	1320	2350	3210	1490	1540	1080	1830	1580	1310
Chloride	mg/L	505	868	674	1420	2530		1640		424	921	605	2040		1190	480	1030	1930	807	744	615	932	894	603
Carbonate	mg/L	29	70	95	<5	189		81		53	57	75	359		73	49.9	140	341	138	88.6	65.1	94.1	87.5	47.6
Conductivity (EC)	uS/cm	3620	4920	4510	7690	11700		8430		3000	6190	3980	11500		7840	4020	7490	11,800	5830	5640	4620	6910	6470	4570
Calcium	mg/L	86.3	113	74.1	205	212		244		113	144	108	61.9		177	86.6	165	119	93.5	113	89.2	105	118	84.2
Potassium	mg/L	322	492	359	1090	1310		1120		329	678	545	1260		1290	481	976	1550	788	728	610	870	717	634
Magnesium	mg/L	61.4	95.8	84.0	142.0	198.0		246		67.0	112	56	177		112	44.9	90.6	148	60.8	59.2	60.3	90	84.4	71.6
Sodium	mg/L	517	870	709	1220	2450		1540		432	838	515	1760		915	365	898	1700	680	591	560	881	844	596
Sulfate	mg/L	140	418	126	555	713		2150		448	751	174	826		341	141	521	856	343	331	308	659	637	361
Phosphorus	mg/L	Not required under previous permit						ired under previou		Not required under previous permit			-		44	30	44.5	48.1	41.6	34.4	34.8	44.7	31.3	26.9
pH in H_20	pH	8.5	8.4	8.7	8.2	8.7		8.5		8.6	8.5	8.7	8.8		8.54	8.56	8.72	8.88	8.96	8.73	8.74	8.74	8.73	8.64
TDS (Calculated)	mg/L	2270	3740	2830	5410	8260		7950		2300	4060	2800	7880		5290	2290	4980	8220	3640	3420	2840	4580	4160	3040
Nitrate	mg/L	Not required under previous permit						ired under previou		Not required under previous permit			0.2		<5.0	<1.0	<0.50	<1.0	0.36	0.86	<0.10	1.35	0.33	0.570
Nitrite	mg/L												-		<0.50	<1.0	<0.50	<1.0	0.11	<0.050	<0.050	<0.050	<0.050	0.083
Nitrate and Nitrite (as N)	mg/L												-		-	-	-	-	-	-	-	-	0.33	0.65
Hardness as $CaCO_3$	mg/L												-		-	-	-	-	-	-	-	-	642	505
Alkalinity (total as $CaCO_3$)	mg/L												-		-	-	-	-	-	-	-	-	1440	1150
Hydroxide	mg/L												-		-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L												-		-	-	-	-	-	-	-	-	<0.1	<0.10
Field Data																								
pH in H_20	pH	Not required under previous permit											na	EMPTY	9.00	8.34	8.84	9.1	8.79	8.76	9.2	8.7	10.4	9.81
Conductivity (EC)	uS/cm												na		7290	300	7640	1201	5190	5720	4480	7210	2230	6.83

Table D.14: Chemical Analytical Results

Sample ID:		Magneson D.5																						
Site Number:		14																						
Date Sampled:	Units	7-Oct-1997	8-Oct-1998	19-Oct-1999	10-Oct-2000	5-Oct-2001	8-Oct-2002	15-Oct-2003	15-Oct-2004	20-Oct-2005	13-Oct-2006	3-Oct-2007	17-Oct-2008	28-Oct-2009	18-Oct-2010	12-Oct-2011	16-Oct-2012	8-Oct-2013	15-Oct-2014	14-Oct-2015	5-Oct-2016	20-Oct-2017	16-Oct-2018	29-Oct-2019
Chem. O_2 Demand	mg/L	90	120	130	120	280	440	240	130	156	117	153	191	181	98.2	156	178	146	100	146	184	268	243	370
Ammonia-N	mg/L	0.05	0.32	0.1	0.08	<0.05	0.13	0.05	1.15	<0.05	1.04	0.52	0.95	0.432	0.087	0.135	0.084	<0.050	0.704	1.38	0.138	2.42	0.455	0.600
Total Kjeldahl Nitrogen	mg/L	3.7	5.1	5.2	4.6	14.2	21.5	8.2	7	5.9	7.5	6.6	8.6	9.67	8.29	5.73	7.03	4.24	4.16	6.24	6.84	11.6	10.0	13.9
Total Organic Carbon	mg/L	34	45	49	47	76	201	49	52	63	46	56	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit											60	68.7	61.6	57.5	60.5	49.1	36.8	55.1	62.4	268	88.0	100
Phenols	mg/L												-	-	-	-	-	-	-	-	-	-	0.0025	0.0071
BTEX, F1 (C6-C10) and F2 (>C10-C16)																								
Benzene	mg/L	Not required under previous permit											<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L												-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L												-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L												<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L												-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L												<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L												<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L												<0.2	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																								
Aluminium	mg/L	Not required under previous permit											1.16	0.057	0.031	0.035	0.106	0.203	<0.01	0.0288	0.0636	0.297	0.0245	0.0182
Antimony	mg/L	<0.0002	0.001	0.0009	0.0009	0.001	0.0022	0.0023	0.0021	0.0012	0.0022	0.0015	0.003	0.00138	0.00082	0.00072	0.00099	0.00104	0.00047	0.00055	0.00049	0.00045	0.00101	0.00073
Arsenic	mg/L	Not required under previous permit											-	-	-	-	-	-	-	-	-	-	0.019	0.0155
Barium	mg/L	0.068	0.081	0.092	0.063	0.121	0.188	0.191	0.197	0.057	0.327	0.083	0.09	0.0835	0.0459	0.0428	0.0737	0.0697	0.0402	0.0616	0.0324	0.0255	0.0764	0.0337
Beryllium	mg/L	Not required under previous permit											<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Boron	mg/L												<0.05	<0.050	0.056	<0.050	<0.050	<0.050	<0.05	0.032	0.038	<0.020	<0.020	0.048
Cadmium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	0.00005	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	<0.000010	<0.000010	<0.000010	0.000019	0.000012
Chromium	mg/L	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	0.024	0.019	<0.005	0.047	0.008	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00020	0.00043	0.00068	0.00025	0.00055
Cobalt	mg/L	0.005	0.022	0.004	0.003	0.003	0.008	0.014	0.01	0.004	0.015	0.005	0.004	0.0034	0.0035	0.0034	<0.0020	<0.0020	0.003	0.00218	0.00169	0.00234	0.00364	0.00428
Copper	mg/L	<0.001	0.014	0.009	0.007	0.008	0.032	0.028	0.016	0.005	0.031	0.008	0.008	0.0055	0.0118	0.0063	0.0035	0.0031	0.0023	0.00201	0.00214	0.00112	0.0052	0.00527
Iron	mg/L	2.770	3.470	3.220	1.510	4.460	6.480	15.2	13.1	0.725	32.2	3.34	0.726	0.059	0.064	0.05	0.098	0.143	<0.01	<0.020	0.322	0.223	0.070	0.277
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.01	0.009	<0.005	0.025	<0.005	0.0086	<0.00010	<0.00010	<0.00010	<0.0050	0.00020	<0.0001	<0.00010	0.00024	0.00021	0.00011	0.00037
Lithium	mg/L	Not required under previous permit											-	-	-	-	-	-	-	-	-	-	0.0576	0.0533
Manganese	mg/L												0.066	<0.0020	0.0384	0.0024	0.0033	0.0047	0.0375	0.00208	0.0381	0.633	0.00515	0.220
Mercury	mg/L	<0.0004	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	0.0000118	<0.0000050	<0.0000050	0.0000063
Molybdenum	mg/L	<0.005	0.005	0.007	0.007	0.012	0.065	0.014	0.019	0.016	0.015	0.008	0.04	0.0326	0.0122	0.0191	0.0458	0.0444	0.0131	0.0218	0.00595	0.00653	0.0110	0.00592
Nickel	mg/L	0.011	0.024	0.02	0.019	0.019	0.071	0.056	0.042	0.025	0.055	0.025	0.033	0.0319	0.0283	0.0314	0.0408	0.0253	0.0204	0.0236	0.0165	0.0168	0.0232	0.0225
Selenium	mg/L	Not required under previous permit											0.0018	0.002	<0.0020	0.00121	0.00091	0.00072	0.00063	0.00087	0.00067	0.00062	0.00078	0.00088
Silver	mg/L												<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Thallium	mg/L												<0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000020	<0.000020	<0.000020	<0.00002	<0.000020
Tin	mg/L												<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Titanium	mg/L												0.05	0.0037	0.0041	0.0015	0.0037	0.0164	<0.001	0.00148	0.00805	0.0116	0.00511	0.00459
Uranium	mg/L												-	-	-	-	-	-	-	-	-	-	0.00351	0.0023
Vanadium	mg/L												0.009	0.0044	0.0074	0.0294	0.0365	0.0286	0.0162	0.0138	0.0178	0.018	0.0188	0.0269
Zinc	mg/L	0.032	0.052	0.013	0.064	0.246	0.031	0.098	0.168	0.01	0.210	0.036	0.006	0.0108	0.003	0.0021	<0.0020	<0.0020	0.0071	<0.0020	0.0028	0.0033	<0.0020	0.004
Routine Water																								
Ion Balance	%	109	100	108	105	107	102	98.2	107	104	102	98.7	100	104	105	91.5	95.3	103	111	94.5	107	94.4	99.5	104
Bicarbonate	mg/L	360	529	455	408	571	1370	482	622	565	658	533	687	664	491	537	709	549	521	713	589	1100	932	850
Chloride	mg/L	40.9	51.6	57.0	60.0	109.0	323.0	104	103	106	99	95	140	126	76.7	82.1	114	89.3	54.9	81.4	71.4	143	145	175
Carbonate	mg/L	26	<5	60	45	69	89	20	19	19	<5	22	29	67.1	19.8	73	46.7	68.9	42.9	40.3	22.4	18.7	37.6	21.7
Conductivity (EC)	uS/cm	1020	976	1200	1030	1460	3320	1410	1700	1530	1500	1420	1830	1810	1280	1610	1950	1480	1370	1640	1520	2080	2030	2120
Calcium	mg/L	30.4	31.1	32	23.7	33.1	36.3	43	48.5	46.2	23.7	30.9	33.8	30	31.8	39.7	32.9	29.2	33.7	34.3	38.5	43.4	35.6	50.3
Potassium	mg/L	40.4	43.2	42.2	32.6	35.1	43.1	57.1	52.5	48.1	35.7	52.6	42.9	40.6	57	52.1	45	40.3	42	44.9	54.5	83.8	67.2	119
Magnesium	mg/L	11.8	12.2	13.5	10.5	12.3	23.2	15.1	18.7	17.2	9.7	15.3	14.2	15.3	13.2	16.9	14.6	11.3	15.6	13.5	20.4	26.1	18.2	35.9
Sodium	mg/L	194	184	238	205	367	802	253	307	323	299	235	359	388	227	252	363	296	261	274	263	375	391	353
Sulfate	mg/L	146	75.2	101	70.2	55	152	221	250	179	97.6	117	162	157	114	172	210	99.7	117	74.4	144	45.4	71.6	162
Phosphorus	mg/L	Not required under previous permit											-	0.77	3.05	2.74	1.27	0.994	1.52	1.40	5.4	5.82	2.99	10.1
pH in H_20	pH	8.9	8.3	9.1	9.0	9.0	8.7	8.6	8.5	9.0	8.3	8.6	8.6	8.89	8.57	8.99	8.85	9.06	8.86	8.71	8.64	8.45	8.66	8.53
TDS (Calculated)	mg/L	666	661	767	647	904	2110	953	1140	1070	889	831	1120	1150	788	952	1170	905	823	915	904	1300	1230	1340
Nitrate	mg/L	Not required under previous permit											<0.1	<0.050	1.68	<0.050	<0.050	<0.050	0.075	<0.040	<0.040	0.19	<0.040	0.557
Nitrite	mg/L												-	<0.050	<0.050	<0.050	<0.050	<0.050	0.029	<0.020	<0.020	0.053	<0.020	<0.020
Nitrate and Nitrite (as N)	mg/L												-	-	-	-	-	-	-	-	-	-	<0.045	0.557
Hardness as $CaCO_3$	mg/L												-	-	-	-	-	-	-	-	-	-	164	273
Alkalinity (total as $CaCO_3$)	mg/L												-	-	-	-	-	-	-	-	-	-	827	733
Hydroxide	mg/L												-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L												-	-	-	-	-	-	-	-	-	-	0.512	0.180
Field Data																								
pH in H_20	pH	Not required under previous permit											8.54	8.26	9.2	9.63	9.10	9.2	8.62	8.87	8.9	8.8	10.6	11.75
Conductivity (EC)	uS/cm												1775	1180	13.84	200	1953	1502	1389	1675	1509	2310	2140	2.78

Table D.15: Chemical Analytical Results

Sample ID:		**Magneson D.6**				
Site Number:		**15**				
Date Sampled:	**Units**	**14-Oct-2015**	**5-Oct-2016**	**20-Oct-2017**	**16-Oct-2018**	**29-Oct-2019**
Chem. O_2 Demand	mg/L	121	106	127	125	125
Ammonia-N	mg/L	0.088	0.056	0.27	<0.050	<0.050
Total Kjeldahl Nitrogen	mg/L	4.06	4.16	4.05	4.58	4.16
Total Organic Carbon	mg/L	-	-	-	-	-
Dissolved Organic Carbon	mg/L	43.1	33	127	43.0	33.1
Phenols	mg/L	-	-	-	0.0021	0.013
BTEX, F1 (C6-C10) and F2 (>C10-C16)						
Benzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L	-	-	-	<0.0005	<0.00050
Xylenes	mg/L	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals						
Aluminium	mg/L	0.0224	0.0167	<0.0050	0.0151	0.0051
Antimony	mg/L	0.00080	0.0007	0.00103	0.00113	0.00086
Arsenic	mg/L	-	-	-	0.019	0.0134
Barium	mg/L	0.0342	0.0266	0.0375	0.0302	0.0512
Beryllium	mg/L	<0.0005	<0.00050	<0.00050	<0.00020	<0.00020
Boron	mg/L	0.306	0.279	0.337	0.301	0.237
Cadmium	mg/L	<0.000025	<0.000025	<0.000025	0.000018	0.000012
Chromium	mg/L	<0.00050	<0.0005	<0.00050	<0.00020	<0.00020
Cobalt	mg/L	0.00061	0.00086	0.00133	0.00089	0.00075
Copper	mg/L	<0.0010	0.0016	<0.0010	0.00103	0.00174
Iron	mg/L	<0.050	<0.050	0.063	0.037	0.023
Lead	mg/L	<0.00025	<0.00025	<0.00025	<0.00010	<0.00010
Lithium	mg/L	-	-	-	0.13	0.0978
Manganese	mg/L	0.00404	0.00561	0.532	0.00962	0.00599
Mercury	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.00327	0.00254	0.0016	0.00211	0.00179
Nickel	mg/L	0.0072	0.0069	0.0086	0.0067	0.0082
Selenium	mg/L	0.00033	0.00037	<0.00025	0.00032	0.00029
Silver	mg/L	<0.000050	<0.000050	<0.000050	<0.000020	<0.000020
Thallium	mg/L	<0.000050	<0.000050	<0.000050	<0.00002	<0.000020
Tin	mg/L	<0.00050	<0.00050	<0.00050	<0.00020	<0.00020
Titanium	mg/L	0.0016	<0.0015	<0.0015	0.00146	0.00134
Uranium	mg/L	-	-	-	0.00442	0.00507
Vanadium	mg/L	0.00450	0.0052	0.0044	0.0042	0.0063
Zinc	mg/L	<0.0050	<0.0050	<0.0050	0.0020	<0.0020
Routine Water						
Ion Balance	%	104	106	94.3	98.7	101
Bicarbonate	mg/L	593	343	694	538	520
Chloride	mg/L	334	235	340	359	286
Carbonate	mg/L	30.9	13.1	20	14.5	16.6
Conductivity (EC)	uS/cm	4080	2790	4020	4070	3120
Calcium	mg/L	54.3	40.2	70.2	41.7	97.9
Potassium	mg/L	31.3	27.1	29.6	29.8	34.1
Magnesium	mg/L	55.5	42.5	56.4	58.5	56.6
Sodium	mg/L	785	528	729	794	558
Sulfate	mg/L	990	711	1030	1120	818
Phosphorus	mg/L	0.707	0.385	0.963	0.486	0.745
pH in H_20	pH	8.61	8.56	8.52	8.47	8.52
TDS (Calculated)	mg/L	2570	1770	2620	2680	2120
Nitrate	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
Nitrate and Nitrite (as N)	mg/L	-	-	-	<0.11	<0.101
Hardness as $CaCO_3$	mg/L	-	-	-	345	478
Alkalinity (total as $CaCO_3$)	mg/L	-	-	-	465	454
Hydroxide	mg/L	-	-	-	<5	<5.0
Fluoride	mg/L	-	-	-	0.22	0.35
Field Data						
pH in H_20	pH	8.68	9.5	8.5	10.9	9.48
Conductivity (EC)	uS/cm	4120	2730	4300	4140	3.82

Table D.16: Chemical Analytical Results

Sample ID:		Beaver D.1																						
Site Number:		**16**																						
Date Sampled:	**Units**	**18-Oct-1996**	**3-Oct-1997**	**8-Oct-1998**	**20-Oct-1999**	**11-Oct-2000**	**4-Oct-2001**	**9-Oct-2002**	**16-Oct-2003**	**14-Oct-2004**	**21-Oct-2005**	**13-Oct-2006**	**3-Oct-2007**	**17-Oct-2008**	**28-Oct-2009**	**19-Oct-2010**	**12-Oct-2011**	**16-Oct-2012**	**8-Oct-2013**	**15-Oct-2014**	**14-Oct-2015**	**5-Oct-2016**	**20-Oct-2017**	**16-Oct-2018**	**29-Oct-2019**
Chem. O_2 Demand	mg/L	60	70	90	90	80	100	80	50	70	59	65	78	85	140	66.4	89	302	73	105	60	74	56	66	93
Ammonia-N	mg/L	0.1	<0.05	0.07	<0.05	<0.05	1.24	<0.05	<0.05	0.05	0.22	<0.05	2.11	0.46	5.66	<0.050	<0.050	<0.050	2.57	<0.05	0.168	<0.05	1.00	1.10	0.071
Total Kjeldahl Nitrogen	mg/L	4.9	2.2	2.9	2.5	2	5.9	2.3	<0.2	2	1.8	2.1	8.5	2.8	9	2.21	2.62	3.98	4.30	3.69	1.61	2.67	2.78	4.27	2.46
Total Organic Carbon	mg/L	25	28	30	25	26	30	32	26	24	22	22	27	-	-	-	-	-	-	-	-	-		-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												27	63.2	24.9	29	29.9	29.5	25.6	22.7	22.5	56.0	25.6	28.1
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0023	0.0099
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												<0.01	0.074	0.022	<0.010	<0.010	0.059	<0.01	0.0119	0.0011	0.008	0.0064	0.0036
Antimony	mg/L	<0.0004	0.0006	0.0011	<0.0004	0.0005	0.0007	<0.0004	0.0009	0.0018	0.001	0.0014	0.0009	0.0008	<0.0016	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00025	0.00024	0.00023	0.00024	0.00022
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.00455	0.00586
Barium	mg/L	0.15	0.049	0.029	0.084	0.074	0.123	0.15	0.051	0..040	0.047	0.061	0.092	0.039	0.115	0.037	0.0521	0.0799	0.0952	0.0558	0.0756	0.0581	0.0707	0.0833	0.0489
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													0.07	<0.050	0.071	<0.050	<0.050	<0.050	<0.05	0.037	0.058	0.037	0.051	0.039
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.00020	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	<0.0000050	<0.0000050	0.000005	<0.0000050	0.0000056
Chromium	mg/L	0.015	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.010	0.01	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	<0.00010	<0.00010	<0.00010	0.00013
Cobalt	mg/L	0.005	<0.002	0.019	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00035	0.0003	0.00078	0.00094	0.00038
Copper	mg/L	0.01	<0.001	0.006	<0.001	0.001	0.007	0.022	0.005	0.001	<0.001	0.002	0.001	0.001	<0.0024	0.0019	<0.0010	<0.0010	<0.0010	<0.001	0.00043	0.00034	0.00101	0.00057	0.00071
Iron	mg/L	6.880	0.376	0.201	0.581	0.127	1.220	0.339	1.17	0.09	0.316	0.311	0.74	0.008	0.089	0.013	0.016	0.04	0.212	0.078	0.038	0.011	0.033	0.026	0.049
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0002	<0.00040	<0.00010	<0.00010	<0.0050	0.00013	<0.0001	<0.000050	<0.000050	0.000075	<0.000050	<0.000050
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0329	0.0308
Manganese	mg/L													0.025	0.137	<0.0020	0.0025	<0.0020	0.248	0.0073	0.00078	0.00062	0.182	0.387	0.00491
Mercury	mg/L	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.00199	0.000986	0.00105	0.00153	0.00067
Nickel	mg/L	0.011	<0.002	0.015	0.005	0.003	<0.002	0.005	0.005	<0.005	<0.002	0.005	0.006	0.007	0.004	0.0049	0.0036	0.0049	0.0047	0.0043	0.00725	0.00521	0.00592	0.00697	0.00493
Selenium	mg/L													0.0015	0.0038	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000217	0.000194	0.000206	0.000284	0.000205
Silver	mg/L													<0.0001	<0.00040	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00020	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	0.000015	<0.000010
Tin	mg/L	Not required under previous permit												<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	0.00016	<0.00010	<0.00010
Titanium	mg/L													0.002	<0.0012	<0.0010	<0.0010	<0.0010	0.0037	<0.001	0.00081	<0.00030	0.00044	0.00086	0.00069
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.00225	0.00115
Vanadium	mg/L													0.01	0.0052	0.0024	0.0031	0.0072	0.0038	0.0036	0.00484	0.00328	0.00439	0.00363	0.00324
Zinc	mg/L	0.046	0.017	0.031	0.005	0.009	0.036	0.011	0.006	0.022	0.002	0.006	0.006	0.009	<0.0040	<0.0020	<0.0020	<0.0020	0.0051	0.0088	<0.0010	<0.0010	0.0098	<0.0010	<0.0010
Routine Water																									
Ion Balance	%	97	103	103	94	103	91.7	102	102	96.7	103	103	97.4	95.5	92.5	93.9	93.5	95.8	101	109	98.6	100	104	103	109
Bicarbonate	mg/L	338	315	271	315	310	423	520	193	361	335	270	386	408	348	327	357	345	429	306	307	396	566	451	464
Chloride	mg/L	138.0	125.0	146.0	203.0	175.0	267.0	436	192	245	182	166	153	233	384	160	117	205	218	145	149	137	203	237	182
Carbonate	mg/L	<5	7	27	15	16	<5	<5	15	<5	<5	<5	<5	9	6.1	11.1	12.8	9.3	11.6	25.2	<5.0	8.4	<5.0	7.9	6.7
Conductivity (EC)	uS/cm	1200	1210	1020	1530	1380	1640	2860	1210	1520	1130	1120	1410	1620	1980	1280	1150	1420	1500	1130	1330	1230	1660	1780	1490
Calcium	mg/L	43.9	43.1	36.1	48.7	47.2	55.8	70.9	63.6	53.2	48.9	46.8	55.9	62.9	72.9	42.1	46.3	43.7	55.7	50.2	53.0	49.4	58.5	67.2	53.7
Potassium	mg/L	12.5	14.5	15.5	14.7	14.6	16.3	31.5	14.4	14.3	10	11.7	13.9	16.4	19.2	13.8	13.4	20.2	21.8	14.9	16.3	16.8	20.6	19.6	19.1
Magnesium	mg/L	19.3	18.4	18.3	21.9	19.0	22.3	55.5	21.7	19.7	17.7	16.0	19.9	24	23.2	18.3	17.2	22.2	24.7	17.9	18.5	20.4	26.6	28.5	28.2
Sodium	mg/L	186	200	204	223	219	228	498	185	234	194	171	206	238	283	185	156	207	234	179	166	185	279	275	266
Sulfate	mg/L	149	165	134	182	135	113	436	195	131	75.3	92.7	174	149	170	122	97.7	114	98.6	55.4	127	93.7	98	163	131
Phosphorus	mg/L	Not required under previous permit												-	0.258	0.568	0.876	0.615	1.45	1.42	0.160	0.612	0.82	0.464	1.41
pH in H_20	pH	8.4	8.6	8.7	8.7	8.7	8.1	7.1	8.8	8.3	8.4	8.3	8.2	8.4	8.38	8.51	8.54	8.52	8.46	8.85	8.23	8.44	8.08	8.39	8.37
TDS (Calculated)	mg/L	717	728	714	864	777	918	1780	782	878	698	637	812	933	1130	713	636	791	875	638	687	705	967	1020	915
Nitrate	mg/L													<0.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	1.38	<0.020	<0.10	0.299	<0.020
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	0.039	<0.010	<0.050	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	0.299	<0.022
Hardness as $CaCO_3$	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	285	250
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	383	392
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.129	0.208
Field Data																									
pH in H_20	pH	Not required under previous permit												8.68	7.93	9.33	8.50	8.78	8.9	8.84	8.68	8.5	8.1	9.6	10.32
Conductivity (EC)	uS/cm													1634	1310	1258	1468	1423	1564	1146	1323	1225	1863	1875	1940

Table D.18: Chemical Analytical Results

Sample ID:		Norgaard D.1																						
Site Number:		18																						
Date Sampled:	Units	17-Oct-1996	3-Oct-1997	8-Oct-1998	20-Oct-1999	11-Oct-2000	5-Oct-2001	9-Oct-2002	16-Oct-2003	14-Oct-2004	21-Oct-2005	13-Oct-2006	3-Oct-2007	17-Oct-2008	28-Oct-2009	19-Oct-2010	12-Oct-2011	16-Oct-2012	8-Oct-2013	15-Oct-2014	14-Oct-2015	5-Oct-2016	20-Oct-2017	16-Oct-2018	29-Oct-2019
Chem. O_2 Demand	mg/L	60	90	100	120	90	110	180	200	110	120	99	<5	109	131	82.8	119	109	106	155	81	80	78	35	158
Ammonia-N	mg/L	<0.05	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	0.06	<0.05	3.85	<0.050	<0.050	<0.050	<0.050	0.062	1.31	0.553	<0.050	<0.050	<0.050
Total Kjeldahl Nitrogen	mg/L	4	1.8	3.8	3.6	2.4	4.7	4.9	3.2	3	3.4	2.7	3.1	3.5	7.86	2.52	4.03	3.42	2.57	2.98	3.14	2.67	2.74	1.71	4.19
Total Organic Carbon	mg/L	24	32	35	45	32	37	62	45	66	47	35	54	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												38	54.4	31.3	34.5	37	34.5	29.5	29.9	27.7	78	21.6	39.2
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0019	0.0081
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												<0.04	0.14	<0.010	<0.010	<0.010	0.022	<0.01	0.0056	0.0086	0.0025	0.0034	0.0035
Antimony	mg/L	<0.0004	0.0006	0.0006	<0.0004	0.0005	0.0004	0.0007	0.0011	0.0015	0.001	0.0010	0.0021	<0.002	<0.0080	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	<0.00020	0.00012	0.00011	0.00027	0.00021
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.00107	0.00247
Barium	mg/L	0.111	0.087	0.084	0.101	0.1	0.133	0.217	0.038	0.048	0.056	0.105	0.145	0.1	0.168	0.0779	0.086	0.0961	<0.0030	0.0947	0.096	0.0642	0.0801	0.0924	0.0716
Beryllium	mg/L	Not required under previous permit												<0.004	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00020	<0.00010	<0.00010	<0.00020	<0.00020
Boron	mg/L													<0.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0.027	0.077	0.032	0.024	0.053
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0004	<0.0010	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	<0.000010	<0.0000050	<0.0000050	0.000018	<0.000010
Chromium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.011	<0.005	<0.005	<0.005	0.013	0.012	<0.02	<0.0080	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00020	0.00015	0.00013	<0.0002	<0.00020
Cobalt	mg/L	<0.002	<0.002	0.019	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.008	0.0049	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00045	0.00033	0.00048	0.0101	0.00040
Copper	mg/L	0.003	0.04	0.005	<0.001	0.001	0.004	0.017	0.005	0.002	<0.001	0.001	0.002	<0.004	<0.012	0.0037	<0.0010	<0.0010	<0.0010	<0.001	<0.00040	0.00022	0.00031	0.00127	0.00049
Iron	mg/L	<0.005	0.265	0.243	0.469	0.063	0.377	4.04	0.372	0.098	0.067	0.136	0.646	0.011	<0.010	0.025	0.034	0.024	0.022	0.073	0.033	0.129	0.081	0.064	0.111
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	<0.0020	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.00010	<0.000050	<0.000050	<0.00010	<0.00010
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0698	0.0423
Manganese	mg/L													0.165	0.378	0.0021	0.01	<0.0020	0.411	0.0039	0.0758	0.00168	0.229	5.26	0.00533
Mercury	mg/L	0.0002	<0.0002	<0.0002	0.0002	0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.02	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.00088	0.000341	0.000524	0.00304	0.00095
Nickel	mg/L	0.003	<0.002	<0.002	0.004	0.003	<0.002	0.011	0.003	<0.002	<0.002	0.005	0.006	<0.008	0.06	0.0034	0.0025	0.0039	0.0043	0.0035	0.0057	0.00333	0.00448	0.0113	0.0042
Selenium	mg/L	Not required under previous permit												0.003	0.0093	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	<0.00010	0.000118	0.000092	0.00013	0.00018
silver	mg/L													<0.0004	<0.0020	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000020	<0.000010	<0.000010	<0.000020	<0.000020
Thallium	mg/L													<0.0004	<0.0010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000020	<0.000010	<0.000010	0.000022	<0.000020
Tin	mg/L													<0.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00020	<0.00010	<0.00010	<0.00020	<0.00020
Titanium	mg/L													<0.004	<0.0060	<0.0010	<0.0010	<0.0010	0.0019	<0.001	<0.00060	0.00072	0.00033	<0.00060	<0.0006
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.0197	0.000974
Vanadium	mg/L													0.009	<0.0020	0.0014	0.0012	0.0038	0.0032	0.0011	0.0032	0.0016	0.00151	<0.0010	0.0013
Zinc	mg/L	0.021	0.051	0.025	0.002	0.001	0.041	0.026	0.006	0.037	0.002	0.01	0.034	<0.008	<0.020	<0.0020	<0.0020	<0.0020	<0.0020	0.0085	<0.0020	0.0013	0.0012	0.0064	<0.0020
Routine Water																									
Ion Balance	%	101	103	99	95	102	103	100	104	98.7	98.2	99.9	95.3	99.5	95.2	94.5	95.6	98	99.0	108	99.2	104	97.9	109	107
Bicarbonate	mg/L	537	639	420	598	551	607	567	228	480	747	602	778	820	718	603	537	532	522	414	455	417	573	558	784
Chloride	mg/L	268.0	375.0	339.0	465.0	343.0	544.0	881	579	586	520	443	514	595	756	296	181	283	242	155	228	156	265	688	285
Carbonate	mg/L	<5	<5	<5	18	<5	<5	44	21	<5	10	<5	6	32	<5.0	<5.0	26.3	12.5	32.7	21.1	6.4	11.2	10.3	<5.0	<5.0
Conductivity (EC)	uS/cm	2250	2510	2140	2770	2410	2890	4120	2890	3080	2790	2350	3030	3230	3820	1800	1560	1790	1600	1250	1740	1180	1800	3810	2120
Calcium	mg/L	93.2	91.1	60.6	64.6	96.8	109	57.7	113	83.7	91.6	90.8	98.7	87.3	102	77.3	64.9	63.9	63.1	69.4	74.9	59.9	79.6	298	109
Potassium	mg/L	21.3	26.1	23.9	23.9	24.9	31.5	36.9	38.1	30.3	31.5	25.7	32	32.6	40	21.5	22.1	28.8	22.5	19.4	22.9	19.2	20	26.1	26.1
Magnesium	mg/L	49.7	57.5	39.5	48.2	49.0	62.4	66.5	91.7	57.9	58.9	48.4	59.5	63.4	67.3	35.5	25.9	29.1	29.4	20.9	26.7	21.8	31	87.2	43.8
Sodium	mg/L	348	380	348	443	344	556	816	556	498	452	360	449	540	613	258	213	266	255	181	216	171	267	498	330
Sulfate	mg/L	378	220	282	245	273	315	342	771	407	153	120	202	133	357	67.6	53.6	54.8	45.1	32.1	96.2	28.8	76.1	592	78.4
Phosphorus	mg/L	Not required under previous permit												-	<0.020	1.03	1.43	0.704	1.04	1.76	0.674	1.02	0.527	0.243	1.02
pH in H_20	pH	8.0	8.3	8.1	8.5	8.2	8.2	8.4	8.8	8.3	8.3	8.3	8.3	8.5	8.31	8.18	8.57	8.49	8.69	8.65	8.37	8.47	8.41	8.18	8.10
TDS (Calculated)	mg/L	1420	1470	1300	1600	1410	1850	2480	2280	1910	1680	1390	1740	1890	2290	1050	851	1000	947	703	896	673	1040	2460	1260
Nitrate	mg/L	Not required under previous permit												<0.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0.219	<0.020	<0.10	<0.10	<0.040
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	0.029	<0.010	<0.050	<0.050	0.022
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.11	<0.045
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	1100	453
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	457	643
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.15	0.273
Field Data																									
pH in H_20	pH	Not required under previous permit												8.42	7.85	8.67	8.46	8.45	9.0	7.72	8.15	8.8	8.3	8.3	9.89
Conductivity (EC)	uS/cm													2240	1890	1292	1167	1801	1621	1256	1774	1220	2040	3960	2.62

Table D.19: Chemical Analytical Results

Sample ID:		Winsnes D.1																						
Site Number:		19																						
Date Sampled:	Units	16-Oct-1996	7-Oct-1997	9-Oct-1998	19-Oct-1999	10-Oct-2000	4-Oct-2001	9-Oct-2002	16-Oct-2003	14-Oct-2004	21-Oct-2005	13-Oct-2006	3-Oct-2007	17-Oct-2008	28-Oct-2009	19-Oct-2010	12-Oct-2011	16-Oct-2012	8-Oct-2013	15-Oct-2014	14-Oct-2015	5-Oct-2016	20-Oct-2017	16-Oct-2018	29-Oct-2019
Chem. O_2 Demand	mg/L	60	70	70	90	100	110	100	80	80	54	65	68	65	101	85.8	68	420	79	94	92	69	83	92	75
Ammonia-N	mg/L	<0.05	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.105	0.09	<0.050	<0.050	0.084	0.059	0.069	<0.05	1.08	0.058	<0.050
Total Kjeldahl Nitrogen	mg/L	3.1	2.5	2.6	2.5	3.4	6.2	4.1	3.6	2.1	1.7	2.4	2.7	3.8	4.48	4.36	2.79	3.66	3.62	3.48	3.76	3.52	4.11	4.01	2.52
Total Organic Carbon	mg/L	25	28	28	27	31	36	40	37	30	23	24	24	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												23	31.9	29.7	25	33.6	28.2	26.4	28.2	27	83	27.3	24.2
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0026	0.0077
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.12	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												<0.01	<0.010	0.025	<0.010	<0.010	<0.010	<0.01	0.0013	<0.0010	0.0038	0.0085	0.0017
Antimony	mg/L	<0.0004	0.0002	0.0009	<0.0004	0.0006	0.0008	0.0006	0.0014	0.0014	0.0015	0.0021	0.0011	0.0007	0.00045	0.0004	<0.00040	<0.00080	<0.00040	<0.0004	0.00029	0.00021	0.00023	0.00030	0.0002
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.00574	0.00471
Barium	mg/L	0.036	0.055	0.049	0.051	0.053	0.042	0.105	0.04	0.011	0.022	0.043	0.081	0.04	0.0418	0.0425	0.0238	0.0149	0.0257	0.0589	0.0508	0.0633	0.0359	0.0623	0.0412
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													<0.05	0.051	0.051	<0.050	<0.050	<0.050	<0.05	0.037	0.046	0.034	0.037	0.039
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	<0.0000050	<0.0000050	<0.0000050	0.0000168	<0.0000050
Chromium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	<0.00010	<0.00010	0.00011	<0.00010
Cobalt	mg/L	<0.002	0.002	0.021	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00033	0.00022	0.00065	0.00055	0.00035
Copper	mg/L	0.002	<0.001	0.009	0.002	0.003	0.006	0.009	0.006	0.003	0.001	0.002	0.002	<0.001	<0.0010	0.0059	<0.0010	<0.0010	<0.0010	<0.001	<0.00020	0.00021	0.00033	0.00043	0.00027
Iron	mg/L	<0.005	0.291	0.200	0.460	0.342	0.081	0.991	0.369	0.203	0.101	0.211	0.76	0.005	0.022	<0.010	0.032	0.011	0.014	0.024	0.014	0.019	0.054	0.038	0.011
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000050	<0.000050	0.000055	0.000061	<0.000050
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0279	0.0235
Manganese	mg/L													0.006	0.0341	0.0022	0.0025	0.0037	0.0029	0.0053	0.00179	0.00088	0.276	0.0371	0.00135
Mercury	mg/L	0.0003	0.0008	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	0.000006	0.0000058	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.000688	0.00036	0.000554	0.000512	0.000602
Nickel	mg/L	<0.002	<0.002	0.012	0.003	0.004	<0.002	0.006	0.004	<0.002	0.002	0.005	0.006	<0.002	0.0026	<0.0020	0.002	<0.0020	<0.0020	0.0025	0.00178	0.00214	0.0035	0.00316	0.00287
Selenium	mg/L	Not required under previous permit												0.0007	0.00049	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000194	0.000232	0.00021	0.000206	0.000204
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	0.000015	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L													<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00030	<0.00030	0.00078	0.00093	<0.0003
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.00159	0.00116
Vanadium	mg/L													0.004	0.0041	0.0018	<0.0010	0.001	<0.0010	0.0015	0.00172	0.00107	0.00167	0.00163	0.00094
Zinc	mg/L	0.006	0.025	0.057	0.003	0.017	0.048	0.008	0.008	0.074	0.002	0.008	0.008	0.03	<0.0020	<0.0020	<0.0020	0.0024	<0.0020	0.0058	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Routine Water																									
Ion Balance	%	98	110	108	103	109	90.3	101	106	105	107	106	97.7	98	100	106	97.1	92.7	103	104	93.2	100	96.3	107	104
Bicarbonate	mg/L	483	445	475	485	464	457	635	361	276	285	315	366	319	366	362	370	348	450	420	408	446	563	469	416
Chloride	mg/L	20.7	20.0	17.0	21.0	21.0	25.0	32	29	29	17	18	15	19	17.9	19.4	15	17.7	19.8	23.5	27.2	38.3	59.3	58.7	71.6
Carbonate	mg/L	<5	<5	<5	17	25	60	44	49	75	13	7	12	46	52.4	32	11	46	11.3	30.9	18.2	9.3	<5.0	<5.0	10.8
Conductivity (EC)	uS/cm	1270	1230	1100	1270	1320	1520	1850	1950	2400	1530	1280	1030	1080	1150	1180	914	1000	1020	1040	971	997	1190	1070	1060
Calcium	mg/L	31.5	32.4	32.3	27.8	26.3	20.8	23.4	32.9	31.9	40.2	39.3	42.2	19.1	19.5	20.4	24.5	15.7	24.4	27.5	19.6	32.4	43.8	26.8	39.2
Potassium	mg/L	8.8	10.6	10.3	11.1	10.8	11	13.4	13.5	11.9	10.9	12.5	11.6	11	13.2	13.9	12.8	12.7	14.2	13.6	12.7	13.7	16.4	15.8	15.7
Magnesium	mg/L	16.6	17.5	17.8	17.7	18.9	19.5	21.6	34.9	31.7	26.3	22	18.7	17.8	19.6	20.8	14.7	15.6	18.2	17.2	14.2	18.7	22.9	21.3	23.7
Sodium	mg/L	219	248	250	259	277	279	415	444	482	289	221	159	191	225	256	149	175	191	191	158	168	190	197	174
Sulfate	mg/L	250	239	235	233	265	278	331	693	809	498	340	206	189	214	282	128	147	133	116	93.9	99.6	111	92.4	106
Phosphorus	mg/L	Not required under previous permit												-	0.523	0.459	0.4	0.391	0.467	0.43	0.336	0.515	0.419	0.339	0.263
pH in H_20	pH	8.2	8.4	8.0	8.6	8.6	9.0	8.7	9.1	9.4	8.6	8.5	8.6	9	9.01	8.69	8.54	9.16	8.49	8.85	8.67	8.48	8.22	8.36	8.51
TDS (Calculated)	mg/L	762	790	796	825	886	902	1160	1470	1610	1040	815	645	649	742	823	537	601	633	626	545	600	725	648	646
Nitrate	mg/L	Not required under previous permit												<0.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.020	<0.020	<0.020	<0.020	0.025
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	<0.010	<0.010	<0.010	<0.010	0.014
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.022	0.039
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	155	195
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	393	359
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.16	0.292
Field Data																									
pH in H_20	pH	Not required under previous permit												9.11	8.5	9.04	8.44	9.49	8.5	8.0	8.84	8.6	8.6	10.7	10.44
Conductivity (EC)	uS/cm													1062	800	1013	1000	1007	1039	1042	1005	1004	1295	1123	1306

Table D.20: Chemical Analytical Results

Sample ID:		Winsnes D.2																						
Site Number:		20																						
Date Sampled:	Units	16-Oct-1996	7-Oct-1997	9-Oct-1998	26-Nov-1999	10-Oct-2000	4-Oct-2001	9-Oct-2002	16-Oct-2003	14-Oct-2004	21-Oct-2005	13-Oct-2006	3-Oct-2007	17-Oct-2008	28-Oct-2009	19-Oct-2010	12-Oct-2011	16-Oct-2012	8-Oct-2013	15-Oct-2014	14-Oct-2015	5-Oct-2016	20-Oct-2017	16-Oct-2018	29-Oct-2019
Chem. O_2 Demand	mg/L	40	50	50	60	70	70	70	50	60	45	56	65	62	80.7	49.6	56	61	65	49	54	81	77	61	79
Ammonia-N	mg/L	<0.05	0.06	<0.05	0.14	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	0.06	<0.050	<0.050	0.056	<0.05	0.139	0.618	0.67	<0.050	0.824
Total Kjeldahl Nitrogen	mg/L	0.9	0.9	1.5	1.6	1.9	2.8	1.5	1.6	1.3	1.6	1.7	1.8	2	2.99	1.5	1.32	1.74	2.29	1.54	1.51	3.93	2.06	1.73	3.35
Total Organic Carbon	mg/L	17	18	21	17	22	24	26	28	18	19	22	25	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												20	27.8	18.7	22	21.5	20.2	17.9	20.0	20.9	77	21.5	25.3
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0018	0.0052
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.0010	0.0018	0.004	0.0046	0.0052
Antimony	mg/L	<0.0004	<0.0002	0.0005	<0.0004	<0.0004	0.0005	<0.0004	0.0009	0.0011	0.0006	0.0012	0.0015	<0.0004	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00013	<0.00010	0.00013	0.00016	0.00013
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.00218	0.00283
Barium	mg/L	0.086	0.179	0.112	0.17	0.118	0.087	0.06	0.128	0.096	0.095	0.132	0.136	0.116	0.189	0.134	0.134	0.107	0.115	0.103	0.119	0.104	0.0911	0.104	0.0997
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0.039	0.04	0.023	0.033	0.028
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.000050	0.000661	<0.000050	<0.0010	<0.000050	<0.00005	<0.0000050	<0.0000050	<0.0000050	0.0000237	0.0000063
Chromium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	<0.00010	<0.00010	0.00013	0.00012
Cobalt	mg/L	<0.002	0.002	0.023	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00025	0.00012	0.0004	0.00053	0.00031
Copper	mg/L	0.002	<0.001	0.007	0.001	0.003	0.002	0.003	0.002	<0.001	0.001	<0.001	<0.001	<0.001	<0.0010	0.0033	<0.0010	<0.0010	<0.0010	<0.001	0.00022	0.00027	0.00037	0.00027	0.00026
Iron	mg/L	<0.005	0.771	1.490	0.065	0.765	0.748	0.308	0.818	0.983	1.29	0.927	1.96	0.057	0.095	0.416	0.152	0.013	0.444	0.047	<0.010	0.878	0.526	0.185	0.815
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000050	<0.000050	0.000111	0.000067	0.000071
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0237	0.0178
Manganese	mg/L													<0.001	0.0306	0.003	<0.0020	<0.0020	<0.0020	<0.002	0.00053	0.00173	0.104	0.0629	0.00851
Mercury	mg/L	0.0002	0.0006	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.0015	0.000584	0.00068	0.00061	0.00039
Nickel	mg/L	<0.002	0.002	0.013	0.007	0.007	<0.002	0.004	0.005	<0.002	0.002	0.005	0.005	0.005	0.0093	0.0045	0.0032	0.0031	0.0030	0.0031	0.00341	0.00267	0.00373	0.00305	0.00293
Selenium	mg/L	Not required under previous permit												<0.0004	<0.00040	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000186	0.000212	0.00019	0.00018	0.000188
Silver	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00010	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	0.000024	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L													<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00030	<0.00030	0.00074	0.00053	0.00095
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.000372	0.000199
Vanadium	mg/L													<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00050	<0.00050	0.00059	0.00071	0.00095
Zinc	mg/L	0.005	0.022	0.135	0.021	0.028	0.038	0.007	0.003	0.044	0.007	0.004	0.01	0.003	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0073	<0.0010	<0.0010	0.0027	<0.0010	<0.0010
Routine Water																									
Ion Balance	%	99	106	104	101	99.5	101	103	103	98.5	105	109	98.7	97.5	96.3	97.6	105	93.9	107	103	102	109	91.1	108	106
Bicarbonate	mg/L	262	273	273	307	272	286	173	293	310	277	299	315	323	340	303	319	295	266	245	255	227	294	269	277
Chloride	mg/L	15.4	15.1	9.3	17.0	15.0	19.0	21	14	13	10	12	13	17	15.8	12.4	12.7	23.4	14.4	13.7	15.6	19.8	38.5	37.6	43.9
Carbonate	mg/L	<5	<5	<5	<5	<5	<5	56	<5	<5	<5	<5	<5	<5	<5.0	<5.0	5.4	6.5	6.3	7.6	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (EC)	uS/cm	514	557	511	591	479	523	514	482	518	501	529	542	552	567	538	567	515	484	465	490	431	634	569	574
Calcium	mg/L	27.3	34.5	36.2	34.1	34.2	26.7	11.7	34.6	32.2	37.6	38.3	41.2	38.3	34.9	34	40.3	23.7	29.8	32	31.6	32.7	39.1	35.2	43.6
Potassium	mg/L	11.5	11.5	11.2	13.3	12.2	13	15.2	14.5	14.4	12.9	14.2	13.8	14.4	16.6	15.6	17.1	15.7	15.4	14.3	16.7	13.6	15.8	17.8	14.8
Magnesium	mg/L	11.2	14.4	13.7	14.7	12.1	13.6	14.7	14.1	12.8	13.4	15.2	14.1	14.3	15.5	13.7	15.8	15.2	14.5	11.9	12.3	12.5	15.8	16.3	15.8
Sodium	mg/L	60	70	65	72	56	56	85	56	51	50	57	52	56	62.2	51.3	61.3	61.9	56.8	46.5	44.4	43.4	61.8	66.1	57.3
Sulfate	mg/L	26	46.9	51.7	39.9	19.3	21	16	16.5	8.9	15.4	14	18.1	13	17.7	13.3	17	8.42	9.93	7.76	10.3	12.4	40	23.8	12.1
Phosphorus	mg/L	Not required under previous permit												-	<0.050	0.072	0.112	0.070 *	0.064	0.088	0.050	0.396	0.27	0.106	0.463
pH in H_20	pH	8.1	8.0	7.7	8.0	7.5	8.1	9.5	8.2	8.2	8.2	8.3	8.2	8.3	8.2	8.38	8.38	8.49	8.44	8.55	8.37	8.04	8.15	8.19	8.13
TDS (Calculated)	mg/L	280	327	322	342	278	300	301	294	290	281	300	308	316	330	294	327	300	278	254	260	246	366	329	324
Nitrate	mg/L	Not required under previous permit												<0.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.020	<0.020	<0.020	<0.020	0.037
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.022	0.037
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	155	174
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	220	227
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.101	0.199
Field Data																									
pH in H_20	pH	Not required under previous permit												8.39	8.4	8.33	7.63	8.36	8.6	7.99	8.10	8.1	8.3	10.3	9.26
Conductivity (EC)	uS/cm													642	450	960	1172	512	503	474	510	4.53	689	600	714

Table D.21: Chemical Analytical Results

Sample ID:		Winsnes D.3																						
Site Number:		21																						
Date Sampled:	**Units**	**16-Oct-1996**	**7-Oct-1997**	**9-Oct-1998**	**19-Oct-1999**	**10-Oct-2000**	**4-Oct-2001**	**9-Oct-2002**	**16-Oct-2003**	**15-Oct-2004**	**20-Oct-2005**	**13-Oct-2006**	**3-Oct-2007**	**17-Oct-2008**	**28-Oct-2009**	**18-Oct-2010**	**12-Oct-2011**	**16-Oct-2012**	**8-Oct-2013**	**15-Oct-2014**	**14-Oct-2015**	**5-Oct-2016**	**20-Oct-2017**	**16-Oct-2018**	**29-Oct-2019**
Chem. O_2 Demand	mg/L	60	80	160	110	110	260	Empty	90	110	54	85	64	106	251	97	96	128	116	108	108	81	97	112	93
Ammonia-N	mg/L	0.06	<0.05	1.45	0.3	<0.05	2.78		<0.05	<0.05	<0.05	0.15	1.47	0.34	1.02	0.083	<0.050	0.225	<0.050	<0.05	0.639	<0.05	0.059	0.090	<0.050
Total Kjeldahl Nitrogen	mg/L	5.5	3.2	10.5	5.2	4	15.8		2.9	3.4	1.7	3.1	3.8	4.1	13.8	4.71	3.08	4.2	4.03	3.81	5.34	2.92	3.91	4.39	2.75
Total Organic Carbon	mg/L	26	32	44	28	39	71		49	38	20	29	29	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit							Not required under previous permit					33	82.1	36.9	31	39	33.1	32.1	37.9	26.8	97	32.4	29.5
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0018	0.0093
BTEX, F1 (C6-C10) and F2(>C10-C16)																									
Benzene	mg/L	Not required under previous permit						Empty	Not required under previous permit					<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit						Empty	Not required under previous permit					<0.01	0.034	<0.010	<0.010	<0.010	<0.010	<0.01	0.0405	0.002	0.003	0.0177	0.0071
Antimony	mg/L	0.0008	<0.0002	0.0014	<0.0004	0.001	0.001		0.0017	0.0013	0.0014	0.0013	0.001	0.0008	<0.0016	<0.00040	<0.00040	<0.00080	0.00044	0.00054	0.00093	0.00031	0.00044	0.00061	0.00024
Arsenic	mg/L	Not required under previous permit							Not required under previous permit					-	-	-	-	-	-	-	-	-	-	0.00898	0.00575
Barium	mg/L	0.109	0.011	0.155	0.159	0.105	0.175		0.006	0.008	0.013	0.12	0.094	0.091	0.109	0.103	0.0553	0.111	0.101	0.0732	0.134	0.101	0.107	0.114	0.0766
Beryllium	mg/L	Not required under previous permit							Not required under previous permit					<0.001	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00020	<0.00010	<0.00010
Boron	mg/L													<0.05	<0.050	<0.050	0.067	0.077	0.073	0.079	0.077	0.094	<0.020	0.021	0.05
Cadmium	mg/L	<0.001	0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.00020	<0.00050	<0.000050	<0.0010	<0.000050	<0.00005	0.0000074	<0.0000050	<0.00010	0.0000199	<0.0000050
Chromium	mg/L	0.008	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	<0.00010	<0.00020	0.00014	<0.00010
Cobalt	mg/L	0.003	0.003	0.022	<0.002	0.002	0.003		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00156	0.00053	0.00124	0.00158	0.00056
Copper	mg/L	0.006	<0.001	0.008	0.001	0.006	0.01		0.005	0.002	<0.001	<0.001	<0.001	0.001	<0.0024	0.0031	<0.0010	0.0016	<0.0010	0.0012	0.00236	0.00132	0.00141	0.00202	0.00071
Iron	mg/L	1.320	1.090	2.500	1.110	0.628	3.690		0.146	0.163	0.051	0.083	0.508	0.015	0.062	0.011	0.02	0.025	0.022	0.047	0.022	0.011	0.03	0.037	0.038
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.0001	<0.00040	<0.00010	<0.00010	<0.0050	<0.00010	0.0001	<0.000050	<0.000050	<0.00010	0.00006	<0.000050
Lithium	mg/L	Not required under previous permit							Not required under previous permit					-	-	-	-	-	-	-	-	-	-	0.0595	0.0419
Manganese	mg/L													0.003	0.0538	<0.0020	<0.0020	<0.0020	0.0593	0.0142	0.00143	0.00076	0.0129	0.00528	0.00437
Mercury	mg/L	0.0003	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.0074	0.00303	0.00251	0.00298	0.000719
Nickel	mg/L	0.007	<0.002	0.027	0.008	0.014	0.008		0.007	<0.002	<0.002	0.004	0.004	0.006	0.0063	0.0058	0.0043	0.0074	0.0041	0.0053	0.0117	0.00722	0.0057	0.0072	0.00398
Selenium	mg/L	Not required under previous permit							Not required under previous permit					0.0014	0.003	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000359	0.000239	0.00027	0.000366	0.000201
Silver	mg/L													<0.0001	<0.00040	0.00032	<0.00010	<0.0050	<0.00010	<0.0001	0.00001	<0.000010	<0.000020	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00020	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000020	0.000017	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	<0.00020	<0.00010	<0.00010
Titanium	mg/L													0.003	<0.0012	<0.0010	<0.0010	0.0012	<0.0010	0.002	0.00198	<0.00030	0.00132	0.00333	0.00134
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.00437	0.0021
Vanadium	mg/L													0.006	0.007	0.002	0.0025	0.0098	0.0019	0.0052	0.00154	0.0016	0.0048	0.00433	0.0018
Zinc	mg/L	0.016	0.022	0.049	0.004	0.063	0.047		0.009	0.06	0.006	0.003	0.017	0.016	0.006	<0.0020	<0.0020	<0.0020	<0.0020	0.0053	<0.0010	0.0014	<0.0020	<0.0010	<0.0010
Routine Water																									
Ion Balance	%	109	109	109	97	107	92.2	Empty	107	103	104	103	101	96.5	106	107	101	97.4	107	106	97.5	105	98.9	105	106
Bicarbonate	mg/L	219	285	336	357	428	623		72	693	381	450	455	352	386	353	446	419	375	292	375	396	504	429	435
Chloride	mg/L	81.9	112.0	156.0	158.0	152.0	248.0		318	294	76	101	133	213	266	270	156	222	209	224	216	238	357	304	244
Carbonate	mg/L	55	15	<5	7	34	<5		114	14	15	28	<5	69	70.5	30	21.1	48.3	38.8	59.6	9.3	<5.0	10.9	<5.0	<5.0
Conductivity (EC)	uS/cm	793	886	992	1210	1310	1640		2950	2620	832	1140	1180	1380	1620	1880	1350	1530	1410	1400	1500	1420	2020	1710	1580
Calcium	mg/L	19.8	32.4	27.9	34	29.1	26.6		57.6	105	46.6	45.4	50.4	39.9	36.7	54.4	54.1	39.3	38.2	29.7	29.8	52.4	52.3	46.7	69.8
Potassium	mg/L	20.6	22.4	22.5	24.5	25.8	26.4		67.3	73	26.1	32.2	25.6	23.3	33.1	38.6	28.8	30.4	28.1	26.1	28.5	27.8	30.3	28.5	22.6
Magnesium	mg/L	18.9	19.3	22.8	28.2	24.6	27.1		158	133.0	34.6	43.9	35.4	32.9	38.7	52.6	37	38	41.6	35.6	30.7	41.4	54.1	45.7	47.4
Sodium	mg/L	136	133	196	175	232	267		506	376	106	142	137	207	288	288	170	224	219	221	193	195	281	254	210
Sulfate	mg/L	26.9	21.6	67	102	51.3	17		1100	638	57.7	67.0	39.5	36.8	61.2	232	60.5	62.9	59.3	37.2	45.9	62.2	73.9	67.1	104
Phosphorus	mg/L	Not required under previous permit							Not required under previous permit					-	1.47	0.613	1.24	1.12	0.685	0.707	0.479	0.287	0.641	0.654	0.755
pH in H_20	pH	9.4	8.8	8.3	8.5	8.8	7.9		10	8.4	8.6	8.5	8.4	9.1	9.06	8.78	8.53	8.97	8.88	9.25	8.47	8.29	8.43	8.30	8.22
TDS (Calculated)	mg/L	466	496	658	705	764	922		2360	1970	550	681	650	795	984	1140	747	871	818	777	738	812	1110	960	912
Nitrate	mg/L	Not required under previous permit							Not required under previous permit					<0.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.040	<0.020	<0.10	<0.020	<0.020
Nitrite	mg/L													-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.02	<0.020	<0.010	<0.050	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.022	<0.022
Hardness as $CaCO_3$	mg/L													-	-	-	-	-	-	-	-	-	-	305	369
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	356	357
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.188	0.184
Field Data																									
pH in H_20	pH	Not required under previous permit												9.08	8.55	9.1	9.23	9.28	9.4	9.65	8.60	8.60	9.10	10.7	9.22
Conductivity (EC)	uS/cm													1356	1050	2160	1780	1541	1439	1393	1530	1476	2100	1198	1960

Table D.22: Chemical Analytical Results

Sample ID:		Winsnes D.4																						
Site Number:		22																						
Date Sampled:	**Units**	**16-Oct-1996**	**7-Oct-1997**	**9-Oct-1998**	**19-Oct-1999**	**10-Oct-2000**	**4-Oct-2001**	**9-Oct-2002**	**16-Oct-2003**	**15-Oct-2004**	**20-Oct-2005**	**13-Oct-2006**	**3-Oct-2007**	**17-Oct-2008**	**28-Oct-2009**	**18-Oct-2010**	**12-Oct-2011**	**16-Oct-2012**	**8-Oct-2013**	**15-Oct-2014**	**14-Oct-2015**	**5-Oct-2016**	**20-Oct-2017**	**16-Oct-2018**	**29-Oct-2019**
Chem. O_2 Demand	mg/L	70	70	100	90	130	150	180	140	150	83	97	86	95	138	88.6	115	116	78	102	96	70	112	101	535
Ammonia-N	mg/L	0.06	<0.05	1.58	<0.05	<0.05	0.52	<0.05	<0.05	0.75	<0.05	<0.05	0.06	3.11	0.917	0.399	<0.050	0.052	<0.050	<0.05	0.070	<0.050	0.120	0.055	0.075
Total Kjeldahl Nitrogen	mg/L	4.5	3	5.5	3.4	3.7	8.2	5.4	5.9	9.3	2.9	2.9	2.6	6.1	8.08	3.47	3.95	4.36	2.65	3.27	2.48	2.33	3.4	3.57	17.0
Total Organic Carbon	mg/L	29	25	34	28	46	61	68	59	55	32	33	33	-	-	-	-		-		-	-	-	-	-
Dissolved Organic Carbon	mg/L	Not required under previous permit												32	47	34.8	32	38.9	32.3	30.4	33.2	25.3	112	34.2	31.2
Phenols	mg/L													-	-	-	-	-	-	-	-	-	-	0.0012	0.0067
BTEX, F1 (C6-C10) and F2 (>C10-C16)																									
Benzene	mg/L	Not required under previous permit												<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L													<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (m & p)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylene (o)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
Xylenes	mg/L													<0.0005	<0.00050	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
Styrene	mg/L													-	-	-	-	-	-	-	-	-	-	<0.0005	<0.00050
F1 (C_6-C_{10})	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F1 (C_6-C_{10}) - BTEX	mg/L													<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
F2 - (C_{10}-C_{16})	mg/L													<0.05	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.10	<0.13	<0.10	<0.10	<0.10
Dissolved Metals																									
Aluminium	mg/L	Not required under previous permit												0.02	0.062	<0.010	<0.010	<0.010	<0.010	<0.01	<0.0010	0.0017	0.0114	0.0455	0.0165
Antimony	mg/L	<0.0004	<0.0004	0.0009	<0.0004	0.0006	0.0009	<0.0004	0.0015	0.0015	0.0016	0.0016	0.0022	<0.0004	<0.0016	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.00033	0.00017	0.00026	0.00029	0.00019
Arsenic	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.00555	0.0057
Barium	mg/L	0.058	0.044	0.063	0.083	0.058	0.052	<0.003	0.089	0.061	0.01	0.022	0.014	0.084	0.0693	0.0728	0.0302	0.0782	0.129	0.0722	0.115	0.0559	0.0462	0.0659	0.0437
Beryllium	mg/L	Not required under previous permit												<0.001	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	0.041	0.041	0.036	0.031	0.033
Cadmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.00020	<0.000050	<0.000050	<0.0010	<0.000050	<0.00005	<0.0000050	<0.0000050	<0.0000050	0.0000172	<0.0000050
Chromium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.00010	<0.00010	<0.00010	0.00012	0.00014
Cobalt	mg/L	<0.002	0.005	0.019	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	0.00056	0.00027	0.00085	0.00099	0.00101
Copper	mg/L	0.002	<0.001	0.007	0.002	0.007	0.009	<0.001	0.006	0.003	<0.001	<0.001	<0.001	<0.001	<0.0024	0.0038	<0.0010	<0.0010	<0.0010	<0.001	0.00043	0.00052	0.0008	0.00118	0.00101
Iron	mg/L	0.612	0.807	1.140	1.810	0.373	0.639	0.065	3.48	0.815	0.3	0.602	0.581	0.041	0.053	0.033	0.018	0.06	<0.010	0.027	0.011	0.021	0.088	0.130	0.898
Lead	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0001	<0.00040	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000050	<0.000050	0.000068	0.00012	0.000139
Lithium	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	0.0158	0.013
Manganese	mg/L													0.404	0.0068	0.0143	0.0326	0.0046	<0.0020	0.003	0.00099	0.00054	0.0158	0.0104	0.410
Mercury	mg/L	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	0.00373	0.00197	0.00135	0.00183	0.000865
Nickel	mg/L	0.002	0.003	0.018	0.006	0.015	<0.002	<0.002	0.011	0.006	0.002	0.005	0.003	0.006	0.0051	0.0051	0.0029	0.004	0.0058	0.0049	0.00578	0.00391	0.00359	0.00364	0.00233
Selenium	mg/L	Not required under previous permit												0.0011	0.0021	<0.00040	<0.00040	<0.00080	<0.00040	<0.0004	0.000293	0.000227	0.000222	0.000252	0.000201
Silver	mg/L													<0.0001	<0.00040	<0.00010	<0.00010	<0.0050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	mg/L													<0.0001	<0.00020	<0.00010	<0.00010	<0.050	<0.00010	<0.0001	<0.000010	<0.000010	<0.000010	0.000017	<0.000010
Tin	mg/L													<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.05	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L													0.001	<0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00030	<0.00030	0.00067	0.00854	0.00139
Uranium	mg/L													-	-	-	-	-	-	-	-	-	-	0.00247	0.000959
Vanadium	mg/L													0.003	0.0049	0.0011	<0.0010	0.0026	<0.0010	<0.001	<0.00050	<0.00050	0.00144	0.00229	0.0018
Zinc	mg/L	0.11	0.016	0.05	0.015	0.246	0.045	0.007	0.014	0.243	0.003	0.005	0.012	0.004	<0.0040	<0.0020	<0.0020	<0.0020	<0.0020	0.0086	<0.0010	0.001	0.0015	<0.0010	0.0012
Routine Water																									
Ion Balance	%	109	107	103	105	109	92	102	104	102	101	103	99.6	95.6	105	104	96.5	98.1	110	107	100	107	101	110	107
Bicarbonate	mg/L	253	287	284	223	591	526	536	387	509	347	336	322	384	288	313	341	311	300	261	248	216	350	290	264
Chloride	mg/L	135.0	105.0	183.0	181.0	134.0	189.0	235	200	207	98	101	83	146	156	242	173	241	240	246	204	170	238	222	246
Carbonate	mg/L	17	41	<5	16	<5	64	124	90	47	<5	13	<5	<5	38.2	11.9	<5.0	14.4	8.8	8.3	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (EC)	uS/cm	884	934	1000	1050	1490	1660	1990	1520	1550	773	905	787	1050	1070	1350	1130	1310	1280	1270	1190	889	1330	1190	1230
Calcium	mg/L	28.1	34	34	29.9	32.4	22.2	25.7	34.2	26.4	21.9	20.5	25.5	28.9	25.8	31.5	29.8	27.2	34.1	27.9	29.4	27.9	40.2	37.5	45.1
Potassium	mg/L	24.4	19.7	25.6	22.8	26	24.6	27.7	29.9	27.7	18.8	24.1	21.2	23.1	25.7	29.7	25.8	28.1	30.6	28.1	25.9	22.9	32.3	32.8	26
Magnesium	mg/L	16.8	26.9	21.3	18.8	23.3	20.0	<0.1	19.2	19.5	13.0	15.9	16.5	18.1	16.9	24.7	20.7	22	24.6	22.3	18.4	18.5	29	26.7	29.2
Sodium	mg/L	141	138	168	169	299	299	2	320	304	138	145	107	153	184	210	149	197	209	198	150	129	182	177	173
Sulfate	mg/L	13.7	36.3	60.5	54.7	105	96	84.6	111	41.9	6	9.4	11.9	22.2	21.3	31.1	11.3	15.7	16.5	11.5	15.3	9.21	24.2	20.6	37.4
Phosphorus	mg/L	Not required under previous permit												-	0.849	0.269	0.594	0.539	0.083	0.264	0.156	0.111	0.312	0.283	2.55
pH in H_20	pH	8.9	9.2	8.1	8.8	8.2	9.0	9.3	9.4	8.9	8.4	8.4	8.4	8.3	8.96	8.57	8.38	8.74	8.50	8.57	8.28	8.05	8.15	8.25	7.99
TDS (Calculated)	mg/L	501	541	633	602	907	977	1200	995	924	468	494	428	582	610	735	580	698	711	671	566	484	718	660	687
Nitrate	mg/L	Not required under previous permit												<0.1	<0.050	0.111	<0.050	<0.050	<0.050	<0.05	<0.040	<0.020	<0.020	<0.020	<0.020
Nitrite	mg/L													-	<0.050	0.052	<0.050	<0.050	<0.050	<0.02	<0.020	<0.010	<0.010	<0.010	<0.010
Nitrate and Nitrite (as N)	mg/L													-	-	-	-	-	-	-	-	-	-	<0.022	<0.022
Hardness as $CaCO_3$	mg/L	Not required under previous permit												-	-	-	-	-	-	-	-	-	-	204	233
Alkalinity (total as $CaCO_3$)	mg/L													-	-	-	-	-	-	-	-	-	-	238	217
Hydroxide	mg/L													-	-	-	-	-	-	-	-	-	-	<5	<5.0
Fluoride	mg/L													-	-	-	-	-	-	-	-	-	-	0.113	0.028
Field Data																									
pH in H_20	pH	Not required under previous permit												8.63	8.41	9.48	9.5	9.27	8.8	8.56	8.44	8.9	9.1	10.5	9.67
Conductivity (EC)	uS/cm													1086	750	2020	1220	1309	1313	1268	1208	862	1429	1274	1545

APPENDIX E

SITE PHOTOGRAPHS

Photo 1: Dugout 12, a typical dugout in the sampling program. Taken October 18, 2022.

Photo 2: Dugout 21, a typical dugout in the sampling program. Taken October 19, 2022.

APPENDIX L

Summary of Revisions

to the

Landfill Operations Plan

CLEAN HARBORS
LANDFILL OPERATIONS PLAN
AND
RYLEY HWRSP FACILITY PLAN

CLEAN HARBORS CANADA, INC.
RYLEY FACILITY
LANDFILL OPERATIONS PLAN

Clean Harbors Ryley Facility manages its Landfill operations through various SOP's which can be found electronically or in the Facility's SOP binder. The following sections summarize some of the relevant SOP's.

A. Operating Record SOP

The landfill Operating Record shall contain:

(i) a copy of the facility's Operating Approval or Registration number;
(ii) as-built records for each constructed landfill cell showing the location and development of excavations, fill areas, final grades and structural components;
(iii) annual topographic survey records and plans showing the areas where waste has been disposed in the previous year of operation;
(iv) the most recent version of the design and operating plan for the landfill;
(v) records of handling of any wastes accepted at the landfill including the amounts accepted and the disposed locations within the landfill;
(vi) all Annual Reports for the landfill as described in Section 7.5 in the Standards for Landfills in Alberta Guide;
(vii) nuisance records;
(viii) The Final Landfill Closure Report as described in section 7.6 in the Standards for Landfills in Alberta Guide;
(ix) All Post-Closure Annual Reports for the landfill as described in section 7.7 of the Standards for Landfills in Alberta Guide;
(x) The name and contact information of all persons who discover ant contravention;
(xi) The names and contact information of all persons who take any remedial actions arising from the contravention of the Act, the regulations, or the approval;
(xii) A description of the remedial measures taken in respect of a contravention of the Act, the regulations or the approval;

The Landfill Operating Record has many components and is a compilation of many separate documents. All required components are stored electronically, hard copy or both at the facility and are available for review at any time as requested. Clean Harbors operates an electronic waste tracking and recording system called WINWEB. Almost every aspect of the business is tracked, recorded or tied to the WINWEB system in some way or another. This computer program tracks and records not only all the waste that is accepted at the facility but many other items as well such as contraventions and incidents. This system also holds scanned images of all shipping and receiving documents of all the waste accepted and shipped from the facility. It provides cradle to grave tracking along with Certificates of Disposal as requested.

B. Waste Control, run-on and run-off controls and nuisance controls SOP

1. Waste Control

Clean Harbors Canada, Inc. Ryley Facility can accept all categories of waste except those listed in section 4.6.1 of Approval 10348-0-00. The secure landfill can receive solid non-hazardous and hazardous wastes that meet the criteria outlined in Section 13(2) of the *Alberta Waste Control Regulations* and *The Alberta User Guide for Waste Managers*. The regulatory and facility specific criteria are summarized as follows:

RYLEY LANDFILL ACCEPTANCE CRITERIA
(APPROVAL 10348-03-00)

1. Waste must have no Free Liquids as defined by the Paint Filter Test (SW 846 - 9095).

2. Waste must have a Flash Point greater than 40°C. Waste streams with a flash point less than 40°C may be accepted. All wastes will be evaluated on a case-by-case basis.

3. Waste must contain less than 1000 mg/kg of halogenated organic compounds as determined using the TCLP extract.

4. Waste must have a pH greater than 2 (pH of 1:1 solid: deionized water mixture).

5. TCLP Extract of the waste must contain the following metals at less than the concentrations shown:

a) Arsenic	500 mg/L	g) nickel	500 mg/L
b) Beryllium	100 mg/L	h) selenium	200 mg/L
c) Cadmium	100 mg/L	i) silver	100 mg/L
d) Chromium (Cr+6)	500 mg/L	j) thallium	200 mg/L
e) Lead	500/mg/L	k) uranium	100 mg/L
f) Mercury	20 mg/L		

6. Solids must contain less than 1000 mg/kg each of benzene, ethyl benzene, methyl ethyl ketone, nitrobenzene, pyridine, toluene, or xylene in TCLP extract.

7. Solids contaminated with acetone, n-butyl alcohol, cyclohexanone, ethyl acetate, ethyl ether, isobutanol, and 2-nitropropane can be landfilled when these solvents are present at levels greater than 1000 mg/kg in TCLP extract only if the waste is non-flammable.

8. Solids contaminated with cresols, or cresylic acid can be landfilled when these solvents are present at levels greater than 1000 mg/kg in TCLP extract only if the waste is non-toxic.

9. Solids contaminated with carbon disulfide or methanol can be landfilled if they are present at levels greater than 1000 mg/kg in TCLP extract only if the waste is non-flammable or non-toxic.

10. Waste must contain less than 50 mg/kg PCBs.

OPERATIONAL CRITERIA

1. Wastes reacting with water to give a temperature rise >15°C- accepted case by case
2. Resistance to penetration must be >3 psi, < 3 psi should go into solidification pit
3. Total cyanide must be <590 mg/kg, Reactive cyanide must be <250 mg/kg
4. Elemental Sulfur concentration must be less than 500 mg/kg
5. Waste must be non-odourous

Waste control is also talked about in section **D**.

2. Surface Water Run-On and Run-Off Control

Water management inside and outside the landfill is important to minimize cost and operational impacts to the landfill operation. The Ryley landfills are built above the surface elevation of the surrounding area and therefore the landfills themselves are not subject to surface run-on problems. The facility itself is built up above the surrounding area to the north and water does not flow on to the site from that direction. Water moving from west to east is directed around the operational areas by means of a drainage ditch that conveys the water to the area southeast of the landfill cells from where it is pumped to follow the natural eastward drainage pattern in the vicinity.

Surface run-off from the roadways, the paved plant site area and areas south of the landfills is collected in a surface water detention pond B, which has two collection ditches flowing into it from the north and from the south. Surface run-off from the lugger pad, container lay-down area and bone yard is collected in surface detention pond A. Water from the detention ponds are sampled, tested and then compared to the discharge criteria in Table 4.3-B of the Operating Approval 10348-03-00. If the analytical results meet the discharge criteria, discharge can commence. In the event that the analytical data does not meet the surface discharge criteria, the Operations Manager and laboratory personnel will evaluate the feasibility of treating the water to achieve the discharge criteria, sending the water for deep-well disposal or other alternative disposal options.

Run-off collected in the landfill or leachate is collected via the leachate collection systems and disposed in Class 1a deepwell. It is important to maintain perimeter

trenches for landfill run-off collection that are deep enough to collect the water that may accumulate from severe or prolonged rainfall events.

3 Nuisance Management

The following sections are summaries of the more detailed procedures described in Appendix C "Fugitive Dust and Odour Best Management Plan."

a) Litter

Litter will be controlled by the use of cover and compaction and by avoiding the dumping dispersible materials on windy days.
Litter that accumulates on the landfill site and/or adjacent properties will be retrieved.

b) Dust

Water will be applied frequently to control dust. Dispersible hazardous wastes will not be landfilled when wind speeds exceed 30 kilometres per hour. The usual source of water for dust control is the surface water detention pond. Other possible sources identified in the Operating Approval include sump waste from car wash bays, waste from hydro-vac operations, leachate and leak detection liquids. Leachate and leak detection liquids are not generally applied since leachate from older cells typically has odour issues.

c) Odour

Highly odorous wastes such as mercaptan or sulphur-treating wastes will **not** be accepted for disposal at the facility. Cover material will be used to control odours from the waste. Odour suppressant chemicals and fans to disperse these chemicals may be used as an additional means of controlling odours.

Should an odour complaint be received at the facility, the name of the caller, date and time of the complaint and contact information of the caller will be recorded on the form included as part of Appendix C Fugitive Dust and Odour Best Management Plan. The nature of the complaint and the address or location that the complaint originates from will be recorded. The Operations or Facility Manager will be notified, and the complaint will be investigated by sending someone to the area as necessary. The weather conditions, wind speed and direction at the time of the complaint will be recorded. The caller will be contacted by the Operations or Facility Manager to inform them of remedial action taken. The date and time of the return contact will be recorded.

C. Waste Processed Through the Solidification/Stabilization Pit SOP

Waste streams containing free liquids or that have little structural integrity (ie.: greases, bio-treater solids) are processed in the solidification/stabilization pit. In the case of bulk loads, they are dumped into the pit using the grating and for containerized waste the containers are placed or emptied into the pit for handling. These wastes are mixed with peat moss, wood chips and/or dry waste streams to absorb free liquids and or provide some solid content to render them suitable for landfill disposal as per the Waste Control Regulation. The waste streams being processed will be mixed with an excess of the reagent to ensure that all free liquid is bound with the reagent before the material is placed in the landfill.

The Operating Approval allows the facility to process waste streams to remove, reduce or alter a hazardous characteristic, such as pH and self-heating. When these operations are undertaken, it is required that the treatment recipe be documented and that the treated mixture be tested to determine the effectiveness of the treatment before the waste is taken to the landfill face for final disposal. In the event that the waste does not meet the landfill criteria, the waste shall be taken back to the treatment area and reprocessed until the criteria are met or the waste shall be repackaged and sent for disposal in an approved facility. Most stabilized materials need to be allowed to stand in luggers or other containers for several days so the concrete can cure before testing and landfill disposal if approved.

D. Waste Acceptance, handling and disposal of wastes SOP

The following section includes procedures for;

(i) Waste characterization and classification at source
(ii) Waste manifest & tracking
(iii) QA/QC waste acceptance procedures
(iv) Waste sampling

Each waste stream to be accepted at the Ryley facility must be subjected to a pre-acceptance review prior to onsite receipt or disposal. The pre-acceptance review must include the collection of information about the waste stream from the generator and may include sample analysis. The purpose of the pre-acceptance review is to determine if the waste is acceptable for receipt at the Ryley facility. Each waste stream will have a waste profile completed prior to receipt of the waste at the facility.

Incoming shipments of waste arriving at the facility must be reviewed to determine acceptability for disposal. As part of this review, shipments must be subjected to visual inspection. This is particularly important for wastes that are not sampled. The visual inspection should be used to ensure that facilities manage only acceptable wastes. Waste must be deemed acceptable prior to

disposal at the facility. Visual inspection must verify that each waste conforms to the information on the profile and shipping documentation.

The number and type of containers in the shipment must be consistent with the information on the manifest. The physical state, absence of free liquids, and color of the waste must also be consistent with the documentation. Each container should be checked for proper and accurate safety marks and checked against the documentation including the manifest.

All incoming bulk loads in luggers, roll-offs, or dump units should be visually inspected to ensure consistency with the documentation. The material should specifically be examined for foreign matter and free liquids. Any discrepancies shall be reported to management.

Sampling of incoming loads should be conducted to verify that the characteristics of the shipment are as expected according to the pre-acceptance review information and the information on the shipment's accompanying documentation. Additional testing may be required because of a discrepancy between containers and their documentation or safety marks. Sampling procedures should be determined based on both the nature of the material and the type of containment. Landfill solids may be checked for pH, BTEX, metals, delta T and flash point.

Appropriate documentation must accompany all samples throughout the analysis process. Waste Profile code or identification should accompany the load for acceptance verification. Receiving personnel will complete the following information prior forwarding samples to the lab:

- Sample information including work order number and date;
- Generator information including name;
- Waste description including waste name, specified information on physical state; and
- Container identification, including container number and any other information to identify the container.

The laboratory should complete the information on the Quality Assurance form (paper or electronic) pertaining to the laboratory analysis and coding; no waste processing should commence prior to completion of this information. The lab must sign in with the receipt date and sign out with approval, code and date.

Facility approval beyond laboratory recommendation may be required for off-spec and non-routine wastes.

Wastes, such as asbestos and monolithic materials need not be sampled; visual inspection is sufficient. Acceptance of asbestos may be limited to certain times dependant on condition of the landfill due to weather events.

Samples from multiple containers may be composited only if they are from the same generator, have the same waste code, and are similar in physical appearance. If the composite sample is found to be “off-spec”, each container comprising the composite must be individually sampled.

On-going waste streams that have not exhibited variability can be off-loaded without sampling but should be re-evaluated annually to confirm their composition. In these cases, careful visual inspection will be sufficient to confirm acceptability.

If the wastes do not conform to the assigned profile and they cannot be accepted due to permit limitations, health and safety concerns, or operational limitations, the generator must be notified promptly of the rejection. The waste must be rejected back to the generator, rerouted or brokered to another disposal facility with the consent of the generator. **Waste that is not acceptable for landfill disposal and has been placed in the landfill MUST be removed within 7 days of receipt and reported to AEP in the monthly contravention report and included in the Annual Report on Landfill Operations.**

Other provincial governments may need to be notified of rejected waste shipments if they originated outside the province of Alberta.

Paperwork review and documentation of waste starts when the waste arrives at the site. The driver is directed to stop on the weigh scale and to bring his paperwork into the entry beside the scale office. The paperwork (bill of lading, manifest) is reviewed for completeness and to ensure that the waste is intended for the Clean Harbors’ facility. If the paperwork is determined to be in order, the truck is scaled in. The generator’s name, sales order number, manifest, bill of lading or receiving docket number is written on the scale ticket. Each scale ticket has a unique number that can be associated with a particular load and shipping document. The wind speed and direction is recorded on the shipment receipt log for loads being offloaded immediately. The receiving personnel radio the landfill operators to find out where the driver should proceed to offload. New drivers or drivers who have not been to the site in the past six months are given a brief safety orientation and shown a map of the site before they are sent back to the landfill. Following this they are directed to proceed to the unloading area. Visual inspections of the load may be performed by personnel in the scale area or by landfill personnel. Samples of waste may be taken at the sampling station or by the landfill operators. When the driver returns to the scale after unloading, the scale ticket is punched in to get the net weight of the waste disposed. This weight is entered on the driver’s paperwork and any discrepancies noted. Most shipping sites do not have scales and the shipping weights are usually estimates that can be out significantly.

Waste Manifesting and Tracking

Hazardous wastes and Dangerous Oilfield Wastes must be accompanied by a shipping document completed by the waste generator that includes proper shipping name of the waste, the UN shipping number and packing group as well as the quantity of waste being shipped for disposal. The transporter of these wastes must have a carrier number issued by Alberta Environment and Parks. The shipping document is to be signed by both the Generator (Part A) and the Carrier (Part B) of the waste before the load leaves the generator's facility. Copy 1 of the manifest is sent to AEP and the receiving jurisdiction if leaving Alberta. The Generator keeps Copy 2 for their records. The Carrier takes the remaining 4 copies with him to be given to the receiving facility.

Upon delivery of the waste to the Receiving facility, the receiving personnel review the shipping document. They will complete Section C of the manifest. One copy will be sent to Alberta Environment, the carrier will be given a copy of the completed manifest or shipping document for his records, copy will be retained by the receiving facility and a copy will be returned to the generator.

A copy of the manifest, the weigh ticket and the sales order will be given to the receiving coordinator. The coordinator will enter the sales order number into the Bulk Receiving Screen of the WINWEB system and then proceed to complete the entry of the manifest number and the weight into the system. The manifest will be scanned into the system as part of the electronic record of the load. The landfill location for the load is also entered into the system. Each load is assigned a unique tracking which is associated with the Sales Order and the manifest. Through the use of this tracking number the location or disposition of the waste can be found at any time.

Waste Sampling

Waste generators should submit a MSDS and/or analysis of the waste stream or a representative sample (when required) as part of the pre-acceptance review process. If no analytical information is available, the Ryley laboratory verifies the material profile by analyzing a representative sample and determining the appropriate disposal/processing method. The pre-acceptance review is repeated when the generator notifies the facility that the waste stream or process has changed. In the absence of a representative sample, Customer Service will make all reasonable efforts to obtain as much information about the waste as possible based on generating process, raw material input, generator knowledge and analysis.

Emergency situations may exempt the requirement to provide a sample to the facility.

Pre-acceptance samples should be taken by the generator or by trained Clean Harbors' personnel. The samples should be representative, exhibiting the average properties of the waste. Generator samplings should be done in consultation with the facility. Samples from generators must be placed in acceptable containers which are compatible with the waste and which meet TDGA requirements. Only samples in intact containers will be accepted for analysis. Samples must be labelled adequately to identify the generator and the waste. If it is a waste stream that has been previously processed, the waste profile or waste code should be included. Customer Service will submit the sample to the laboratory for analysis with the appropriate information. The Ryley laboratory will assign a laboratory sample log number to the sample(s) for laboratory sample tracking purposes.

Sample(s) will be analyzed as per the"Solid Waste Acceptance Criteria".

Wastes Requiring Special Handling

The Clean Harbors Ryley facility can receive materials that require special handling procedures. Those that are received on a routine basis are discussed here. These materials may have restricted acceptance dates.

Molecular Sieve and Catalyst Loads

Molecular sieves and catalysts are typically composed of activated alumina or other activated substrates. These materials can generate heat when exposed to moisture or air. Sometimes sufficient heat can be generated to boil off the water contacting the sieve or cause the material to smoulder. These materials have caused fires when in contact with ignitable materials. Molecular Sieves and catalyst wastes are required to be deactivated by the generator prior to receipt at the landfill. The following procedures must be followed when landfilling these materials:

- Spread a layer of the molecular sieve or catalyst on an inert portion of the landfill surface.
- Monitor any water reactivity and temperature rise.
- When any reaction has subsided and temperature is similar to surrounding area, move material to final placement area and cover thoroughly before end of the shift.

E. Detecting, preventing and disposal of unauthorized wastes SOP

These procedures are mentioned in sections **B** and **D** under the Waste Control and Acceptance Procedures.

F. Waste placement SOP

The wastes should be placed in the landfill in lifts of approximately 1 meter in depth. Each lift should be compacted as much as possible during placement depending upon the type and volume of the waste stream. This is done by making multiple passes over the waste with the compactor. The landfills are divided into imaginary grids. The grids are marked using a combination of letters and numbers that mark each grids height and its east/west and north/south location in the landfill. The markers are placed on the landfill berm around the outside two edges of the landfill having letters on one side and number on the other side. Each individual grid is 10 meters x 10 meters. For example, if a load is placed in L3B5R, it would be in landfill 3, in layer B from the bottom (2 meters) and in the grid section where 5 and R intersect.

Typically, the facility runs two operating faces simultaneously – one for debris waste streams and the other for soil and loose fill wastes. Each operating face is kept to as small an area as is practical. The facility receives a wide variety of waste types of varying compositions and consistencies. Operationally this means that the working face areas can vary depending upon the waste mix being received on any given day in order that the waste can be properly managed. Wastes with little structural integrity require a wider, shallower operating area than soil or debris waste streams. Each working face shall be identified to the scale office and clerical staff as well as landfill personnel using a grid system that enables the location of waste streams within the landfill.

Liner Protection

Prior to the disposal of waste in a landfill cell, a minimum of 18 inches (0.45 metre) of protective cover material will be placed over the primary synthetic liner at the base of the cell. This material will include 18 inches (0.45 metre) of thickness over the granular material typically used as part of the primary leachate collection system. A minimum of 18 inches (0.45 metre) of protective cover material will be placed on all landfill side slopes before waste is placed near the side slopes. As an additional measure to protect the liner, rigid debris such as pipe, pieces of wood and metal will not be placed in the bottom lift of the landfill or near the side slopes of the landfill cells.

G. Sulphur loads SOP

The facility may occasionally accept limited amounts of sulphur contaminated waste (Sulphur content >0.05% or >500 mg/kg). When Operations management approves receipt of a sulphur waste, the procedure from the *Guidelines for Landfill Disposal of Sulphur Waste and Remediation of Sulphur Containing Soils (Sept 2011)* will be followed when sulphur loads are received at the facility for disposal.

WARNING
SULPHUR MAY REACT IF MIXED WITH OTHER WASTE MATERIAL RESULTING IN A POSSIBLE VAPOR RELEASE OR FIRE. EXTREME CARE MUST BE USED TO SEGREGATE SULPHUR LOADS FROM OTHER MATERIAL.

- Before placing sulphur loads, a barrier of alkaline material, such as limestone, 60 cm deep will be placed on the base area and around the perimeter of the area (if alternate alkaline material is used the depth must be changed to account for the material's calcium carbonate equivalence – AltaSteel EAF dust at 1 metre thickness).
- The sulphur material will then be placed on the alkaline material.
- The sulphur material will be covered with alkaline material.
- Small quantities of sulfur may be blended with alkaline equivalent at the appropriate blend ratio as pre-determined by the Facility Manager or Lab Manager.

H. Bagged asbestos loads SOP

This procedure will be followed when bagged asbestos loads are received at the facility for disposal: Refer to "Guidelines for the Disposal of Asbestos Waste" AB Environment 1989.

- Position the load as close as possible to the work face.
- A landfill employee must supervise deposition of asbestos waste.
- Asbestos waste must be covered with at least 25 centimetres (10 inches) of non-asbestos containing material to prevent direct contact of equipment with the asbestos waste.
- Place cover material in front of and on top of the bags.
- Push the load up the work face, keeping soil between the bags and the dozer blade.

I. Surface spreading of leachate and leak detection liquid SOP

Although it has not been done in recent years, leachate and leak detection liquid (leachate) may be spread on the surface of the landfill cells for dust control and volume reduction through evaporation, if the leachate is not odourous. This option for handling leachate is usually only applicable to landfill cells early in their life. Older cells typically have a significant odour and are not suitable for surface spreading.

If a cell's leachate is suitable for surface spreading for dust control or for evaporation, the leachate may be transferred from the leachate storage tank to the tank truck used for spreading water for dust control. This truck will then slowly

spread the water over the surface of the landfill cells in a manner similar to that used by road construction crews when watering in clay road bases and gravel. It is important not to put so much water on the surface that the landfill surface becomes muddy.

The date, volume and source of leachate used for dust control must be recorded and reported as part of the facility's annual Landfill Operations Report to Alberta Environment and Water. Additionally, any air monitoring events that correspond to the dates that leachate was spread must be recorded and reported to Alberta Environment.

J. Lab Screening of Pyrophoric Wastes For Water Quenching SOP Combined

with **K** – See Appendix "B"

K. Water Quenching Treatment of Pyrophoric Wastes SOP

Combined with **J** – See Appendix "B"

L. Odour and fugitive dust response program

This is included in our Fugitive Dust and Odour Best Management Plan in Appendix "C"

M. Fugitive dust and odour best management plan

This is attached as Appendix "C"

N. Run-off & industrial wastewater monitoring and management program

Surface water from the facility is collected in two surface water detention ponds. Precipitation falling on the paved plant area, the landfill access roads and waste container storage areas is collected in the surface water holding ponds. This water must be sampled, analyzed by a commercial laboratory and the results compared to the facility's discharge criteria as specified in Table 4.3-B of Operating Approval 10348-03-00. **The analytical results must be reviewed by 2 of the following people, Facility Manager, Operations Manager or Laboratory Chemist, to confirm that the results meet discharge criteria.** If the analysis meets the specified criteria, discharge to the neighbouring natural drainage area is begun. Surface discharge is accomplished by pumping the water via a suction hose, pump and discharge hose to the natural drainage area east of the landfill cells. While pumping of the first discharge of the year is underway, samples of the water are taken and submitted for bioassay analysis at a third-party testing facility. The bioassay testing consists of the following acute tests:

- Acute Lethality Testing
    - 96-hour static trout bioassay

- 48-hour static daphnia magna bioassay

Results of all testing of the surface water holding ponds are submitted to Alberta Environment as part of the Monthly Industrial Runoff Report by the end of the month following the month in which the discharge occurred.

Approval 10348-03-01 requires that samples of dugouts and water wells within a 1.6 kilometer radius of the facility be sampled and analyzed for the monitoring parameters listed in Table 4.5-A of the Approval. This work is sub-contracted to an engineering and consulting firm for sampling, analysis and reporting. The final reports are submitted to Clean Harbors for review and submission as the Annual Dugout and Water Well Sampling Program Report to Alberta Environment. The property owner is sent a copy of the analysis for each dugout or water well on his land. The analytical data for dugouts is extremely variable because they are susceptible to major variations in water level and subsequent changes in dissolved water chemistry. No impacts attributable to the operation of the facility have been found since this monitoring program began in 1996.

Run-off controls are also talked about in section **B.**

O. Leachate monitoring and management program

Samples of each landfill cell's primary and secondary leachate are analyzed quarterly for the parameters specified on Table 4.4-A of Operating Approval 10348-03-01 (same parameters as groundwater wells). Primary leachate analyte concentrations are affected significantly by the amounts of precipitation that have fallen on the landfill and the composition of the waste present in each landfill cell. Therefore, there is not necessarily any typical pattern that may be observed in the analytical data. The Operating Approval requires that copies of the leachate analyses be submitted as part of the Annual Report to Alberta Environment.

Management of the leachate involves monitoring its movement through control zones and removing the leachate from the collection areas. The layers of liner create leachate control zones. Submersible pumps remove the leachate from all zones except Cell 1 secondary. The zones are defined as follows:

- Primary zone is between the first layer of waste and the primary (upper) layer HDPE liner.
- Secondary zone is between the primary HDPE liner and the secondary (lower) HDPE liner.

Sumps are designed into the landfill so that leachate will collect in them. Samples of the leachate are taken as required in Table 4.6-D and analyzed for the parameters listed in Table 4.4-A subject to 4.4.8 and 4.4.9.

Clean Harbors must monitor the secondary leachate quantity collected both the active and inactive (closed) cells. This procedure must be revised as new cells are brought into operation and existing cells are closed (capped).

Cell 1 Leachate Management

Primary leachate is removed from Cell 1 via the piping up the southeast side of the cell and pumped into a portable tote which is then sucked out with a vacuum truck. Cell 1 was capped in August 1999 and therefore primary leachate volumes reflect a steady decrease.

Secondary leachate from Cell 1 collects in vertical tube just south-east of the primary riser. Any liquid, which is below the primary liner and above the secondary liner, flows by gravity into the collection tube. The secondary system is equipped with a submersible pump. The pump will transfer the liquid from the below grade tube to a portable tote at ground level.

Readings on the Secondary Leachate System are to be performed each time the secondary is pumped. This reading is to be recorded in the Leachate Log Book and on the Daily Inspection Sheet. **If this reading shows an increase greater than 790 litres per day per acre, IMMEDIATELY notify Operations/Facility Manager.**

Whenever leachate is shipped from the storage tank, the volume must be recorded.

Cells 2, 3A, 3B and 3C Leachate Management

Cells 2, 3A, 3B and 3C are constructed differently from Cell 1. The primary and secondary leachate collects in sumps inside the berms of each cell. The piping for each leachate system is located in a trench that runs up the side of the cell. Submersible pumps, one each for each system, primary and secondary, are lowered down the pipe into the sump to remove the leachate from the cells. Power to the pumps is controlled by switches in the leachate buildings at the top of the berms.

The primary leachate systems have been equipped with a level sensor system that allows the leachate levels to be retrieved using a Levelogger or laptop PC. The primary leachate level must be recorded at least once every three working days and immediately prior to leachate removal (i.e.: pumping to surface storage tanks). **The maximum acceptable leachate head for these cells is 1.0 meters above the primary liner.** Commencing May 1, 2008 the leachate head must be recorded. Effective August 15, 2008 the leachate head in Cells 3A – 3C shall not exceed 1.0 metres in those landfill cells. Notwithstanding the foregoing, the leachate head shall only exceed the maximum acceptable leachate head for a maximum duration of 14 days subsequent to a precipitation event, unless otherwise authorized in writing by AEP.

Cell 3D, 3E and Cell 4 Leachate Management

Cell 3D, 3E and Cell 4 have a Maximum Acceptable Leachate Head level of 0.3 m (30 cm). Notwithstanding the foregoing, the leachate head shall only exceed the maximum acceptable leachate head for a maximum duration of 14 days subsequent to a precipitation event, unless otherwise authorized in writing by AEP.

Primary leachate is pumped directly in to surface storage tanks in each landfill cell for loading into tankers for deepwell disposal. The volume pumped to the storage tanks must be measured or calculated each time leachate is removed from the leachate collection system.

Leak Detection Liquid Management

The secondary leachate pump outlet is routed to a calibrated container to measure the volume pumped each day. The secondary leachate readings are recorded daily in the Leachate Log Book for each cell and reported as part of the daily inspection sheets. **If a reading greater than 790 litres/hectare per day is recorded, the Operations Manager and/or the Facility Manager must be notified immediately.**

Whenever leachate is pumped from the primary or secondary leachate systems, the volume pumped must be recorded. The volume of primary and/or secondary leachate shipped must also be recorded.

P. Leak detection liquid monitoring and management program

This section is covered in section **M.**

Q. Groundwater monitoring program

48 groundwater wells are installed around the facility and the landfill cells. These monitoring wells are sampled once each year. The sampling, analysis and reporting are sub-contracted to an engineering and consulting firm. The final reports are submitted to Clean Harbors for final review and an electronic copy is submitted as the facility's Annual Groundwater Monitoring Report to Alberta Environment. Additional monitoring wells are installed as the landfill cells are constructed.

Groundwater monitoring parameters have been specified in the Operating Approval 10348-03-00, Table 4.9-A. The consultant's reports tabulate each monitoring well's analytical data since the well was installed and first sampled. No environmental impacts from the facility's operations have been detected in the monitoring wells since groundwater monitoring began in 1991. Contents of the

Groundwater Monitoring Report are described in Section 4.9.14 of Approval 10348-03-00.

R. Remediation plan to deal with groundwater deterioration

In the event that groundwater impacts due to the landfill operations are detected, Clean Harbors and its consultants will formulate a remediation plan based on the contaminant and the site conditions at that time. This program will be formulated in conjunction with discussions with AEP.

S. Soil monitoring program

As per section 4.10.2 of the facilities Approval, soil monitoring at the facility is required twice during the approval term. The first soil monitoring program report was submitted to AEP on January 31, 2020. The second soil monitoring program proposal is due on or before January 31, 2024 and the second soil monitoring program report is due on or before January 31, 2025. The facilities soil monitoring program is developed together with an engineering and consulting firm.

T. Soil management program

On September 18, 2020 Clean Harbors received confirmation of acceptance from AEP of its Soil Management Program Proposal dated January 31, 2020 and Soil Management Program Proposal Deficiency Response Letter dated September 4, 2020. In accordance with Section 4.10.11 of the Approval, Clean Harbors was given authorization to implement the Soil Management Program as described in the aforementioned two documents. A 2020 Soil Management Program report was submitted to AEP on March 29, 2021 and a Sulphate Concentration Isopleths report was submitted to AEP on April 29, 2021. As per the Soil Management Plan Update included in the 2020 Soil Management Program report, remediation and confirmatory sampling of the area around 2020 delineation bore-holes 20-6 and 20-8 and in the graveled area west of the process building, was completed in October 2021. A Soil Management Program Remediation report, including a Soil Management Plan Update, will be provided to the Director for Approval by March 31, 2022.

U. Landfill cell cover system

The facility is primarily an industrial waste landfill and as such much of the waste received is soil, filter cakes and other materials that do not attract nuisance vectors such as birds and rodents. This material is typically not as susceptible to dispersion by the wind and therefore, does not require the same type of cover frequency that may be necessary in a municipal solid waste landfill. Areas that will remain inactive for extended periods of time should be covered with 10 to 15

centimetres of clean material such non-regulated soil, sand or clay. As stated in Sections 4 and 5, cover should be applied immediately to dispersible wastes, odourous waste and materials that require special handling.

V. Scale and equipment maintenance and monitoring program

Scale Maintenance

The weigh scales at the Ryley facility are checked for accuracy semi-annually by a third-party calibration company. Any problems with load cells and cables are repaired as they occur by their trained service personnel. The Scale is also subject to periodic inspections by Weights and Measures Canada.

Equipment Maintenance

All equipment maintenance is recorded and monitored using an electronic maintenance program. This system is linked to each facility and maintenance hub which is accessed through our WinWeb program. Landfill operators are responsible for completing and recording in a logbook daily maintenance checks and notifying the maintenance mechanic of any issues. The facility's maintenance mechanic based on the manufacturer's recommended schedules performs routine maintenance on the landfill equipment and records it in the program. Other larger repairs may be completed by or sent to our larger repair shops in Leduc.

W. Health and site safety program

Clean Harbors believes that its employees' safety and protection of the environment are the two most important priorities that the company has. The Ryley facility has always maintained a high standard of safety and environmental compliance. Its commitment to safety is exemplified by participation in Alberta Human Resources and Employment's Certificate of Recognition program and the use of an external auditor to monitor compliance with the standards. The corporate Health and Safety manager for facility visits the site regularly to conduct inspections, assist with training and the implementation of improved health and safety management practices.

Clean Harbors maintains a Health and Safety SharePoint site that contains corporate Policies and Standards, Guideline, Safe Work Practices and a Forms library that gives employees and managers access to current information. The Ryley facility follows a Health and Safety Manual containing' policies and procedures regarding safety. The manual identifies program responsibilities, hazard identification and communication, personal protective equipment, including respiratory protection, confined space entry guidelines, drum handling guidelines, grounding and bonding guidelines for transfer of flammable liquids. It

also includes the procedures for accident and incident reporting and health and safety committee operation.
The facility has an Orientation Program form that must be completed for new employees. New personnel are given basic information in their first days of employment. The orientation program ensures that personnel have read the appropriate Standard Operating Procedures (SOP) before being sent onto the site to work with an experienced employee.

The facility's Safety Meetings are used as a forum to maintain employee's compliance with the corporately mandated standard of meeting the OSHA 24/40 Hour Hazardous Waste Operations program (HAZWOPER). A module of this program is reviewed at each Safety Meeting. These modules include topics such as personal protective equipment, hazard communication and WHMIS, confined space entry and lockout/tag-out of energy sources.

In addition to supplying first aid and CPR training for employees, the facility has purchased an Automatic External Defibrillator (AED) as a supplement to the training program

X. Facility Wildlife Management Plan

See Appendix D

Y. Community Complaint Response Plan

See Appendix E

Z. Facility Emergency Management Plan

A copy of the facility's Contingency Plan is attached as Appendix F. This includes fire, spills and health concerns.

AA. Up-to-date landfill layout with survey records including final cover elevations and contours and facility infrastructure components

Appendix G provides this information.

Ambient Air

The Ambient Air Monitoring Program has been modified to meet the most recent Directive as approved by Alberta Environment and Parks that requires that the facility monitor for the following parameters.

Wind Speed and Direction

Wind speed and direction shall be monitored continuously. The data shall be downloaded monthly and stored on the Group drive for report generation (I;\Ryley\Group\Wind Data\Year\Month).

` Particulate Matter (PM_{10})

Particulate Matter shall be collected once every 12 days for 24 hour period at the Ryley Lift Station. The particulate material collected on the filter shall be

submitted to Innotech Alberta in Vegreville to be analyzed for the following parameters:

a. Particulate quantity (ug/m3)
b. **If particulate quantity per filter exceeds 50 ug/m3, then** the filter shall be analyzed for the following parameters:
    1. Water soluble cations - (Na, K, Ca, Mg)
    2. Metals - Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Silver, Thallium, Tin
    3. Anions - Ammonium, Chloride, Nitrate, Sulphate

Total Hydrocarbons and Volatile Organic Compounds

An air sample is taken once every 12 days for a period of 24 hours using specially prepared sample canister obtained from the–Innotech Laboratory in Vegreville. After the sample has been collected the container is returned to the laboratory to be analyzed for Total Non-Methane Organic Compounds (TNMOC or Total Hydrocarbons) by GC-FID and Volatile Organic Compounds (ozone precursor compound list) by GC-MS.

Reporting

Monthly reports will be submitted to Alberta Environment and Parks

An Annual Air Monitoring Report will be submitted to the Director, Alberta Environment, on or before March 31 of each year on the information collected in the previous year.

CLEAN HARBORS CANADA, INC.
HWRSP FACILITY PLAN

1. HWRSP Facility Operations

Clean Harbors Ryley Facility manages its Hazardous Waste/ Recyclable Storage and Processing facility (HWRSP) operations through various SOP's which can be found in the Facility's SOP binder. The following sections summarize some of the relevant SOP's.

2. Drum Receiving

For the intention of this document "drum(s)" refers to all containers that may be received in the transfer station buildings. The loading dock is the primary means used for unloading trucks that deliver waste to the facility. Items may also be off-

loaded directly off a truck (i.e. flat deck) if deemed necessary and can be done in a safe manner.

Limits

Maximum Hazardous Waste and Hazardous recyclable volume storage limits for the HWRSP Facility can be found in the Approval 10348-03-00 in Sections 4.6.20 – 23.

Off-loading

Off-loaded drums will be brought primarily into the Process building but may also be placed in the Staging area if there is not sufficient room in Process building. After the load is placed in a building it will be assigned a label with a unique bar-code. Bar-code numbers are tracked through the company's data base system (WINWEB) and can be tracked from cradle to grave. Drums are confirmed to match their waste profile or waste code either visually or through a quick set of simple tests (such as pH paper test). If a drum is found not to match its code or profile it is sampled and submitted to the main lab for code verification. After the drums have been either sampled or verified, they can be further processed or moved to the Staging building and stored for future shipping.

3. Drum Processing

The scrubber shall be operable during any processing, transferring or while containers are open in both or either of the Process and Staging buildings as per section 4.2 in the Approval.

Bulking

Drums of liquids that have similar characteristics and that are confirmed to be compatible may be comingled or "bulked" together to save space and money. Flammable liquids and liquids with high heat values may be bulked together following SOP 90RY-101-00. Low heat value and non-flammable or aqueous liquids may also be bulked together following the same SOP. A site vacuum truck is used when bulking drums. After the procedure has been completed the bulked liquid will either be transferred to its corresponding storage tank or straight to a tanker that is waiting to be shipped. The Ryley Facility has 3 storage tanks inside the Process building that store bulk liquids.

a) T100 – Flammable Liquids (18,000 L)
b) T200 – Flammable Liquids (18,000 L)

c) T300 – Non-Flammable Liquids (36,000 L)

Each tank is equipped with high levels alarms and level measuring devices.

Lab Pack Processing

Labpacks are processed at the labpack bulking station. Ensuring the scrubber system is operable during processing is mandatory as per the Approval. Typical labpack waste streams that are bulked into drums are acids, bases, flammable liquids, non-flammable liquids and flammable sludges. All labpacks that are processed must be tracked through the WINWEB system.

Landfilling

Drums and containers that arrive at the facility via the transfer station intended for the landfill are typically staged onsite prior to disposal at the landfill. Typically, a forklift is used to load a haul truck with the drums and the haul truck is driven to the landfill for final disposal. Clearance must be obtained from the landfill crew prior to the delivery of items for landfill. Drums that are coded as sludge and require solidification prior to final placement must be dumped into the sludge pit as directed by the landfill crew. All drums delivered to the landfill and/or sludge pit must be tracked through the WINWEB system.

Off-spec Drums

If a drum is found to not match its profile (off-spec) then a new code is determined as a result of laboratory testing. The new code and any changes in processing are then communicated to the customer.

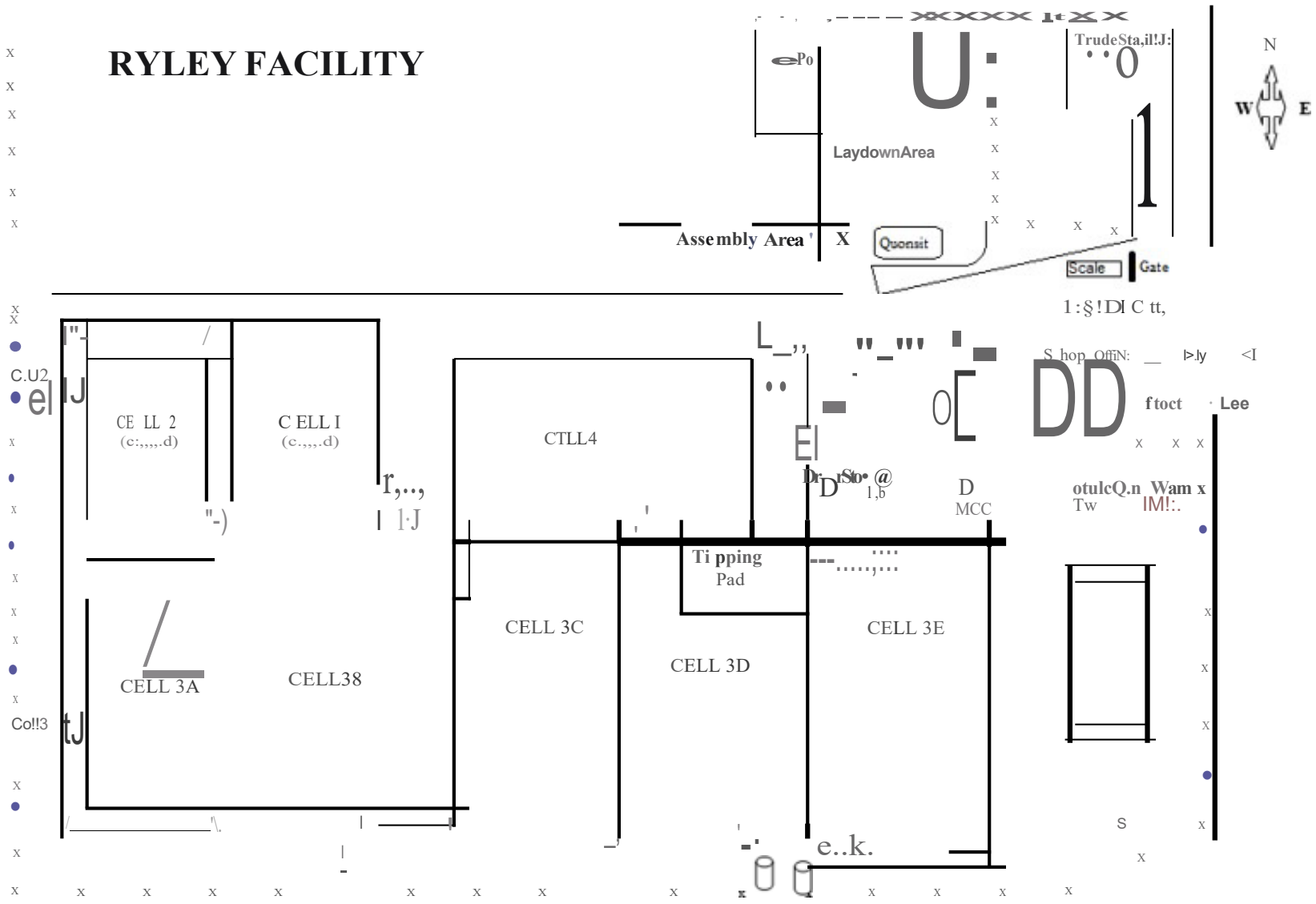
4. WINWEB Data base and Tracking System

The facility incorporates an internal waste tracking and data base network called WINWEB that is designed, built and exclusive to Clean Harbors. Almost every aspect of the business is tracked, recorded or tied to the WINWEB system in some way or another. Clean Harbors utilizes a data and information management system called WINWEB to record and store all information associated with shipments entering the facility including Generator's names, locations and manifest related data. The WINWEB system is currently used by all of Clean Harbors' sites across North America including the Ryley facility. The Company will use this system to track and record arrival and departure dates of all waste.

APPENDIX A

Site Diagram

RYLEY FACILITY



Appendix B

Water Quenching Treatment and Lab Screening of Pyrophoric Wastes SOP

Clean Harbors Ryley Facility Water Quenching Treatment and Lab Screening of Pyrophoric Wastes SOP

PROCEDURE NO: SOPL001-016

Approved By: **Stan Yuha, General Manager** Stan Yuha _____
Signature

Brian Fraser, Compliance Manager _____
Signature

Scope

Clean Harbors has developed the following procedure for conducting water quenching treatment activities to neutralize waste streams that exhibit heat when they come in contact with water.

Waste Requiring Water Quenching in Sludge Pits

The facility current Approval 10348-03-01 allows for many different treatment activities, including solidification, stabilization and neutralization. These treatments currently take place in one of the two sludge pits that are located adjacent to the tipping pad which is currently located in Cell 3D. Once the new waste receiving pad is constructed and operational they will take place in the sludge pits that will be located on the new receiving area located NE 9 – 50 – 17 W4.

The company routinely accepts wastes (non-hazardous and hazardous) such as spent catalyst material that is within its acceptance criteria but on occasion, exhibits heat or heat increases when exposed to water or moisture. Although the material may evolve heat upon contact with water, the properly classified material has no reactive tendencies that neither produces immediate danger for life or environment nor is the material classified as reactive waste. Waste streams proposed for water quenching would not be classified as substances and mixtures which, in contact with water emit flammable gases and or vapors of concern.

Although the waste does not to meet the definition of reactive waste, from an operational perspective the evolution of heat is a condition that requires proper management. In the past the company has experienced the occasional fire at some of our landfill facilities while managing these materials. The company has evaluated the root cause of each incident and implemented operational and engineering controls to prevent these situations from reoccurring.

Prior to initiating cooling activities the Company may contact the Generator and request additional information on the material in this container. Based upon the information discussed with the generator; the information on the profile and manifest sheets; pre-test lab results; and internal discussions on handling methods the company will determine the appropriate measures

to process the waste. If testing indicates cooling is required, the loaded containers will then be transported to one of the prescribed sludge pits for water quenching activities.

The company intends to use the two sludge pits for hydrating loads where necessary. The waste class types intended for neutralization and/or stabilization are typically as follows:

- Catalyst
- Mole Sieves
- Pyrophoric Wastes
- Other waste streams as identified through lab testing

Prior to treatment each profile will tested in the lab to ensure there are no contaminates of concern being released. To simulate landfill quenching conditions, a sample will be placed into a jar/container and water will be added. The released gases will be screened for the presence of; flammability, volatile organic compounds (VOCs), total hydrocarbons (HCs), total non-methane organic compounds (TNMOC), particulate matter (PM), Ammonia, H_2S and odour. Positive results would trigger further testing to identify constituents of concern via GC-MS or ICP (total metals). Once a profile passes the above testing it will then be approved for water quenching treatment.

Procedure for Lab Screening of Pyrophoric Wastes for Water Quenching

1.0 Scope and Application

This procedure is intended to test the suitability of waste for the quenching treatment process before the waste profile is approved to Clean Harbors Ryley. Waste is subjected to this procedure (Lab screening of pyrophoric wastes for water quenching), if the waste meets the following properties:

1. It is water reactive, i.e. $\Delta T > 15$ °C. (see Method MTD041 - ΔT Differential Temperature).
2. Passes the Division 4.3 quick screen procedure, i.e. a match will not ignite vapours when water is added (see MTD050 Screens - Water Reactive Div. 4.3). Any waste that fails the Division 4.3 screen procedure will not be suitable for quenching.

This test is not quantitative and is intended as a simulation of quenching in the sludge pit. The results are qualitative and indicate whether any VOCs, hydrocarbons, H_2S, PM, and/or Ammonia are likely to be released as a result of quenching.

2.0 Materials and Apparatus

- 360 mL glass jars
- ppbRAE 3000 gas detector set to “as isobutyl reference” with hydrophobic probe filter
- RKI Eagle gas detector set to “as Hexane reference” with hydrophobic probe filter
- Temtop 6746 Handheld PM Dust Monitor
- pH paper (Alkacid test paper Fisher Scientific Cat #A980)
- Nanopure water

- Fumehood
- Quench Assessment Lab Form
- Lab Stand

3.0 Procedure

Samples for lab screening of pyrophoric waste are obtained following the procedure: MTD004 Rev 2 Sampling methodology.

3.1 Screens of PM and Released HCs, TNMOC, VOCs, H_2S (see Figure 1)

3.1.1 In 360 mL glass jar, add 100 mL of waste to be tested

3.1.2 Measure out 100 mL of nanopure water

3.1.3 In a fumehood, insert Temtop Dust Monitor, ppbRAE , and RKI Eagle sampling hoses into headspace above the jar.

3.1.4 Ensure the logged maximum values on each meter is cleared

3.1.5 Pour the measured 100 mL of water over the waste quickly

3.1.6 Wait until all meter readings reach a maximum and are declining for at least 2 minutes.

3.1.7 Note odour and document peak values on the "Quench Assessment Lab Form" for;

- Released H_2S, HCs, and TNMOC from RKI Eagle
- Released VOCs from ppbRAE
- PM from Temtop 6746 Dust Monitor

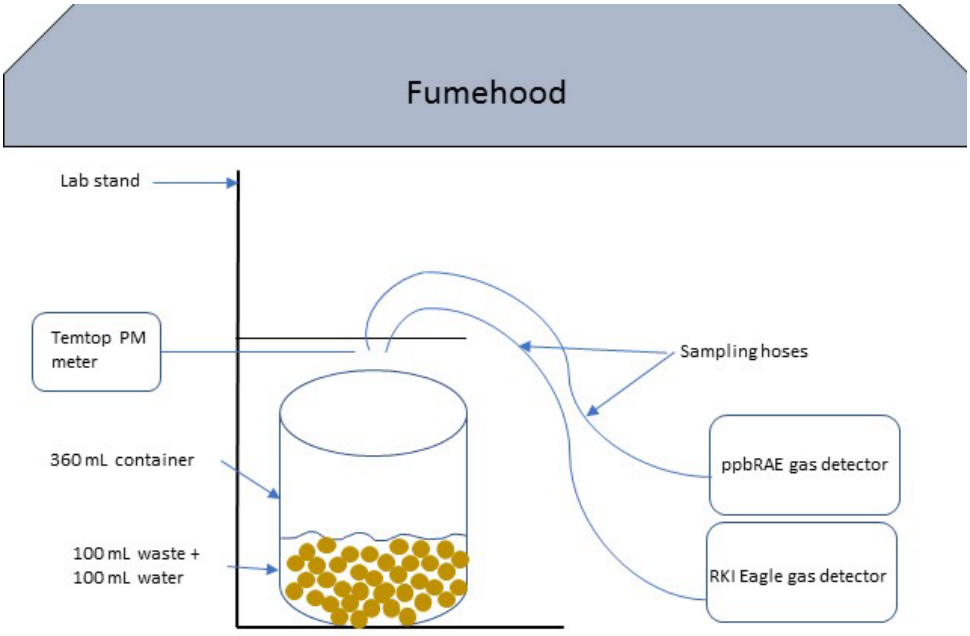


Figure 1: diagram depicting layout for quench test

3.2 Ammonia Screen

3.2.1 Using a 50 mL vial, add 10 mL of nanopure water to 10 mL of waste with wetted pH paper in the headspace

3.2.2 Interpretation:

- Blue color = Alkaline gas released (record as Ammonia– Positive)
- No change = No Ammonia released (record as Ammonia– Negative)

3.2.3 If positive, determine releasable Ammonia concentration via Draeger tube

3.3 Further Identification of off-gases from quenching test

A GC-MS headspace screen of a wetted sample can be used to identify gases released when the sample is wetted. The collection of off-gases occurs directly in the headspace vial prior to GC-MS analysis.

3.3.1 In a 20 mL vial add 1 mL of nanopure water to 1 g of waste

3.3.2 Immediately cap the vial and wait 2 minutes (or until temperature has peaked) before drawing a headspace sample for GC-MS injection

3.3.3 After the sample has been processed, a database search can be used to identify volatiles released when waste comes into contact with water

3.4 Total Metals Analysis

If PM is released during the screen procedure, the sample can be digested and analyzed to determine the total metals present in the waste.

3.4.1 Sample is prepared as per EPA METHOD 3050B Acid Digestion of Sediments, Sludges, and Soils.

3.4.2 Sample is analyzed on ICP as per MTD013 Rev 2 ICP Operations - Varian 725-ES.

3.5 Assessment of Results

Report pass/fail based on pass criteria (see Table 1). If any parameter exceeds the recommended limit, the waste fails to meet quenching criteria.

Table 1: Pass Criteria for Quenching

Parameter	**Pass Criteria**
ΔT (°C)	-
Flammability (Flash with water)	Must not flash
Released VOCs (ppm as isobutyl)	<100
Released HCs (ppm as Hexane)	<1000
Released TNMOC (ppm as Hexane)	<1000
Particulate Matter (Positive/Negative)	-
Total Metals (Dependent on PM presence)	-
Released Ammonia (ppm)	<100
Released H_2S (ppm)	<10
Odour (None/Mild/Medium/Strong)	-

3.6 Documentation and Record keeping of Lab screening results

Lab screen results will be recorded on the Quenching Assessment Lab form (see figure 2) and filed electronically by Lab log number. Results will be scanned into the specific profile attachments for that waste stream on Winweb.

Quenching Assessment Lab Form

See Clean Harbors Ryley Facility Water Quenching SOP (SOPL001-016) for procedure

Date:	**Profile:**
Customer:	**Manifest/BOL:**
QAS/Log #:	**Bin #:**

Parameter	**Pass Criteria**	**Result**
ΔT (°C)	-	
Flammability (Flash with water)	Must not flash	
Released VOCs (ppm as isobutyl)	<100	
Released HCs (ppm as Hexane)	<1000	
Released TNMOC (ppm as Hexane)	<1000	
Particulate Matter (Positive/Negative)		
Total Metals		
Released Ammonia (ppm)	<100	
Released H_2S (ppm)	<10	
Odour (None/Mild/Medium/Strong)		

Assessment (Pass/Fail)	

Comments:

_____

_____

_____

_____

Figure 2: Quenching Assessment Lab Form Example

Quenching Treatment Process:

The proposed method below describes the process of cooling waste that exhibits heat when in contact with water:

1. Adding water to sludge pit to allow any heat that is generated during material off-loading process to be dissipated by the water.
2. Off-loading the prescribe material into sludge pits and immersing the waste rapidly in water, the heat of reaction is safely dissipated into a large, inert heat sink and without any observable temperature increase.
3. If necessary adding additional water during or after the off-loading process in order to further prevent temperature increases;
4. Once the quenching activity has been completed it may be necessary to manage waste in the prescribe pits by applying solidification/pH reagents or other treatment and or inspection to ensure the waste is suitable for landfill disposal.
5. The Company will, if necessary, utilize odour and dust control techniques such as application of odor control reagent. The Company actively ensures that employees maintain these control measures.
6. Once the materials are treated with water and cooling process is completed, the material will not react with water again. They are deemed inert from that point forward and suitable for disposal.

The facility is currently approved to solidify sludge waste. Water will be taken from the surface water ponds and introduced into the pits on an as needed basis to assist with the cooling process. Excess water will be solidified using reagents available on site. Treatment of waste will be conducted in accordance with site standard operating procedures.

Monitoring Program:

The following data will be recorded in WINWEB:

1. Date: the date quenching activities was conducted;
2. Waste Description:
    a. Waste Type: the type waste that quenching was treated (i.e., catalyst)
    b. Profile Number: the Clean Harbors profile number. The Waste Profile provides all analytical details on waste;
    c. Tonnage treated

Table 2

Waste Description			
Date	**Waste Type**	**Profile Number**	**Tonnage Processed**

APPENDIX C

Fugitive Dust and Odor Response and Best Management Plan

FUGITIVE DUST & ODOUR RESPONSE AND BEST MANAGEMENT PLAN

TABLE OF CONTENTS

APPENDICES

APPENDIX A SDS'S

MATERIAL SAFETY DATA SHEETS

Dust Lynx H56
Ecosorb 606
Calcium Chloride
Portland Cement

1.0 INTRODUCTION

The following report details the Fugitive Dust and Odour Best Management Plan (BMP) prepared for Clean Harbors Canada, Inc. Ryley Facility, located 2 km north of Highway 14 on the west side of Secondary Road 854, Alberta. The purpose of this BMP is to identify the sources of fugitive dust & odour emissions within the Facility, and to provide details about the management programs that are used to control these emissions.

The objectives of this BMP are to:

- Provide an overview of the processes at the Facility and identify potential sources of fugitive dust;
- Assess the human health risks posed by the fugitive dust through a review of the size range and composition of the dust particles;
- Discuss dust control measures and implementation frequency for each of the identified sources;
- Discuss odour control measures and implementation frequency for each of the identified sources;
- Outline maintenance and inspection procedures;
- Illustrate how ongoing compliance is ensured through the use of a monitoring and record-keeping program; and
- Detail the employee training program for fugitive dust control procedures.

2.0 FACILITY & PROCESS DESCRIPTION

Clean Harbors Ryley facility is a hazardous waste transfer station as well as a secure landfill located 2 km north of Highway 14 on the west side of Secondary Road 854, in east central Alberta. A Site Location Plan is provided on Figure 1.

This facility is permitted to accept all hazardous wastes with the exception of explosives, radioactive wastes and infectious wastes. Although the Ryley facility is permitted to solidify and stabilize hazardous waste on its site, it cannot import hazardous waste for landfill disposal. It can import non- hazardous waste for landfill disposal.

Ryley Facility consists of vehicle maintenance building, drum staging and processing buildings, air emissions control building and the secure landfills. The apron around the buildings and the main roadway to the landfill is paved. Truck traffic to the landfill occurs on paved road up to the graveled landfill access road into the landfill and onto a tipping pad constructed of rig mats.

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3.0 SOURCE OF FUGITIVE DUST & ODOUR

The sources of fugitive dust and odour that have been identified for the facility activities are included in the following table, recognizing that some of these areas contribute to both dust and odour:

DUST	ODOUR
Paved Roads	Landfill
Unpaved Roads	Mixing pits
Storage Piles	Leachate
Container lay-down areas	Transfer operations

3.1 PAVED ROADS

The paved roads used by the Facility are indicated on the site plan as Figure 2. The roads are used by heavy transport vehicles (transport trucks and landfill vehicles) to transport solid hazardous waste to the landfill; by operations personnel in pick-up trucks, back-hoes, forklifts, yard trucks and vans.

The paved roads may be a source of Particulate Matter (PM) and PM_{10} emissions, from the accumulation of dust on the road surface deposited by vehicular traffic. Vehicle speed, vehicle weight, moisture content, and silt content are all critical factors in the amount of fugitive dust emitted from paved roads. The particle distribution of the dust tends to have a greater percentage of fines than unpaved roads, but there is significantly less dust on paved roads. PM_{10} is the respirable fraction of particulate and can have an impact on human health. The metals content of this dust is negligible. The emissions of PM_{10} from the paved roads are controlled and the off-site concentrations are expected to be below levels of human health concern.

3.2 UNPAVED ROADS

The unpaved roads used by the Facility are indicated on Figure 2. The roads in the landfill area are used by landfill vehicles as part of solid waste disposal activities and by excavation vehicles for earth moving activities. The unpaved yards in the staging/laydown areas are used by vehicles laying down luggers and roll-offs for temporary storage and for staging trailers and containers for transportation activities.

Chapter 11.19 of the USEPA AP-42 document identifies unpaved haul roads as a source of PM and PM_{10} emissions, in the form of fugitive dust. Vehicle speed, vehicle weight, moisture content, and silt content are all critical factors in the amount of fugitive dust emitted from unpaved roads. Particle sizing and composition will vary at the Facility, but emissions of trace metals will be negligible. PM_{10} is the respirable fraction of

particulate and can have an impact on human health. The emissions of PM_{10} from the unpaved roads are controlled and the off- site concentrations are expected to be below levels of human health concern.

3.3 STORAGE PILES

The site may stockpile clay materials, sub-soil and top soil that is removed in the course of cell construction and removed from open areas on-site. Material is stored in piles in the area south of landfill Cells 3A and 3B. The consistency of this product is clay and soil.

The fugitive dust emissions from this area are therefore generally not respirable and do not pose any human health risks.

3.4 CONTAINER LAYDOWN AREAS

Container lay-down areas are used by the various operations at the facility for temporary storage of luggers and roll-off containers prior to and after processing or landfill activity. These areas are monitored by supervisory staff on a daily basis. They are west of the surface water pond and north of Landfill Cells 3C and 3D shown on Figure 2. A small portion of this area is paved but most of it is unpaved. The contours of the surface are sloped to provide storm water run-off control to contained areas on the site.

3.5 LEACHATE

All precipitation that enters any working landfill cell and comes into contact with waste is handled as landfill leachate. T h e leachate is collected using pumps and pipes and transferred to the leachate storage tanks. The landfill leachate can contain dissolved salts, dissolved organics, and trace concentrations of heavy metals and ammonia. The leachate storage tanks have a total storage capacity of 570,000 liters. The leachate is pumped from the leachate storage tanks to tanker trucks and shipped off-site for deep well disposal.

3.6 LANDFILL

A portion of the solid waste received for landfill disposal contains volatile organic compounds (VOCs) that depending upon environmental factors such as wind speed and temperature will volatilize from the exposed surface of the waste. A key factor that affects the rate of volatilization is the size of the exposed waste face. These emissions could lead to off-site odours or unacceptable ambient air quality.

The release of VOC to the atmosphere from the waste is not a constant phenomenon. A freshly placed load of waste will have the highest rate of VOC release when initially placed. As the surface of the waste becomes depleted in VOC (due to the volatilization loss) the overall rates of VOC release decreases markedly. This is because the remaining VOC contained within the waste mass must diffuse out to the surface from within the solid matrix. Thus the rate of diffusion within the solid waste mass becomes the rate- limiting factor to the VOC emission rate.

3.7 SOLIDIFICATION AND STABILIZATION PIT

The facility has two solidification and stabilization pits located in landfill Cell 3D. The facility receives wet waste that requires solidification to pass the paint filter test and/or operational requirements and wet or dry wastes that require stabilization to meet landfill disposal criteria. Many of these waste streams are received from interceptor sumps and tank cleanout operations. These types of wastes have the potential to contain organic chemicals/hydrocarbons that may have some odour. The facility will process these wastes and to transport them promptly to the disposal area where they will be covered to minimize their exposure to the atmosphere.

The most common drying agents are peat moss and wood chips. Fugitive emissions from these stockpiles do not pose any human health risks. They also act as odour mitigation reagents by acting as a bio-filter.

Stabilization is generally accomplished using Portland cement. Portland cement is a fine particulate. This process is only conducted when the wind speed is low to minimize any airborne particulate creation. To further control dust emissions the cement is added in super sacs to a mixture of the waste being stabilized and water. The super sacs are opened with the bucket of the excavator when in contact with the water-waste mixture. The waste, water and reagent are mixed slowly with the excavator to minimize any dust emission.

When mixing is complete, the damp stabilized material is transferred to lugger bins to cure before testing to ensure that the material is suitable for landfill disposal. There are no fugitive dust emissions from the operation at this point.

4.0 CONTROL METHODOLOGY AND FREQUENCY

Reducing the potential for fugitive dust generation is an ongoing commitment, especially during the hot and dry summer months. This section provides an overview of the procedures in place at the Facility to limit emissions of fugitive dust from potential sources.

4.1 PAVED ROADS

Treatment measures include washing the road with water, spraying water to reduce dust emissions and sweeping the roadways with a sweeper attachment for the facility's skidsteer. If fugitive dust emissions become a concern during cold, dry winter conditions, sweeping may be employed instead of washing in order to avoid safety concerns as a result of ice formation on the roadways. Sweeping can be contracted on a situational basis with the Town of Tofield.

4.1.1 Paved roads, aprons, and the area from front gate to Secondary 854 line is watered during dry periods to keep down road dust.

4.1.2 A sweeper operates regularly in the same areas to remove as much dust as possible from paved roads throughout the facility with special emphasis on the paved landfill access areas.

4.1.3 All facility roads have a speed limit of 20 km/hr, intended to keep down dust as well as for safety reasons. Drivers, including yard drivers, found to be exceeding the speed limit will be disciplined.

4.2 UNPAVED ROADS

The majority of unpaved roads at the Facility are treated with a commercial dust suppressant that renders the road close to paved quality. The MSDS for this product is included in Appendix A. The product is applied as needed from the early spring to late fall. The treated roads are maintained through the application of water once the coating has initially cured.

The unpaved roads that are not eligible for treatment with the commercial dust suppressant are watered to control the emissions of fugitive dust on a daily basis, as needed, using a watering truck. Emissions are further controlled by a posted speed limit of 20 km/hr.

4.2.1 Unpaved operations areas at the landfill are regularly watered to keep down dust. The 20 km/hr. speed limit is enforced in unpaved areas as well to keep down dust and for safety reasons.

4.2.2 The Contractors conducting earth-moving operations will supply road-watering equipment and will keep their area of operation watered regularly to keep down road dust.

4.2.3 A dust suppressant will be applied to exposed waste in the landfill area during dry periods.

4.2.4 The Landfill facility will ensure that a soil stabilizer or vegetative cover is applied to the exterior of the perimeter berm as well as areas on the site that have been capped.

4.2.5 During dry spells the transportation staging areas and the laydown yards will be watered down regularly.

4.3 STORAGE PILES

The Facility may have uncovered storage piles of clay and excess top soil, used to cover the waste face and eventually to cap the landfill. Continuous unloading and loading may occur in this area during capping and other operations. During dry conditions water can be sprayed directly onto the piles if immediate fugitive dust mitigation is

required. Piles may be seeded to grass if they are going to be inactive for longer periods of time.

4.4 CONTAINER LAYDOWN AREAS

The Ryley facility operates under a specific site procedure attached in the appendix of this Plan that outlines the specific requirements for the site employees to follow to mitigate odours from the lay down areas. The main preventative measure is to ensure that all containers remain properly tarped/covered this requires that routine inspections are conducted on these areas. Water is used as a dust control measure in these areas. The containers in these areas are kept covered to reduce the potential of releasing odours at the facility.

4.5 LANDFILL

The following general measures are implemented at the landfill to minimize VOC emissions from the landfill and to reduce the potential for off-site odours:

- The waste is pre-screened at the laboratory to identify potentially odourous waste streams and appropriate handling and packaging procedures are recommended to the waste generator and shipper;
- The waste on-receipt at the landfill is transferred in bulk to the landfill working face to minimize its disturbance;
- The area of exposed waste including the working face of the landfill is minimized to the extent possible to reduce the exposed surface area of the waste; and,
- Odourous wastes are covered with non-odorous low porosity waste materials to the extent possible. This is done in accordance with existing procedures for odour control.
- As a precautionary measure the company has purchased 3 portable mister fans that can be transported to an area where additional control may be necessary. These units can be placed in predominately downwind locations in order to suppress the airborne odours. The product used for this application is EcoSorb 606.
- A portable sprayer that can be towed by an ATV is available to spray the odour suppressing chemical directly on the waste surface. The product used for this application is EcoSorb 606.
- Straw may also be used as a means to control dust and odours. Round straw bales can be spread over the landfill using a bale buster.

5.0 INSPECTION AND MAINTENANCE PROCEDURES

- Daily inspections are conducted by the Landfill Supervisors at the Facility to monitor the effectiveness of dust control practices. The treated roads are reviewed as part of these daily inspections, and further treatment requirements are identified at that time.

- Landfill personnel are instructed to watch for dust generation and to be aware of odor sources. If they see dust blowing or notice the presence of odours, they are to notify their supervisor and take immediate action to stop the dust and/or suppress the odour.

- All employees are instructed to report any occurrence of visibly blowing dust from anywhere in the facility. The management staff of the area takes immediate action to mitigate the situation.

6.0 TRAINING OF STAFF

As part of maintaining best management practices for controlling and preventing fugitive dust emissions, an initial training program will be provided for all applicable Facility staff. The training will cover the control techniques in place for managing fugitive emissions and how to maintain them; how to conduct a fugitive dust observation check and fill out the associated paperwork; what to do in the case of an unexpected fugitive dust release; and, who to notify of any concerns or problems pertaining to fugitive dust. Refresher training will be provided as necessary, based on changes to the fugitive dust emission control techniques.

7.0 CONTINUING IMPROVEMENTS

As part of implementing a successful fugitive dust and odour best management plan, it is important to be aware of areas where fugitive dust and odour emissions can be reduced further. The Facility is endeavoring to improve their capacity for controlling fugitive dust emissions, and several areas in particular have been identified as potential future improvements, as follows;

- Opportunities to reduce the size of storage piles and the retention time of materials in the piles are a continual improvement process; and

- Staging areas/laydown areas may be paved in the future to reduce wind-blown dust from these areas.

- If the waste area is going to be inactive for an extended period of time it should be covered with a minimum of 20 centimeters of intermediate cover to prevent odours or waste movement.

TITLE: Environmental Management Program			
Facility: Ryley Facility	**Prepared by: Don White**	**SOP Number: 90RY-206-00**	**Page 1 of 7**
	Title: Compliance Manager	**Issue Date: August 2019**	
Reviewed By: Stan Yuha	**Title: General Manager**	**Next Review Date: August 2024**	
Reviewed By:	**Title: Operations Manager**		

1.0 Objective

Clean Harbors' Ryley Facility is dedicated to protecting the environment and therefore has developed this Standard Operating Procedure to establish an Environmental Management Program. The purpose of the Environmental Management Program is to identify and prevent potential Environmental impacts on site or off site. The Environmental Management Program identifies the controls in place, including checklists and reports, to manage odours and dust.

2.0 Site Specific Terms

- Bale Buster – unit pulled behind a farm tractor which breaks down straw bales and blows the straw onto the ground surface.
- EcoSorb 606 – deodorizing chemical that can be diluted and misted through a fan dispersion system or sprayed through an agricultural sprayer unit (MSDS attached).
- Dust Lynx – dust suppression chemical that mixes with water and is placed using a water truck or other pumping unit (MSDS attached).

3.0 Responsibilities

General Manager

The General Manager is responsible for ensuring all reasonable measures are taken to minimize the impact of this facility on the environment, the employees and the community. The General Manager is responsible for addressing concerns from members of the community and for alerting Alberta Environment's Environmental Response line promptly should there be any emission issues.

Supervisors

The Supervisors will ensure that all inspections are done as scheduled and controls are functioning properly. The Supervisors are responsible for ensuring all employees are aware of the components of the Environmental Management Program and the equipment involved.

Employees

Employees will ensure that Environmental Control equipment is used when appropriate and that any environmental concerns are brought to the attention of the Supervisor. If an employee is unsure of any part of this Standard Operating Procedure, he/she will go to the Supervisor for clarification.

4.0 Prerequisites

The following prerequisites must be completed prior to performing this procedure.

Health and Safety
- Any incidents, including near misses, are to be reported immediately to the supervisor.

Environmental
- If an incident occurs, report it immediately to your supervisor, and implement the facility's Emergency Preparedness Plan, if applicable.
- Spills are to be cleaned up immediately.

Documented Training
- SOP training, refreshed every three years.
- Task specific training.

5.0 Procedure

5.1 ODOUR CONTROL

5.1.1 Odour Action Plan

This plan re-emphasizes previous practices that have demonstrated success and incorporates improvements elaborated bellow:

5.1.1.1 Identification of Odorous Materials

The onsite laboratory staff, as part of the company's waste profiling procedure, will screen all potential waste streams. All wastes will be assessed for potential odours based on the following criteria:

1. Knowledge of the generating process (i.e. chemical production, refining wastes, etc.).
2. Assessment of the concentration of the contaminants concerned (i.e. does the waste contain known odorous components – such as naphthalene, reduced sulpur species).
3. Visit to the site (project work only) to better determine odour potential if appropriate.
4. Develop and access better analytical methods and protocols for the quantification of odour levels.
5. Establish a data bank of known odour causing wastes or compounds.

5.1.1.2 Odorous Materials Shipment and Receipt

Once an odorous waste steam has been identified as a potential candidate for disposal at the Ryley Facility, a team approach will be used to assess requirements for shipment, receipt and onsite management.

Members of this team may include Operations, Landfill, Laboratory, Technical Services staff and Management. This team will establish the full management cycle of the waste transaction including, but not limited to the following:

1. Container selection (i.e. roll-off, tanker, etc.)
2. Special packaging requirements (i.e. plastic roll-off box liners)
3. Sampling protocols upon arrival
4. Arrival times
5. Cell placement, tanker off-loading procedures

6. Daily receiving volumes
7. Special operational procedures.

5.1.1.3 Onsite Management of Odorous Materials

All odorous wastes transported to the site will be received in suitable containers. This includes tankers, roll-offs, dump trailers and lugger boxes and drums. Atmospheric exposure of odorous materials will be restricted by adherence to the requirement to tarp roll-off boxes, lugger and dump trailers and closing all hatches on tankers; except when sampling, for short duration's while off-loading, and during tanker cleaning operations.

Landfill

The preferred way to receive and manage odorous wastes at the Landfill is in lined roll-off or lugger boxes. The waste will be transported into the Landfill cell in the lined container and placed in the cell. Every effort will be made to ensure that the integrity of the liner is maintained. Once the odorous material has been placed in the cell, non-odorous wastes or some other suitable non-odorous cover material will cover it. This same principle will be followed for wastes that come in via end dump units.

5.1.2 Operator Odour Checks

All employees will report any odours to his or her immediate supervisor upon detection and complete an Internal Complaint Form, Appendix A. In addition, operators expected to check their area to identify any sources of odour.

The operator shall include the following in this check:

- All hatches on storage are closed;
- All vent systems are monitored to ensure that there are no significant odours being emitted;
- Lids are on pails when not in use;
- Sumps are maintained as low as possible;
- Odorous tramp material is cleaned up; and
- Scrubber system is checked to ensure it is within operating parameters.

An odour is considered to have a potential for off-site impact if it can be detected 3 meters downwind. This inspection is documented by completion of the checklist for the area.

5.1.3 Controlling Odorous Solid Waste

The Landfill Supervisor will have responsibility for the detection of odours that may specifically originate from Landfill activities. It will be the responsibility of the Landfill Supervisor to check for odours intermittently throughout the day. A final check will be carried out at the end of the day's receiving. If an odour problem is detected, remedial action will be taken as soon as possible. Odours may emanate from the landfill operating face, landfill leachate and the solidification/stabilization pit.

Odour control procedures for the landfill are outlined below:

a) All waste streams being considered for disposal are screened by the laboratory for odour levels. Wastes possessing odours that cannot be managed are not accepted into the plant site.
b) Incoming loads are monitored for odour levels as part of the receiving procedure. Wastes with strong odours may be rejected if this procedure and mitigative efforts are ineffective.
c) Landfilled wastes with noticeable odours are covered with non-odorous wastes or other material, such as odour absorbing reagent, as soon as practical.

d) Leachate is removed from the landfill cells daily as a part of normal landfill operations.
e) The size of the landfill's working face is minimized as best as is practical.
f) Vehicles containing waste are kept closed or covered until ready to dump and during sampling.
g) Special packaging provisions are employed as needed (drums, bags, etc.).
h) Wastes offloaded for solidification/stabilization processing are dumped directly in the mix pit.
k) Wastes mixed in the solidification/stabilization area are subject to conditions a) through c) above.
l) On deposition of waste or mixing, if a persistent, noxious or strong odour is encountered that may have an external impact, the operator shall report the odour to the landfill supervisor and immediately apply corrective measures to reduce or eliminate the odours. These corrective measures can be found in section 5.1.6.1 of this procedure (they involve covering the waste and/or adding reagents to mask or reduce the chemical characteristics that contribute to odours).
m) The facility receives waste from transfer stations and original generators. If a waste is received from either of these sources and a persistent noxious odour is detected, treatment will occur – however, if these best efforts are not successful, alternative measures will be employed to minimize offsite impacts of successive shipments. These measures include;
    - Odour treatment at an alternative location (possibly the generator's site),
    - Restrict/retard acceptance of odourous waste for processing at the site.

When an odour is detected by an employee, or when an odour complaint is received from a neighbor or the MOE, corrective action suitable for the source of the odour is initiated and the complaint and corrective action is documented (see Appendices A and B for forms).

Documentation related to each odour complaint, investigation or corrective action is distributed to the General Managers, as well as the Compliance Manager. These individuals review each incident to ensure that appropriate actions are taken to control off-site odour impacts.

5.1.4 Scrubber/Carbon Absorber

Vapours may occur during the storage and processing of organic wastes in the Processing and Staging Building. The facility has a scrubber system that removes air from these buildings and passes it through a sodium hydroxide/sodium sulfite reducing solution and then through a carbon absorbers to remove acidic gases and organic vapours.

1. The scrubber pH is monitored daily and must remain above a pH of 8.0. This value is reported on the Operator's Daily Inspection entered into WINWEB.
2. The carbon absorber exhaust is monitored weekly for Total Petroleum Hydrocarbons. This value is entered into the WINWEB Inspection report. If the level of Total Petroleum Hydrocarbon exceeds 50 ppm, the carbon must be changed out.

5.1.5 Site Inspection

Similar to the Landfill Operations, the Transfer Station Operations group also monitors for odors and dust on a continuous basis. If either is detected, they will initiate the appropriate corrective actions as well as notify their Supervisor. The Supervisor will then forward the notification onto the Operations or General Manager. If any odours are detected steps will be taken to eliminate the odour and an "Internal Odour Complaint Form" (See Appendix A) will be completed.

5.1.6 Mitigation Steps

5.1.6.1 Mitigation of Landfill Odours

The following is a list of steps to mitigate landfill related odours that may stem from the landfill face, mixing pit or the receiving cells:

a) Immediate cover with non-odorous soil or material
b) The addition of materials that exhibit odour-suppressing properties. These materials may consist of straw or a direct application of Ecosorb.
f) Handling potentially problematic waste streams or projects during those colder months, where lower temperatures result in lower effusion of odorous compounds from the waste mass into the atmosphere.
g) Working waste in smaller batches, thus lowering the surface area of the exposed material to the atmosphere.
h) Certain waste streams or projects that produce known odours may necessitate specific handling procedures to mitigate odours.
i) Adhering to the steps outlined in 5.1.3

5.1.7 *Dealing With the Public*

Removed – See Community Complaint Response Plan

5.1.8
Reporting

Removed – See Community Complaint Response Plan

5.2 DUST ABATEMENT

5.2.1 Road and Un-Paved Operating Areas

- Roads and unpaved operating areas at the Landfill will be regularly watered to keep down road dust.
- A road sweeper will operate as needed to remove as much dust as possible from paved roads throughout the facility.

5.2.2 Earth Moving Contractors

- The Contractors conducting earth-moving operations will supply road-watering equipment and will keep their area of operation watered regularly to keep down road dust.

5.2.2 Dust Reduction from Active Waste Face, Final Cap and Berm

- A suitable dust suppressant will be applied to exposed waste in the area of the landfill as needed. This may include but not limited to; straw, water and a suitable dust control liquid such as Dust Lynx.
- The facility will ensure that a vegetative cover is applied to the exterior of the perimeter berm as well as areas on the site that have a final cap.

5.2.3 Dust Reduction from Staging Areas and Container Storage Areas

- During dry periods the Transportation Staging Areas and Container Storage Areas will have water or dust suppressant applied as needed to keep dust from blowing from these unpaved areas.

5.2.4 Traffic on Facility Roads

- All facility roads have a speed limit of 20 km/hr intended to keep down dust as well as for safety reasons.
- Drivers, including yard drivers, found to be exceeding the speed limit will be disciplined.

5.2.5 Visible Emissions

- If an incident occurs, report it immediately to the Shift Supervisor. Supervisors must advise the General Manager of each reported emission.

6.0 Consequences of Deviations

In addition to the process interruptions which can occur, the following additional consequences of deviations could result:

- Injuries and/or fatalities
- Property damage
- Regulatory violations and/or fines
- Damaged public relations and/or customer relations
- Disciplinary actions up to and including termination

7.0 Appendices

Appendix A SDS

MSDS SHEETS

Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)
Ecosorb 606

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

SECTION I

Manufacturer's Name
OMI Industries

Address (Number, Street, City, State and Zip Code)
One Corporate Dr., Suite 100
Long Grove, IL 60047

Emergency Telephone Number
(800) 662-6367

Telephone Number for Information
(847) 304-9111

Date Prepared
01-05-11

SECTION II - Hazardous Ingredients/Identity Information

Hazardous Components (Specify Chemical Identity: Common Name(s)) | N/A | **OSHA PEL** | **ACGIH TLV** | **Other Limits Recommended** | **%**

Product is a proprietary blend of essential oils, surfactant, and water. All constituents are not considered hazardous according to the Federal Hazard Communication Standard (29 CFR 1910.1200)

HMIS Classification: Health 0; Flammability 0, Reactivity 0, Protective Equipment B

Product has been tested for toxicity according to United States Environmental Protection Agency Guidelines
Acute Oral Toxicity Study per EPA OPPTS 870.1100- Not toxic by oral ingestion
Acute Dermal Toxicity Study per EPA OPPTS 870.1200 - Not toxic by dermal absorption
Acute Inhalation Toxicity Study per EPA OPPTS 870.1300- Not toxic by inhalation exposure
Acute Eye Irritation Study per EPA OPPTS 870.2400 - Product not an eye irritant
Acute Skin Irritation Study per EPA OPPTS 870.2500 - Product is not skin irritant
Dermal Sensitization Study per EPA OPPTS 870.2600- Product is not a skin sensitizer

All Ingredients can be found listed on the following chemical substance inventories:
United States TSCA, Canadian DSL, European EINECS and Australian AICS

SECTION III - Physical/Chemical Characteristics

Boiling Point ~212° F	**Specific Gravity (H2O) = 1)** 0.99
Percent Volatile <1.5	**Melting Point** 32° F
	pH ~6.3

Solubility in Water
Soluble

Appearance and Odor
Milky white/opaque white, slight citrus or floral odor

SECTION IV - Fire and Explosion Hazard Data

Flash Point (Method Used) None	**Flammable Limits**	**LEL** N/A	**UEL** N/A

Extinguishing Media
Does not burn

Special Fire Fighting Procedures None	**Unusual Fire and Explosion Hazards** None

SECTION V - Reactivity Data

Stability

Stable

Incompatibility (Materials to Avoid)

Strong oxidizing agents

Hazardous Decomposition or By-products

None knowr

Hazardous Polymerization

Will not occur

SECTION VI - Health Hazard Data

Route(s) of Entry	Inhalation?	Eyes	Ingestion?
	Yes	Yes	No

Health Hazards (Acute and Chronic)

Eye contact may cause mild irritation - Wash 15 minutes with water
Seek medical attention if symptoms persist

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
	No	No	No

Signs and Symptoms of Exposure

None

Medical Conditions Generally Aggravated by Exposure

None knowr

Emergency and First Aid Procedures

Eyes - wash with water 15 minutes
Ingestion - drink several glasses of water, see physician if symptoms persist

SECTION VII - Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled

Flush to drain with large quantities of water

Waste Disposal Method

Flush with water to drain

Precautions to Be Taken in Handling and Storing

Storage of product below 32 deg and above 85 degrees may cause layering

Other Precautions

Wash with soap and water if exposed

SECTION VIII - Control Measures

Respiratory Protection (Specify Type)

None required

Ventilation

Good ventilation

Eye Protection

Goggles recommended

Gloves/Other Protective Clothing or Equipment

Gloves recommended

Work/Hygienic Practices

Wash with soap and water before eating or smoking

Material Safety Data Sheet

Dust Lynx H56

1. Identification of the Product and the Company

Product Name: Dust Lynx H56

Chemical Family: Polymer - Glycerol blend

Material Uses: Dust Lynx H56 is used for dust control on roadways and parking lots.

Supplier: Cleartlow Enviro Systems Group lnc.
#140, 134 Pembina Road
Sherwood Park, AB T8H 0M2
Ph. 780 -410-1403
Fx. 780-41 0-1406
www.cleartlowg roup .com

In Case of Emergency: 780-410-1403

2. Composition / Information on Ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3. Hazard Identification

Potential Acute Health Effects

Inhalation: Inhalation not l i kely. Mis ts may cause upper tract irri tation .
Ingestion: Can ir ritate the mouth , throat ilnd st ,;,-11a c h.
Skin: May cause mild irritation.
Eyes: May cause mild irritation.
Carcinogenicity: No information was located.
Reproductive Toxicity: No information was located.
Mutagenicity: No information was loc ated.

4. First Aid Measures

Inhalation: Remove victim to fresh air. If symptoms pers ist , get medical attention.

Skin contact: Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. Get medical attention of i rritat ion develops or persists.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention immediately if irritation develops or persists.

Ingestion: if mater ial is ingested, immediately contact a physician or poison control center. Do not induce vomiting.

5. Fire-Fighting Measures

Flammable Class: The product is not flammable .

Extinguishing Media: Use an extinguishing media suitable for the surrounding fire (dry powder, CO_2) .

Special Exposure Hazards: This product presents no unusual hazards in a fire situation.

Protection Against Fire: Do not enter fire area without proper protective equip ment , including respiratory protection.

NFPA Ratings for this product are:	HEALTH2	FLAMMABILITY 0	fNSTABILITY 0
HMIS Ratings for this product are:	HEALTH2	FLAMMABILITY 0	REACTIVITY 0

6. Accidental Release Measures

Personal precautions: Wear suitable protective cloth in g and gloves. Avoid contact with the eyes and skin.

Environmental Precaut ions: Prevent entry to sewers and pub li c waters .

Procedure for Clean-up: Dike for recovery or absorb with appropriate material. Recover the cleaning water for disposal.

7. Handling and Storage

General: Avoid contact with the eyes and skin.

Handling: Wear suitable protective clothing. Wash hands and other exposed areas with mild soap and water before eat, drink or smoke and when leaving work .
Handle in accordance with good industrial hygiene and safety procedures.

Storage: Store in a dry, well-ventilated area.

8. Exposure Controls / Personal Protection

Personal Protection

Respiratory: No special respiratory protection equipment is recommended under normal conditions of use with adequate ventilation.

Hands: Wear cloves in case ofrepeated or prolonged contact.

Eyes: Even though no eye contact is expected under reasonable conditions of use, appropria te eye protection should be worn when handling this materia l (safety glasses with side shields).

Skin Wear suitable protective clothing.

Ingestion: When using, do not eat, drink or smoke.

9. Physical and Chemical Properties

Physical State: Viscous liquid

Color: Brown

pH: 9-11 (1% solution)

Specific Gravity: 1.1-1.2 (@20°C)

Boiling/Condensing Point: > I 00°C (2 I 2°F)

Vapour Pressure: <0.01 mm Hg (0.00 kPa)

Evaporation Rate: <0.01

Flash Point: >l 00°C (2 I 2°F) (open cup)

15. Regulatory Information

EC Labelling:	Non-dangerous under transport regu lations .
S Phrase(s):	None.
R Phrase(s):	None.
Domestic Substances List:	Yes.
Non-Domestic Substances List (NDSL):	Yes.
Toxic Substances Control Act:	Yes.
WHMIS Classification:	02B.

16. Other Information

Recommended Uses and Restrictions:
See product technical data sheet for detailed informat ion.

Additional Information: This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the C PR.

Prepared By: Cleartlow Enviro Systems Group, Inc.

Date of Issue: 05/13/2013

Disclaimer: NOTICE TO READER:
Cleartlow, expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or i ng red ie nt percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from Cleartlow Enviro Systems Group.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources . While the information is believed to be accurate, Cleartlow makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Cleartlow's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their paiticular purposes and they assume all risks of their use , handling, and disposal of the produc t, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

*****END OF MSDS*****

MSDS- MATERIAL SAFETY DATA SHEET

CALCIUM CHLORIDE, LIQUID
CAS NUMBER: 10043-52-4

1. CHEMICAL PRODUCT & COMPANY IIJENTIFICATION:

TRADE NAME {COMMON NAME): Liquid Calcium Chloride
SYNONYMS: Calcium Chloride Aqueous Solution
$CaCl^2$
$CaCl^2$ Aqueous Solution
Calcium (II) Chloride
Calcium (II) Chloride Aqueous Solution
Calcium Dichloride
Calcium Dichloride Aqueous Solution

MANUFACTURER/SUPPLIER:

Lady Carmen Trucking Ltd.
P.O. Box398
Brooks, Alberta
T1R 184

EMERGENCY TELEPHONE NUMBERS:

Plant Operator: Glenn Stinn - (403) 793-4397
Plant Owner: Carmen Dussault - (403) 793-7846

PRODUCT USE: Road Dust Control
Road Base Stabilization
Drilling Mud Lubricant
Heavy Equipment Tire Ballast

MSDS PREPARATION: Envirotech Seivices (403) 362-2651, (403) 362-9567 cell
CURRENT ISSUE DATE: June 6, 2011

2. COMPOSITION/INGREDIENTS:

28-30% Calcium Chloride Aqueous Solution
Calcium Chloride: **CAS#** 10043-52-4
LOSO Oral Rat 1000mg/kg
LCS0/96 Hour Fish >100mg/L
Water: CAS#7732-18-5

13. HAZARDS IDENTIFICATION:

LOW TOXICITY - MAY CAUSE IRRITATION TO SKIN, EYES. RESPIRATORY AND GASTROINTESTINAL TRACTS, HARMFUL IF SWALLOWED OR INHALED.

ROUTES OF ENTRY/POTENTIAL ACUTE EXPOSURE HEALTH EFFECTS:

SKIN CONTACT: May cause skin irritation. Prolonged contact may cause superficial burns. Contact with abraded or broken skin may cause severe necrosis.
EYES: May irritate or bum eyes. possible corneal injury.
INHALATION: Mistinhalation may initate nose, throat and lungs, may cause nosebleeds.
INGESTION: Low toxicity, *may* irritate gastrointestinaltract- cause nausea and vomiting.
CHRONIC EXPOSURE EFFECTS: None identified.

14. FIRST A(D MEASURES:

SKIN CONTACT: Wipe off excess solution from skin and flush with water.
EYES: Immediately flush with water including behind eyelids and continue for at least 15 minutes. Obtain medical attention.
INHALATION: Remove to fresh air. Obtain medical attention.
INGESTION: Low toxicity if ingested in small quantity. For large quantity if conscious immediately ingest 2-4 glasses of water or milk and obtain medical attention.

NOTE TO PHYSICIAN: Oral ingestion *may* cause serum acidosis.

js. FIRE FIGHTING'.MEASURES:

NON FLAMMABLE & NON COMBUSTIBLE.

FIRE: Not considered a fire hazard.
EXPLOSION: Not considered an explosion hazard.
FIRE CONTROL: Isolate area and use appropriate means to extinguish surrounding fire.
SPECIAL INFORMATION: At high temperatures calcium chloride may produce toxic or Irritating fumes. Fire fighters should wear full protective clothing and equipment.

j s. ACCIDENTAL RELEASE MEASURES:

ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT {SECTION 8). SPILLED BRINE MAY CREATE A SLIPPING HAZARD.

SMALL SPILLS: Isolate area, eliminate source and contain spilled material if possible, recover freeliquid with absorbant, mop orotherappropriatemeansand collectfordisposal. Dilute residues with water, recover liquid with absorbant. Repeat as necessary.

LARGE SPILLS: Isolate area, eliminate source and contain with Impermeable *or* absorbent barrier. Recover free liquid and treat residues as *tor* smallspills. Prevent spills *from* entering sewers or waterways.

1. HANDLING & STORAGE:

VENTILATION: Natural ventilation is adequate for exterior areas. Local exhaust should be used in confined storage, packaging and uploading areas, over open processing equipment and where mist is produced.
HANDLING: Avoid contact with eyes, skin or clothing and use appropriate personal protective equipment. Avoid inhaling mist or vapours. Use good personal hygiene and housekeeping.
STORAGE: Store in secure corrosion resistant container. Do not use zinc or galvanized metal containers.

S. EXPOSURE CONTROLS/PERSONAL PROTECTION:

RESPIRATORY PROTECTION: For mist and/or vapour exposure wear NIOSH/MSHA approved respirator. Respirator should be constructed of corrosion resistant materials.
EYES & FACE: For mist exposure and general handling wear chemical safety glasses and a hard hat Contact lenses should not be worn.
HANDS: Chemical resistant gloves.
BODY: Coveralls and/or fong sleeve shirt and trousers. Chemical resistant safety boots with non-slip soles..
EXPOSURE RESPONSE: Readily accessible eye-wash station and shower recommended.

19. PHYSICAL & CHEMICAL PROPERIIES:

PHYSICAL STATE: Clear to slightly turbid brownish liquid.
ODOUR: Slight acrid odour.
CALCIUM CHLORIDE: CaCt2, Molecular Weight 110.99
SOLUBILITY IN WATER: Solid 74.5gm/100ml @20°C, brine 100% miscible.
SPECIFIC GRAVITY@20°C: 20% Solution 1.19, 30% Solution 1.30, 40% Solution 1.44.
VAPOUR PRESSURE@ 20°C: 20% Solution 16mm Hg, 30% Solution 11mm Hg, 40% Solution 7.3mm Hg.
VAPOUR DENSITY: NIA (water vapour only).
EVAPORATION RATE: N/A (water vapour only).
BOILING POINT: 20% Solution +105°C, 30% SolutiOn +110"C, 40% Solution +118°C.
FREEZING POtNT: 20% Solution -20°C, 30% Solution -47"C. 40% Solution +16°C.
pH: Neutral or slightly alkaline.
COEFFICIENT OF WATER/OIL DISTRIBUTION: ***NIA***

1.0. STABILITY & REACTIVITY:

STABILITY: Product is stable.

INCOMPATIBILITY (MATERIALS TO AVOID):
• Reacts violently with boron trifluoride (BF3) or;;mixture of boron trioxide & calcium oxide (820^3 + $CaCO^3$).
- Water-reactive materials (eg. Sodium) cause an exothermic reaction.
- Methyl vinyl ether can start a runaway polymerization reaction.
• Zinc metal (galvanized coatings) react to generate potentially explosive hydrogen.
• Metals in general and aluminum, aluminum alloys and yellow brass in particular are corroded by calcium chloride.

HAZARDOUS DECOMPOSITION PRODUCTS: Chlorine gas is generated when heated to decomposition.

11. TOXICOLOGICAL INFORMATION:

RAT ORAL LD50: 1000mg/kg (anhydrous).

IRRITANCY: May cause irritation.
SENSITIZATION: May cause irritation.
CARCINOGENICITY: None known.
REPRODUCTIVE TOXICITY: None known.
TERATOGENICITY: None known.
MUTAGENICITY: None known.
TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None known.

12. ECOLOGICAL INFORMATION:

NOT KNOWN TO BIODEGRADE OR BIOACCUMULATE.

AQUATIC TOXICITY: LC50/96 is over 100 mg/L.

13, DISPOSAL CONSIDERATIONS:

Disposal Methods must comply with Provincial, State, Federal and Local disposal or discharge laws.

In limitedquantities *and* if permitted by applicable disposalregulations dilute with water and flush to sewer with additional water. May require disposal at an approved waste facility.

14. TRANSPORT INFORMATION:

Not a dangerous good, not regulated.

15. REGULATORY INFORMATION:

CALCIUM CHLORIDE WHMIS CLASSIFICATION: 02B -Toxic material causing other toxic effects (Eye & Skin irritant).

1G. OTHER INFORMATION:

NFPA 704 CLASSIFICATION: Health - 1
Flammability - O
Reactivity - 0
Specific Hazard - None

The data contained herein is believed to be accurate and reliable. No warranty is expressed or implied and Lady Carmen Trucking Ltd. and Envirotech Services **assume no responsibility regarding the accuracy or completeness of the data provided or its application.**

REFERENCES;
"Calcium Chloride Handbook" - Dow Chemical Company, August, 2003
"MSDS Calcium Chloride, Liquid" - General Chemical, Parsippany, NJ, May, 2001

Material Safety Data Sheet

Section 1: PRODUCT AND COMPANY INFORMATION

Product Name(s): Lafarge Portland Cement (cement)

Product Identifiers: Cement, Portland Cement, Hydraulic Cement, Oil Well Cement, Trinity® White Cement, Antique White Cement, Portland Limestone Cement, Portland Cement Type I, IA, IE, II, 1/11, IIA, II L.A., III, **IIIA,** IV, IVA, V, VA, 10, 20, 30, 40, 50, GU, GUL, MS, MH, HE, LH, HS, OWH, OWG Cement, OW Class GHSR

Manufacturer:
Lafarge North America Inc.
12018 Sunrise Valley Dr, Suite 500
Reston, VA 20191

Information Telephone Number:
703-480-3600 (9am to 5pm EST)

Emergency Telephone Number:
1-800-451-8346 (3E Hotline)

Product Use: Cement is used as a binder in concrete and mortars that are widely used in construction. Cement is distributed in bags, totes and bulk shipment.

Note: This MSDS covers many types of Portland cement. Individual composition of hazardous constituents will vary between types of Portland cement.

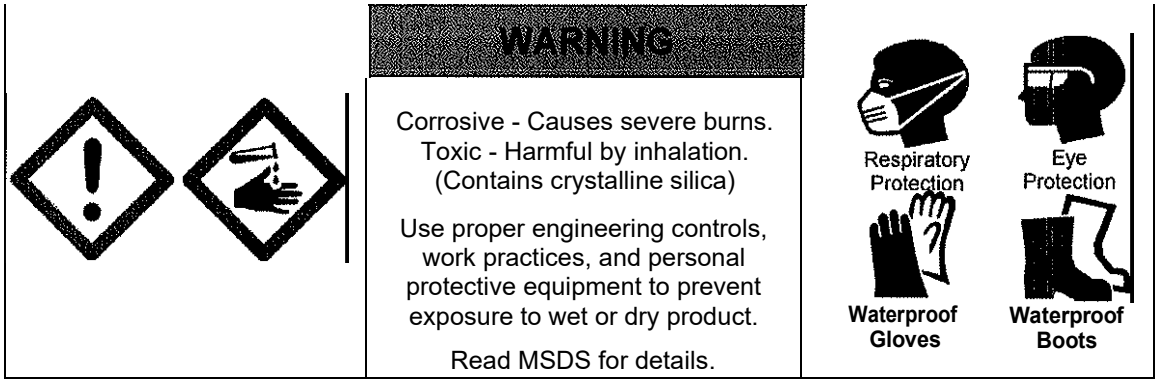
Section 2: COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent (By Weight)	CAS Number	OSHA PEL-TWA (mg/m^3)	ACGIHTLV-TWA(m/m^3	LD•o (mouse, intra eritoneal	LC50
Portland Cement'	100	65997-15-1	.15 (T); 5J L	1(R)	**NA**	**NA**
Calcium Sulfate*	2-10	13397-24-5	15(T); 5(R)	10 (T)	**NA**	**NA**
Calcium Carbonate*	0-15	1317-65-3	15 (T); 5(R)	3 (R), 10 (T)	**NA**	NA
Calcium Oxide	0-5	1305-78-8	5(T)	2 (T)	3059 m9.i,l<lJ	NA
Magnesium Oxide	0-4	1309-48-4	15 (T)	10 (T.)	**NA**	**NA**
Crystalline Silica	0-0.2	14808-60-7	[(10) / (%SiO_2+2)] (R); [(30) / (%SiO_2+2)] (T)	0.025 (R)	NA	NA

Note: Exposure limits for components noted with an • contain no asbestos and <1% crystalline silica

Cement is made from materials mined from the earth and is processed using energy provided by fuels. Trace amounts of chemicals may be detected during chemical analysis. For example, cement may contain trace amounts of calcium oxide (also known as free lime or quick lime), free magnesium oxide, potassium and sodium sulfate compounds, chromium compounds, nickel compounds, and other trace compounds.

Section 3: HAZARD IDENTIFICATION



Section 3: HAZARD IDENTIFICATION (continued)

Emergency Overview: Cement is a solid, grey, off white, or white odorless powder. It is not combustible or explosive. A single, short-term exposure to the dry powder presents little or no hazard. Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible tissue (skin, eye, respiratory tract) damage due to chemical (caustic) burns, including third degree burns.

Potential Health Effects:

Eye Contact: Airborne dust may cause immediate or delayed irritation or inflammation. Eye contact with large amounts of dry powder or with wet cement can cause moderate eye irritation, chemical burns and blindness. Eye exposures require immediate first aid and medical attention to prevent significant damage to the eye.

Skin Contact: Cement may cause dry skin, discomfort, irritation, severe burns, and dermatitis.

Burns: Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible damage to skin, eye, respiratory and digestive tracts due to chemical (caustic) burns, including third degree burns. A skin exposure may be hazardous even if there is no pain or discomfort.

Dermatitis: Cement is capable of causing dermatitis by irritation and allergy. Skin affected by dermatitis may include symptoms such as, redness, itching, rash, scaling, and cracking.

Irritant dermatitis is caused by the physical properties of cement including alkalinity and abrasion.

Allergic contact dermatitis is caused by sensitization to hexavalent chromium (chromate) present in cement. The reaction can range from a mild rash to severe skin ulcers. Persons already sensitized may react to the first contact with cement. Others may develop allergic dermatitis after years of repeated contact with cement.

Inhalation (acute): Breathing dust may cause nose, throat or lung irritation, including choking, depending on the degree of exposure. Inhalation of high levels of dust can cause chemical burns to the nose, throat and lungs.

Inhalation (chronic): Risk of injury depends on duration and level of exposure.

Silicosis: This product contains crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica from this product can cause silicosis, a seriously disabling and fatal lung disease. See Note to Physicians in Section 4 for further information.

Carcinogenicity: Cement is not listed as a carcinogen by IARC or NTP; however, cement contains trace amounts of crystalline silica and hexavalent chromium which are classified by IARC and NTP as known human carcinogens.

Autoimmune Disease: Some studies show that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders such as scleroderma (thickening of the skin), systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys.

Tuberculosis: Silicosis increases the risk of tuberculosis.

Renal Disease: Some studies show an increased incidence of chronic kidney disease and end-stage renal disease in workers exposed to respirable crystalline silica.

Section 3: HAZARD IDENTIFICATION (continued)

Ingestion: Do not ingest cement. Although ingestion of small quantities of cement is not known to be harmful, large quantities can cause chemical burns in the mouth, throat, stomach, and digestive tract.

Medical Conditions Aggravated by Exposure: Individuals with lung disease (e.g. bronchitis, emphysema, COPD, pulmonary disease) or sensitivity to hexavalent chromium can be aggravated by exposure.

Section 4: FIRST AID MEASURES

Eye Contact: Rinse eyes thoroughly with water for at least 15 minutes, including under lids, to remove all particles. Seek medical attention for abrasions and burns.

Skin Contact: Wash with cool water and a pH neutral soap or a mild skin detergent. Seek medical attention for rash, burns, irritation, dermatitis, and prolonged unprotected exposures to wet cement, cement mixtures or liquids from wet cement.

Inhalation: Move person to fresh air. Seek medical attention for discomfort or if coughing or other symptoms do not subside.

Ingestion: Do not induce vomiting. If conscious, have person drink plenty of water. Seek medical attention or contact poison control center immediately.

Note to Physician: The three types of silicosis include:

- Simple chronic silicosis - which results from long-term exposure (more than 20 years) to low amounts of respirable crystalline silica. Nodules of chronic inflammation and scarring provoked by the respirable crystalline silica form in the lungs and chest lymph nodes. This disease may feature breathlessness and may resemble chronic obstructive pulmonary disease (COPD).
- Accelerated silicosis - occurs after exposure to larger amounts of respirable crystalline silica over a shorter period of time (5-15 years). Inflammation, scarring, and symptoms progress faster in accelerated silicosis than in simple silicosis.
- Acute silicosis - results from short-term exposure to very large amounts of respirable crystalline silica. The lungs become very inflamed and may fill with fluid, causing severe shortness of breath and low blood oxygen levels.

Progressive massive fibrosis may occur in simple or accelerated silicosis, but is more common in the accelerated form. Progressive massive fibrosis results from severe scarring and leads to the destruction of normal lung structures.

Section 5: FIREFIGHTING MEASURES

Flashpoint & Method: Non-combustible

General Hazard: Avoid breathing dust. Wet cement is caustic.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Firefighting Equipment: Cement poses no fire-related hazard. A SCBA is recommended to limit exposures to combustion products when fighting any fire.

Combustion Products: None.

Section 6: ACCIDENTAL RELEASE MEASURES

General: Place spilled material into a container. Avoid actions that cause the cement to become airborne. Avoid inhalation of cement and contact with skin. Wear appropriate protective equipment as described in Section 8. Scrape wet cement and place in container. Allow material to dry or solidify before disposal. Do not wash cement down sewage and drainage systems or into bodies of water (e.g. streams).

Waste Disposal Method: Dispose of cement according to Federal, State, Provincial and Local regulations.

Section 7: HANDLING AND STORAGE

General: Keep bulk and bagged cement dry until used. Stack bagged material in a secure manner to prevent falling. Bagged cement is heavy and poses risks such as sprains and strains to the back, arms, shoulders and legs during lifting and mixing. Handle with care and use appropriate control measures.

Engulfment hazard. To prevent burial or suffocation, do not enter a confined space, such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains cement. Cement can buildup or adhere to the walls of a confined space. The cement can release, collapse or fall unexpectedly.

Properly ground all pneumatic conveyance systems. The potential exists for static build-up and static discharge when moving cement powders through a plastic, non-conductive, or non-grounded pneumatic conveyance system. The static discharge may result in damage to equipment and injury to workers.

Usage: Cutting, crushing or grinding hardened cement, concrete or other crystalline silica-bearing materials will release respirable crystalline silica. Use all appropriate measures of dust control or suppression, and Personal Protective Equipment (PPE) described in Section 8 below.

Housekeeping: Avoid actions that cause the cement to become airborne during clean-up such as dry sweeping or using compressed air. Use HEPA vacuum or thoroughly wet with water to clean-up dust. Use PPE described in Section 8 below.

Storage Temperature: Unlimited. **Storage Pressure:** Unlimited.

Clothing: Promptly remove and launder clothing that is dusty or wet with cement. Thoroughly wash skin after exposure to dust or wet cement.

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls: Use local exhaust or general dilution ventilation or other suppression methods to maintain dust levels below exposure limits.

Personal Protective Equipment (PPE):

Respiratory Protection: Under ordinary conditions no respiratory protection is required. Wear a NIOSH approved respirator that is properly fitted and is in good condition when exposed to dust above exposure limits.

Eye Protection: Wear ANSI approved glasses or safety goggles when handling dust or wet cement to prevent contact with eyes. Wearing contact lenses when using cement, under dusty conditions, is not recommended.

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION (continued)

Skin Protection: Wear gloves, boot covers and protective clothing impervious to water to prevent skin contact. Do not rely on barrier creams, in place of impervious gloves. Remove clothing and protective equipment that becomes saturated with wet cement and immediately wash exposed areas.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid (powder).	**Evaporation Rate:**	NA.
Appearance:	Gray, off white or white powder.	**pH (in water):**	12-13
Odor:	None.	**Boiling Point:**	>1000° C
Vapor Pressure:	**NA.**	**Freezing Point:**	None, solid.
Vapor Density:	NA.	**Viscosity:**	None, solid.
Specific Gravity:	3.15	**Solubility in Water:**	Slightly (0.1 - 1.0%)

Section 10: STABILITY AND REACTIVITY

Stability: Stable. Keep dry until use. Avoid contact with incompatible materials.

Incompatibility: Wet cement is alkaline and is incompatible with acids, ammonium salts and aluminum metal. Cement dissolves in hydrofluoric acid, producing corrosive silicon tetrafluoride gas. Cement reacts with water to form silicates and calcium hydroxide. Silicates react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.

Hazardous Polymerization: None. **Hazardous Decomposition:** None.

Section 11 and 12: TOXICOLOGICAL AND ECOLOGICAL INFORMATION

For questions regarding toxicological and ecological information refer to contact information in Section 1.

Section 13: DISPOSAL CONSIDERATIONS

Dispose of waste and containers in compliance with applicable Federal, State, Provincial and Local regulations.

Section 14: TRANSPORT INFORMATION

This product is not classified as a Hazardous Material under U.S. DOT or Canadian TDG regulations.

Section 15: REGULATORY INFORMATION

OSHA/MSHA Hazard Communication: This product is considered by OSHNMSHA to be a hazardous chemical and should be included in the employer's hazard communication program.

CERCLA/SUPERFUND: This product is not listed as a CERCLA hazardous substance.

EPCRA SARA Title Ill: This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 and is considered. a hazardous chemical and a delayed health hazard.

EPRCA SARA Section 313: This product contains none of the substances subject to the reporting requirements of Section 313 of Title Ill of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Section 15: REGULATORY INFORMATION (continued)

RCRA:	If discarded in its purchased form, this product would not be a hazardous waste either by listing or characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.
TSCA:	Portland cement and crystalline silica are exempt from reporting under the inventory update rule.
California Proposition 65:	Crystalline silica (airborne particulates of respirable size) and Chromium (hexavalent compounds) are substances known by the State of California to cause cancer.
WHMIS/DSL: (I)@	Products containing crystalline silica and calcium carbonate are classified as O2A, E and are subject to WHMIS requirements.

Section 16: OTHER INFORMATION

Abbreviations:

>	Greater than	JNA	Not Applicable
ACGIH	American Conference of Governmental Industrial Hygienists	[NFPA ,'--_	National Fire Protection Association
GAS No	Chemical Abstract Service number	NIOSH	National Institute for Occupational Safety and Health
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	,_N_T_P	-+-N_ati_c,11al Toxicology£rc,gra_rn .
		OSHA	Occupational Safety and Health Administration
CFR	..code for Federal Begulations	PEL	Permissible ExposLJre in,it .....
CL	Ceiling Limit.	pH	Negative log of hydrc._gen_io_n _
DOT	U.§, DepartniEIntofTransportation	PPE	.i Personal Prc,tective Eguipnient
EST	Eastern Standard Time	R	Bespirable_F>artic_u_la_te _
HEPA	High-Efficiency Particulatef\ir.	RCBJ\. .	.Be ource(;gnsElrv<1tionanc1gecCJvery.Act
HMIS	Hazardous Materials Identification	SARA	Superfund Amendments and
	§yst<1n1		<-R_e_a_ut_h_o_riz_a_t_io_n_A_c_t
!ARC	International Agency for Research on Cancer	T	Total Particulate
		TOG	Transportation of Danger.Cl.us Goods
LC,o	Lethal Concentration	TLV	Threshold Limit Value
LD,o	Lethal Dose		
. mgtrn³	j imgrams per bi rn t ;		
MSHA	Mine Safety and Health Administration		Information System

This MSDS (Sections 1-16) was revised on March 1, 2011.

An electronic version of this MSDS is available at: www.lafarge-na.com under the Sustainability section.

Lafarge North America Inc. (LNA) believes the information contained herein is accurate; however, LNA makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein which is not intended to be and should not be construed as legal advice or as insuring compliance with any federal, state or local laws or regulations. Any party using this product should review all such laws, rules, or regulations prior to use, including but not limited to US and Canada Federal, Provincial and State regulations.

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Appendix D - Facility Wildlife Management Plan

WILDLIFE MANAGEMENT PLAN

WMP RYLEY HAZARDOUS WASTE STORAGE FACILITY AND LANDFILL

MANAGEMENT PLAN	Wildlife	**REVISION NO.:**	00	**PAGE:**	1 of 10 + attachments
SUBCATEGORY:	All Activities	**CREATION DATE:**	September 2022	**APPROVED DATE:**	October 2022
				EXPIRY DATE:	October 2023

1.0 PURPOSE

The Wildlife Management Plan (WMP) is a condition of the approval amendment (Approval No. 10348-03-01) under the Alberta *Environmental Protection and Enhancement Act* (EPEA) for the construction, operation, and reclamation of a Class I and Class II Industrial Landfill and a Hazardous Waste/Recyclable Storage and Processing Facility (the Ryley Landfill) issued to Clean Harbors Canada Inc. (Clean Harbors) on June 21, 2022. The WMP is intended to provide Clean Harbors employees, contractors, and visitors with Standard Operating Procedures (SOPs) (3) to prevent, remove, and report wildlife sightings, including wildlife residences (dens, nests, roosts, hibernacula) and alert others of potentially dangerous or aggressive animals.

This WMP applies to all wildlife and/or wildlife residences seen on the landfill facility, including roads, pad sites, temporary laydowns, and/or wherever workers are present.

2.0 DEFINITIONS

Aggressive Animal: threatening animal behaviour that could result in actual or potential harm to people (e.g., animal does not flee when deterrents are used, flattened ears, bluff-charge, attack).

Deterrent: a noise, visual, or physical stimuli used towards/on an animal with the intent of repelling.

Food Conditioned: wildlife that has learned to associate people, waste storage areas, and landfill activities as potential food sources. Wildlife can become food conditioned after obtaining a food item even the once and can become an aggressive animal.

Habituated: wildlife can become habituated to people and landfill activities after repeated exposure without negative consequence. Habituated wildlife respond to people and/or activities onsite with little fear (respond weakly or not at all) and can become an aggressive animal.

Potentially Dangerous Animal: any of the big game species (black bear [*Ursus americanus*], cougar [*Puma concolor*], Canada lynx [*Lynx canadensis*], moose [*Alces alces*], elk [*Cervus canadensis*], white-tailed deer [*Odocoileus virginianus*], and mule deer [*Odocoileus hemionus*]), as well as coyote [*Canis latrans*]) have the potential to become dangerous to people.

Property Damage: any incident in which the property of the Ryley Landfill, its employees, contractors, and/or visitors is damaged by an animal and requires repair or replacement.

Qualified Environmental Professional: a Qualified Environmental Professional (QEP) is an experienced wildlife biologist who is appropriately trained in the identification of wildlife species, the federal and provincial regulatory requirements, and has experience with the management and mitigation of human-wildlife interactions. The QEP may be a Clean Harbors employee or contractor.

Wildlife Attractant: a substance or item that could be reasonably expected to attract an animal, including, but not limited to food and petroleum products. Natural food sources, such as a carcass and other putrescent waste are also attractants.

Wildlife Incident: all wildlife incidents are reported to the Facility General Manager with potential escalation of reporting. A reportable wildlife incident includes:

- Wildlife mortality and/or injury due to, or suspected from landfill activities;
- Accidental destruction of a wildlife residence (den, nest);
- Human-wildlife interactions that present a risk to either people or animals, including incidents of an aggressive animal and wildlife-caused property damage;
- Any big game species has, or potentially has, gained access to a man-made attractant; and
- Anytime that deterrent action is taken.

Wildlife Residence: nests, dens, roosts, hibernacula.

3.0 BACKGROUND

The Ryley Landfill is located approximately two kilometres north of the Town of Ryley, Alberta. The landscape surrounding the facility is prairie parkland, including a mix of agricultural lands, another waste management facility, and pockets of aspen forests and wetlands. This location appears to be outside of the black bear distribution range in the province according to Alberta Environment and Parks (AEP)[1], however, Ryley is within the black bear range identified in Mammals of Alberta[2], and the nearby Beaver Hills area has recent confirmed sightings of black bear in the area. Therefore, it is considered highly likely that black bears are in the area and should be considered in wildlife management planning. There are several additional big game species with potential to occur in the area, including cougar, moose, elk, white-tailed deer, and mule deer. Smaller mammals with potential to occur in the area which may require management/mitigation include striped skunk (*Mephitis mephitis*), common raccoon (*Procyon lotor*; as their range expands into central Alberta), rabbits and hares, and American badger (*Taxidea taxus*). Other wildlife which may be found within the Ryley Landfill includes birds, amphibians, and reptiles, some of which may be protected under federal and provincial legislation, including the Alberta *Wildlife Act*, federal *Migratory Birds Convention Act*, and/or the federal *Species at Risk Act*.

The primary mitigation measure for wildlife management in place at the Ryley Landfill Facility is a 6-foot fence (1.8 metres) with three strings of barbed wire at the top which encloses the entire facility. Access

[1] Government of Alberta. 2022. Black Bear Management – Overview. Available at: https://www.alberta.ca/black-bears-overview.aspx. Accessed September 19, 2022.
[2] Pattie, D. and Fisher, C. 1999. Mammals of Alberta. Lone Pine Publishing: Edmonton, Alberta. 240 pp.

to the facility is via a gate with a similar structure to the fence. The gate is always closed, except when access is required by vehicles. Areas of grass/vegetation within and around the facility is mowed as required and the waste streams accepted within the facility typically do not attract vermin, including:

- Hazardous waste: petroleum products, solvents, paints, inorganic waste, organic chemicals, contaminated soils from spills, etc.
- Non-hazardous waste: inorganic sludges, slurries, solids, inert inorganic waste, organic chemicals, activated carbon, contaminated soil and debris, etc.

4.0 RESPONSIBILITIES

4.1 Facility General Manager

- Ensures this WMP is communicated to on-site employees, contractors, and visitors.
- Provides appropriate training.
- Ensures this plan is updated, implemented, and followed.
- Identifies when a QEP is required to provide support for wildlife incidents and/or take action for potentially dangerous and/or aggressive animals following procedures outlined in SOP #2 *Reporting and Responding to a Wildlife Sighting and Deterrent Use*.
- Ensures wildlife sightings and actions are recorded, as required.

4.2 Qualified Environmental Professional

- Has and maintains appropriate training. The QEP may be a Clean Harbors employee or a contractor.
- Records wildlife sightings and residences on the Wildlife Observation Logs following these procedures, including those seen by others and previously reported when asked to do so.
- Takes necessary action to avoid destruction of and disturbance to nests, dens, roosts, and hibernacula following these procedures.
- Notifies and take advice from regulatory authorities, as required, when nests, dens, and roosts/hibernacula have the potential to be destroyed/disturbed.
- Issues temporary stop-work and setback distances, as appropriate with the Facility General Manager.
- Supports the Facility General Manager, when necessary, for actions regarding potentially dangerous and/or aggressive animals and follow procedures outlined in SOP #2 *Reporting and Responding to a Wildlife Sighting and Deterrent Use*.

4.3 All Employees, Contractors, and Visitors

- Understand and follow this procedure.
- Communicate the locations of wildlife to other employees, and travel with extra caution and restrict speeds in these areas.
- Report wildlife sightings and residences in the Wildlife Observation Log, as required.
- Take reasonable precaution to avoid disturbing wildlife, if any, on site.
- Ask the Facility General Manager for clarification of the WMP, when required.

5.0 STANDARD OPERATING PROCEDURES

In support of this WMP, SOPs have been developed for the identification, reporting, response, and preventative measures to reduce/mitigate wildlife interactions within the Ryley Landfill.

5.1 SOP #1 Wildlife Preventative Measures

This procedure is intended to provide Clean Harbors employees, contractors, and visitors with guidelines for reducing and managing wildlife attractants and reducing risk of wildlife habituation, injury, and mortality.

The purpose of this procedure is to provide direction to all on-site workers on how to reduce wildlife attractants and restrict access of wildlife to the Ryley Landfill. The proper storage, handling, and disposal of products that can attract wildlife is essential to reduce the risk of wildlife attraction and habituation to the facility. Failure to properly contain wildlife attractants may result in food conditioning and aggressive animal behaviour.

5.1.1 Waste Management

- All employees will follow the guidelines and recommendations in this WMP while on site at Ryley Landfill.
- Employees, contractors, and visitors will ensure that no litter, wildlife attractants, or hazardous materials are accessible to wildlife. This includes ensuring proper storage and use of any material that could be considered an attractant or hazard to wildlife.
- If possible, all personnel on site will collect litter, improperly stored attractants, and misdirected waste, and, if safe to do so, properly dispose of them.
- All personnel on site are prohibited from feeding wildlife or leaving food out for wildlife.
- All personnel who suspect wildlife is attracted to the worksite will report it to the Facility General Manager immediately.

5.1.2 Ryley Landfill Infrastructure

- The access gate will remain closed when not in use or will have a monitor to watch for potential wildlife ingress if the gate is left open for an extended period. If the gate is found open with no monitor present it will be reported to the Facility General Manager.
- The facility boundary fence and gate shall be routinely inspected for signs of damage or wildlife passage. Any locations where wildlife can access the facility will be reported to the Facility General Manager and they will implement the necessary maintenance.
- Facility infrastructure (e.g., building, light standards, etc.) shall be routinely monitored for signs of wildlife use (e.g., nests, roosts, feeding, sheltering). Any location of persistent wildlife use will be reported to the Facility General Manager. If necessary, a QEP may be required to provide support and determine mitigation measures to deter wildlife use.
- On-site personnel will inform the Facility General Manager of maintenance needs to prevent wildlife from sheltering.

5.2 SOP #2 Reporting and Responding to Wildlife Sightings

This procedure is intended to provide Clean Harbors employees, contractors, and visitors with guidelines to report wildlife sightings, including wildlife residences (dens, nests, roosts, hibernacula), safely respond to a wildlife sighting, use deterrents (including herding), and report actions taken.

This procedure applies to all areas of the Ryley Landfill, including the roads, pad sites, temporary laydowns, and/or wherever workers are present. In general, all wildlife should be left undisturbed. Many wildlife sightings won't require action, including when:

- The animal poses no danger because the species is not a risk to people or property (e.g., snowshoe hare);
- The animal (and its residence) is not in danger of harm; and
- The animal has not gained access to an attractant, such as a food reward.

Wildlife deterrents only work if there is an absence of food, shelter, and other rewards for animals at the facility. Refer to SOP #1 for procedures to reduce wildlife attractants. Should the situation permit, consultation with a QEP and/or AEP regarding appropriate use of deterrents prior to action is recommended.

- Everyone on site is to record wildlife observed within the perimeter fence, with the exception of birds. unless a nest is observed, or an improperly stored attractant is suspected. Records of wildlife sightings and wildlife residences are used to apply mitigations and avoid/reduce the likelihood of adverse wildlife effects.
- Enter the wildlife sighting into the Wildlife Observation Log daily (see attached Wildlife Observation Log). The log is kept at the Ryley Landfill office. Best practice is to fill out the log promptly upon returning to the office. Record the wildlife sighting only once.
- If a potentially dangerous or aggressive animal is observed, immediately alert others of the animal's location via radio and follow the procedures outlined in Section 5.2.1.
- If wildlife is reported on or near roads, traffic will stop for all wildlife seen crossing or attempting to cross. Headlights are to be turned off once the vehicle is stopped to allow the animal to cross, if applicable. All employees/contractors are to remain in the vehicle and shall not attempt to herd the animal off the road. Should the animal not move off the road, notify the Facility General Manager and they will respond, if required, following deterrent action outlined in Section 5.2.5.
- The Facility General Manager will ensure that Wildlife Observation Logs are available at the office.
- The Facility General Manager and/or designated person(s) is to review the Wildlife Observation Logs weekly to identify where wildlife is repeatedly sighted and to inform adaptive management. A repeat wildlife sighting may indicate an improperly stored attractant, a possible wildlife residence, or maintenance needs on the perimeter fence.
- Copies of the logs will be retained and filed at the office.

5.2.1 Aggressive Animal

Any employee, contractor, or visitor that encounters an aggressive animal is to immediately take refuge.

- Immediately alert others of the animal's location via radio.
- Get to and remain in a safe shelter or vehicle, until confirmation can be made that the area is clear.

- Immediately notify the Facility General Manager and provide the following information: the species, the animal's location, staff locations (including those nearby), and perceived risk to people.
- The Facility General Manager and/or designated person(s) will respond immediately to secure the site and people's safety.
- Consult with a QEP for advice and additional support to safely deter the animal away from the facility and people (refer to Section 5.2.5 Responding with Wildlife Deterrents).
- In the unlikely event that no deterrents are proving successful, and the aggressive animal remains in the area, the QEP will contact AEP for advice and/or additional support.
- The Facility General Manager, with support from the QEP, will follow the procedures in Section 5.2.6 including filling out a Wildlife Incident Report and reporting the aggressive animal incident to AEP within 24 hours.

5.2.2 Nest, Den, Roost, or Hibernaculum

Birds, bats, and other wildlife may nest, roost, den, or take refuge in man-made buildings, culverts, light standards, soil piles, as well as any natural habitat in/near the facility. No employee, contractor, or visitor shall disturb, destroy, or collect a nest (or egg), den, roost, or hibernaculum.

- Employees, contractors, and visitors will record a nest, roost, den, or hibernaculum seen or suspected in the Wildlife Observation Log and notify the Facility General Manager immediately of the observation.
- Once notified of the presence of a wildlife residence, the Facility General Manager will confirm the observation (if required), notify a QEP to determine any setback distances required, and restrict activity (if any activity present) within the appropriate setback distance to avoid disturbing the residence. No person shall destroy a nest, den, roost, or hibernacula at any time, even if unoccupied.
- The QEP to notify and consult with AEP **within 24 hours** of the observation if the wildlife residence was or has the potential to be destroyed or disturbed, by landfill activity (i.e., Project activities within the setback distances recommended by the QEP).
- The QEP, will discuss adaptive management actions with the regulatory authority on an appropriate setback distance to active worksites to minimize disturbances to a wildlife residence. In cases where the residence cannot be avoided, the QEP will discuss adaptive management actions, including any permit requirements, with the regulatory authority on how to proceed.
- The Facility General Manager, with support from a QEP, if applicable, will record the incident in a Wildlife Incident Report and provide a copy of the report to AEP **within 24 hours** when a wildlife residence was harmed because of landfill activities. The Facility General Manager will also investigate the cause of the incident and consider adaptive management action, evaluating if (and how) wildlife mitigation may have failed as outlined in Section 5.2.6. Mitigation methods will be updated to reduce the likelihood of the incident reoccurring, if applicable.

5.2.3 Animal Carcass or Injured or Sick Animal

- All employees, contractors, and visitors are to immediately report a sighting of an animal carcass, injured, or sick animal to the Facility General Manager, including if the animal was accidentally harmed by the observer.
- If the animal is behaving in ways that suggest that they may be infected with rabies (e.g., unusual aggression or boldness, excess saliva or foaming around the mouth, drooping head, and partial

paralysis) get to and remain in a safe shelter or vehicle, until confirmation can be made that the area is clear.

- If the animal was accidentally harmed by an employee, contractor, or visitor, all persons involved and/or witnesses are to remain on the scene and stay in a shelter or vehicle for safety.
- Provide the Facility General Manager with information such as the time, events leading up to the incident, condition of the animal and its location, cause of incident (if known), and staff involved which will be reported in the Wildlife Incident Report (see attached Wildlife Incident Report form).
- Once notified, the Facility General Manager is to immediately respond to an animal carcass and/or injured or sick animal, including those that look to have been harmed by a predator.
- In response to the incident the Facility General Manager will:

  a) Assess the level of harm and safety risk to any person(s) involved in the incident and in the area. Injured animals may act aggressively. Implement a temporary shut-down of applicable work sites, if required;

  b) If the animal remains on the scene, consider the animal's injuries, without touching the animal. If the animal has left the scene, assess the conditions through discussions with the person who reported the incident;

  c) Consider the animal's behavior and general body condition. Animals behaving in ways that suggest that they may be infected with rabies include unusual aggression or boldness, excess saliva or foaming around the mouth, drooping head, and partial paralysis;

  d) Look for an apparent cause of death (if applicable); and

  e) Facility General Manager to contact a QEP and/or AEP for advice and/or additional support.

- The Facility General Manager and/or the QEP will notify AEP of the incident when carcasses resulting, or suspected, from the facility and consult with the regulators how to dispose of the carcass. Do not move the carcass of an animal possibly diseased until direction is provided by AEP. Appropriate personal protective safety measures must be taken when handling all carcasses.
- Should the incident involve an injured or sick animal, the Facility General Manager will notify AEP immediately and follow regulator direction. If the incident occurs during regular working hours, call the Camrose/Vegreville AEP Fish and Wildlife Office. If the incident occurs after working hours and is an emergency, call the Report a Poacher Line and/or 9-1-1.
  - **AEP Camrose/Vegreville Fish and Wildlife Office: 780-632-5410.**
  - **AEP 24-hour Emergency Line: 1-800-642-3800** (Report a Poacher Line, also used for wildlife emergencies).
- The Facility General Manager, with support from a QEP, if applicable, will follow the procedures in Section 5.2.6 including filling out a Wildlife Incident Report and provide a copy of the report to AEP **within 24 hours** when wildlife was harmed, or suspected, by the facility.

5.2.4 Animal-Related Property Damage

- If property damage from wildlife is identified, the employee who identified it will first determine if there are any wildlife still in the vicinity. If there is a potentially dangerous animal nearby, move to a secure location.

- Notify the Facility General Manager of the property damage and animal, if applicable.
- Once notified, the Facility General Manager to then respond to instances of animal-related property damage.
- If property damage is ongoing and/or a dangerous animal remains nearby, the Facility General Manager will use appropriate deterrent action to move the animal and secure the area (refer to Section 5.2.5). Should the situation permit, consultation with a QEP and/or AEP regarding appropriate use of deterrents prior to action is recommended.
- Once the area is secure, the Facility General Manager will conduct an inspection of the property damage, undertake the required maintenance (e.g., fix holes in/under the facility perimeter fence), and with support from the QEP, follow the procedures in Section 5.2.6 for a wildlife incident.

5.2.5 Responding with Wildlife Deterrents

Often deterrent action is not required, and the animal moves away on their own accord once aware of human presence. All employees, contractors, and visitors may make an animal aware of their presence by talking loudly or waving their arms.

Deterrent action may be required when:

- An animal is acting aggressively and/or poses an immediate threat to people or property;
- The animal is in a potentially hazardous location and not moving off on their own accord; and
- The animal has, or has the potential to, gain access to a food reward.

Herding is used to move wildlife away slowly and safely from potentially hazardous sites, such as active construction and/or operational sites where there is risk to harming and/or alarming an animal. Herding actions will always prioritize the safety of site personnel but must be conducted in a manner that minimizes the risk of injury to both wildlife and personnel and stress to the animal. Herding should be completed using a vehicle to ensure safety to people and the animal.

- The Facility General Manager will designate a responsible person to conduct the herding and notify any employees, contractors, and visitors in the area that wildlife herding is going to be undertaken and to clear the area.
- A safe exit pathway for the animal will be ensured (i.e., back through the perimeter fence or gate) prior to approaching the animal.
- Slowly (at a walking pace) use the vehicle to approach the animal to encourage the animal to move away out of the facility. Continue the approach until the animal begins moving. If the animal stops moving again the approach can be resumed until the animal has moved back through the facility boundary fence.
- Advancement towards the animal should be temporarily halted if the animal shows signs of alarmed response (fight or flight). The herder must be careful not to overstress the animal and must back off when the animal begins moving in the desired location. Undue harassment must be avoided. The vehicle horn can be used as an auditory deterrent only when the animal is not moving on their own accord.
- Advancement should not exceed closer than 30 m from the animal when herding with the vehicle.
- If the animal continues an approach towards humans, and/or will not move, the animal should be treated as though it may be aggressive (refer to Section 5.2.1).

- Should the situation permit, consultation with a QEP and/or AEP regarding appropriate use of deterrents prior to action is recommended.
- The location where the fence has been breached will be immediately repaired following confirmation that there are no other animals inside of the facility.

5.2.6 Incident Reporting

A Wildlife Incident Report must be filled out by the Facility General Manager when:

1. Wildlife mortality and/or injury due to, or suspected from, the landfill or activities at the facility;
2. Accidental destruction of a wildlife residence (den, nest);
3. Human-wildlife interactions that present a risk to either people or animals, including incidents of wildlife exhibiting aggressive behaviour (e.g., animal does not flee when deterrents are used, flattened ears, charge or bluff-charge, attack) or a wildlife-caused property damage;
4. Big game species has, or potentially has, gained access to a man-made attractant (food/shelter); and
5. Anytime deterrent action is taken.

In the event of a wildlife incident, the Facility General Manager, with support from a QEP, if applicable, will record the incident in a Wildlife Incident Report and will conduct an investigation to the cause of the incident, considerations for adaptive management action, and evaluating if (and how) wildlife mitigation may have failed. Mitigation methods will be updated to reduce the likelihood of the incident reoccurring, if applicable. If wildlife (or its residence) was harmed as a result of Project activities, the Facility General Manager will provide a copy of the incident report to AEP within 24 hours.

The Facility General Manager will also discuss the incident with personnel (e.g., safety memo, meeting), including what happened, how it was mitigated, and any lessons learned from the incident.

6.0 SUPPORTING DOCUMENTS

1. Wildlife Observation Log
2. Wildlife Incident Report

Wildlife Observation Log
And
Wildlife Incident Report

WILDLIFE OBSERVATION LOG

Main Office

Date (YY/MM/DD)	**Location**	**Time**	**Species** (common name)	**Number of Animals**	**Observer**	**Notes** (animal behaviour and or reaction to Project, health, etc.)

RYLEY LANDFILL WILDLIFE INCIDENT REPORT

INCIDENT REPORT NO.:

Location of Incident (e.g., detailed worksite location):

Date of Incident:	**Time of Incident:**	**Incident Report No.:**
Name(s) of Individual(s) Involved: Contact Number(s):		

Nature of Wildlife Incident:

- ☐ Wildlife Mortality/Injury from Project; Euthanized? ☐ Yes; ☐ No
- ☐ Wildlife Attack
- ☐ Aggressive/Threatening Wildlife Behaviour
- ☐ Deterrent Used
- ☐ Property Damaged
- ☐ Wildlife Has, or Potentially Has, Accessed an Attractant
- ☐ Wildlife Residence Damaged
- ☐ Other:_____

Species: _____

# of Animals Involved:_____

Cubs/Young Present? ☐ Yes; ☐ No

Evidence of Disease, Injury, or Malnourished? ☐ Yes; ☐ No. Explain: _____

Wildlife Behaviour (select multiple, if applicable): ☐ Predatory; ☐ Defensive; ☐ Curious/Approached;

☐ Feeding; ☐ Food Conditioned ☐ Running/Traveling; ☐ Fled the Scene; ☐ Other:_____

Details of Incident (e.g., age and sex of wildlife, distinguishing features of the animal (colour, markings), the animal's direction of travel, aggressive behaviour, weather conditions, unsecured attractants, estimate how long the animal was dead, any other animals seen in the area, description of property damage, photographs):

RYLEY LANDFILL WILDLIFE INCIDENT REPORT

INCIDENT REPORT NO.:

Reason(s) for Deterrent Use (select multiple, if applicable)**:**

- ☐ Inside Perimeter Fence
- ☐ Endangering Human Safety
- ☐ Destroying Property
- ☐ Gained Access to a Food Reward
- ☐ Involved in Previous Incident(s)
- ☐ Other (Specify):

Deterrent(s) Used	**Deterrent Success** (provide more info on back)	**Damage by Wildlife***
☐ Herding with Vehicle	☐ Yes ☐ No	☐ Human Injury ☐ Human Mortality
☐ Vehicle Horn	☐ Yes ☐ No	☐ Equipment/Supplies:_____ Damage $_____
☐ Other:_____	☐ Yes ☐ No	☐ Other:_____

*Describe the damage in the Details of Incident section

Report to Alberta Environment and Parks (AEP) anytime an animal is injured/harmed by the Project, caused damaged property, deterred, obtained food reward, involved in a human-wildlife conflict, when nest/den accidentally destroyed. If the incident occurs during normal working hours, call the Camrose/Vegreville AEP Fish and Wildlife Office. If the incident occurs after working hours and is an emergency, call the Report a Poacher Line and/or 9-1-1.

AEP Camrose/Vegreville Fish and Wildlife Office: 780-632-5410

AEP 24-hour Emergency Line: 1-800-642-3800 (Report a Poacher Line, also used for wildlife emergencies)

Discussion with Regulators

Date & Time Spoke to Regulator:_____

Regulator Contact:_____

Direction Provided by Regulator: (type of deterrent to use, carcass disposal, removal of attractant, reporting, etc.)

Report Completed by:_____

Date Report Submitted to AEP: _____

Report Submitted by:_____

Appendix E - Community Complaint Response Plan

CLEAN HARBORS RYLEY COMMUNITY COMPLAINT RESPONSE PLAN

1. Purpose

Having impacts on the local community from Ryley Facility operations can result in short and long-term problems in areas such as: regulatory compliance and community relations. Odours are an inherent part of the operations of landfills and transfer station facilities and must be properly and proactively managed. It is important to understand that it is our host community that is affected by odours and other issues from our operations. The management and control of off-site impacts is not always an easy task.

The purpose of this Community Complaint Response Plan is to establish standard procedures to be followed in actively handling and managing odour issues and complaints. The plan establishes resources and procedures for collecting data pertinent to complaints and defines methods for responding complaints. The plan is divided into 4 main sections. Section 2 deals with the complaint processing and procedure of receiving the complaint and handling the complainant. Section 3 describes the gathering of the environmental data. Section 4 outlines procedures implementation of any corrective actions. Section 5 includes notifications, record keeping and reporting procedures for documentation regarding odour management and complaints.

The implementation of this plan will improve Community Compliant Response Plan at Ryley Facility (the facility) while also improving the perception of our operations by our host communities

1. Compliant Processing

When a complaint is received, it should be routed to the Facility General Manager or designee. These people are the only site personnel authorized to receive the complaint except in the event both are gone and unable to be reached.
The Facility General Manager or designee should then discuss the compliant issue with the complainant. The site-specific list of discussion points referenced earlier should be used as a guide during this conversation.

a. Odour Complaints

- At the time the complaint is received, the Facility General Manager or designee should complete the Odour Complaint Call Log Form found in Appendix A, paying special attention to recording the specific time and location of the detected odours. When answering a complaint call:
    - Get caller's name address and telephone number.
    - Do not argue with the complainant.
    - Be sympathetic to the person's situation; tell them you are sorry for their inconvenience.
    - Let them vent all their frustrations.
    - Ask questions pertaining to the odour complaint form such as:
        - What type of odour do you smell?
        - How strong is the odour?
        - When did you first begin smelling the odour?
        - Has the same odour been noticed before?
        - What direction is the odour coming from?
        - Was/Is the weather unusual in any way when you smelled the odour?

    - Ask if the neighbour wishes a follow-up check/communication with the Facility General Manager or designee.
- Tell the complainant what your course of action is to help with the problem.
- Tell the complainant that you will follow-up to make sure the problem has been resolved.
- The Site Manager or designee should:
    - Visit the location of the complaint ~~immediately~~ to confirm odour. The visit should occur shortly after the complaint is received.
    - Speak to the supervisors if necessary (if source may be from their area).
    - Check weather station data for the specific time and date of the odour complaint. Record the relevant data on Odour Complaint Call Log Form.
- Make follow-up call(s) to the complainant as required. The follow-up call should include, at a minimum:
    - The manager's findings concerning the complaint.
    - The source of the odours, if determined.
    - The duration of the odour, if known.
    - Any corrective measures if odours are from the facility.
- File the Odour Complaint Call Log Form in an accessible electronic file folder.

b. Other Complaints

Other complaints will be received and handled similar to an odour complaint but more specific to the style of complaint received.

2. Weather Data Collection

The facility has installed an on-site meteorological station to record meteorological data. The meteorological station records data at minimum 1-minute intervals which is documented using electronic downloads. The site has devices capable of measuring the following meteorological parameters:

- Wind Direction and Speed
- Rainfall/Precipitation Amounts
- Temperature

3. Corrective Actions:

To prevent further complaints, the facility should:

- Compare present odour complaint received to past odour complaints. Determine any correlation between the complaints. For example, do the complaints come at a specific time of day or when a specific operation is taking place on the site?
- Review list of common on-site sources for the cause of the odour complaint.
- Identify corrective measures for all potential odour sources. Some examples are:
    - Revamp housekeeping and operational controls of landfill waste.
    - For one-time events that involve disposing of odorous waste, dispose of in a dedicated trench or pit, cover frequently, and utilize an odour control agent misted around the perimeter of the disposal area.
    - Add liquid odour control chemicals directly to leachate or sludge tanker truck.
    - Apply daily cover.

    - Evaluate potential pre-treatment of odorous waste streams with customer
- Implement and document corrective measures.

When the Manager or designee returns to the site:

- Speak to the supervisors if necessary (if source may be from their area).
- Document all findings as well as a record of your communication with the neighbour.
- Complete the Odour Complaint Log Form and internal incident report
- Report back to the neighbours if so requested.

Complaints are recorded upon receipt using the Odour Complaint Call Log Form. On-site wind speed and direction are recorded prior to initiating an off-site investigation of the complaint.

- The complaint is investigated by the Manager, or designated company representative, as soon as possible after receipt.
- The Manager is responsible for notifying the 24-hour Environmental Hotline of the Alberta Environment and Parks (AEP) within two hours of the complaint.
- The Manager is responsible for completing a Notification Report email to Facility management, CAO of Village of Ryley, CAO of Beaver County and AEP.
- The purpose of the investigation by the Manager is to substantiate the complaint in order for Clean Harbors to identify the specific source/cause and take the appropriate steps to rectify the situation.
- The complaint, including details of location, time of day, nature of the complaint, weather conditions (including on-site wind speed and direction, cloud conditions, local precipitation and temperature) and any on-site operating circumstances are documented on the Complaint Report form.
- Subject to the investigation of the complaint and any potential on-site operating conditions associated with the complaint, corrective actions are taken by the Manager, as appropriate.
- Results of the investigation, corrective actions taken, or reasons for no action are documented by completing the Odour Complaint Log Form and an internal incident reportkept on file by Clean Harbors.
- A direct response from Clean Harbors regarding the complaint investigation, findings and corrective actions is provided to the complainant within 24 hours, if requested.

4. Notification

A summary of the complaint investigation, findings and corrective actions is to be provided to the CAO of Village of Ryley and the CAO of Beaver County within 24 hours, or one business day. Follow up information will be provided as appropriate depending on the nature and duration of the situation leading to the complaint.

A summary of all complaints received at the facility is provided to the CAO of Village of Ryley, CAO of Beaver County and AEP. This includes corrective actions taken to address the specific complaint.

A summary of all complaints received at the facility is included in the Annual Landfill Report which will be submitted to the AEP by March 31st each year. Copies of the report are also provided to CAO of Village of Ryley, CAO of Beaver County and posted on the Clean Harbors website.

Odour Complaint Call Log Form

Caller Information *(Recommended)*	
Caller name *(optional)*	**Phone number** *(optional)*
Call Date	**Call Time**

Issue details *(Recommended)*	
Location where air quality or odour issue was experienced	
Alleged source of air quality or odour issue	

When was the air quality or odour issue first noticed? How long did it last?				
☐ One time	Start time:		End time:	
☐ Continuous since	Date:		Time:	
☐ Daily	Time of day		Frequency	

Intensity *(Optional; used primarily for odours)*

- ☐ Faint: odour barely detectable
  (e.g. have to be standing still, facing into the wind to detect odour)
- ☐ Moderate: odour is easily detected but not overpowering
  (e.g. can detect odour while walking and breathing normally)
- ☐ Strong: odour is penetrating
  (e.g. can be detected easily, detected at all times and is hard to escape)

Description *(Optional; used primarily for odours, checking off as applies)*

Chemical	Earthy	Offensive
☐ Acidic	☐ Grass	☐ Garbage
☐ Bleach	☐ Hay	☐ Garlic/Onion
☐ Glue	☐ Mould	☐ Rancid
☐ Mothballs	☐ Peat-like	☐ Sour milk
☐ Nail polish	☐ Pine	☐ Sweet & sour
☐ Petroleum	☐ Swamp	☐ Rotten eggs
☐ Plastic	☐ Wood	☐ Rotting meat
☐ Rubbery	☐ Yeast	☐ Rotting vegetables
☐ Solvent		☐ Skunk
☐ Tar		☐ Urine
☐ Turpentine		☐ Vomit
☐ Vinegar		☐ Yeast
☐ Varnish		

Medicinal	Fecal	Putrid
☐ Alcohol	☐ Manure	☐ Burning carcasses
☐ Ammonia	☐ Septic	☐ Dead animal
☐ Methanol	☐ Sewer	☐ Decay

Fruity	Floral	Smoky
☐ Citrus	☐ Flowers	☐ Burnt plastic
☐ Fermented	☐ Fragrant	☐ Burnt rubber
☐ Fruity	☐ Herbal	☐ Coffee-like
☐ Over ripe fruit	☐ Perfume	☐ Exhaust
	☐ Spicy	☐ Grass-smoke
		☐ Wood-smoke

Fishy	Other
☐ Dead fish	

Weather conditions *(Recommended; at the time the issue was noticed)*

General Conditions	Cloud Cover	Wind speed	Wind Direction
☐ Dry	☐ Clear	☐ None	What direction was the wind coming from?
☐ Rainy	☐ Light cloud	☐ Light	
☐ Foggy	☐ Scattered cloud	☐ Steady	
☐ Snowy	☐ Overcast	☐ Strong/Gusting	

Action Taken *(Recommended)*

Investigation Results:	
Actions Taken:	
AEP Notification: (Contact must be made within two hours of the complaint)	Time: AEP Incident Number:
Company Representative:	
Incident Completion Date:	

Appendix F

Emergency Management Plan

Clean Harbors Canada, Inc.
Ryley Facility, Alberta

Emergency Management Plan

January 2023

TABLE OF CONTENTS

EMERGENCY MANAGEMENT PLAN

Approved By: Stan Yuha, Facility Manager Stan Yuha

Signature

Approved By: Wayne Codd, Operations Manager

Signature

1.0 Introduction

1.1 Emergency Management Plan

This Emergency Management Plan has been written with the intent of providing operating guidelines to deal with any foreseeable emergencies which may arise during the course of operations at the Ryley Facility or during transportation of wastes to or from Ryley.

1.2 Purpose

The purpose of the Emergency Management Plan is to provide a framework for both general and specific policies and procedures and lines of communication that can be put into motion in the event of an emergency. By implementing and maintaining an effective Emergency Management Plan, Clean Harbors Canada, Inc. plans to reduce the Corporations exposure to loss by providing for:

i) The safety and well-being of all employees and others;
ii) Minimizing damage to the environment;
iii) Process of recovery and resumption of operations;
iv) And effective incident reporting chain.

1.3 Revision Procedure

1.3.1 The Emergency Management Plan policies, frameworks, roles, and responsibilities described, will be reviewed and revised annually and will be the responsibility of the Facility Manager or his delegate. Employees who actually participate in any emergency response are in the best position to determine the safest and most efficient methods.

1.3.2 Revisions to the Plan will be initiated by completing the Revision Request Form (Figure 1). The Revision Request must pass through the stages identified on the form.

1.3.3 The Facility Manager or his delegate has the responsibility for maintaining the currency of the Emergency Management Plan procedures at Clean Harbors Canada, Inc…(Ryley)

2.0 Company Operations

2.1 Clean Harbors Canada, Inc. (Ryley), owns and operates a Transfer Station, Class 1 Secure Landfill, and Hazardous Waste Transportation and Service Centre.

2.2 Clean Harbors Canada, Inc. (Ryley), offers as a service, the transportation, consolidation, and storage of acceptable specified waste streams.

2.3 Office Location

Clean Harbors Canada, Inc.
50114 – Range Road 173
Ryley, Alberta T0B 4A0
Ph #780-663-3828
Fax #780-663-3539

3.0 Emergency Response

3.1 In case of emergency, this facility is equipped with an audible emergency alarm system. This system consists of alarm horns located throughout the facility. The horns are positioned in such a manner that they will be heard regardless of an employee's location, or activity. The alarm will be activated from a control panel located in the dispatcher's office. Personnel working in landfill will be notified of an emergency via the radio

3.2 For the purpose of the alarm system, certain areas of the plant have been designated as emergency assembly points. The locations of these points are as follows:

a) Primary assembly point – NW corner of parking lot in front of office facilities;
b) Secondary assembly point – green landfill shack;
c) Tertiary assembly point – move crosswind to a safe distance from the emergency site; this area will be determined by the E.R.T. Coordinator at the time.

4.0 Facility Alarm System Procedure

4.1 Emergency Procedure

In the event of an emergency, the alarm system will be activated, causing the plant emergency horn to sound. After approximately twenty (10) seconds, the horn will cease. Once the alarm has sounded, employees will proceed as follows:

a) Secure their worksite to ensure that it is not left in a hazardous state;
b) Insure that all personnel in the area are aware that the alarm has been sounded;
c) Proceed to the appropriate assembly point and await instructions.

Termination of an emergency will be announced over the loud speaker (All-Clear).

In the event of an emergency, the Facility Manager or designate will initiate the Facility Alarm System.

4.2 Emergency Phone List

Fire Dept 911
RCMP, Tofield 911
Ambulance, Tofield 911
Village Office 780-663-3653
County Office……780-6633730
Alberta Public Safety Service 1-800-272-9600
(Evacuation and Disaster Services)
Hospital (Health Center). 780-662-3263
Poison Center 1-800-332-1414
(If busy, call Calgary) 1-403-270-1414
Federal Health & Safety Office……..1-800-641-4049
Canutec 1-613-996-6666
Alberta Environment & Parks 1-800-222-6514

4.3 Facility Alarm System

4.3.1 Testing Procedures

Testing of the plant alarm system to ensure operational readiness should take place once monthly before the 15 (fifteenth) day of the month. It will consist of activating the alarm system for approximately 5-10 seconds.

5.0 Emergency Situations Classification

5.0.1 This section will outline the responsibilities and communications network for the following incidents:

5.0.1.1 Serious injury/death at facility
5.0.1.2 Fire/explosion at facility
5.0.1.3 Leaks/spills
5.0.1.4 Bomb threats
5.0.1.5 Demonstration/pickets at facility

5.0.2 During most of the above listed incidents, the Resource Team will convene to assist and advise the Response Team and Emergency Response Coordinator. The Resource Team will consist of the following personnel:

i) Facility Manager (Stan Yuha)
ii) The Emergency Response Coordinator position will be filled by the Operations Manager (Wayne Codd)
iii) Receiving Coordinator (who will bring office radio to the conference room).

5.0.3 Duties of the Resource Team

i) To assemble in the conference room in the Administration Building or alternate, as required.
ii) Pick-up visitor's log and driver's sign-in log on the way to conference room.
iii) Receive all area head counts and confirm with records.

iv) Advise and assist the Emergency Response Team to deal with the incident.
v) Advise building wardens as to where the staff should reassemble in the event of adverse weather or changes in conditions.
vi) To provide assistance to Facility Manager, as required.
vii) To advise when “all-clear” can be sounded.
viii) To contact all external agencies for accident investigation.

5.0.4 The incidents involving fire, explosion, bomb threat, and evacuations of the plant outline some of the responsibilities for the Building Wardens, listed below:

i)	Administration/Maintenance Building:		Krystle Venables
		Alternate:	Leanne Monteith
ii)	Drum Staging & Process Building:		Thomas Peschel
		Alternate:	Nick Sideroff
iii)	Lab Buildings:		Todd Webb
		Alternate:	Thomas Peschel
iv)	Landfill Area:		Jerimiah Meyn
		Alternate:	Bill Fawcett

5.0.5 For all buildings, a Warden shall be named.
5.0.6 The degree to which the outlined procedures are implemented will depend upon the severity of the incident.

5.1 Serious Injury or Death at Facility

The following procedures outline the responsibilities and communications network in the event of a serious injury or death. Serious injury would include broken bones, traumatic amputation, internal bleeding, loss of an eye, third degree burns, paralysis, poisoning, or significant exposure to designated substances.

5.1.1 Senior Employee at the Scene

Should a serious injury occur at the facility, the Senior Employee should:

i) Sound alarm and inform Dispatch;
ii) Assess hazards and provide First Aid until relieved;
iii) Secure and isolate area;
iv) In the event of a fatality, the body should be covered but not moved.

The senior employee will then secure the accident site until Emergency Response Team arrives and makes notes for a preliminary accident investigation.

5.1.2 Supervisor

The Operations Supervisor should:

i) Advise Facility Manager of incident and situation;
ii) Conduct detailed assessment of cause of incident, and damage to material or equipment;
iii) Determine if additional personnel or equipment is required;

iv) Act as coordinator between Emergency Response Team and Resource Team;

v) Log sequence of events as they occur.

5.1.3 The Facility Manager

The Facility Manager should:

i) Begin Clean Harbors Canada, Inc. (Ryley) incident alert procedures;

ii) Convene Resource Team;

iii) Maintain communication with E.R. Coordinator;

iv) See Figure 2;

v) In the event of a fatality, the RCMP must be notified. They will then contact the Medical Examiner's Office.

vi) Notify the Federal Health & Safety Office.

Note: Telephone use is to be restricted during an emergency. All incoming calls are to be forwarded to the Resource Team.

5.2 Fire and/or Explosion at Facility

The following procedures outline the responsibilities and communications network in the event of a fire and/or explosion at the Facility. The activities outlined may be implemented in varying degrees depending upon the nature and extent of the situation. See Figure 3. For location of the fire hydrant, stand pipes and man-gates, See Figure 4, 5 and 6.

Figure 1

Clean Harbors Canada, Inc
Ryley, Alberta

Suggested Revision of Operating Policies and Procedures

Location: _____ Section: _____

Suggested Revision: _____

_____

_____

_____

_____

_____

_____

_____

Suggested Date: _____ By: _____

Concurred By: _____

Routing: Operations Manager

Figure 2

SERIOUS INJURY OR DEATH

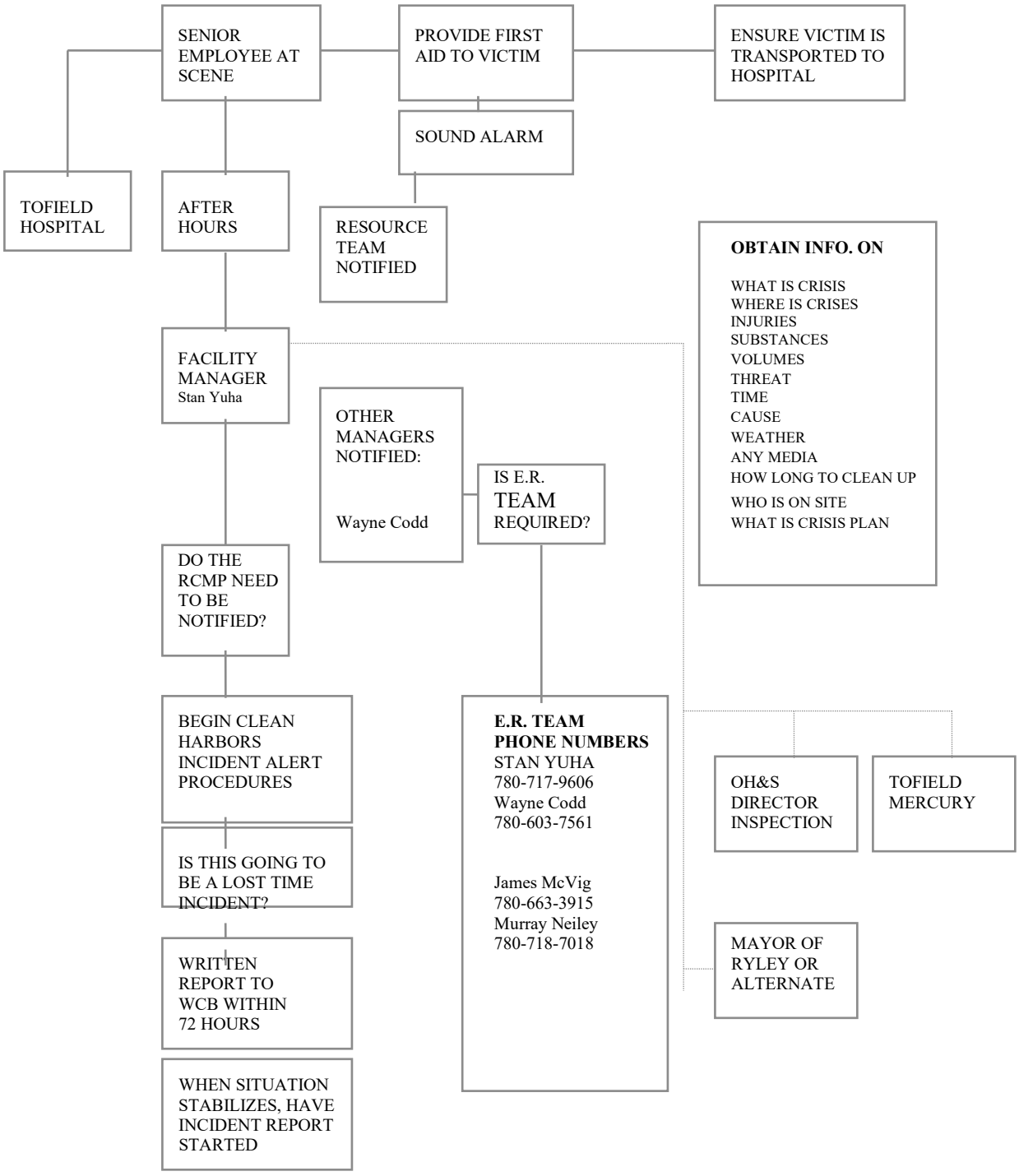


Figure 3

FIRE AND/OR EXPLOSION

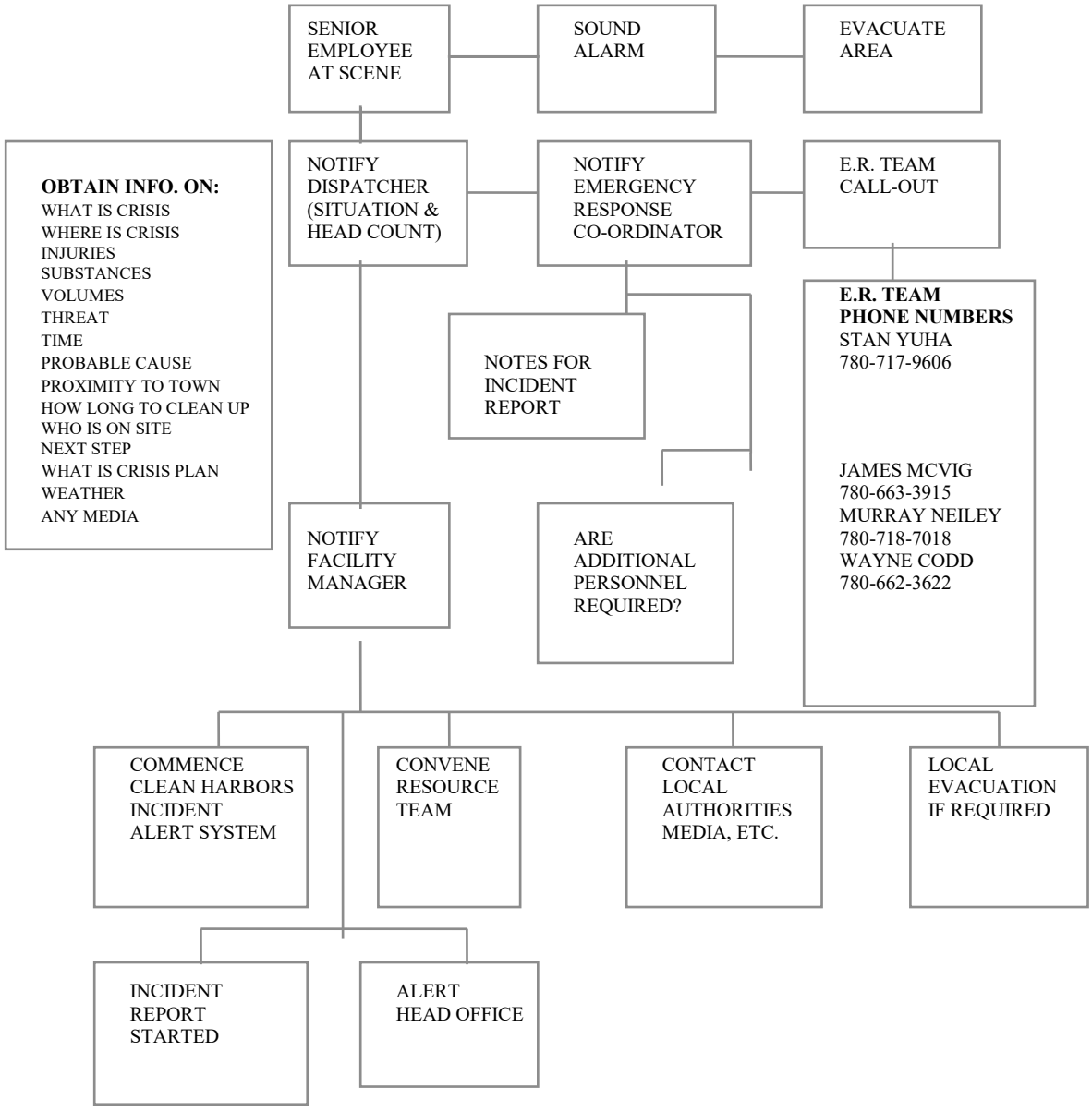


Figure 4

FIRE EXTINGUISHER LOCATIONS - LANDFILL

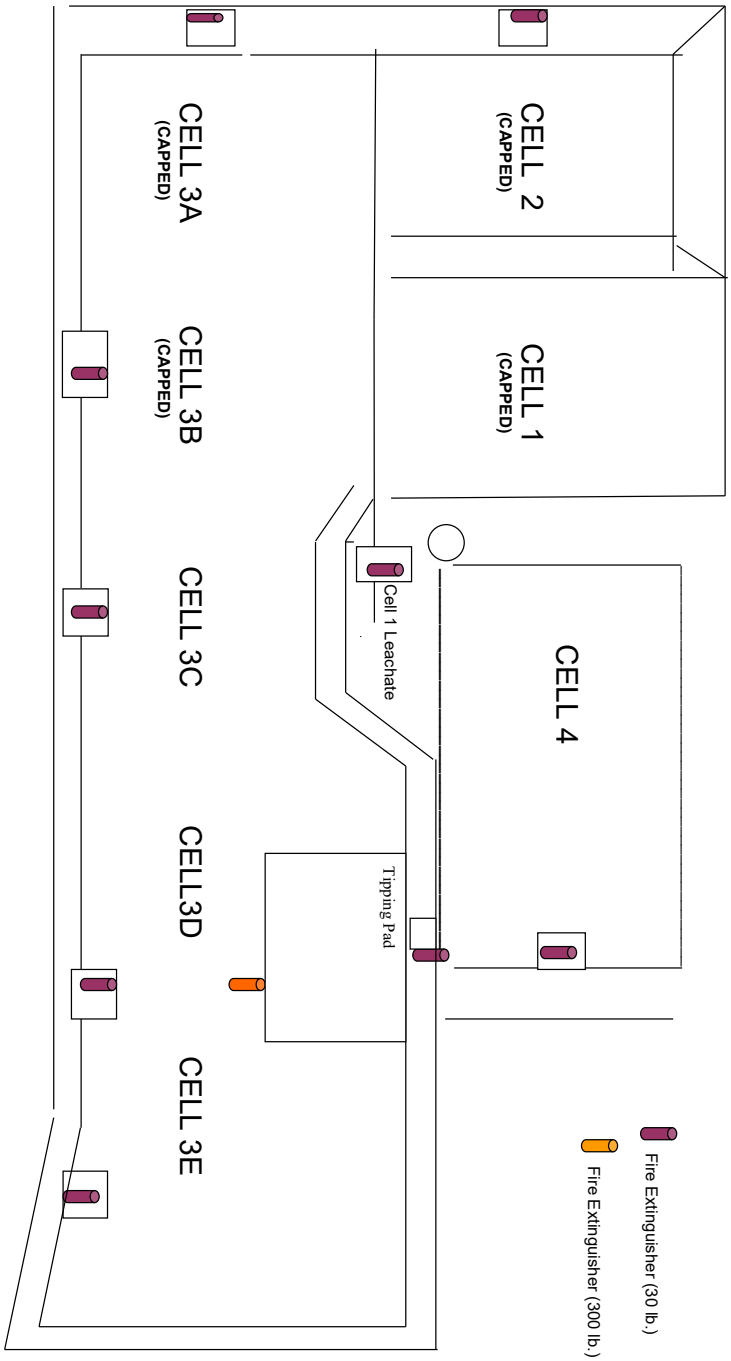


Figure 5

FIRE HYDRANT AND EXTINGUISHER LOCATIONS

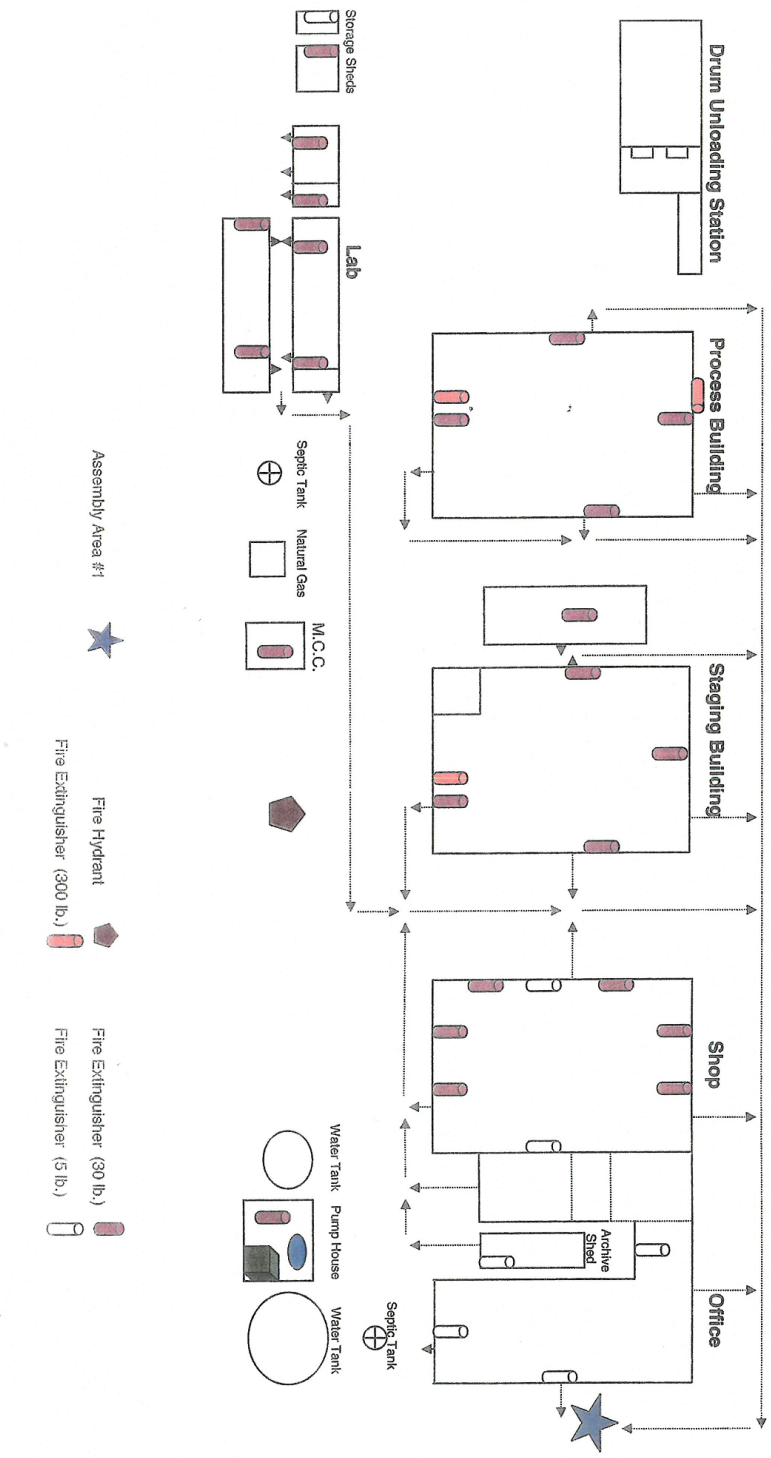
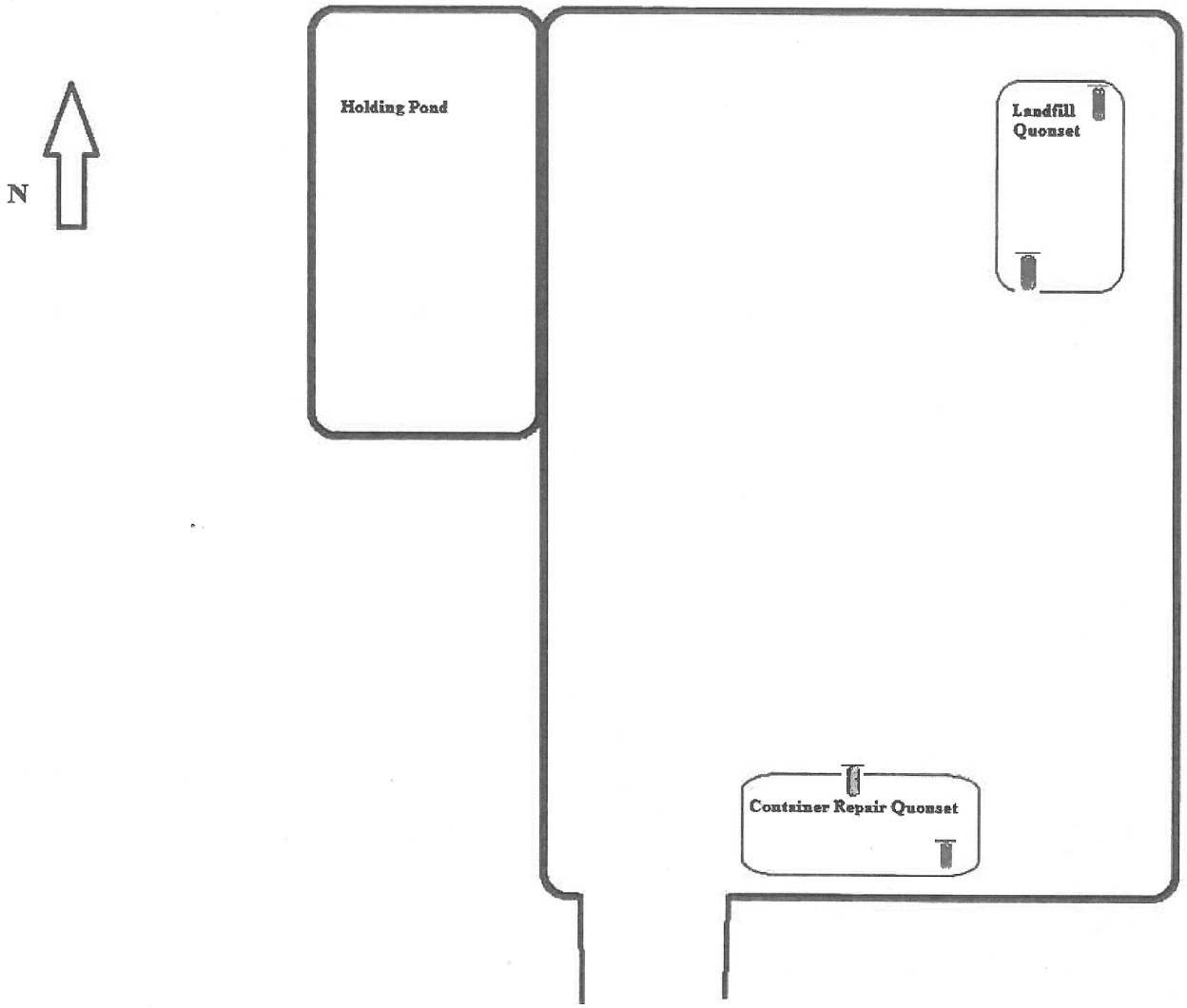


Figure 6

FIRE EXTINGUISHER LOCATIONS - LAYDOWN AREA



5.2.1 Senior Employee at Scene

Should a fire or explosion occur at the Facility, the Senior Employee should:

- **i)** Sound alarm and inform Dispatch
- **ii)** Assure that all personnel are accounted for and out of danger;
- **iii)** Secure and isolate area;
- **iv)** Assess additional manpower needs for firefighting;
- **v)** Take steps to minimize risk to personnel and loss or damage equipment or material;
- **vi)** Be prepared for the situation to deteriorate further.

5.2.2 Operations Manager

The Operations Manager should:

- **i)** Advise Facility Manager of incident and situation;
- **ii)** Conduct detailed assessment of cause of incident, and damage to material or equipment;
- **iii)** Determine if additional personnel or equipment is required;
- **iv)** Act as coordinator between Emergency Response Team and Resource Team;
- **v)** Log sequence of events as they occur.

5.2.3 Facility Manager

The Facility Manager should:

- **i)** Convene Resource Team;
- **ii)** Maintain communication with E.R. Coordinator;
- **iii)** Begin Clean Harbors Canada, Inc. (Ryley) emergency response procedure;
- **iv)** Contact local authorities as required (RCMP, etc.).

5.3 Leakage and Spills at Facility

5.3.1 The following procedures outline the responsibilities of personnel and the communication network to be established in the event of a leak or spill at the Facility.

5.3.2 The activities outlined may be implemented in varying degrees depending upon the nature and severity of the incident. See Figure 7.

5.3.3 Definitions

A **leak** is defined as seepage of special waste from a drum or small container or tank (less than 10 liters).

A **small spill** is defined as seepage or spillage of special waste from a drum or small container (more than 10 liters but less than 100 liters).

A **large spill** is defined as a loss of special waste from a drum or drums, or other containers, or from a tank in which the amount lost is greater than 100 liters.

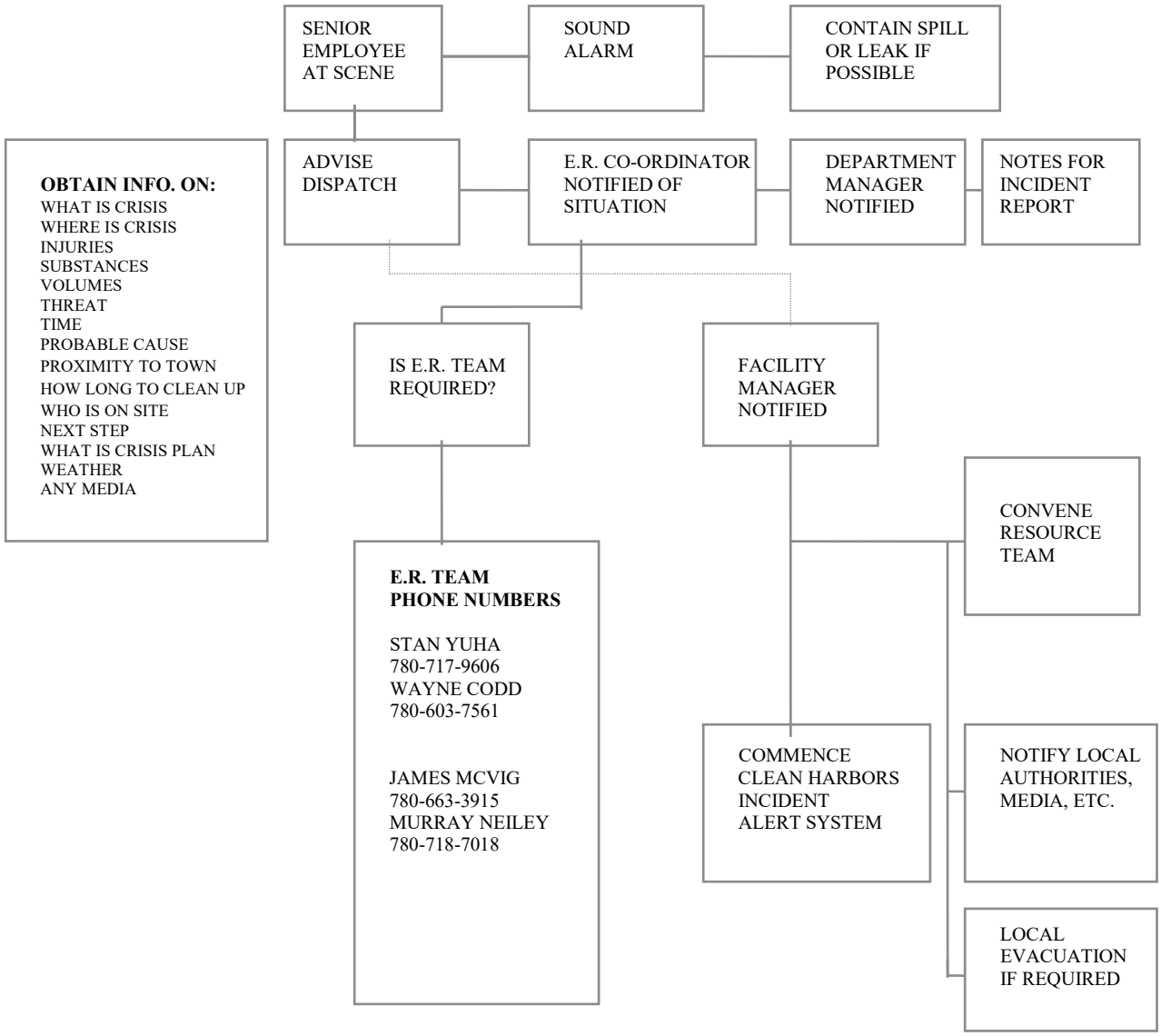
5.3.4 Senior Employee at Scene

The Senior Employee should:

- **i)** Take measures to contain spill or stop leak, if possible;

Figure 7

LEAKAGE AND SPILLS



ii) Identify the components of the waste that has been spilled or is leaking;
iii) Advise Dispatcher;
iv) Refer to appropriate WASTE PROFILE SHEET and MATERIAL SAFETY DATA SHEET for information on substance, potential hazards and handling precautions.

5.3.5 Department Supervisor

The Department Supervisor should:

i) Confirm the identification of the spilled or leaking waste;
ii) Determine volume of spilled or leaking waste;
iii) Confirm all necessary immediate response has been initiated;
iv) Assess need for additional manpower, i.e.: Response Team, contractors;
v) Advise Facility Manager
vi) Make notes for incident report.

5.3.6 Facility Manager

The Facility Manager should:

i) Commence Clean Harbors Canada, Inc. (Ryley) Incident Alert System;
ii) Convene Resource Team;
iii) Communicate with E.R. Coordinator during response.

5.4 Bomb Threats

5.4.1 The following procedures outline the responsibilities of personnel and the communications network in the event of a bomb threat at the Facility.

5.4.2 The activities outlined may be implemented in varying degrees depending upon the nature and severity of the incident.

5.4.3 This procedure is designed to combat bomb threats by incorporating the following basic elements:

i) Obtain as much information as possible from caller;
ii) Contact Tofield RCMP (911) and other emergency services (Facility Manager);
iii) Appraise the threat (see Flow Chart for questions). Figure 8;
iv) Record time, take notes;
v) Keep caller on the line as long as possible;
vi) Ask where the bomb is;
vii) Ask when the bomb will go off;
viii) Listen for any clues that may be helpful;
ix) Did the caller have an accent?;
x) List for background noises and sounds.

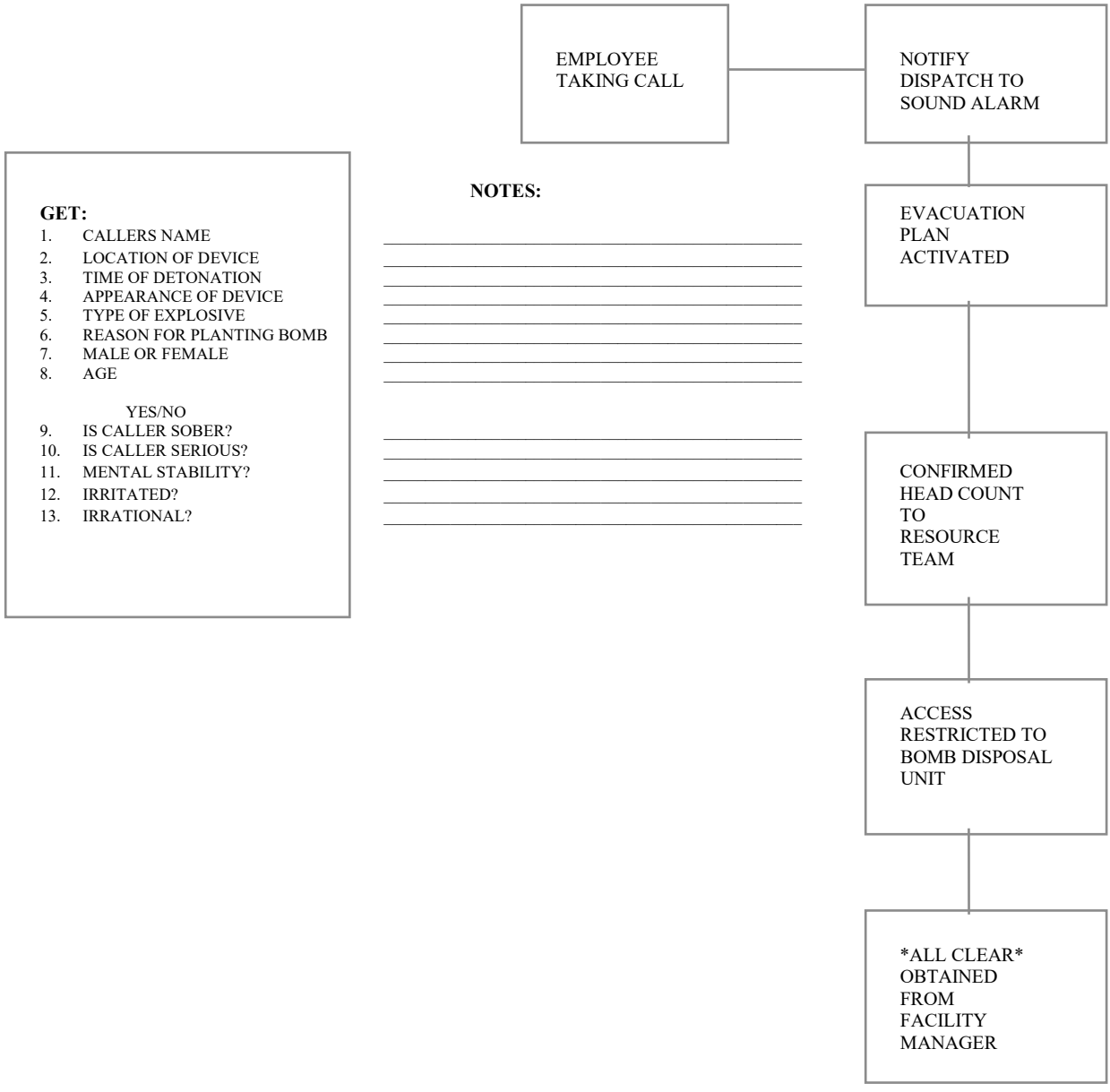
5.4.4 Emergency Action

Upon receipt of information, the person answering the phone will advise Dispatch to sound alarm.

The Dispatcher will inform the E.R. Coordinator of the situation and then inform the Facility Manager.

Figure 8

BOMB THREATS



Once <u>all</u> personnel have been evacuated from all Facility buildings, no one is allowed to re-enter any building for any reason, until given “all-clear” by the responding Bomb Disposal Unit Supervisor in consultation with the Facility Manager.

5.5 Demonstration and Pickets

The possibility exists that the Facility will be a target of demonstrators and pickets. During any such incident, the physical security of the plant assumes a greater importance than under normal conditions.

5.5.1 Advance Warning

Any employee learning that a demonstration is to occur will inform his Department Supervisor or the Facility Manager as soon as possible.

5.5.2 Facility Manager

Once the Facility Manager becomes aware that a demonstration will occur, he will:

- **i)** Initiate Incident Alert System as required;
- **ii)** Advise the Tofield RCMP (911) and request assistance;
- **iii)** Assess the need for additional Facility security;
- **iv)** Review physical protection of essential services and supplies (water, gas, electrical and phone);
- **v)** Advise all personnel against antagonistic or threatening behavior;
- **vi)** Move personal vehicles into secure area if possible;
- **vii)** Ensure that no shipments will be received until further notice and process operations suspended and secured;
- **viii)** Discuss with Resource Team;
- **ix)** See Figure 9.

DO NOT CONFRONT PICKETERS, PLAY A PASSIVE ROLL

5.6 Storms and Tornadoes

Notification: Upon receipt of a severe weather alert via radio, the Dispatcher will notify the Operation's Manager via portable radio and the rest of the plant via the P.A. System.

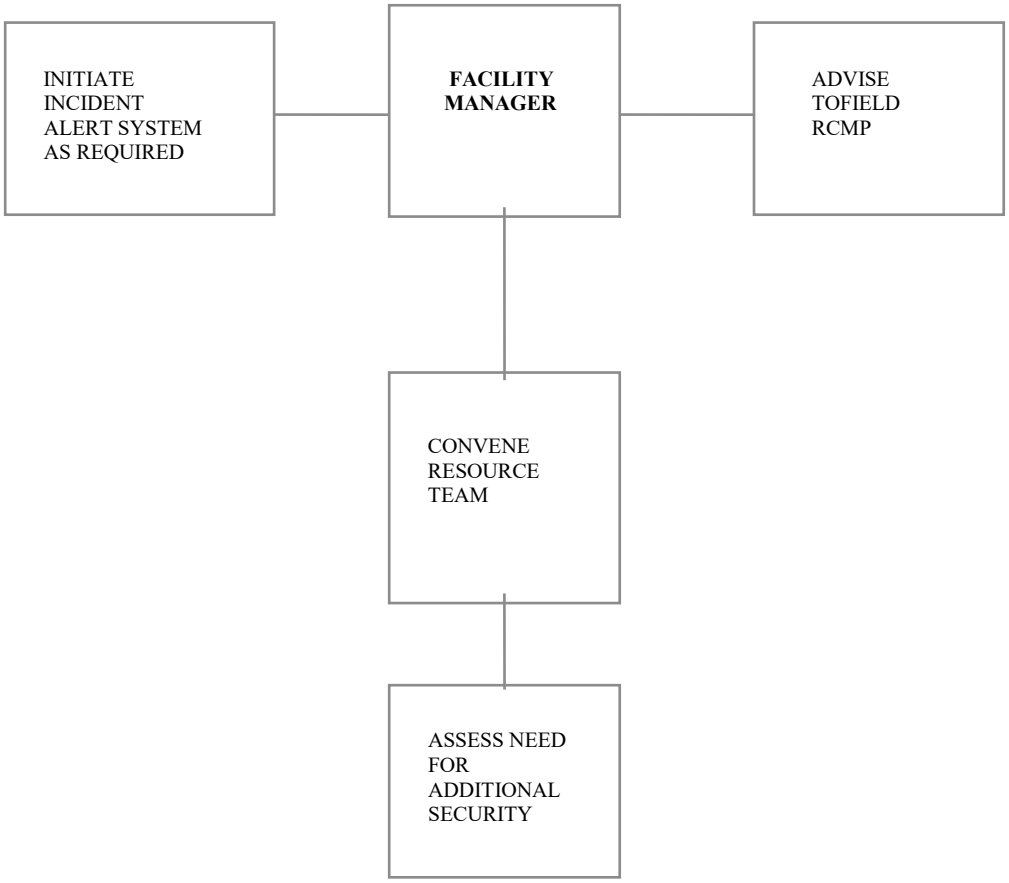
Severe Weather Warning and Severe Thunderstorms Imply the Possibility of Tornadoes

5.6.1 Direct Response

- **i)** The Emergency Response Coordinator should watch for approaching storm and keep the Plant updated on storm's path via the Dispatcher;
- **ii)** If a tornado is sighted, inform all staff over the radio and a 911 call will be placed immediately;
- **iii)** Alert Emergency Response Team to be ready to respond to the aftermath of a severe thunderstorm/tornado;
- **iv)** Take cover if necessary. See Safety Hints 5.6.3, 5.6.4, 5.6.5, and 5.6.6.

Figure 9

DEMONSTRATIONS AND PICKETS



Watch Procedure for Tornadoes

- **i)** Upon receiving a “Tornado Watch” via radio or Weather Alert System, the Dispatcher will notify the Coordinator via the portable radio; the Plant Employees via P.A. System; and Landfill via the mobile radio;
- **ii)** The Coordinator needs to watch the sky for approaching severe weather, which implies possibility of a tornado;
- **iii)** The Dispatcher will keep the Coordinator updated by listening to the radio;
- **iv)** Based on area conditions around the Plant site, the Coordinator will send a spotter to a watch point. The Coordinator will select the watch point and spotter. The spotter must have a clear view in the direction in which the possible tornado is most apt to come from, and stay relatively close to the Plant. This person will stay in continuous contact with the Coordinator via the mobile and/or portable radio.
- **v)** Upon spotting a tornado, the spotter will notify the Coordinator immediately and proceed to move out of the path himself.
- **vi)** When the Coordinator and Dispatcher hear that there is a tornado approaching the site, the Dispatcher will announce over the P.A. System for everyone to take cover and also notify Landfill via mobile radio. The Coordinator will notify everyone wearing a portable radio.
- **vii)** Shut Main Breakers in MCC and Maintenance Shop. After power shutdown radios will work on channel 2 only.
- **viii)** At this time all Operations will be shut down and the Operators will take cover in the closest safe place.
- **ix)** Everyone will stay in the safe area until the Coordinator gives the “all clear” via radio, then they will report to their supervisor for a head count;
- **x)** The Coordinator is responsible for activating any Emergency Response Teams required to respond to the aftermath of a tornado.
- **xi)** Restoration of power will be determined after the evaluation of any damage.

5.6.2 Safety Hints (Tornado)

- **i)** Stay away from windows, doors and outside walls;
- **ii)** Protect your head;
- **iii)** Shelter under a stairway, sturdy table or in a closet;
- **iv)** Stay near the center of a building or the side away from the storm;
- **v)** Avoid large unsupported roof areas like the Vehicle Maintenance Building. If caught in such a building, head for the lowest floor, an inside hallway, small room or get under something sturdy;
- **vi)** If caught outside or in the tornado path, move away at a right angle. Example: flat in a ditch, depression or ravine;

vii) DO NOT remain in a small vehicle or light truck, it may over turn;

viii) If no shelter can be found, hang onto a small tree or shrub.

5.6.3 Safety Hints (Thunderstorm)

i) Downpours accompanying thunderstorms can cause flash floods, so do not shelter where you may be trapped by rising water.

5.6.4 Safety Hints (Lightning)

i) Don't make yourself into a lightning rod or stand near a possible lightning conductor;

ii) Don't project yourself above the surrounding terrain.

iii) Stay indoors and away from electrical appliances;

iv) Avoid using phones or showers;

v) Don't stand under trees or near tall objects;

vi) In open country drop to your knees, bend forward so that your head is lower than your back, put your hands on your thighs, but don't let your head touch the ground. Don't lie flat on the ground.

vii) Stay away from open water and metal objects such as clotheslines; wire fences, rails, golf carts, bicycles and farm machinery;

viii) Don't carry such things as umbrellas, golf clubs, fishing rods, etc.

ix) Remember that people who are struck by lightning receive severe shocks and may be burned, but they can be handled safely. Victims who appear dead may be revived. Artificial resuscitation is a good start point after help is activated.

x) Refer to the Facility's Severe Weather Action Plan for more details.

5.6.5 Safety-Hints (Hailstorm)

i) Large hail often accompanies severe thunderstorms. If caught outdoors, crouch to create as small as an area as possible and protect your head and neck.

5.6.6 All Clear

i) The Emergency Response Coordinator will announce the "All Clear" via portable radio.

ii) The Dispatcher will relay this information via the Plant P.A. System.

6.0 Evacuation Plan

6.1 In the event that a local evacuation is required, coordination with local authorities will be required. Call 911 and ask for Police and Fire and answer all the questions of the 911 dispatcher to the best of your ability. Once Police and Fire arrive they will obtain as much information as possible to assist their evacuation plans. They will initiate and coordinate any evacuation if needed.

7.0 Emergency Response Team Areas of Responsibility

7.0.1 In the event of an emergency team (E.R.T.) call out, the areas of responsibility must be established to avoid duplication of effort, confusion and delay in action.

7.0.2 Upon arrival at the scene, the E.R.T. captain should begin the site assessment and control of two (2) priorities, which are as follows:

a) Search and rescue (SAR); immediately call Fire & EMS (911)
b) Control of hazard (CH).

7.1 Search and Rescue

7.1.1 A three-(3) man team should immediately begin to co-ordinate a SAR effort. The ERT Captain can contact the E.R. Coordinator to confirm and determine whether or not all personnel have been accounted for. Specific items to be determined by the SAR leader are:

a) Extent of hazard;
b) Specific hazards not readily noticeable;
c) Probable/possible locations of any personnel not accounted for;
d) Equipment required initiating response;
e) Probable cause;
f) Any other pertinent information.

7.1.2 The remaining members can begin to assemble personal equipment deemed necessary to affect a rescue. When the SAR captain has finished his assessment, he can brief the other members as to what specialized equipment or procedures will be required to commence rescue operations. While the other team members are assembling the required gear, the captain can brief the E.R.T. Coordinator, then begin to organize his own personal gear into position.

7.2 Control of Hazard

7.2.1 The E.R.T. members not involved in SAR should begin an immediate control of hazard response. The CH team should begin an immediate site assessment to determine the appropriate response action. The E.R.T. Captain can request through the E.R. Coordinator, information from computerized MSDS files, which may help to determine;

a) Extent of hazard;
b) Specific hazards not readily noticeable;
c) Equipment required initiating response;
d) Probable cause;
e) Any other pertinent information.

7.2.2 The CH team leader can then brief the other CH team members to what specialized equipment or procedures will be required to initiate the response. While the other members are assembling the required gear, the captain can brief the E.R.T. Coordinator, then begin to assemble his own gear into position.

7.3 Specific Personnel Requirements

7.3.1 The E.R.T. Coordinator should ideally be someone from management (Operations). This position is to act as a liaison between the E.R.T. Captain and the Resource Team. The Resource Team will be composed of the Facility Manager, the Transportation Supervisor, and the Lab Supervisor, and will liaise with off-site resources such as Ryley Fire Department, RCMP, Ambulance and Hospital and the media.

7.3.2 The E.R.T. Captain is responsible for the command and control of the team while on call-out. He should keep the E.R.T. Coordinator briefed of the situation and of any developments as they occur, within reason.

7.3.3 One of the CH team members should be a chemical technician with knowledge of the properties and characteristics of substances being dealt with. The other CH team member should be a driver/operator. The remaining members of the team can be made up of personnel that have received the prerequisite training.

7.3.4 The E.R.T. Coordinator can brief other plant personnel and designate assistance if deemed necessary by the E.R.T. Captain. (i.e.: firefighting, etc.).

7.4 Communications

7.4.1 During an E.R.T. call-out, <u>all</u> communications should follow the same path as the organization chart. During call-out, personnel, by human nature, will respond adversely to stress, which will be present. By following prescribed guidelines for communication, errors or omissions can be reduced, allowing for a faster, more effective response to be achieved.

7.4.2 Ideally, communications should be secured to prevent the unauthorized release of information to those not having the “need to know”. All information relative to the response should be made available to the Resource Team, who can then determine which information can be given wider circulation.

7.4.3 A possible series of codes to indicate given situations should be established for use with radio communications to keep information secure. (See Figure 10).

8.0 Quarantine

8.1 When an E.R.T. response is initiated, and it has been determined where the problem has occurred, all documentation relative to that shipment should be quarantined to provide an accurate record of material. By keeping an accurate record of material, it will be possible to determine how much, if any, material is lost during the response. (ie. by fire, leak, or evaporation, etc.).

8.2 Other documents to be put under quarantine should also include the following:

- **a)** Visitor lists;
- **b)** Contractor lists.

9.0 Department Wardens

9.1 A designated warden for each department will provide a head count of each department to the Resource Team. The normal Resource Team station will be the Administration building Conference room, and the alternate station will be the Lab Office.

10.0 Wrap-up

10.1 When the response has been completed, the E.R.T. members will:

- **a)** Decontaminate, clean, store, and replenish gear as required;
- **b)** Make notes of aspects of response that they were directly involved in;
- **c)** Make notes of any aspects of the response that they witnessed;
- **d)** Make notes of any deficiencies, errors, or omissions in the procedures, equipment, etc.

10.2 All notes should be given to the E.R.T. Captain so that a brief report can be written (1 hour) and submitted to the E.R.T. Coordinator. An in-depth report should then be written (24 hour) covering all aspects of the response.

10.3 During Step A, team members should be discouraged from discussing the response, in order that a clear progression of events can be maintained by each member. These can then be cross-referenced to the E.R.T. Coordinator's log of events to obtain a precise record of the response. Response members should then meet to discuss the incident in order to diffuse stress.

10.4 A follow-up meeting should be held (1 week) to address any concerns, and allows for input regarding changes or additions to policy, procedure, etc. Arrangements for critical incident stress debriefing can be determined as required.

11.0 Training

11.1 Training requirements at the Ryley Facility have been set such that response team employees will receive as a minimum, the following courses:

- **a)** Fire extinguisher training;
- **b)** First aid;
- **c)** CPR;
- **d)** WHMIS;
- **e)** TDG.

12.0 Response Team Training

12.1 In addition to the general plant training, the Response Team may also receive, but not limited to the following additional training:

- **a)** Fire-fighting;
- **b)** Emergency response;
- **c)** Confined spaces entry and rescue.

12.2 Training will be provided to members such that a level of competence, that meets industry standards, is achieved.

13.0 Drills

13.1 The E.R.T. will perform practice drills of varying difficulty and scope. These drills will be defined as follows:

- **a)** **Minor** – a leaking drum or flange;
- **b)** **Moderate** – split container, vehicle accident (including injuries), small fire; moderate emergencies are such that they have a very real potential of becoming major if not acted upon quickly.
- **c)** **Major** – a large spill involving a large tank, difficult terrain, fire, toxic chemicals, or men down.

- **Note** – A major drill may incorporate a moderate drill and a moderate drill may incorporate a minor drill.

13.2 Drill Log and Evaluation

A record shall be kept indicating when emergency response drills are performed, the scope of the drill (minor, moderate, or major) and the effectiveness of the drill.

Figure 10

Radio Secure Transmission Codes

INJURY/DEATH

Green	- minor injury	- treatable on site
Yellow	- moderate injury	- treatable off site - not requiring hospitalization
Red	- major injury	- treatable off site - requiring hospitalization
Black	- fatality	- do not move unless threatened by fire

FIRE/EXPLOSION

Orange	- fire	- any fire on site shall be considered serious, regardless of size
White	- explosion	- may be a result of fire or may cause fire to spread

These codes may be given in random to explain sequence of event.

LEAKS/SPILLS

Brown	- loss of containment of waste.

13.3 Emergency Response Drills

13.3.1 The following scenarios listed for each category of emergency (minor, moderate, and major) will have a sub-category of injury, fire, and spill.

13.3.2 Minor emergency scenarios:

a) Leaking drum of glycol in drum storage building;
b) Small fire in wastepaper basket;
c) Person slips on ice; suspected sprained ankle.

Minor emergencies are such that they should be able to be responded to by any plant personnel. The E.R.T Captain and the E.R.T. Coordinator should be made aware of the situation as soon as possible, in the event that the situation deteriorates further. Minor emergencies pose little or no threat to personnel, property or environment.

13.3.3 Moderate emergency scenarios:

a) Tanker parked in yard has leaked approximately 200 gallons of used motor oil;
b) Fire in vehicle engine compartment;
c) Person struck by vehicle backing up; suspected broken leg and concussion.

Moderate emergencies are such that they should be responded to by the E.R.T., as special equipment or procedures may be required to affect a response. Moderate emergencies pose a possible threat to personnel, property and/or environment.

13.3.4 Major emergency scenarios:

a) Leak in tank farm; unknown quantity of caustic liquid on ground;
b) Reactive fire in labpack processing area;
c) Man down in leachate system pit area; unconscious, unknown injuries.

Major emergencies are such that they must be responded to by the E.R.T. as quickly as possible. Major emergencies constitute a definite and immediate threat to personnel, property and/or the environment.

14.0 Evaluation

14.1 A process of determining the effectiveness of the response must be laid out prior to the institution of an E.R.T. program, in order that a fair and objective evaluation can be made. By assessing each response in a similar manner, standards can be achieved and maintained at desired levels.

14.2 The evaluation should be broad in scope in order that no aspect of the response is overlooked, yet able to pinpoint areas of weakness in procedure or policy that deter from the required objective.

14.3 The following areas should be the basis of an evaluation to an emergency response:

a) Actual response times:
- how quickly after the incident was the alarm sounded;
- how long did evacuation plans take to complete;
- how long before an accurate account of personnel on site was completed;

- how long before form-up of E.R.T.;
- how long before site assessment by E.R.T. Captain;
- how long before E.R.T. Coordinator was briefed by E.R.T. Captain.

b) Operational procedures:
- are operational procedures streamlined enough to provide an effective response yet broad enough in scope to encompass all aspects of the response?

c) Technical procedures:
- most procedures (i.e. use of specialized equipment) will be set out according to the manufacturer's operations manual.

These procedures can be tailored to Ryley's own requirements as required and refined during training.

d) Communications:
- review communications network to determine any areas that require change or improvement.

e) Personnel:
- determine any areas where training of personnel can be improved. Constructive criticism of personnel performance to determine where improvements can be made.

f) Equipment:
- review equipment performance to determine effectiveness;
- maintain a catalogue of equipment, which may improve or streamline ability to complete required tasks.

g) Miscellaneous:
- any other aspects of the response that need to be addressed.

15.0 Critique of Evaluation

A critique of each evaluation should be done to determine if all aspects were dealt with accordingly. The critique should be done in a manner that ensures that ensures that criticism is kept on a constructive level.

16.0 Emergency Response Protocol

The proper emergency response requires preparation. The purpose of this document is to provide guidance for the medical management of exposure situations. Clearly, training and experience must augment portions of this protocol.

The recommended protocol is:

a) Rescue, when necessary, employing proper equipment and methods.
b) Attention to emergency health problems – breathing, cardiac functions, bleeding, shock.
c) Obtain as much exposure history as possible (a sample is attached).
d) Transfer the victim to the medical facility designated by suitable and appropriate conveyance.

e) Call the medical facility and advise them that the patient(s) is/are being sent and that they can anticipate a call from the EMR physician. EMR will contact the medical facility and request specific testing which may be appropriate. EMR physicians will monitor the care of the victim. Site officers and personnel should not attempt to get this information, as this activity leads to confusion and misunderstanding.

f) Call EMR, being prepared to provide:

- **i)** Any known information about the nature of the exposure;
- **ii)** As much of the exposure history as was feasible to determine in the time allowed;
- **iii)** Name and phone number of the medical facility to which the victim(s) has/have been taken.
- **iv)** Names of the exposed individuals.
- **v)** Name and phone number of an informed site officer who will be responsible for further investigations.

As environmental data is gathered and the exposure scenario becomes more clearly defined, this information should be forwarded to the EMR Medical Director or Assistant Medical Director.

EMR will compile the results of all data and provide a summary report of the incident. A copy of this report should be placed in each victim's medical file in addition to being distributed to appropriately designated company officials.

Each individual worker will receive a letter describing the incident but deleting any personal or individual comments. A personalized letter describing the individual findings/results will accompany this generalized summary. A copy of the personal letter will be filed in the continuing medical file maintained by EMR.

Potential Exposure Report

Name: _____ Date of Exposure: _____

Social Security No: _____ Age: _____ Sex: _____

Client Contact: _____Phone #: _____ Co: _____

I. Exposing Agent

What was individual doing? _____
How long did individual work in area before signs/symptoms developed? _____
Was protective gear being used? If yes, what was the PPE? _____
Was there skin contact? _____
Was the exposing agent inhaled? _____
Were other persons exposed? If yes, did they experience symptoms? _____

II. Signs and Symptoms (check off appropriate symptoms)

Immediately With Exposure:

Burning of eyes, nose, or throat
Tearing
Headache
Cough
Shortness of breath
Chest tightness/pressure
Nausea/vomiting
Dizziness
Weakness

Delayed Symptoms:

Weakness
Nausea/vomiting
Shortness of breath
Cough
Loss of appetite
Abdominal pain
Headache
Numbness/tingling

III. Present Status of Symptoms (check off appropriate symptoms)

Burning eyes, nose, or throat
Tearing
Headache
Cough
Shortness of breath
Chest tightness/pressure
Cyanosis
Nausea/vomiting
Dizziness
Weakness
Loss of appetite
Abdominal pain
Numbness/tingling

Have symptoms: (please check off appropriate response and give duration of symptoms)
Improved _____ Worsened _____ Remained Unchanged _____

IV. Treatment of Symptoms (check off appropriate response)

None ____ Self-medicated ____ Physician Treated ____

17.0 PCB Handling

17.1 PCB Fires

The Ryley facility's Process and Staging buildings are supplied with all necessary equipment to handle PCB fires. It should be noted that should a fire occur in one of the above-mentioned buildings, the building exhaust fans will not start as per the fire system interlock. The exhaust fans are for fume removal only, should it be required.

The foam fire suppression sprinkler system is more than capable of containing PCB fires as per the Alberta Fire Code –1997.

17.2 PPE for PCB Waste Handling

Routine precautions should be observed when handling liquids containing PCB's. The protective clothing to be worn will vary with individual circumstances, such as concentration, quantity of PCBs and whether in solid or liquid form. Where workers may come in direct contact with askarel (pure PCBs), protective clothing impervious to PCBs should be worn. Gloves, boots, disposal coveralls, bib-type aprons, and eye protection (face shields or chemical safety goggles) should be worn as necessary. Materials used to protect against dermal exposure are compared in the following Table 1.

TABLE 1

Materials used for Protection from Dermal Exposure to Undiluted PCBs

Highly Recommended (provides protection for over one hour)	Recommended (provides protection for 1 hour)	Limited use or Not Recommended (provides protection for less than 1 hour)
Butyl Rubber Neoprene Nitrile Rubber Polyvinyl Alcohol Viton Saranex Teflon	Chlorinated Polyethylene	Styrene Butadiene Rubber Natural Rubber

Where PCBs are in closed containers such as capacitors, transformers, tanks or drums, or are entrapped in solid substances or equipment, and there is not direct contact with PCBs, special clothing and apparatus may not be necessary, e.g., if a lift truck operator is moving a drum or a palleted piece of PCB equipment.

As a general rule, the handling of hot liquids should be avoided. If the temperature of the liquid is above 55^0C, a full-face, self-contained breathing apparatus should be worn for other than brief periods of exposure.

EMERGENCY PHONE NUMBERS
OUR LICENCE NUMBER: 10348-02-00

AEP (Spill &Contravention Reporting). . . ……. . . . 1-800-222-6514

AMBULANCE – Tofield 911
RCMP – Tofield. 911
FIRE – Ryley. 911
FIRE – Tofield 911
POISON CENTRE 1-800-332-1414
CHUBB SECURITY 1-888-353-7989
1-780-423-3281
1-780-421-4841

AFTER HOURS EMERGENCY # 1-800-483-3718

VILLAGE OF RYLEY 780-663-3653
COUNTY OF BEAVER 780- 663-3730
Allan Weiss – (Regional Emergency Manager) . . . . ……. cell 1-780 208-1500
Health & Safety Officer (Federal)……..……1-800641-4049
AEP - EMERGENCY # 1-800-222-6514
AEP - Non-Emergency 1-800-272-9600

Ryan Taylor (Health & Safety Mgr) 1-435-393-1050
Brian Fraser (Compliance Manager) ……..…… 1-780-288-2797
Mike Parker (V.P Environmental Compliance) . . . . . .…..... 1-519-312-8522

Cliff's Towing – (Edmonton) 1-780-451-5555
Plumber – B & M – (Tofield) . . . . …780-662-2454
Electrician – D-2 Electric 1-780-672-8700
Backhoe & Heavy Equipment – Jerry's Backhoe – (Tofield) . . .. .780- 662-3408

Transportation Department – Mobile Numbers
Tyler Esak…. 1-780-777-6906
Leanne Monteith……1-780-235-5374
On-Call Personnel – Mobile . . . . Stan Yuha 1-780-717-9606
Wayne Codd 1-780-603-7561

RESPONSE TEAM HOME NUMBERS

Stan Yuha 780-662-3889
Wayne Codd 780-662-3622
James McVig…….. 780-663-3915
Murray Neiley……780-718-7018

EMERGENCY RESPONSE PLAN

Approved By: Stan Yuha, Facility Manager _____
Signature

Approved By: Wayne Codd, Operations Manager _____
Signature

1.0 Emergency Response Procedure

1.1 Purpose of Procedure

To establish a pre-determined plan of action for facility staff and visitors during emergency situations at the facility. Such emergency procedures should be designed to protect personnel, property and the environment.

1.2 Introduction

The nature of the Ryley facility is such that emergency situations could arise from the operations of waste management. Emergency situations could include fire, spills, and uncontrolled reactions of incompatible wastes and/or reagents, personal injury accidents, severe weather scenarios and other unforeseen situations.

The Ryley facility is equipped with an alarm horn which when sounded will initiate the following emergency actions of plant staff and visitors.

The objective of these emergency procedures is to manage the emergency around the following points:

a) Sound an audible alarm to initiate appropriate actions.
b) Account for all staff and visitors by gathering all persons except our response team in a pre-determined assembly area.
c) Confirm the location and safety of individuals by means of a head count and to initiate a search for those persons unaccounted for.
d) Set up a communications system to facilitate crisis management.
e) Secure the facility, control and rectify the emergency and initiate further Incident Alert Procedures.
f) Ensure all visitors or contractors on site have an assigned sponsor to sign them in.
g) Define role of third party Emergency Response Teams if required by facility. (Local Fire Departments, Ambulance & RCMP)

1.3 Steps to Follow During an Emergency

a) Emergencies will normally be reported by plant staff via telephone, radio communication or face to face reports. Once reported, the alarm switch in the Dispatch office should be activated. Announce alarm over radio as well.

b) Once the alarm has been sounded, a brief P.A. announcement giving the nature and location of the emergency will be made. After the P.A. announcement is made, the same announcement will be made over the two-way radio system.

c) Upon hearing the alarm all personnel, including contractors, will secure their job and report immediately to the appropriate assembly area.

d) Upon hearing the alarm, the Response Team will congregate at the Fire Pump House to plan any needed response. The Operations Manager or his delegate will coordinate the Response Team.

e) Upon hearing the alarm, facility personnel, contractors and visitors will congregate at the designated assembly area. In cases of inclement weather, and at the conclusion of a satisfactory head count, plant personnel in the main assembly area may be directed to enter the administrative building for the remainder of the emergency.

f) Upon hearing the alarm, the Fire Warden or Designate will deliver the sign-in register to the conference room along with a two-way radio and cell phone. The supervisor will then secure the front gate and conduct the head count. After performing the head count, the Fire Warden will join the Resource Team in the conference room.

g) Upon hearing the alarm, the Facility Manager or designate and the Fire Warden will meet in the conference room and make up the Resource Team.

h) Upon hearing the alarm, the Receptionist will forward all incoming calls to the answering service and proceed to the appropriate assembly area for a head count.

i) The Resource Team will initiate the incident alert system as required, supply support for the Emergency Response Coordinator (the Operations Manager or his delegate).

j) Upon hearing the alarm, the Emergency Response Coordinator will determine the location and nature of the emergency and coordinate the Emergency Response Team’s response as necessary.

k) Upon hearing the alarm, it will be the responsibility of each Manager and Supervisor to account for his or her staff for the purpose of the head count.

l) Upon hearing the alarm, each sponsor of a visitor or contractor is responsible to account for his or her visitor or contractor.

m) Unless directed (otherwise), all personnel should report to the normal assembly areas. Each situation may require that an alternate assembly area be used; this alternate area will be announced on the P.A. system and radio system. Any permits issued prior to the alarm are void and new permits will have to be made out for all contractors or operations requiring them.

n) At the conclusion of the emergency, on advice from the Emergency Coordinator, the Resource Team will sound the “All Clear”.

1.4 Roles of Third Party Response Teams

a) In the event that the facility's Emergency Response Team needs assistance from a third party Emergency Response Team, this request is to be made by the Response Team Coordinator to the Resource Team who will in turn contact the required services.

b) Once the third party Emergency Response Team(s) arrive, they will stop outside the fence/gate and await further instruction from the Emergency Response Coordinator.

c) The Clean Harbors Response Coordinator will remain Incident Scene Commander or a joint command will be formed.

APPENDIX G

Survey Records and Final Cover Elevations and Contours

TETRA TECH

TECHNICAL MEMO

ISSUED FOR USE

To:	Clean Harbors Inc. Stan Yuha – Facility Manager	**Date:**	January 17, 2023
c:	Michael E. Parker – Vice President Canadian Environmental Compliance	**Memo No.:**	1
From:	Spencer Smith, P.Eng. Sean Buckles, M.Sc., P.Eng.	**File:**	704-SWM.SWOP04490-01
Subject:	Remaining Airspace – January 6, 2023 Clean Harbors Facility, Ryley, Alberta		

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was requested to complete the remaining airspace calculations for the Clean Harbors Facility located near Ryley, Alberta. These calculations are based on the topographic waste survey completed by Clean Harbors Industrial Services – Unmanned Aerial Systems on January 6, 2023. This work was completed as requested by the Clean Harbors Inc. (Clean Harbors) Ryley Landfill Facility Manager on December 8, 2022.

2.0 AIRSPACE MODELLING

Using AutoCAD Civil 3D software, Tetra Tech completed airspace modelling based on the January 6, 2023 survey data provided by Clean Harbors, and design top of waste elevations previously completed by Tetra Tech. The 3D Drawing models are done in Universal Transverse Mercator (UTM) NAD83, Zone 12. As of January 6, 2023, the remaining airspace in Area 1 (Cell 3E) is estimated at 5,650 m^3; the remaining airspace in Area 2 (Cell 4 and the north portion of Cell 3C and Cell 3D) is estimated at 40,134 m^3; and the remaining airspace in the tipping pad area is estimated at 162,030 m^3.

The total estimated remaining airspace at the Clean Harbors Ryley Facility as of December 31, 2021, is 207,814 m^3. The total estimated remaining airspace excluding the tipping pad area is 45,784 m^3. This information is presented in Table 1 below and in the attached Drawing C100 and Drawing C101.

Table 1: Airspace Modelling Summary

Area	Remaining Airspace Volume	Notes
Area 1 (Cell 3E)	5,650 m^3	A reduction of approximately 2,509 m^3 since the December 31, 2021 survey.
Area 2 (Cell 4 and North Portion of Cell 3C and Cell 3D)	40,134 m^3	A reduction of approximately 116,119 m^3 since the December 31, 2021 survey.
Tipping Pad Area	162,030 m^3	A reduction of approximately 21,382 m^3 since the December 31, 2021 survey.
Total	**207,814 m^3**	

The remaining airspace within the proposed 2023 capping area, as shown on Drawing C100, was calculated to be 9,924 m^3. This is included in the total remaining airspace in Area 2, outlined above in Table 1. There was a total of 140,010 m^3 of waste placed since the December 31, 2022 Survey. This includes any snow cover picked up by the Survey.

Tetra Tech Canada Inc.
14940 - 123 Avenue
Edmonton, AB T5V 1B4 CANADA
Tel 780.451.2121 Fax 780.454.5688

3.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Clean Harbors Canada Inc. and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Clean Harbors Canada Inc., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

4.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

704-SWM.SWOP04490-01
704-SWM.SWOP04490-01
704-SWM.SWOP04490-01
704-SWM.SWOP04490-01

Prepared by:
Spencer Smith, P.Eng.
Project Engineer – Team Lead
Solid Waste Management Practice
Direct Line: 403.723.6933
Spencer.Smith@tetratech.com

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704-SWM.SWOP04490-01
704-SWM.SWOP04490-01

Reviewed by:
Sean Buckles, M.Sc., P.Eng.
Senior Project Engineer – Team Lead
Solid Waste Management Practice
Direct Line: 403.723.6876
Sean.Buckles@tetratech.com

/as

PERMIT TO PRACTICE
TETRA TECH CANADA INC.

RM SIGNATURE: _____

RM APEGA ID #: _____

DATE: _____

PERMIT NUMBER: P013774
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Enclosure: Tetra Tech's Limitations on the Use of this Document
2022 Waste Survey Drawing C100 and Drawing C101

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

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Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

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Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

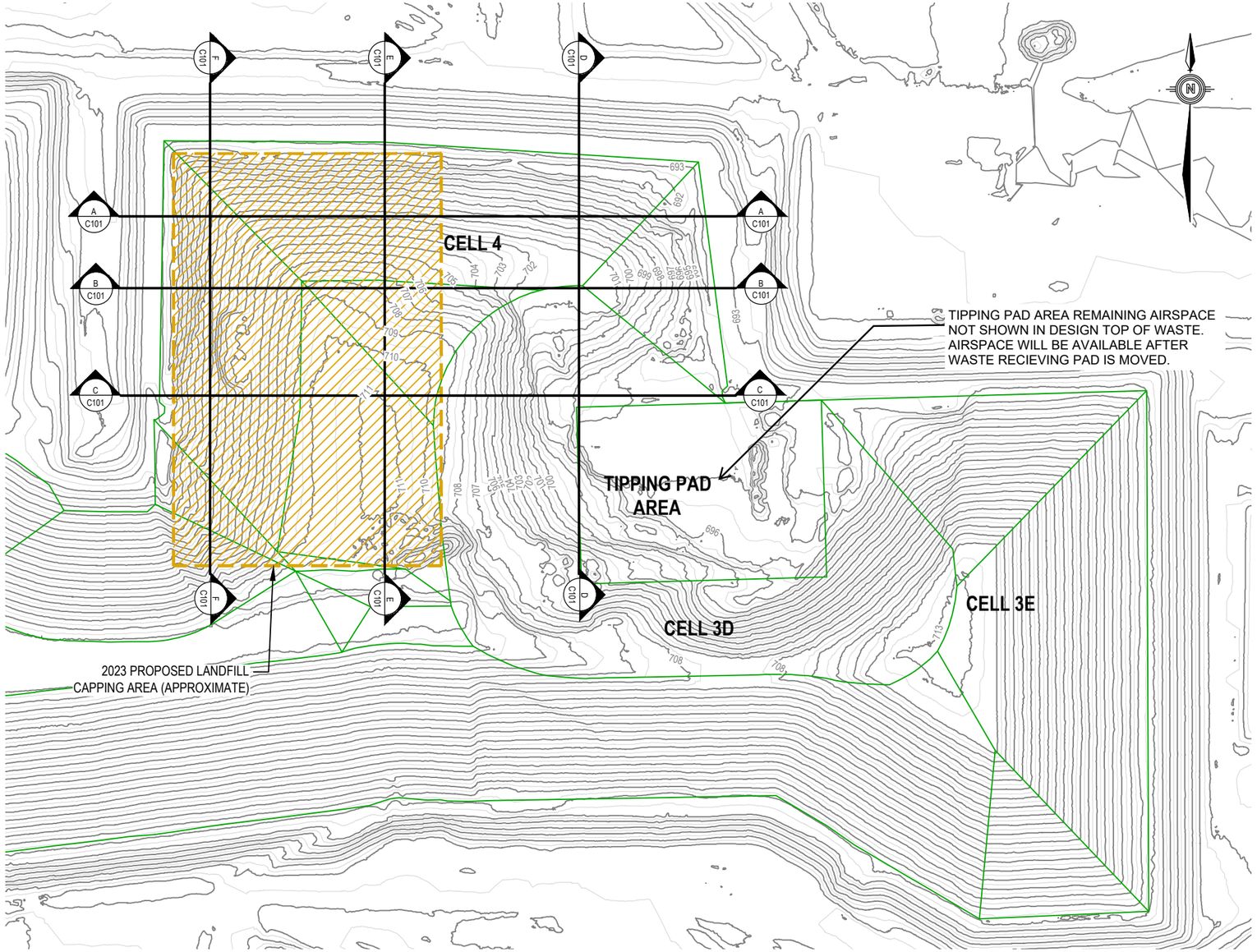
The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

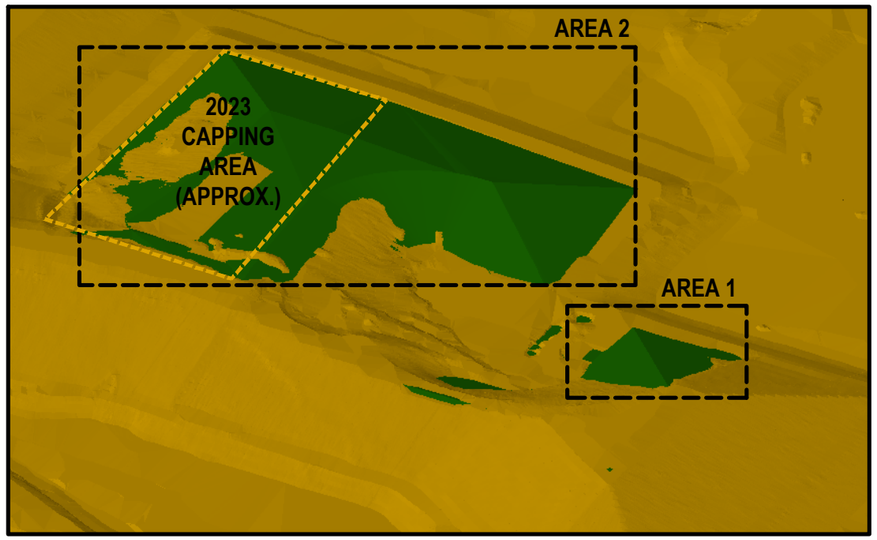
TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.



EXISTING WASTE TOPOGRAPHY - 2022 YEAR END SURVEY (Flown on January 6, 2023)



DESIGN TOP OF WASTE (green) VS. 2022 YEAR END WASTE SURVEY (orange)

AREA 1 REMAINING AIRSPACE.....5,650 m³

AREA 2 REMAINING AIRSPACE.....40,134 m³

REMAINING AIRSPACE IN TIPPING PAD BOWL.....162,030 m³

REMAINING AIRSPACE TOTAL.....207,814 m³

REMAINING AIRSPACE WITHIN 2023 CAPPING AREA.....NET: 9,924 m³ (CUT=3,022 m³, FILL=12,947 m³)

WASTE PLACED SINCE DECEMBER 2021 SURVEY.....140,010 m³

NOTES:

1. TOPOGRAPHY SHOWN IS THE 2022 YEAR END WASTE SURVEY (Surveyed by Clean Harbors on Jan 6, 2023)
2. UTM with NAD83 datum, Zone 12, Meter; Central Meridian 111d W

STATUS
ISSUED FOR USE

NUM	DATE	APR	DESCRIPTION
			REVISIONS
B	JAN 12/23	SS	ISSUED FOR USE
A	JAN 09/23	SS	ISSUED FOR REVIEW
NUM	DATE	APR	DESCRIPTION
			DRAWING STATUS

PERMIT

PROFESSIONAL SEAL

CLIENT

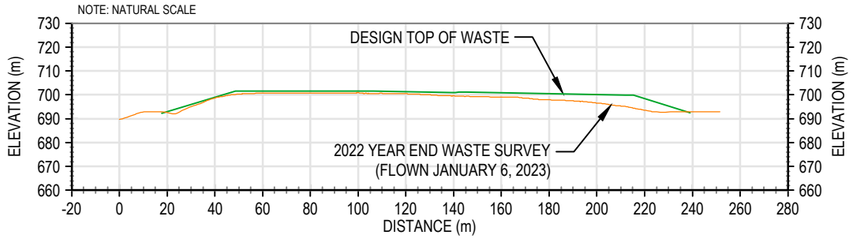
CleanHarbors

TETRA TECH

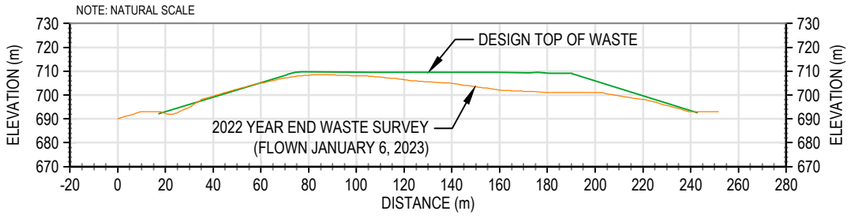
CLEAN HARBORS
2022 YEAR END WASTE SURVEY

PLAN
2022 YEAR END WASTE SURVEY

PROJECT No.	OFFICE	DES	CKD	REV	DRAWING
SWM.SWOP04490-01	EDM	-	SS	-	C100
DATE: January 12, 2023	SHEET No. 1 of 2	DWN DRG	APP SS	STATUS B	



SECTION A



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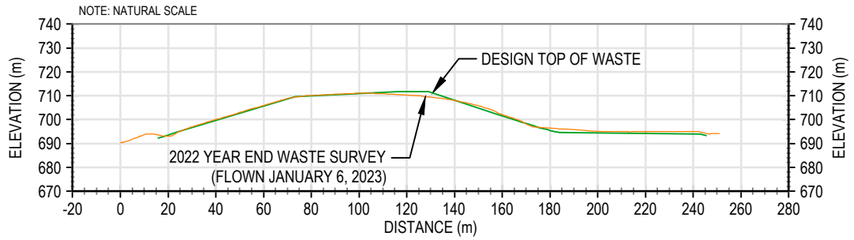

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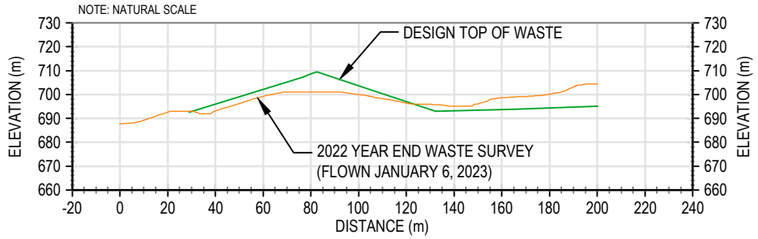

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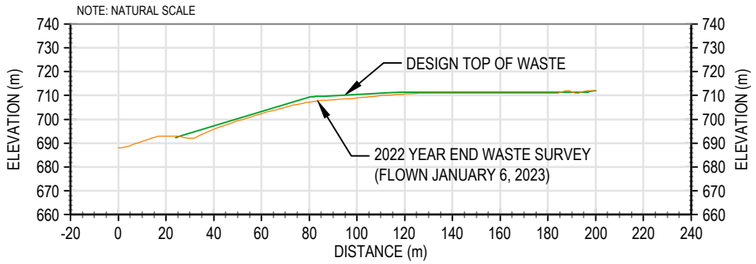
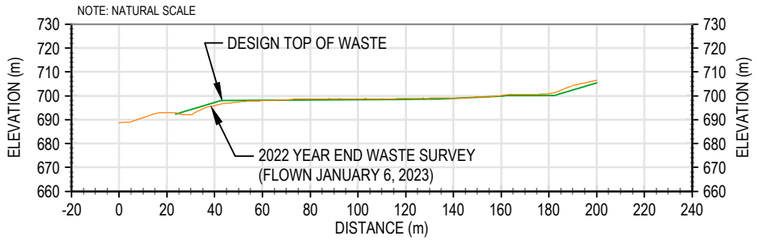


SECTION E



SECTION F

STATUS
ISSUED FOR USE

NUM	DATE	APR	DESCRIPTION
			REVISIONS
B	JAN 12/23	SS	ISSUED FOR USE
A	JAN 09/23	SS	ISSUED FOR REVIEW
NUM	DATE	APR	DESCRIPTION
			DRAWING STATUS

PERMIT

PROFESSIONAL SEAL

CLIENT

CleanHarbors

TETRA TECH

CLEAN HARBORS
2022 YEAR END WASTE SURVEY

CROSS-SECTIONS A - F
2022 YEAR END WASTE SURVEY

PROJECT No.	OFFICE	DES	CKD	REV	DRAWING
SWM.SWOP04490-01	EDM	-	SS	-	C101
DATE: January 12, 2023	SHEET No. 2 of 2	DWN DRG	APP SS	STATUS B	

APPENDIX M

Inspection Form Examples

RY - DAILY WASTE CELLS INSPECTION LOG

Form Code: 706

Compliance Header	
Inspector Name	
Area of Inspection	
Inspection Date and Time	
Instructions 1	
Note condtion of inspection items. If item does not apply to an area, mark N/A. Describe the problems and remedial actions in the space provided under each inspection item.	
Cell 1	
Leachate building and tank	
Secondary water pumped (litres)	
Cell 1 cap condition (grass, erosion)	
Cell 2	
Leachate building and tank	
Secondary water pumped (litres)	
Cell 2 cap condition (grass, erosion)	
Cell 3A (Cell 3)	
Leachate building and tank	
Secondary water pumped (litres)	
Cell 3 cap condition (grass, erosion)	
Cell 3B (Cell 4)	
Leachate building and tank	
Secondary water pumped (litres)	
Cell 4 cap condition (grass, erosion)	
Cell 3C (Cell 5)	
Leachate building and tank	
Secondary water pumped (litres)	
Cell 5 cap condition (grass, erosion)	

Cell 3D (Cell 6)	
Leachate building and tank	
Secondary water pumped (litres)	
Cell 6 cap condition (grass, erosion)	
Cell 3E (Cell 7)	
Leachate building and tank	
Secondary water pumped (litres)	
Cell 7 cap condition (grass, erosion)	
Cell 4 (Cell 8)	
Leachate building and tank	
Secondary water pumped (litres)	
Cell 4 cap condition (grass and erosion)	
Pond 2	
Type in pond level (Below first mark; Between marks; Above top mark; Pumping)	
Pond 2 compliance	
Pond 3	
Type in pond level (Below first mark; Between marks; Above top mark; Pumping)	
Pond 3 compliance	
Dispersible waste must not be landfilled when wind exceeds 30 KM/HR	
Wind Direction (Wind direction is the direction the wind is coming from.)	
Average wind speed (km/hr)	
Precipitation (inches)	
Appearance/ cleanliness: Cell entrance, roads, buildings, bone yard, security	
Lugger pad	
Compliance Footer	
Inspector Signature	
Attach Photo	
Inspection Overall Assessment	

RY - DAILY WASTE CELLS INSPECTION LOG

Response Id: 9529746

Compliance Header	
Inspector Name	026681 - Murray Neiley (MURRAYN1)
Area of Inspection	Ryley
Inspection Date and Time	04/26/2022 2:05 PM
Instructions 1	
Note condtion of inspection items. If item does not apply to an area, mark N/A. Describe the problems and remedial actions in the space provided under each inspection item.	
Cell 1	
Leachate building and tank	Pass
Secondary water pumped (litres)	0
Cell 1 cap condition (grass, erosion)	Pass
Cell 2	
Leachate building and tank	Pass
Secondary water pumped (litres)	132
Cell 2 cap condition (grass, erosion)	Pass
Cell 3A (Cell 3)	
Leachate building and tank	Pass
Secondary water pumped (litres)	5
Cell 3 cap condition (grass, erosion)	Pass
Cell 3B (Cell 4)	
Leachate building and tank	Pass
Secondary water pumped (litres)	771
Cell 4 cap condition (grass, erosion)	Pass
Cell 3C (Cell 5)	
Leachate building and tank	Pass
Secondary water pumped (litres)	2
Cell 5 cap condition (grass, erosion)	Pass
Cell 3D (Cell 6)	
Leachate building and tank	Pass

Secondary water pumped (litres)	0
Cell 6 cap condition (grass, erosion)	Pass
Cell 3E (Cell 7)	
Leachate building and tank	Pass
Secondary water pumped (litres)	73
Cell 7 cap condition (grass, erosion)	Pass
Cell 4 (Cell 8)	
Leachate building and tank	Pass
Secondary water pumped (litres)	259
Cell 4 cap condition (grass and erosion)	Pass
Pond 2	
Type in pond level (Below first mark; Between marks; Above top mark; Pumping)	Top level
Pond 2 compliance	Pass
Pond 3	
Type in pond level (Below first mark; Between marks; Above top mark; Pumping)	Above bottom level
Pond 3 compliance	Pass
Dispersible waste must not be landfilled when wind exceeds 30 KM/HR	
Average wind speed (km/hr)	21
Wind Direction (Wind direction is the direction the wind is coming from.)	SE
Precipitation (inches)	0
Appearance/ cleanliness: Cell entrance, roads, buildings, bone yard, security	Pass
Lugger pad	Pass
Compliance Footer	
Inspector Signature	
Inspection Overall Assessment	Inspection Passed

RY Transfer Station Daily Inspection

Form Code: 863

Compliance Header	
Inspector Name	
Area of Inspection	
Inspection Date and Time	
Instructions1	
Inspections must be conducted daily when the facility is in operation. Note condition of inspection items. All unsatisfactory findings must be explained below. Include any repairs, changes or other remedial actions required.	
Fire pumphouse	
Engine fuel (%)	
Fire tank level (%)	
Fire tank temp. (°C)	
Potable tank (%)	
Potable tank temp. (°C)	
Fire pumphouse compliance	
Scrubber building	
Caustic tank pH > 8.0	
Weekly exhaust PPM	
Scrubber building compliance	
Inspection items1	
MCC building	
Staging building	
Process building	
Yard	
Compliance Footer	
Inspector Signature	
Attach Photo	

Inspection Overall Assessment	

RY Transfer Station Daily Inspection

Response Id: 9808117

Compliance Header	
Inspector Name	027455 - James McVig (MCVIGJ1)
Area of Inspection	Ryley
Inspection Date and Time	06/24/2022 4:02 PM
Instructions1	
Inspections must be conducted daily when the facility is in operation. Note condition of inspection items. All unsatisfactory findings must be explained below. Include any repairs, changes or other remedial actions required.	
Fire pumphouse	
Engine fuel (%)	100
Fire tank level (%)	95
Fire tank temp. (°C)	14
Potable tank (%)	45
Potable tank temp. (°C)	18
Fire pumphouse compliance	Pass
Scrubber building	
Caustic tank pH > 8.0	8.94
Weekly exhaust PPM	N/A
Scrubber building compliance	Pass
Inspection items1	
MCC building	Pass
Staging building	Pass
Process building	Pass
Yard	Pass
Compliance Footer	
Inspector Signature	
Inspection Overall Assessment	Inspection Passed

CO Management Inspection

Response Id: 2172512

Landlord Header	
Inspector Name	013193 - Stan Yuha (YUHAS1)
Area of Inspection	Ryley
Inspection Date and Time	06/07/2017 10:42 AM
CO Management Inspection Instructions	
Instructions: Note condition of inspection items. If item does not apply to an area, mark N/A. All unsatisfactory findings must be explained below. Include any repairs, changes or other remedial actions required or performed.	
Container Storage Areas	
The housekeeping meets Clean Harbors standards. [Clean floors, clean walls, no trash, clean equipment, tools in proper storage locations, no odors or spills]	Pass
There are no visible stains in the containment or other plant areas.	Pass
The containers do not have waste/staining on the outside which would require cleaning or over-packing	Pass
The Containers are in good condition, (not crushed, pinched or damaged), properly closed, with legible labels that are facing the aisle.	Pass
Containers are stored in an organized fashion that allows for easy inspection; aisle space meets regulatory/permit requirements, and is clear and free of obstructions	Pass
The containers have labels that are completed properly with no missing information (i.e. accumulation start date, hazard identification, etc.)	Pass
There are no cracks or gaps in containment that need to be caulked/sealed. Any areas of older cracks that have been previously repaired are still in good condition.	Pass
If concrete is sealed, sealant is in good	Pass

condition with no cracks, gaps or areas needing repairs.	
Any sumps in containment are empty and clean.	Pass
Satellite or accumulation containers are properly marked and closed.	N/A,N/A
There are no observed safety issues (trips/slips/fall hazards, damaged equipment).	Pass
Tanks	
Housekeeping meets Clean Harbors' standards.. There is no debris, plant matter, accumulated rain water or other material accumulated within containment.	Pass
There are no visible stains in the containment area.	Pass
Any small containers within the containment are properly marked and closed (unless adding or removing material).	N/A
Sumps are clean and empty.	N/A
If the tanks store hazardous waste they are marked with the words Hazardous Waste, have a NFPA diamond and appropriate "confined space" markings at entrances, and any other registration or permit required markings.	Pass
If the tanks are out of service, they are marked with the words Out of Service and properly documented in the WIN tank management system.	N/A
Satellite or accumulation containers are properly marked and closed.	N/A
Level indicators are functional and do not indicate any potential overflow condition.	Pass
All tanks are documented in the WIN tank management system.	Pass
There are no observed safety issues.	Pass,Pass,Pass,Pass
PCB Storage	

Any spills or visible stains have had a proper decon and wipe test	N/A
All pumps and equipment associated with PCBs have PCB labeling.	N/A
Out of Service dates and PCB marks are properly placed on containers	N/A
Tanks have PCB mark	N/A
Containment areas used to store PCB's are coated and the coatings are free of cracks, gaps, and damage.	Pass
Entrances to the storage area are marked with the PCB Label as well as all access points into the facility. These marking requirements are also followed in the laboratory (if applicable).	Pass
Housekeeping meets Clean Harbors' standards [Clean floors, clean walls, no trash, clean equipment, tools in proper storage locations, no odors or spills]	Pass
There are no observed safety issues.	Pass,Pass,Pass
Process Areas	
Process areas are free of heavy residues (accumulated solids, sludges or other process residues) that indicate a spill or equipment leak has occurred.	Pass
Satellite or accumulation containers are labeled properly and remain closed.	Pass
No visible staining on floors	Pass
Housekeeping meets Clean Harbors' standards.	Pass,Comments: The used oil drums in the shop,Fail,Reason for failure: housekeeping,Work Ticket Status: Review
There are no observed safety issues.	Pass
Yard/General	
There are no incoming loads sitting in the yard that exceed the allowed time limit.	Pass
There are no outgoing loads sitting in the yard for more than the allowed time limit (10 days in	Pass

most cases).	
Trucks in staging or storage areas containing hazardous waste have the manifest attached to the truck or in close proximity.	Pass
Truck landing gear is supported and is not sinking into the ground.	Pass
There are no visible stains on the surfaces outside the facility.	Pass
There are no vehicles parked in the yard that are leaking.	Pass
Housekeeping meets Clean Harbors' standards.	Comments: The used oil drums in the shop,Fail,Reason for failure: housekeeping,Work Ticket Status: Review
Facility signage is in good order and legible, including all required perimeter signs.	Fail,Reason for failure: missing information (signs,postings),Work Ticket Status: Existing
Security fencing is not damaged or compromised; gates are closed and locked when facility is not manned, or if required to be closed and locked due to permit conditions during normal operations.	Pass
Security cameras (if required) are operational.	Pass
Yard lights are all operational.	Pass
Spare or excess equipment storage area (Boneyard) is organized and neat.	Pass
There are no observed safety issues.	Pass,Pass
Permit or SOP Requirements	
All operations are compliant with permit requirements	Pass
All operations are compliant with SOP or BMP requirements	Pass
Inspections are properly done and findings are documented on work tickets	Pass
All pending work tickets are promptly managed to completion.	Pass
Landlord Footer	
	

Inspector Signature	
Inspection Overall Assessment	Inspection Failed

CO Management Inspection

Response Id: 10253210

Landlord Header	
Inspector Name	013193 - Stan Yuha (YUHAS1)
Area of Inspection	Ryley
Inspection Date and Time	09/29/2022 11:53 AM
CO Management Inspection Instructions	
Instructions: Note condition of inspection items. If item does not apply to an area, mark N/A. All unsatisfactory findings must be explained below. Include any repairs, changes or other remedial actions required or performed.	
Container Storage Areas	
The housekeeping meets Clean Harbors standards. [Clean floors, clean walls, no trash, clean equipment, tools in proper storage locations, no odors or spills]	Comments: Both process and staging floor,Fail,Reason for failure: housekeeping,Work Ticket Status: Review
There are no visible stains in the containment or other plant areas.	Pass
The containers do not have waste/staining on the outside which would require cleaning or over-packing	Pass
The Containers are in good condition, (not crushed, pinched or damaged), properly closed, with legible labels that are facing the aisle.	Pass
Containers are stored in an organized fashion that allows for easy inspection; aisle space meets regulatory/permit requirements, and is clear and free of obstructions	Pass
The containers have labels that are completed properly with no missing information (i.e. accumulation start date, hazard identification, etc.)	Pass
There are no cracks or gaps in containment that need to be caulked/sealed. Any areas of older cracks that have been previously repaired are still in good condition.	Pass
If concrete is sealed, sealant is in good	Pass

condition with no cracks, gaps or areas needing repairs.	
Any sumps in containment are empty and clean.	Pass
Satellite or accumulation containers are properly marked and closed.	N/A,N/A
There are no observed safety issues (trips/slips/fall hazards, damaged equipment).	Pass
Tanks	
Housekeeping meets Clean Harbors' standards.. There is no debris, plant matter, accumulated rain water or other material accumulated within containment.	Pass
There are no visible stains in the containment area.	Pass
Any small containers within the containment are properly marked and closed (unless adding or removing material).	N/A
Sumps are clean and empty.	Pass
If the tanks store hazardous waste they are marked with the words Hazardous Waste, have a NFPA diamond and appropriate "confined space" markings at entrances, and any other registration or permit required markings.	Pass
If the tanks are out of service, they are marked with the words Out of Service and properly documented in the WIN tank management system.	N/A
Satellite or accumulation containers are properly marked and closed.	N/A
Level indicators are functional and do not indicate any potential overflow condition.	Pass
All tanks are documented in the WIN tank management system.	Pass
There are no observed safety issues.	Pass,Pass,Pass,Pass
PCB Storage	

Any spills or visible stains have had a proper decon and wipe test	N/A
All pumps and equipment associated with PCBs have PCB labeling.	N/A
Out of Service dates and PCB marks are properly placed on containers	N/A
Tanks have PCB mark	N/A
Containment areas used to store PCB's are coated and the coatings are free of cracks, gaps, and damage.	Pass
Entrances to the storage area are marked with the PCB Label as well as all access points into the facility. These marking requirements are also followed in the laboratory (if applicable).	Pass
Housekeeping meets Clean Harbors' standards [Clean floors, clean walls, no trash, clean equipment, tools in proper storage locations, no odors or spills]	Pass
There are no observed safety issues.	Pass,Pass,Pass
Process Areas	
Process areas are free of heavy residues (accumulated solids, sludges or other process residues) that indicate a spill or equipment leak has occurred.	Pass
Satellite or accumulation containers are labeled properly and remain closed.	Pass
No visible staining on floors	Pass
Housekeeping meets Clean Harbors' standards.	Pass,Pass
There are no observed safety issues.	Pass,Pass
Yard/General	
There are no incoming loads sitting in the yard that exceed the allowed time limit.	Pass
There are no outgoing loads sitting in the yard for more than the allowed time limit (10 days in most cases).	Pass
Trucks in staging or storage areas containing	Pass

hazardous waste have the manifest attached to the truck or in close proximity.	
Truck landing gear is supported and is not sinking into the ground.	Pass
There are no visible stains on the surfaces outside the facility.	Pass
There are no vehicles parked in the yard that are leaking.	Pass
Housekeeping meets Clean Harbors' standards.	Pass
Facility signage is in good order and legible, including all required perimeter signs.	Pass
Security fencing is not damaged or compromised; gates are closed and locked when facility is not manned, or if required to be closed and locked due to permit conditions during normal operations.	Pass
Security cameras (if required) are operational.	Pass
Yard lights are all operational.	Pass
Spare or excess equipment storage area (Boneyard) is organized and neat.	Pass
There are no observed safety issues.	Pass
Permit or SOP Requirements	
All operations are compliant with permit requirements	Pass
All operations are compliant with SOP or BMP requirements	Pass
Inspections are properly done and findings are documented on work tickets	Pass
All pending work tickets are promptly managed to completion.	Pass
Landlord Footer	
Inspector Signature	
Inspection Overall Assessment	Inspection Failed

APPENDIX N

Financial Security Calculations

Closure and Post-Closure Cost Calculations 2022 (Cell 5 Amendment)

Clean Harbors Ryley Landfill Facility - Financial Security Calculations - Closure and Post Closure Details

CLOSURE COST ESTIMATES

ITEM	QUANTITY	COST/UNIT	CELL 1	CELL 2	CELL 3A	CELL 3B	CELL 3C	Cell 3D	Cell 3E	Cell 4	Cell 5
CLOSURE COSTS, LANDFILL CELLS											
Cell area (m2)			10530	15210	20408	18517	19357	26058	28551	25046	41550
Capping Status			**Capped**	**Capped**	**Capped**	**Capped**	**64% Capped**	**29% Clay Cap - 6% Capped**	**Clay Cap 76%**	**0% Capped**	**0% Capped**
Surface prep'n/m2*		$ 2.00	$ -	$ -	$ -	$ -	$ 17,808.44	$ 37,002.36	$ 13,704.48	$ 50,092.00	$ 83,100.00
Clay req'd/m2 @ 0.6 m thickness(m3) *	0.6	$ 11.00	$ -	$ -	$ -	$ -	$ 58,767.85	$ 122,107.79	$ 45,224.78	$ 165,303.60	$ 274,230.00
Supply & install HDPE liner/m2 (black) *		$ 13.05	$ -	$ -	$ -	$ -	$ 116,200.07	$ 319,653.49	$ 372,590.55	$ 326,850.30	$ 542,227.50
Supply & install Geotextile/m2 **		$ 2.00	$ -	$ -	$ -	$ -	$ 17,808.44	$ 48,989.04	$ 57,102.00	$ 50,092.00	$ 83,100.00
QA/QC (15% of total of first 4 items) ***	15%		$ -	$ -	$ -	$ -	$ 31,587.72	$ 79,162.90	$ 73,293.27	$ 88,850.69	$ 147,398.63
Sub-soil @ 0.45 m thickness (m3) *	0.45	$ 7.25		$ -	$ -	$ -	$ 31,576.11	$ 85,014.23	$ 93,147.64	$ 81,712.58	$ 135,556.88
Native soil cover @ 0.15 m thickness (m3) *	0.15	$ 7.25	$ -	$ -	$ -	$ -	$ 10,525.37	$ 28,338.08	$ 31,049.21	$ 27,237.53	$ 45,185.63
Fertilizer & hydroseeding - cost/m2 ****		$ 2.00	$ -	$ -	$ -	$ -	$ 19,357.00	$ 52,116.00	$ 57,102.00	$ 50,092.00	$ 83,100.00
Subtotal Closure Costs			**$ -**	**$ -**	**$ -**	**$ -**	**$ 303,631.00**	**$ 772,383.88**	**$ 743,213.94**	**$ 840,230.69**	**$ 1,393,898.63**
Engineering * **	5%			**$ -**	**$ -**	**$ -**	**$ 15,181.55**	**$ 38,619.19**	**$ 37,160.70**	**$ 42,011.53**	**$ 69,694.93**
Contingency	15%			**$ -**	**$ -**	**$ -**	**$ 47,821.88**	**$121,650.46**	**$117,056.19**	**$132,336.33**	**$219,539.03**
Total Closure Costs				**$ -**	**$ -**	**$ -**	**$ 366,634.43**	**$ 932,653.53**	**$ 897,430.83**	**$ 1,014,578.55**	**$ 1,683,132.59**

* Unit rates based on Cell 5 Bid Sheet 2023
** Based on standard industry unit rate
*** Based on Typical Capping Engineering & QA-QC
**** Unit rate based on recent hydroseed rates (2023)

CELL CLOSURE COST $3,211,297.34

STORMWATER RETENTION POND CLOSURE

ITEM	COST/UNIT	POND 1*	POND 2	POND 3**
Pond Volume (m3)			7600	0
Pond Area (m2)			5000	0
			0	
Clay fill (m3)	$ 8.00	$ -	$ 66,880.00	$ -
Sub-soil @ 0.35 m thickness (m3)	$ 7.25	$ -	$ 12,687.50	$ -
Native soil cover @ 0.15 m thickness (m3)	$ 7.25	$ -	$ 5,437.50	$ -
Seeding - cost/m2	$ 0.50	$ -	$ 2,500.00	$ -
Pond surface gravel removal incl geotextile	$ -	$ -	$ -	$ -
Geomembrane liner removal	$ 5.00	$ -	$ 25,000.00	$ -
pumping the water down	$ 10,000.00	$ -	$ 10,000.00	$ -

* Decommissioned
** Closure of Pond 3 is included in the Closure Costs for the Equipment Storage and Laydown Area, below.

STORMWATER RETENTION POND CLOSURE (POND 2 ONLY) $122,505.00

CLOSURE COSTS, TRANSFER STATION

DISPOSAL COST FOR INVENTORY REMOVAL*	$548,687.37
TRANSPORTATION COST FOR INVENTORY DISPOSAL**	$238,971.53
MOBILIZATION***	$6,225.00
UTILITY LOCATES/CONFIRM UTILITY DISCONNECT***	$12,450.00
TANK CLEANING***	$193,082.32
REMOVE TANKS ***	$10,130.57
REMOVE SECONDARY CONTAINMENT***	$28,738.34
BUILDING DEMOLITION & REMOVAL***	$142,192.70
BUILDING FOUNDATION REMOVAL***	$376,078.40
PROCESS EQUIPMENT REMOVAL***	$4,357.50
REMOVE MISCELLANEOUS ITEMS, ASPHALT, FENCING ETC***	$138,534.89
DEMOBILIZATION***	$6,225.00
CONFIRMATORY SOIL SAMPLING***	$31,125.00
ENVIRONMENTAL REPORTING***	$9,337.50
REMEDIATION & RECLAMATION CERTIFICATE/CONFIRMATION OF NO IMPACT***	$12,450.00
ON-SITE CONSULTING FEES (SITE SUPERVISION, LABORERS***	$44,820.00
ON-SITE CONSULTING FEES (POST-CLOSURE ACTIVITIES***	$22,410.00

Leachate Tank T5100 removed and disposed

PROJECT MANAGEMENT FEE (10% OF TOTAL CONSTRUCTION ABANDONMENT/DEMOLITION COSTS)***			$84,508.11									
CLOSURE COSTS, TRANSFER STATION			**$1,910,324.20**									
* cost based on rates from Clean Harbors Environmental USA and SECURE Dated 2014 (Waste Disposal Cost tab)												
** cost based on typical 2023 transport costs from Clean Harbors (Waste Disposal Cost tab)												
*** cost based on TetraTech 2014 Estimated Decommissioning & Abandonment Costs & Pardy's Waste Management Cost Estimate												
- All costs have been adjusted based on inflation from the Bank of Canada between 2014 and 2023 - Total inflation over 9 years is 24.5% as checked on March 15, 2023												
TRANSFER STATION CLOSURE					$1,910,324							
TIPPING PAD REMOVAL												
Pump water out of pond			$10,000.00									
Geomembrane liner removal (Pad and Pond)			$34,500.00									
Geotextile removal (Pad and Pond)			$18,400.00									
Pond berm removal [backfilling the pond with this clay]			$0.00									
Backfilling Pond with Clay			$15,200.00									
Subsoil placement (0.35 m) (Pad, Pond, and Roadway)			$72,318.75									
Topsoil placement (0.15 m) (Pad, Pond, and Roadway)			$30,993.75									
Seeding and fertilizing (Pad, Pond, and Roadway)			$14,250.00									
Granular base course removal (Pad and Roadway)			$18,487.50									
Granular sub-base course removal (Pad and Roadway)			$30,087.50									
Asphalt Concrete Pavement removal (Pad)			$9,425.00									
Waste Receiving Pit - 150 mm Granular Base removal			$362.50									
Waste Receiving Pit - 300 mm Granular Sub-Base removal			$725.00									
Shale Bins			$1,000.00									
Screw Piles for Side Dumps removal			$2,000.00									
300mm dia. CSP Culvert removal and disposal			$1,000.00									
450mm dia. CSP Culvert removal and disposal			$1,000.00									
RipRap Class 1M (Culverts) removal			$1,920.00									
RipRap Swale and Apron, Class 1M removal			$3,840.00									
leachate tank removal			$5,000.00									
Tank disposal			$0.00									
12 x 12 m Sawdust Storage Tent removal			$5,000.00									
Storage Shed removal			$5,000.00									
Wash Water Tank removal			$1,000.00									
4x5x4 Steel Mix Pit removal			$20,000.00									
Site Electrical Including Lighting removal			$5,000.00									
Retaining wall removal			$25,000.00									
Engineering, Environmental, and Administration - 15% of construction cost			$49,726.50									
CLOSURE COSTS, TRANSFER STATION			**$331,510.00**									
* Quantities based on 2022 Pad Construction Bid Sheet as summarized below												
**Unit rates based on Cell 5 Bid Sheet 2023												
TIPPING PAD REMOVAL COST					$331,510							
CLOSURE COSTS, EQUIPMENT STORAGE AND LAYDOWN AREA (INCL. POND 3)												
Pump water out of pond			$10,000.00									
Geomembrane liner removal			$42,000.00									
Pond berm removal [backfilling the pond with clay]			$0.00									
Backfilling Pond with Clay			$67,200.00									
Subsoil placement (0.35 m) (Pad and Pond)			$96,425.00									
Topsoil placement (0.15 m) (Pad and Pond)			$41,325.00									
Backfilling Permanent drainage ditches			$4,000.00									
Seeding and fertilizing the Pad and Pond area			$19,000.00									
Equipment removal (assumed to be salvagable)			$0.00									
Equipment diposal (no disposal required)			$0.00									
Soil sampling in case of site remediation			$20,000.00									
Project Management and Project Administration (15%)			$41,992.50									
Site Remediation [pending results of soil sampling]			$55,990.00									
CLOSURE COSTS, EQUIPMENT STORAGE AND LAYDOWN AREA (INCL. POND 3)			**$397,932.50**									
Pad and Pond Construction Estimate - Budgetary October 25.pdf (sharepoint.com)												
Unit rates based on Cell 5 Bid Sheet 2023												
EQUIPMENT STORAGE AND LAYDOWN AREA (INCL. POND 3) CLOSURE					$397,933							

Closure and Post-Closure Cost Calculations 2022 (Cell 5 Amendment)

POST CLOSURE COST ESTIMATE													
INSPECTIONS BY TECHNICIAN			**TIME (HOUR)**	**COST/HOUR***	**AVERAGE ANNUAL COST (# INSPECTIONS)(TIME)(COST)/25 YR}**								
1/WEEK, FIRST 3 MONTHS	12												
1/MONTH, 4-12 MONTHS	9												
1 PER 2 MONTHS, YEARS 2-5	24												
1 PER 6 MONTHS, YEARS 6-25	40												
TOTAL	**85**		8	$ 95.00	$ 2,584.00								
INSPECTIONS BY ENGINEER													
2/YEAR, FIRST YEAR	2												
1/YEAR, YEARS 2-25	24												
TOTAL	**26**		8	$ 119.00	$ 990.08								
*Costs based on Tetra Tech 2023 T1 rate and E1 rate													
*Company min range													
TOTAL AVERAGE ANNUAL INSPECTION COSTS					**$ 3,574.08**								
MAINTENANCE													
GRASS MOWING, PER YEAR					$ 12,000.00								
- Based on information provided by Clean Harbors (March 2023), assumed a total grass mowing of 12,000													
TOTAL ANNUAL MAINTENANCE COSTS					**$ 12,000.00**								
ADMINISTRATION COSTS	0												
ESTIMATED ANNUAL ADMIN, (HOURS)	80												
COST/HOUR*	$ 119.00												
ANNUAL ADMINISTRATION COST	**$ 9,520.00**												
*Costs based on Tetra Tech 2023 E1 rate													
*Company min range													
TOTAL ANNUAL ADMINISTRATION COST					**$ 9,520.00**								
LANDFILL GAS MANAGEMENT & MONITORING	**Not applicable - no gas generated from Industrial landfill wastes, no landfill gas monitoring and management currently at the landfill facility**												
SURFACE WATER/STORMWATER MANAGEMENT & MONITORING	**Not applicable - site will be re-vegetated, surface water & stormwater will flow to natural drainage areas. Closure costs are shown above**												
LEACHATE MONITORING	**Quantity**		**UNITS**	**COST/UNIT***	**$ -**								
Leachate head monitoring, monthly	12		8	$95.00	$9,120.00								
Leachate analysis - annual (primary & secondary) (Clean Harbors 2023)	8		2	$475.00	$7,600.00								
*Costs based on Tetra Tech 2023 T1 Minimum rate													
ANNUAL LEACHATE MONITORING COSTS					**$16,720.00**								
GROUNDWATER MONITORING													
# MONITORING WELLS*	48		[Confirmed in 2022 annual report]										
# MONITORING EVENTS/YEAR*	1		[Monitored and sampled in June 2022]										
COST OF MONITORING/WELL (includes est. reporting costs)	$ 748.33												
ANNUAL MONITORING COSTS**	**$ 35,920.00**												
* Tetra Tech 2022 Groundwater Monitoring Program, Ryley Class I Waste Management Facility, Ryley, Alberta													
**The Tetra Tech 2022 budget for the GMP is 35,920.00.													
TOTAL ANNUAL GROUNDWATER MONITORING COSTS					**$35,920.00**								
SUMMARY:													
ANNUAL POST CLOSURE COST					**$ 77,734.08**								
POST CLOSURE COST (25 YEARS)					$ 1,943,352.00								
CUMULATIVE LEACHATE MANAGEMENT COSTS (25 YEARS)					**$ 3,768,569.54**								
CLOSURE & POST POST CLOSURE (NO NET PRESENT VALUE)					**$ 11,431,714.66**								

Clean Harbors Ryley Landfill Facility - Financial Security Calculations

Closure and Post Closure Net Present Value Calculation

Closure Cost	
Cell Closure Cost	$3,211,297
Pond 2	$122,505
Transfer Station	$1,910,324
Tipping Pad	$331,510
Laydown Area	$397,933
TOTAL Closure	**$5,973,569**

Post Closure Cost	
Inspection	$3,574
Maintenance	$12,000
Administration	$9,520
Leachate Management (First Year)	$868,896
Groundwater Monitoring	$35,920
Leachate Monitoring	$16,720
TOTAL Annual Post Closure	**$946,630**

TOTAL Annual Post Closure (Excl. Leachate)	**$77,734.08**

Total Post Closure Period Costs (NPV)		
Discount Rate *	3.38%	
Inflation **	1.92%	

* Bank of Canada long-term (30 year) Benchmark Bond Yield - Average between 03/2023 - 01/2001

Selected bond yields - Bank of Canada

** Average CPI inflation from Q1 1993 - Q4 2022 in Canada

Inflation: Definitions, graphs and data - Bank of Canada

Summary	Total $
Closure Cost	$5,973,569
Post Closure (25 year period with Discount Factor applied)	$5,168,036
Total	**$11,141,605**

Clean Harbors Ryley Landfill Facility - Financial Security Calculations
Closure and Post Closure Net Present Value Calculation

Annual Post Closure Cost

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Inflated Values	1.000	1.019	1.039	1.059	1.079	1.100	1.121	1.142	1.164	1.186	1.209	1.232	1.256	1.280	1.305	1.330	1.355	1.381	1.408	1.435	1.462	1.490	1.519	1.548	1.578
Post Closure Costs (With Leachate Reduction and Inflation Factor Applied)	$946,630	$821,485	$817,170	$819,331	$312,698	$245,206	$277,944	$167,242	$145,757	$131,586	$122,308	$116,719	$113,701	$112,195	$112,894	$115,059	$117,265	$119,513	$121,805	$124,141	$126,521	$128,947	$131,420	$133,940	$136,508

CHUBB

199 Bay Street, Suite 2500
PO Box 139, Commerce Court Postal Station
Toronto ON M5L 1E2 Canada

O (416) 863-0550
F (416) 863-5010

CONTINUATION CERTIFICATE

To be attached to and form part of
AB Environmental Protection Act Bond, Approval No. 10348-03-00

BOND NO.:	M220739
BOND AMOUNT:	$9,744,260.45 CAD
BROKER:	HUB INTERNATIONAL HKMB LIMITED
SURETY:	CHUBB INSURANCE COMPANY OF CANADA
PRINCIPAL:	CLEAN HARBORS CANADA, INC.
OBLIGEE:	HER MAJESTY THE QUEEN IN RIGHT OF ALBERTA AS REPRESENTED BY THE MINISTER OF ENVIRONMENT AND PARKS ATTN: DIRECTOR, SOUTH REGION 5TH FLOOR, 9915 108 STREET, EDMONTON AB, T5K 2G8
INCEPTION DATE:	SEPTEMBER 06, 2016
EFFECTIVE TERM:	SEPTEMBER 06, 2022 TO SEPTEMBER 06, 2023.

This certificate is subject to the same terms, conditions and exclusions of the original contract and written amendments thereto.

Continuation of a bond is further subject to the condition that the maximum aggregate liability of the company shall not be cumulative and shall in no event exceed the amount shown above.

NOTHING HEREIN CONTAINED shall alter, vary or extend any provisions or conditions of this bond other than as stated above.

Dated this **15th** day of **August, 2022**

CHUBB INSURANCE COMPANY OF CANADA

Christina Kontogeorgopoulos, Attorney-in-Fact

APPENDIX O

Site Development Plan

TETRA TECH

TECHNICAL MEMO

ISSUED FOR USE

To:	Clean Harbors Inc. Stan Yuha – Facility Manager	**Date:**	January 17, 2023
c:	Michael E. Parker – Vice President Canadian Environmental Compliance	**Memo No.:**	1
From:	Spencer Smith, P.Eng. Sean Buckles, M.Sc., P.Eng.	**File:**	704-SWM.SWOP04490-01
Subject:	Remaining Airspace – January 6, 2023 Clean Harbors Facility, Ryley, Alberta		

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was requested to complete the remaining airspace calculations for the Clean Harbors Facility located near Ryley, Alberta. These calculations are based on the topographic waste survey completed by Clean Harbors Industrial Services – Unmanned Aerial Systems on January 6, 2023. This work was completed as requested by the Clean Harbors Inc. (Clean Harbors) Ryley Landfill Facility Manager on December 8, 2022.

2.0 AIRSPACE MODELLING

Using AutoCAD Civil 3D software, Tetra Tech completed airspace modelling based on the January 6, 2023 survey data provided by Clean Harbors, and design top of waste elevations previously completed by Tetra Tech. The 3D Drawing models are done in Universal Transverse Mercator (UTM) NAD83, Zone 12. As of January 6, 2023, the remaining airspace in Area 1 (Cell 3E) is estimated at 5,650 m^3; the remaining airspace in Area 2 (Cell 4 and the north portion of Cell 3C and Cell 3D) is estimated at 40,134 m^3; and the remaining airspace in the tipping pad area is estimated at 162,030 m^3.

The total estimated remaining airspace at the Clean Harbors Ryley Facility as of December 31, 2021, is 207,814 m^3. The total estimated remaining airspace excluding the tipping pad area is 45,784 m^3. This information is presented in Table 1 below and in the attached Drawing C100 and Drawing C101.

Table 1: Airspace Modelling Summary

Area	Remaining Airspace Volume	Notes
Area 1 (Cell 3E)	5,650 m^3	A reduction of approximately 2,509 m^3 since the December 31, 2021 survey.
Area 2 (Cell 4 and North Portion of Cell 3C and Cell 3D)	40,134 m^3	A reduction of approximately 116,119 m^3 since the December 31, 2021 survey.
Tipping Pad Area	162,030 m^3	A reduction of approximately 21,382 m^3 since the December 31, 2021 survey.
Total	**207,814 m^3**	

The remaining airspace within the proposed 2023 capping area, as shown on Drawing C100, was calculated to be 9,924 m^3. This is included in the total remaining airspace in Area 2, outlined above in Table 1. There was a total of 140,010 m^3 of waste placed since the December 31, 2022 Survey. This includes any snow cover picked up by the Survey.

Tetra Tech Canada Inc.
14940 - 123 Avenue
Edmonton, AB T5V 1B4 CANADA
Tel 780.451.2121 Fax 780.454.5688

3.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Clean Harbors Canada Inc. and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Clean Harbors Canada Inc., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

4.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

704-SWM.SWOP04490-01
704-SWM.SWOP04490-01
704-SWM.SWOP04490-01
704-SWM.SWOP04490-01

Prepared by:
Spencer Smith, P.Eng.
Project Engineer – Team Lead
Solid Waste Management Practice
Direct Line: 403.723.6933
Spencer.Smith@tetratech.com

704-SWM.SWOP04490-01
704-SWM.SWOP04490-01
704-SWM.SWOP04490-01
704-SWM.SWOP04490-01

Reviewed by:
Sean Buckles, M.Sc., P.Eng.
Senior Project Engineer – Team Lead
Solid Waste Management Practice
Direct Line: 403.723.6876
Sean.Buckles@tetratech.com

/as

PERMIT TO PRACTICE
TETRA TECH CANADA INC.

RM SIGNATURE: _____

RM APEGA ID #: _____

DATE: _____

PERMIT NUMBER: P013774
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Enclosure: Tetra Tech's Limitations on the Use of this Document
2022 Waste Survey Drawing C100 and Drawing C101

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

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The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

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1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

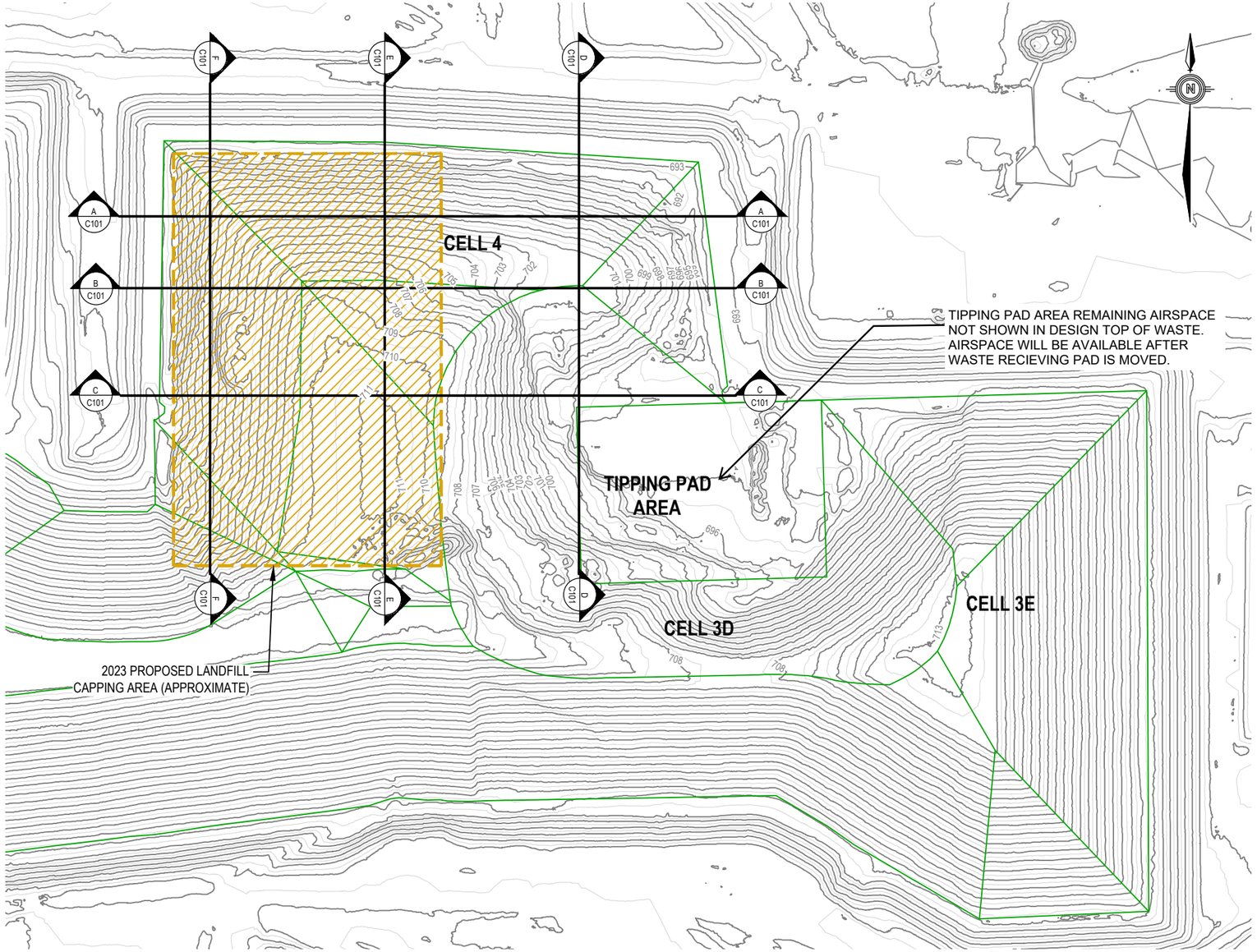
The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

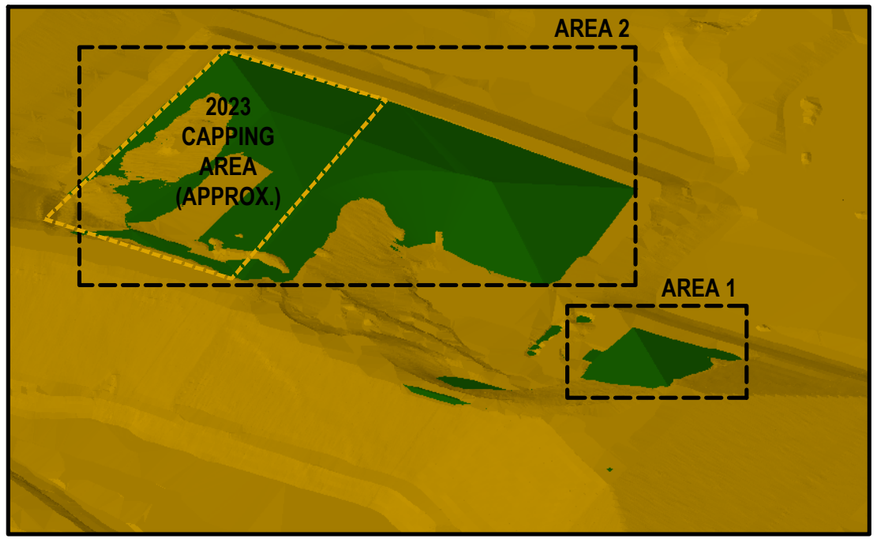
TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.



EXISTING WASTE TOPOGRAPHY - 2022 YEAR END SURVEY (Flown on January 6, 2023)



DESIGN TOP OF WASTE (green) VS. 2022 YEAR END WASTE SURVEY (orange)

AREA 1 REMAINING AIRSPACE.....5,650 m³

AREA 2 REMAINING AIRSPACE.....40,134 m³

REMAINING AIRSPACE IN TIPPING PAD BOWL.....162,030 m³

REMAINING AIRSPACE TOTAL.....207,814 m³

REMAINING AIRSPACE WITHIN 2023 CAPPING AREA.....NET: 9,924 m³ (CUT=3,022 m³, FILL=12,947 m³)

WASTE PLACED SINCE DECEMBER 2021 SURVEY.....140,010 m³

NOTES:

1. TOPOGRAPHY SHOWN IS THE 2022 YEAR END WASTE SURVEY (Surveyed by Clean Harbors on Jan 6, 2023)
2. UTM with NAD83 datum, Zone 12, Meter; Central Meridian 111d W

STATUS
ISSUED FOR USE

NUM	DATE	APR	DESCRIPTION
			REVISIONS
B	JAN 12/23	SS	ISSUED FOR USE
A	JAN 09/23	SS	ISSUED FOR REVIEW
NUM	DATE	APR	DESCRIPTION
			DRAWING STATUS

PERMIT

PROFESSIONAL SEAL

CLIENT

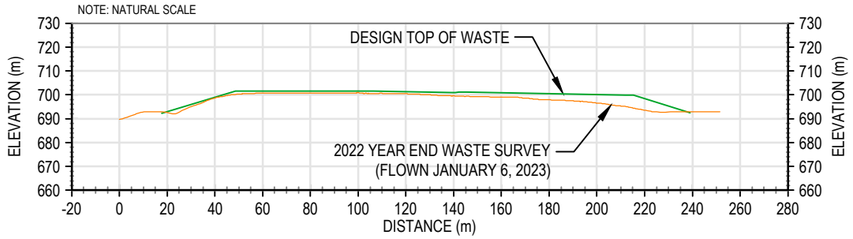
CleanHarbors

TETRA TECH

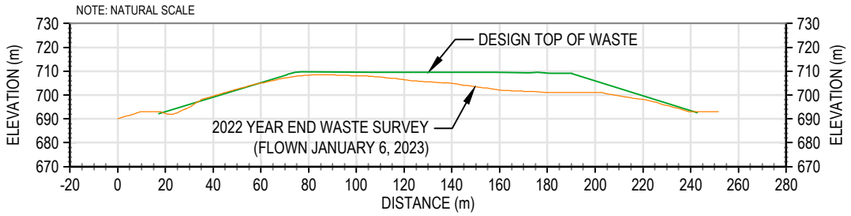
CLEAN HARBORS
2022 YEAR END WASTE SURVEY

PLAN
2022 YEAR END WASTE SURVEY

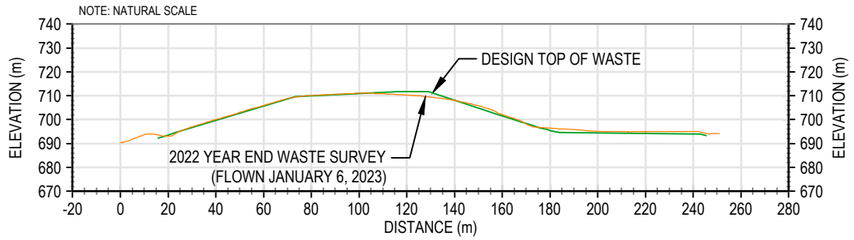
PROJECT No.	OFFICE	DES	CKD	REV	DRAWING
SWM.SWOP04490-01	EDM	-	SS	-	C100
DATE: January 12, 2023	SHEET No. 1 of 2	DWN DRG	APP SS	STATUS B	



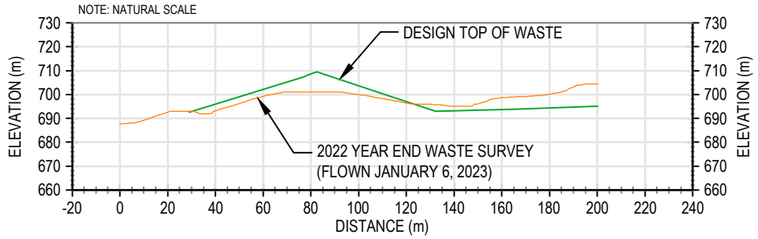
SECTION A



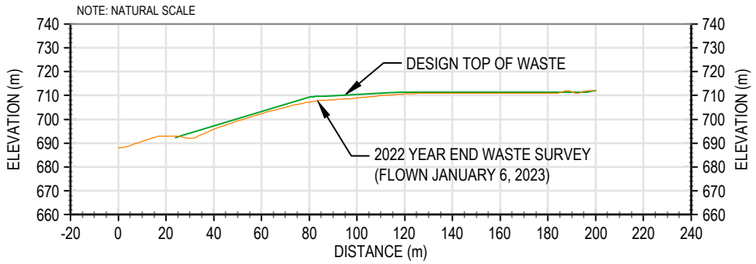
SECTION B



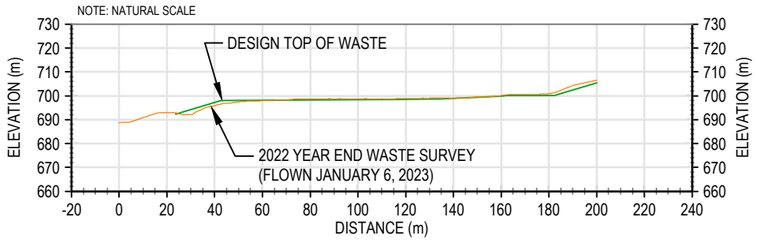
SECTION C



SECTION D



SECTION E



SECTION F

STATUS
ISSUED FOR USE

NUM	DATE	APR	DESCRIPTION
			REVISIONS
B	JAN 12/23	SS	ISSUED FOR USE
A	JAN 09/23	SS	ISSUED FOR REVIEW
NUM	DATE	APR	DESCRIPTION
			DRAWING STATUS

PERMIT

PROFESSIONAL SEAL

CLIENT

CleanHarbors

TETRA TECH

CLEAN HARBORS
2022 YEAR END WASTE SURVEY

CROSS-SECTIONS A - F
2022 YEAR END WASTE SURVEY

PROJECT No.	OFFICE	DES	CKD	REV	DRAWING
SWM.SWOP04490-01	EDM	-	SS	-	C101
DATE: January 12, 2023	SHEET No. 2 of 2	DWN DRG	APP SS	STATUS B	

APPENDIX P

Annual Landfill Cell Closure Report

Annual Landfill Cell Closure Report

No landfill cells were closed in 2022.

Appendix Q

Contravention Reports

(7-Day Letters)

April 6, 2022

Environmental Response Centre
Alberta Environment
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 389285

On April 4th, 2022, one of our 30 tonne articulating dump trucks caught on fire.

The dump trucks are used to haul waste from our waste receiving area to the spot in our landfill where the waste is placed permanently. When bulk waste is received at our facility, the customer trucks drive onto our tipping pad and dump the waste into a large receiving pit. The tipping pad is constructed of wooden rig mats therefore preventing the highway trucks from driving on actual waste which prevents tracking on the highway after they leave the facility. A track-hoe is used to transfer the waste from the pit into the dump trucks.

At approximately 5:00 pm that day, one of our Equipment Operators parked the dump truck in the waste loading area. He commented to the track-hoe operator on his radio that the dump truck had just started going through its engine emission control re-gen process, so he would go up to the scale office to weigh in the next truck. The track-hoe operator was about to start loading the dump truck as he rotated the track-hoe when he noticed the dump truck engine compartment engulfed in flames. The operators notified management and notified the local fire department. The fire department responded within approximately 15 minutes and extinguished the fire. The entire event took approximately 30 minutes before the fire was considered out.

A black plume of smoke did occur during the fire. The attached wind data shows the wind was out of the east, blowing west at a speed of approximately 5 m/s. To help interpret the wind data, the first line which is at 16:50 or 4:50 pm, reflects a wind speed of 4.4 m/s and 102 degrees. The wind data is from just before the fire started, 16:50 hrs to just after the fire was extinguished, 17:40 hrs. There were no residences in the path of the smoke. Other than the smoke, there were no other environmental impacts that resulted from this incident and no landfill waste was involved in the fire.

P.O. Box 390, Ryley, AB T0B 4A0 (780) 663-3828 (780) 663-3539

Unfortunately there was not much evidence left to investigate in the engine compartment. The cause of the fire is assumed to be a result from the emission control re-gen process. The re-gen process is when the emission control system pumps urea into a canister that contains the catalyst which reduces the NOx emissions. When the urea is pumped into the canister, it gets extremely hot to essentially clean itself. Although this process is not supposed to cause any damage to the engine, something failed or happened that started the whole compartment on fire. We were not able to determine that exact cause or why the system failed. The unit was a 2014 CAT with over 16,000 operating hours on the truck.

If you have any questions, do not hesitate to contact me at (780) 663-2509.

Yours truly,

Stan Yuha

Stan Yuha
Facility GM
Clean Harbors Canada, Inc.

P.O. Box 390, Ryley, AB T0B 4A0 (780) 663-3828 (780) 663-3539

May 3, 2022

Environmental Response Centre
Alberta Environment and Parks
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 390124
Clean Harbors Approval No. 10348-03-00

On Monday, May 2nd, 2022 Clean Harbors received an odor complaint from a Ryley resident. The resident called my cell phone at 4:10pm complaining about a rotten odor coming from Clean Harbors. I immediately investigated and confirmed that we had not received any odorous wastes prior to the call. I suspected the odor may have come from our cell 4 leachate water tank. After one odor complaint last year, we discovered the odor may have been coming from the vent line on this leachate tank. We connected a carbon scrubber drum to the vent line to capture any odors while the primary leachate is pumping and this seemed to be successful. During our investigation yesterday, we suspected the drum may have become saturated and became non-effective. We decided to replace the drum with a new one and this was completed within 20 minutes of receiving the complaint. We are confident this will mitigate any odors that may further come from this tank.

The wind was blowing from the NNE at approximately 5-7 m/s during this event. There is the possibility the smell was coming from the village lagoon which would have also been inline with the village at this time.

We have been utilizing good cover on a regular basis and in my opinion the landfill is in good shape. We continue to track any received loads of concern and if any odors are detected, the material is buried and covered immediately. If the wind is blowing towards Ryley and the load is rejected.

If you have any further questions, do not hesitate to contact Stan Yuha (Facility Manager) at (780) 663-2509.

Sincerely,

Stan Yuha

Stan Yuha
General Manager

May 5, 2022

Environmental Response Centre
Alberta Environment and Parks
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 390217
Clean Harbors Approval No. 10348-03-00

On Wednesday, May 4th, 2022 Clean Harbors received an odor complaint from a Ryley resident. The resident called my cell phone at 6:30pm complaining about a chemical, burning tire odor coming from Clean Harbors. I immediately investigated and confirmed that we had not received any odorous wastes prior to the call. We obviously weren't burning any tires or anything like that either. I was not at the facility at that time so I called one of our landfill operators and had him walk the top of the landfill to investigate any odor. He called back to say he could not detect any offensive odors, just a mild (regular) landfill odor, adding that it was not offensive.

We will install carbon scrubber drums on all our leachate tanks. Typically, in the past, the other leachate tanks have not been an issue but we will do this to eliminate the possibility and any odors coming from the vents on those tanks that are on the town-ward side of the landfill.

The wind was blowing from the NNE at approximately 6-8 m/s during this event. There is the possibility the smell was coming from the village lagoon which would have also been inline with the village at this time.

We have been utilizing good cover on a regular basis and in my opinion the landfill is in good shape. We continue to track any received loads of concern and if any odors are detected, the material is buried and covered immediately. If the wind is blowing towards Ryley and the load is rejected.

If you have any further questions, do not hesitate to contact Stan Yuha (Facility Manager) at (780) 663-2509.

Sincerely,

Stan Yuha

Stan Yuha
General Manager

May 18, 2022

Environmental Response Centre
Alberta Environment and Parks
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 390648
Clean Harbors Approval No. 10348-03-00

On Tuesday, May 17th, 2022 Clean Harbors received an odor complaint from a Ryley resident. The resident called my cell phone at 1:38 pm complaining about a chemical, burning tire odor coming from Clean Harbors. This was the same resident complaining of the same odor on May 4th. I immediately investigated and confirmed that we had not received any odorous wastes prior to the call. We obviously weren't burning any tires or anything like that either. I and one other Clean Harbors employee drove into Ryley, up & down the streets and avenues, past the residents' home and neither of us could detect any odor. I called the resident back at 1:49 pm as I was driving by his house and he informed me the odor went away.

We have not yet completed the installation of the carbon scrubber drums on all our leachate tanks. We are waiting for the plumbing to arrive. However, because the wind was going to be blowing towards town that day, we had shut off all our leachate pumps in the morning, so we were not pumping any leachate before the complaint was received.

The wind was blowing from the N/NNW at approximately 4.5-9.8 m/s during this event. I would have to say the odor was unsubstantiated at this time.

We have been utilizing good cover on a regular basis and in my opinion the landfill is in good shape. We continue to track any received loads of concern and if any odors are detected, the material is buried and covered immediately. If the wind is blowing towards Ryley and the load is rejected.

If you have any further questions, do not hesitate to contact Stan Yuha (Facility Manager) at (780) 663-2509.

Sincerely,

Stan Yuha

Stan Yuha
General Manager

June 2, 2022

Environmental Response Centre
Alberta Environment and Parks
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 391193
Clean Harbors Approval No. 10348-03-00

On Wednesday, June 1st, 2022 Clean Harbors received an odor complaint from a Ryley resident. The resident called my cell phone at 12:23 pm complaining about an odor she described as an "old petro chemicals" smell. I immediately investigated and confirmed that we had not received any odorous wastes out of the ordinary. I then drove into Ryley and drove by their house and through the back alleys and could not detect any odor. Her and her husband were outside at the time, so I stopped to talk with them. She said the odor comes and goes and it went away. The wind was quite calm, varying, blowing mainly from the NW at ~ 1 m/s at the time of the complaint. This is the same couple that complains regularly. I ensured them if the odor was coming from Clean Harbors, we take action to cover and resolve the issue.

We have not finished installing the scrubber drums on all the leachate tanks yet, but I confirmed we were not pumping leachate, so that was not the source of the odor

We have been utilizing good cover on a regular basis and in my opinion the landfill is in good shape. We continue to track any received loads of concern and if any odors are detected, the material is buried and covered immediately. If the wind is blowing towards Ryley and the load is rejected.

If you have any further questions, do not hesitate to contact Stan Yuha (Facility Manager) at (780) 663-2509.

Sincerely,

Stan Yuha

Stan Yuha
General Manager

June 28, 2022

Environmental Response Centre
Alberta Environment and Parks
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 400556
Clean Harbors Approval No. 10348-03-01

On Wednesday, June 22nd, 2022 Clean Harbors received an odor complaint from a Ryley resident. The resident called my cell phone at 4:08 pm complaining about an odor he described as a chemical smell. He said it comes and goes. I immediately investigated and confirmed that we had not received any odorous wastes out of the ordinary. I ensured them if the odor was coming from Clean Harbors, we take action to cover and resolve the issue. I asked one of our Landfill Operators to go on top of the landfill between the working face and the village and he could not detect any strong or strange odors.

The wind was light, varying, blowing mainly from the NNE (10 – 40 degrees) at ~ 3 m/s at the time of the complaint. The village lagoon may have been the cause of the odor since it is just to the immediate east of our landfill.

We have been utilizing good cover on a regular basis and in my opinion the landfill is in good shape. We continue to track any received loads of concern and if any odors are detected, the material is buried and covered immediately. If the wind is blowing towards Ryley and the load is rejected.

If you have any further questions, do not hesitate to contact Stan Yuha (Facility Manager) at (780) 663-2509.

Sincerely,

Stan Yuha

Stan Yuha
General Manager

August 22nd, 2022

Environmental Response Centre
Alberta Environment and Parks
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 402971
Clean Harbors Approval No. 10348-03-01

On Sunday, August 21st, 2022 Clean Harbors received an odor complaint from a Ryley resident. The resident called my cell phone at 11:15 am complaining about odor coming from the Clean Harbors Landfill. He didn't give me a lot of details but more proceeded to be quite verbally abusive. After we hung up, I immediately investigated and confirmed with Landfill personnel that we had not received any odorous wastes out of the ordinary that morning. I asked one of our Landfill Operators to go on top of the landfill between the working face and the village and he could not detect any strong or strange odors.

The wind was light, varying, blowing mainly from the NNE 1 – 40 degrees, averaging 20-30 degrees, at ~ 4-7 m/s at the time of the complaint. We could not confirm or substantiate that our landfill was the source of the odor. The village lagoon may have been the cause of the odor since it is just to the immediate east of our landfill, which is also NE of the Village. The Clean Harbors Landfill is more true north of the Village.

We have been utilizing good cover on a regular basis and in my opinion the landfill is in good shape. We continue to track any received loads of concern and if any odors are detected, the material is buried and covered immediately. If the wind is blowing towards Ryley and the load is rejected.

If you have any further questions, do not hesitate to contact Stan Yuha (Facility Manager) at (780) 663-2509.

Sincerely,

Stan Yuha

Stan Yuha
General Manager

October 6th, 2022

Environmental Response Centre
Alberta Environment and Parks
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 405070
Clean Harbors Approval No. 10348-03-01

On Sunday, October 2nd, 2022 Clean Harbors received an odor complaint from a Ryley resident. The resident called my work cell phone at 5:58 pm complaining about odor coming from the Clean Harbors Landfill. He didn't give me a lot of details but mentioned he noticed the odor for about half an hour. He only wanted to leave his first name, but I knew this person from previous complaints. After our short conversation, I asked one of our Landfill Foreman to drive through Ryley and near the complainant's residence and drive between the landfill and the village to see if he could detect any odors. He reported that he could not detect any strong or strange odors. The landfill was closed for business at the time of the call, but I also talked to the operators that were working earlier that day and they reported they had not received anything odorous earlier that day. Upon further investigation from my Foreman driving through the village, he reported there was a road maintenance crew tarring the village roads that was only a block away from the complainant's home. I also spoke with another employee who lives two blocks south of the complainant and she reported that she could smell the crew working on the roads. Ultimately, we could not confirm the source of the odor the complainant was smelling.

I received a second call from another resident, Wayne Kushnir at 6:23 pm and much like his previous complaint call in August, he was extremely rude and swore at me and then hung up. I did not get to have much of a discussion with him.

Our wind data log shows that at 5:30 pm the wind was blowing at 4.8 m/s and 21 degrees out of the NNE. The direction gradually changed coming straight from the north at 6:00 pm but lessening to 4.1 m/s and then gradually lessened to 1.6 m/s at 7:00 pm, drifting from the NNW.

On Monday the wind was not blowing towards Ryley. On Tuesday the wind was forecasted to blow towards the village later that afternoon and evening. That afternoon we sprayed the active surface of our landfill area with our Ecosorb deodorizer. We feel that if the odor was coming from our landfill, this treatment neutralized the smell. We received no odor complaints Tuesday evening.

If you have any further questions, do not hesitate to contact Stan Yuha (Facility Manager) at (780) 663-2509.

Sincerely,

Stan Yuha
General Manager

Dec. 22, 2022

Environmental Response Centre
Alberta Environment and Parks
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 407961
Clean Harbors Approval No. 10348-03-01

On Thursday, December 22nd, 2022 Clean Harbors received an odor complaint from a Ryley resident. The resident called my cell phone at 12:19 pm complaining about an odor he described as a strong but different smell. While he was informing me the odor was entering his house I checked the direction and velocity of the wind. I informed him the wind was coming from the south as it had been all morning and any odors he was smelling was definitely not coming from Clean Harbors. He went on to say that he knows that wind swirls and was convinced it was coming from Clean Harbors. I mentioned the wind was quite moderate and definitely not swirling as I confirmed this by visually watching all the exhaust from building heaters, equipment and vehicles on our site blow to the north, as he lives in the Village of Ryley which is to the south of Clean Harbors. I asked him what was to the south of him and he replied, "the highway". I then said that I had no idea what was causing the odor and he got short and angry with me and said that he was going to call Environment Canada and hung up on me.

Since the wind was confirmed blowing from the south, no further action by myself was taken.

If you have any further questions, do not hesitate to contact Stan Yuha (Facility Manager) at (780) 663-2509.

Sincerely,

Stan Yuha

Stan Yuha
General Manager

Jan. 12, 2022

Environmental Response Centre
Alberta Environment
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 386952

On January 10th, 2022, I received notification from our Consultant Engineers that there was irregular data in the Dec. 2021 monthly wind data download. It appears the translator, which also records the data, was reading the wind speed and wind average correctly, however the wind direction had remained at 357 degrees since Dec. 14th. The Facility confirmed the anemometer itself was working normally. The Facility Manager then reset the translator by unplugging and plugging it back in and it started working normally again. This has never happened before and unfortunately, we have no explanation as to why the instrument appeared to have a technical glitch while recording the wind direction parameter while simultaneously properly recording the other parameters. We will continue to monitor the instrument closely to ensure no other instances occur.

This equipment malfunction has also affected the first 10 days' worth of data in the month of January and we will also include a copy of this letter in our January Air Monitoring report.

This event is in contravention of Section 4.2.14 of our Approval, as part of our requirement to meet the Air Monitoring Directive. There were no environmental impacts associated with the unusual failure of the wind data instrument.

If you have any questions, do not hesitate to contact me at (780) 663-2509.
Yours truly,

Stan Yuha

Stan Yuha
Facility GM
Clean Harbors Canada, Inc.

Jan. 27, 2022

Environmental Response Centre
Alberta Environment
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 387295

On January 18th, 2022, our lab chemist had reached out to the ALS laboratory in Edmonton (9450 17 Ave NW) inquiring about missing analytical data from the November 2021 report. The routine parameters for pond B (Table 4.3-E) was missing and Total chlorinated phenols for pond C. Pond B parameters include pH, Electrical Conductivity, TDS, TSS, Total chlorinated phenols, and anions. On January 21st, ALS Labs had replied to our email confirming that unfortunately ALS had misplaced the sample bottles delivered in October 2021 and the missing data would not be available.

After the contravention was reported to the AEP on January 21st, I received a call from Scott Simms with the AEP. He asked if we would be able to obtain a sample from the ponds as soon as possible and submit for the missing analytical data. I said that we would be able to obtain an ice auger and that we would do exactly that. Over-coming some initial mechanical issues with the ice auger, we were finally able to obtain the sample on January 26th. We delivered them to the lab on the same day. The data will be included in our follow up report.

This event is in contravention of Section 4.3.20 of our Approval, as part of the annual monitoring of the surface water detention pond. The data will be included in the annual report along with a copy of this letter. There were no environmental impacts associated with the contravention as there have been no discharges from the pond in 2021. To prevent reoccurrence, pond samples will be taken during the summer. This will allow more time to resolve discrepancies with ALS and resample if necessary.

If you have any questions, do not hesitate to contact me at (780) 663-2509.

Yours truly,

Stan Yuha

Stan Yuha
Facility GM
Clean Harbors Canada, Inc.

July 29, 2022

Environmental Response Centre
Alberta Environment and Parks
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 401968
Clean Harbors Approval No. 10348-03-01

On Thursday July 28th, 2022 a Clean Harbors employee started his morning shift and entered the processing building. He immediately noticed a drum on our bulking tray had ruptured and leaked its contents onto the floor and into the sump. He notified management and donned proper PPE and investigated further. The drum that ruptured was a plastic drum that contained an acid mixture. He neutralized the acid spill with a neutralizing acid from the emergency spill kit and proceeded to clean up the mess. He also neutralized the liquid in the sump. The sump is a blind sump that is itself, contained. The 205 liter drum was approximately three quarters full and there was still one third left in the drum so we estimated the spill was approximately 100 liters. There were no injuries and no environmental impacts resulting from this incident.

The drum was sitting on a spill tray however the leak occurred directly on the side of the drum facing the outside edge of the tray and "split" in such a way that the leak missed the tray. Usually when a plastic drum becomes pressurized, it turns into the shape of a jelly bean and remains that shape even after it bursts. This drum strangely only exhibited stress signs sideways, not on the top or bottom.

Upon further investigation we learned the technician was bulking small containers of acid (consolidating) into this drum the previous two days. He was following our procedure which includes checking compatibilities and watching for signs of reactions such as vapors and temperature increase. He confirmed when he sealed the drum at the end of the previous day there were no signs of vapors and the drum was at room temperature.

A delayed reaction had occurred. We will continue to follow our strict procedure which includes checking compatibilities. We will add into the procedure that all drums that are being bulked into will need to be monitored for at least one hour after they have been sealed for the day.

If you have any further questions, do not hesitate to contact Stan Yuha (Facility Manager) at (780) 663-2509.

Sincerely,

Stan Yuha
General Manager

August 17th, 2022

Environmental Response Centre
Alberta Environment and Parks
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 402552
Clean Harbors Approval No. 10348-03-01

On Thursday August 11th, 2022 the device that is used to read the leachate levels in the bottom of our landfills stopped working. This device hooks to a long cable that is attached to the individual level logger sensors that are in the very bottom of each landfill. We changed batteries and did everything we could to try to get it working again, to no avail that day. I called our supplier that informed me a new instrument was two weeks out. I called AEP to report that this was going to be in contravention of Section 4.4.7, Table 4.6-D of our approval which states we have to measure the level of leachate a minimum of every three days. We have readings from the previous day (10th) and prior.

The next day, Friday August 12th, our operator was able to get readings for all the landfills, however it took several attempts. For an unknown reason the device seemed to work intermittently. We have been able to get daily level readings the following Monday and days since. It takes extra time and several attempts, but it's been successful. Technically, we have not been out of compliance yet, as I had suspected we would be. We will continue to record readings as long as the device works, and switch to the new device we it arrives. I will also send an updated 7-Day letter to inform if in fact we do fall out of compliance or if we do not have a contravention.

If you have any further questions, do not hesitate to contact Stan Yuha (Facility Manager) at (780) 663-2509.

Sincerely,

Stan Yuha

Stan Yuha
General Manager

August 31st, 2022

Environmental Response Centre
Alberta Environment and Parks
111, Twin Atria Building
4999 – 98 Avenue
Edmonton, Alberta T6B 2X3

To Whom It May Concern:

Re: Reference Number 402552
Clean Harbors Approval No. 10348-03-01

UPDATE:

Yesterday we received our new instrument. We now have a back-up instrument. However, we have been able to obtain readings at a minimum of every three days with our original instrument since I reported this as a non-compliance issue. We are unsure why the original instrument had "issues" intermittently, but we were able to make it work. It turns out that we were never out of compliance.

On Thursday August 11th, 2022 the device that is used to read the leachate levels in the bottom of our landfills stopped working. This device hooks to a long cable that is attached to the individual level logger sensors that are in the very bottom of each landfill. We changed batteries and did everything we could to try to get it working again, to no avail that day. I called our supplier that informed me a new instrument was two weeks out. I called AEP to report that this was going to be in contravention of Section 4.4.7, Table 4.6-D of our approval which states we have to measure the level of leachate a minimum of every three days. We have readings from the previous day (10th) and prior.

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If you have any further questions, do not hesitate to contact Stan Yuha (Facility Manager) at (780) 663-2509.

Sincerely,

Stan Yuha

Stan Yuha
General Manager