

Bottom Ash Data

2024 Week 5

The following analytical report represents bottom ash composite results for week 5 of 2024 (January 28, 2024 to February 3, 2024).

The bottom ash meets the conditions of Metro Vancouver's 2020 Bottom Ash Management Plan and is suitable for disposal.



CERTIFICATE OF ANALYSIS

Work Order : **VA24A2417**
Client : **Covanta Burnaby Renewable Energy, ULC**
Contact : Nicole Victor
Address : 5150 Riverbend Drive
Burnaby BC Canada V3N 4V3
Telephone : ----
Project : Weekly Bottom Ash - Suite
PO : VANCO0000052919
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Standing Offer (BC work)
No. of samples received : 12
No. of samples analysed : 12

Page : 1 of 13
Laboratory : ALS Environmental - Vancouver
Account Manager : Ian Chen
Address : 8081 Lougheed Highway
Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 07-Feb-2024 12:15
Date Analysis Commenced : 08-Feb-2024
Issue Date : 12-Feb-2024 09:27

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

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).



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).

<i>Unit</i>	<i>Description</i>
%	percent
mg/kg	milligrams per kilogram
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: Soil					Client sample ID				
(Matrix: Soil/Solid)					BA 2405-A-1	BA 2405-A-2	BA 2405-A-3	BA 2405-A-4	BA 2405-A-5
Client sampling date / time					31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2417-001	VA24A2417-002	VA24A2417-003	VA24A2417-004	VA24A2417-005
					Result	Result	Result	Result	Result
Physical Tests									
Moisture	----	E144/VA	0.25	%	23.5	23.1	23.5	25.1	24.4
pH (1:2 soil:water)	----	E108/VA	0.10	pH units	11.5	11.6	11.4	11.6	11.6
Metals									
Aluminum	7429-90-5	E440/VA	50	mg/kg	45700	44100	58500	40600	48400
Antimony	7440-36-0	E440/VA	0.10	mg/kg	165	135	134	130	144
Arsenic	7440-38-2	E440/VA	0.10	mg/kg	15.8	16.5	14.5	20.2	14.3
Barium	7440-39-3	E440/VA	0.50	mg/kg	452	581	517	520	464
Beryllium	7440-41-7	E440/VA	0.10	mg/kg	0.44	0.42	0.42	0.40	0.40
Bismuth	7440-69-9	E440/VA	0.20	mg/kg	11.4	13.6	11.2	14.4	11.9
Boron	7440-42-8	E440/VA	5.0	mg/kg	250	219	221	249	212
Cadmium	7440-43-9	E440/VA	0.020	mg/kg	13.1	12.0	12.0	13.7	12.7
Calcium	7440-70-2	E440/VA	50	mg/kg	152000	156000	158000	153000	150000
Chromium	7440-47-3	E440/VA	0.50	mg/kg	182	182	152	176	148
Cobalt	7440-48-4	E440/VA	0.10	mg/kg	643	43.1	145	34.5	60.1
Copper	7440-50-8	E440/VA	0.50	mg/kg	3240	2990	1420	2680	1690
Iron	7439-89-6	E440/VA	50	mg/kg	62400	64700	39500	47800	46600
Lead	7439-92-1	E440/VA	0.50	mg/kg	374	403	347	336	885
Lithium	7439-93-2	E440/VA	2.0	mg/kg	34.9	37.0	38.6	33.0	29.6
Magnesium	7439-95-4	E440/VA	20	mg/kg	12900	12700	12100	11700	11800
Manganese	7439-96-5	E440/VA	1.0	mg/kg	1490	806	983	722	1000
Mercury	7439-97-6	E510/VA	0.0500	mg/kg	0.0724	0.0665	0.0768	0.0558	0.0563
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg	20.7	20.9	18.5	21.9	17.1
Nickel	7440-02-0	E440/VA	0.50	mg/kg	177	179	136	137	107
Phosphorus	7723-14-0	E440/VA	50	mg/kg	10000	12600	9400	10600	10500
Potassium	7440-09-7	E440/VA	100	mg/kg	6720	6380	6830	5680	6190
Selenium	7782-49-2	E440/VA	0.20	mg/kg	0.42	0.51	0.41	0.43	0.40
Silver	7440-22-4	E440/VA	0.10	mg/kg	7.40	5.89	5.97	5.86	3.92
Sodium	7440-23-5	E440/VA	50	mg/kg	18000	19300	18700	16800	17400
Strontium	7440-24-6	E440/VA	0.50	mg/kg	477	512	361	326	325



Analytical Results

Sub-Matrix: Soil					Client sample ID	BA 2405-A-1	BA 2405-A-2	BA 2405-A-3	BA 2405-A-4	BA 2405-A-5
(Matrix: Soil/Solid)					Client sampling date / time	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2417-001	VA24A2417-002	VA24A2417-003	VA24A2417-004	VA24A2417-005	
					Result	Result	Result	Result	Result	
Metals										
Sulfur	7704-34-9	E440/VA	1000	mg/kg	13800	13400	13800	13200	12800	
Thallium	7440-28-0	E440/VA	0.050	mg/kg	0.052	<0.050	0.058	<0.050	<0.050	
Tin	7440-31-5	E440/VA	2.0	mg/kg	191	133	123	119	118	
Titanium	7440-32-6	E440/VA	1.0	mg/kg	346	328	651	296	390	
Tungsten	7440-33-7	E440/VA	0.50	mg/kg	18.4	19.7	22.4	21.3	16.8	
Uranium	7440-61-1	E440/VA	0.050	mg/kg	4.89	4.20	4.22	3.89	4.27	
Vanadium	7440-62-2	E440/VA	0.20	mg/kg	41.5	45.0	45.0	37.3	38.0	
Zinc	7440-66-6	E440/VA	2.0	mg/kg	3820	3560	3700	3820	3390	
Zirconium	7440-67-7	E440/VA	1.0	mg/kg	3.1	2.4	4.6	3.3	5.3	
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units	11.9	11.8	11.9	11.9	11.9	
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units	8.13	8.52	8.37	8.63	8.39	
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units	2.91	2.91	2.91	2.91	2.91	
pH, TCLP final	----	EPP444/VA	0.010	pH units	7.04	7.23	7.06	7.44	7.38	
Antimony, TCLP	7440-36-0	E444/VA	1.00	mg/L	<1.00	<1.00	<1.00	<1.00	<1.00	
Arsenic, TCLP	7440-38-2	E444/VA	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L	<2.5	<2.5	<2.5	<2.5	<2.5	
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025	
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L	2.44	2.33	2.30	2.42	2.30	
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L	0.128	0.097	0.085	<0.050	0.067	
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L	2310	2310	2320	2360	2350	
Chromium, TCLP	7440-47-3	E444/VA	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	
Cobalt, TCLP	7440-48-4	E444/VA	0.050	mg/L	0.903	0.414	0.763	0.811	0.718	
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L	0.759	0.779	0.716	0.756	0.769	
Iron, TCLP	7439-89-6	E444/VA	5.0	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	
Lead, TCLP	7439-92-1	E444/VA	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	
Magnesium, TCLP	7439-95-4	E444/VA	2.5	mg/L	118	120	118	119	119	
Mercury, TCLP	7439-97-6	E512/VA	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Nickel, TCLP	7440-02-0	E444/VA	0.25	mg/L	0.30	0.31	0.42	<0.25	0.27	
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA 2405-A-1	BA 2405-A-2	BA 2405-A-3	BA 2405-A-4	BA 2405-A-5
Client sampling date / time					31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2417-001	VA24A2417-002	VA24A2417-003	VA24A2417-004	VA24A2417-005	
					Result	Result	Result	Result	Result	
TCLP Metals										
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Thallium, TCLP	7440-28-0	E444/VA	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Uranium, TCLP	7440-61-1	E444/VA	0.20	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium, TCLP	7440-62-2	E444/VA	0.15	mg/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Zinc, TCLP	7440-66-6	E444/VA	0.50	mg/L	5.09	3.57	8.38	1.60	1.38	1.38
Zirconium, TCLP	7440-67-7	E444/VA	10	mg/L	<10	<10	<10	<10	<10	<10

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

Please refer to the Accreditation section for an explanation of analyte accreditations.



Analytical Results

Sub-Matrix: Soil					Client sample ID				
(Matrix: Soil/Solid)					BA 2405-A-6	BA 2405-A-7	BA 2405-A-8	BA 2405-A-9	BA 2405-A-10
Client sampling date / time					31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2417-006	VA24A2417-007	VA24A2417-008	VA24A2417-009	VA24A2417-010
					Result	Result	Result	Result	Result
Physical Tests									
Moisture	---	E144/VA	0.25	%	24.5	25.0	25.1	25.6	25.9
pH (1:2 soil:water)	---	E108/VA	0.10	pH units	11.5	11.7	11.6	11.7	11.7
Metals									
Aluminum	7429-90-5	E440/VA	50	mg/kg	40100	35400	41600	45500	44400
Antimony	7440-36-0	E440/VA	0.10	mg/kg	128	140	143	168	152
Arsenic	7440-38-2	E440/VA	0.10	mg/kg	14.4	37.0	16.3	20.6	14.2
Barium	7440-39-3	E440/VA	0.50	mg/kg	483	482	513	544	595
Beryllium	7440-41-7	E440/VA	0.10	mg/kg	0.44	0.42	0.40	0.56	0.36
Bismuth	7440-69-9	E440/VA	0.20	mg/kg	10.2	11.5	24.6	11.4	11.0
Boron	7440-42-8	E440/VA	5.0	mg/kg	222	179	265	200	300
Cadmium	7440-43-9	E440/VA	0.020	mg/kg	11.8	11.3	12.6	11.6	12.4
Calcium	7440-70-2	E440/VA	50	mg/kg	145000	147000	155000	158000	159000
Chromium	7440-47-3	E440/VA	0.50	mg/kg	176	153	216	648	220
Cobalt	7440-48-4	E440/VA	0.10	mg/kg	40.2	306	47.2	53.4	465
Copper	7440-50-8	E440/VA	0.50	mg/kg	2990	3590	3640	2790	4170
Iron	7439-89-6	E440/VA	50	mg/kg	52600	61500	48200	45400	42100
Lead	7439-92-1	E440/VA	0.50	mg/kg	1340	334	345	581	353
Lithium	7439-93-2	E440/VA	2.0	mg/kg	32.4	33.2	27.4	38.8	72.2
Magnesium	7439-95-4	E440/VA	20	mg/kg	14000	12200	12000	12300	12600
Manganese	7439-96-5	E440/VA	1.0	mg/kg	772	994	887	968	953
Mercury	7439-97-6	E510/VA	0.0500	mg/kg	0.0864	0.0738	0.898	0.0700	0.0775
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg	25.1	32.0	21.2	99.4	377
Nickel	7440-02-0	E440/VA	0.50	mg/kg	158	166	148	747	335
Phosphorus	7723-14-0	E440/VA	50	mg/kg	9950	9780	10900	10600	10100
Potassium	7440-09-7	E440/VA	100	mg/kg	6120	5910	5780	6040	5560
Selenium	7782-49-2	E440/VA	0.20	mg/kg	0.38	0.46	0.48	0.39	0.43
Silver	7440-22-4	E440/VA	0.10	mg/kg	4.72	5.07	9.86	16.7	4.06
Sodium	7440-23-5	E440/VA	50	mg/kg	18100	17200	17200	17300	17000
Strontium	7440-24-6	E440/VA	0.50	mg/kg	346	345	409	347	456
Sulfur	7704-34-9	E440/VA	1000	mg/kg	13700	12800	12800	13200	13600



Analytical Results

Sub-Matrix: Soil					Client sample ID	BA 2405-A-6	BA 2405-A-7	BA 2405-A-8	BA 2405-A-9	BA 2405-A-10
(Matrix: Soil/Solid)					Client sampling date / time	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2417-006	VA24A2417-007	VA24A2417-008	VA24A2417-009	VA24A2417-010	
					Result	Result	Result	Result	Result	
Metals										
Thallium	7440-28-0	E440/VA	0.050	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	
Tin	7440-31-5	E440/VA	2.0	mg/kg	131	133	1010	159	162	
Titanium	7440-32-6	E440/VA	1.0	mg/kg	422	263	318	435	421	
Tungsten	7440-33-7	E440/VA	0.50	mg/kg	19.2	26.8	19.5	25.2	21.0	
Uranium	7440-61-1	E440/VA	0.050	mg/kg	4.08	4.30	4.10	4.38	4.68	
Vanadium	7440-62-2	E440/VA	0.20	mg/kg	41.4	40.3	41.1	44.9	43.7	
Zinc	7440-66-6	E440/VA	2.0	mg/kg	6490	3320	7100	5360	3490	
Zirconium	7440-67-7	E440/VA	1.0	mg/kg	3.5	3.8	2.9	3.2	2.9	
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units	11.8	11.9	11.9	11.9	11.9	
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units	8.20	8.77	8.74	8.81	8.75	
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units	2.91	2.91	2.91	2.91	2.91	
pH, TCLP final	----	EPP444/VA	0.010	pH units	7.24	7.29	7.30	7.73	7.83	
Antimony, TCLP	7440-36-0	E444/VA	1.00	mg/L	<1.00	<1.00	<1.00	<1.00	<1.00	
Arsenic, TCLP	7440-38-2	E444/VA	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L	<2.5	<2.5	<2.5	<2.5	<2.5	
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025	
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L	2.38	2.21	2.35	2.36	2.21	
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L	0.074	0.152	0.073	<0.050	<0.050	
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L	2360	2220	2310	2310	2230	
Chromium, TCLP	7440-47-3	E444/VA	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	
Cobalt, TCLP	7440-48-4	E444/VA	0.050	mg/L	0.787	0.676	0.314	0.226	0.148	
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L	0.765	0.745	0.659	0.674	0.693	
Iron, TCLP	7439-89-6	E444/VA	5.0	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	
Lead, TCLP	7439-92-1	E444/VA	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	
Magnesium, TCLP	7439-95-4	E444/VA	2.5	mg/L	122	122	120	117	113	
Mercury, TCLP	7439-97-6	E512/VA	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Nickel, TCLP	7440-02-0	E444/VA	0.25	mg/L	0.46	0.27	0.41	<0.25	<0.25	
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA 2405-A-6	BA 2405-A-7	BA 2405-A-8	BA 2405-A-9	BA 2405-A-10
Client sampling date / time					31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00	31-Jan-2024 09:00
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2417-006	VA24A2417-007	VA24A2417-008	VA24A2417-009	VA24A2417-010	
TCLP Metals					Result	Result	Result	Result	Result	
Thallium, TCLP	7440-28-0	E444/VA	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Uranium, TCLP	7440-61-1	E444/VA	0.20	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	
Vanadium, TCLP	7440-62-2	E444/VA	0.15	mg/L	<0.15	<0.15	<0.15	<0.15	<0.15	
Zinc, TCLP	7440-66-6	E444/VA	0.50	mg/L	3.12	2.79	2.42	<0.50	<0.50	
Zirconium, TCLP	7440-67-7	E444/VA	10	mg/L	<10	<10	<10	<10	<10	

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

Please refer to the Accreditation section for an explanation of analyte accreditations.



Analytical Results

Sub-Matrix: Soil					Client sample ID	BA 2405-A-11	BA 2405-A-12	----	----	----
(Matrix: Soil/Solid)					Client sampling date / time	31-Jan-2024 09:00	31-Jan-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2417-011	VA24A2417-012	-----	-----	-----	
					Result	Result	----	----	----	
Physical Tests										
Moisture	---	E144/VA	0.25	%	26.0	24.6	----	----	----	
pH (1:2 soil:water)	---	E108/VA	0.10	pH units	11.6	11.8	----	----	----	
Metals										
Aluminum	7429-90-5	E440/VA	50	mg/kg	48700	38200	----	----	----	
Antimony	7440-36-0	E440/VA	0.10	mg/kg	132	132	----	----	----	
Arsenic	7440-38-2	E440/VA	0.10	mg/kg	12.8	15.4	----	----	----	
Barium	7440-39-3	E440/VA	0.50	mg/kg	578	545	----	----	----	
Beryllium	7440-41-7	E440/VA	0.10	mg/kg	0.36	0.34	----	----	----	
Bismuth	7440-69-9	E440/VA	0.20	mg/kg	11.5	9.68	----	----	----	
Boron	7440-42-8	E440/VA	5.0	mg/kg	226	153	----	----	----	
Cadmium	7440-43-9	E440/VA	0.020	mg/kg	12.9	20.3	----	----	----	
Calcium	7440-70-2	E440/VA	50	mg/kg	144000	142000	----	----	----	
Chromium	7440-47-3	E440/VA	0.50	mg/kg	141	146	----	----	----	
Cobalt	7440-48-4	E440/VA	0.10	mg/kg	43.4	307	----	----	----	
Copper	7440-50-8	E440/VA	0.50	mg/kg	10700	2290	----	----	----	
Iron	7439-89-6	E440/VA	50	mg/kg	88800	45900	----	----	----	
Lead	7439-92-1	E440/VA	0.50	mg/kg	2880	359	----	----	----	
Lithium	7439-93-2	E440/VA	2.0	mg/kg	26.7	25.6	----	----	----	
Magnesium	7439-95-4	E440/VA	20	mg/kg	11600	12200	----	----	----	
Manganese	7439-96-5	E440/VA	1.0	mg/kg	963	896	----	----	----	
Mercury	7439-97-6	E510/VA	0.0500	mg/kg	0.0573	0.0566	----	----	----	
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg	16.8	21.0	----	----	----	
Nickel	7440-02-0	E440/VA	0.50	mg/kg	167	591	----	----	----	
Phosphorus	7723-14-0	E440/VA	50	mg/kg	8620	7900	----	----	----	
Potassium	7440-09-7	E440/VA	100	mg/kg	5190	5740	----	----	----	
Selenium	7782-49-2	E440/VA	0.20	mg/kg	0.43	0.45	----	----	----	
Silver	7440-22-4	E440/VA	0.10	mg/kg	6.47	5.38	----	----	----	
Sodium	7440-23-5	E440/VA	50	mg/kg	15500	15500	----	----	----	
Strontium	7440-24-6	E440/VA	0.50	mg/kg	348	348	----	----	----	
Sulfur	7704-34-9	E440/VA	1000	mg/kg	11300	11800	----	----	----	



Analytical Results

Sub-Matrix: Soil					Client sample ID	BA 2405-A-11	BA 2405-A-12	----	----	----
(Matrix: Soil/Solid)					Client sampling date / time	31-Jan-2024 09:00	31-Jan-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2417-011	VA24A2417-012	-----	-----	-----	
					Result	Result	----	----	----	
Metals										
Thallium	7440-28-0	E440/VA	0.050	mg/kg	0.057	<0.050	----	----	----	
Tin	7440-31-5	E440/VA	2.0	mg/kg	540	134	----	----	----	
Titanium	7440-32-6	E440/VA	1.0	mg/kg	535	318	----	----	----	
Tungsten	7440-33-7	E440/VA	0.50	mg/kg	25.2	15.0	----	----	----	
Uranium	7440-61-1	E440/VA	0.050	mg/kg	3.94	3.91	----	----	----	
Vanadium	7440-62-2	E440/VA	0.20	mg/kg	39.3	37.9	----	----	----	
Zinc	7440-66-6	E440/VA	2.0	mg/kg	3770	3290	----	----	----	
Zirconium	7440-67-7	E440/VA	1.0	mg/kg	2.9	2.9	----	----	----	
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units	11.9	11.9	----	----	----	
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units	8.70	8.88	----	----	----	
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units	2.91	2.91	----	----	----	
pH, TCLP final	----	EPP444/VA	0.010	pH units	7.62	7.89	----	----	----	
Antimony, TCLP	7440-36-0	E444/VA	1.00	mg/L	<1.00	<1.00	----	----	----	
Arsenic, TCLP	7440-38-2	E444/VA	1.0	mg/L	<1.0	<1.0	----	----	----	
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L	<2.5	<2.5	----	----	----	
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L	<0.025	<0.025	----	----	----	
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L	2.33	2.32	----	----	----	
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L	<0.050	0.130	----	----	----	
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L	2260	2300	----	----	----	
Chromium, TCLP	7440-47-3	E444/VA	0.25	mg/L	<0.25	<0.25	----	----	----	
Cobalt, TCLP	7440-48-4	E444/VA	0.050	mg/L	0.407	0.180	----	----	----	
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L	0.768	0.720	----	----	----	
Iron, TCLP	7439-89-6	E444/VA	5.0	mg/L	<5.0	<5.0	----	----	----	
Lead, TCLP	7439-92-1	E444/VA	0.25	mg/L	<0.25	<0.25	----	----	----	
Magnesium, TCLP	7439-95-4	E444/VA	2.5	mg/L	115	115	----	----	----	
Mercury, TCLP	7439-97-6	E512/VA	0.0010	mg/L	<0.0010	<0.0010	----	----	----	
Nickel, TCLP	7440-02-0	E444/VA	0.25	mg/L	0.25	<0.25	----	----	----	
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L	<0.10	<0.10	----	----	----	
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L	<0.050	<0.050	----	----	----	



Analytical Results

Sub-Matrix: Soil					Client sample ID		BA 2405-A-11	BA 2405-A-12	----	----	----
(Matrix: Soil/Solid)					Client sampling date / time		31-Jan-2024 09:00	31-Jan-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2417-011	VA24A2417-012	-----	-----	-----	-----	-----
TCLP Metals					Result	Result	---	---	---	---	---
Thallium, TCLP	7440-28-0	E444/VA	1.0	mg/L	<1.0	<1.0	---	---	---	---	---
Uranium, TCLP	7440-61-1	E444/VA	0.20	mg/L	<0.20	<0.20	---	---	---	---	---
Vanadium, TCLP	7440-62-2	E444/VA	0.15	mg/L	<0.15	<0.15	---	---	---	---	---
Zinc, TCLP	7440-66-6	E444/VA	0.50	mg/L	0.79	<0.50	---	---	---	---	---
Zirconium, TCLP	7440-67-7	E444/VA	10	mg/L	<10	<10	---	---	---	---	---

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

Please refer to the Accreditation section for an explanation of analyte accreditations.



QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : VA24A2417</p> <p>Client : Covanta Burnaby Renewable Energy, ULC</p> <p>Contact : Nicole Victor</p> <p>Address : 5150 Riverbend Drive Burnaby BC Canada V3N 4V3</p> <p>Telephone : ----</p> <p>Project : Weekly Bottom Ash - Suite</p> <p>PO : VANCO0000052919</p> <p>C-O-C number : ----</p> <p>Sampler : ----</p> <p>Site : ----</p> <p>Quote number : Standing Offer (BC work)</p> <p>No. of samples received : 12</p> <p>No. of samples analysed : 12</p>	<p>Page : 1 of 15</p> <p>Laboratory : ALS Environmental - Vancouver</p> <p>Account Manager : Ian Chen</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 07-Feb-2024 12:15</p> <p>Issue Date : 12-Feb-2024 09:28</p>
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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)

- No Analysis Holding Time Outliers exist.

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: **Soil/Solid**

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-1	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-10	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-11	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-12	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-2	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-3	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-4	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔



Matrix: Soil/Solid

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-5	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-6	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-7	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-8	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2405-A-9	E510	31-Jan-2024	10-Feb-2024	28 days	10 days	✔	11-Feb-2024	28 days	11 days	✔
Metals : Metals in Soil/Solid by CRC ICMS										
LDPE bag BA 2405-A-1	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✔	12-Feb-2024	180 days	12 days	✔
Metals : Metals in Soil/Solid by CRC ICMS										
LDPE bag BA 2405-A-10	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✔	12-Feb-2024	180 days	12 days	✔
Metals : Metals in Soil/Solid by CRC ICMS										
LDPE bag BA 2405-A-11	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✔	12-Feb-2024	180 days	12 days	✔
Metals : Metals in Soil/Solid by CRC ICMS										
LDPE bag BA 2405-A-12	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✔	12-Feb-2024	180 days	12 days	✔



Matrix: Soil/Solid

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA 2405-A-2	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✓	12-Feb-2024	180 days	12 days	✓	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA 2405-A-3	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✓	12-Feb-2024	180 days	12 days	✓	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA 2405-A-4	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✓	12-Feb-2024	180 days	12 days	✓	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA 2405-A-5	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✓	12-Feb-2024	180 days	12 days	✓	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA 2405-A-6	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✓	12-Feb-2024	180 days	12 days	✓	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA 2405-A-7	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✓	12-Feb-2024	180 days	12 days	✓	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA 2405-A-8	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✓	12-Feb-2024	180 days	12 days	✓	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA 2405-A-9	E440	31-Jan-2024	10-Feb-2024	180 days	10 days	✓	12-Feb-2024	180 days	12 days	✓	
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA 2405-A-1	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days		



Matrix: Soil/Solid

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2405-A-10	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2405-A-11	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2405-A-12	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2405-A-2	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2405-A-3	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2405-A-4	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2405-A-5	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2405-A-6	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2405-A-7	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days	



Matrix: Soil/Solid

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA 2405-A-8	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA 2405-A-9	E144	31-Jan-2024	----	----	----		09-Feb-2024	----	9 days		
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA 2405-A-1	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA 2405-A-10	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA 2405-A-11	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA 2405-A-12	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA 2405-A-2	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA 2405-A-3	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA 2405-A-4	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔	



Matrix: Soil/Solid

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2405-A-5	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2405-A-6	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2405-A-7	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2405-A-8	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2405-A-9	E108	31-Jan-2024	10-Feb-2024	30 days	10 days	✔	11-Feb-2024	30 days	11 days	✔
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA 2405-A-1	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA 2405-A-10	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA 2405-A-11	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA 2405-A-12	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔



Matrix: Soil/Solid

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA 2405-A-2	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA 2405-A-3	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA 2405-A-4	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA 2405-A-5	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA 2405-A-6	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA 2405-A-7	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA 2405-A-8	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA 2405-A-9	E512	08-Feb-2024	10-Feb-2024	36 days	10 days	✔	10-Feb-2024	36 days	10 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA 2405-A-1	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✔	11-Feb-2024	188 days	11 days	✔	



Matrix: Soil/Solid

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2405-A-10	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✔	11-Feb-2024	188 days	11 days	✔
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2405-A-11	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✔	11-Feb-2024	188 days	11 days	✔
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2405-A-12	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✔	11-Feb-2024	188 days	11 days	✔
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2405-A-2	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✔	11-Feb-2024	188 days	11 days	✔
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2405-A-3	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✔	11-Feb-2024	188 days	11 days	✔
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2405-A-4	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✔	11-Feb-2024	188 days	11 days	✔
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2405-A-5	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✔	11-Feb-2024	188 days	11 days	✔
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2405-A-6	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✔	11-Feb-2024	188 days	11 days	✔
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2405-A-7	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✔	11-Feb-2024	188 days	11 days	✔



Matrix: Soil/Solid

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA 2405-A-8	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✓	11-Feb-2024	188 days	11 days	✓	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA 2405-A-9	E444	08-Feb-2024	10-Feb-2024	188 days	10 days	✓	11-Feb-2024	188 days	11 days	✓	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-1	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✓	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-10	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✓	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-11	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✓	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-12	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✓	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-2	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✓	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-3	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✓	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-4	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✓	



Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-5	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✔
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-6	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✔
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-7	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✔
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-8	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✔
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2405-A-9	EPP444	31-Jan-2024	08-Feb-2024	----	----		----	28 days	8 days	✔

Legend & Qualifier Definitions

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: **Soil/Solid**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Mercury in Soil/Solid by CVAAS	E510	1327873	1	19	5.2	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	1327874	1	19	5.2	5.0	✔
Moisture Content by Gravimetry	E144	1327879	1	12	8.3	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	1327877	1	19	5.2	5.0	✔
Laboratory Control Samples (LCS)							
Mercury in Soil/Solid by CVAAS	E510	1327873	2	19	10.5	10.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	1327874	2	19	10.5	10.0	✔
Moisture Content by Gravimetry	E144	1327879	1	12	8.3	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	1327877	1	19	5.2	5.0	✔
Method Blanks (MB)							
Mercury by CVAAS (TCLP)	E512	1329028	1	12	8.3	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	1327873	1	19	5.2	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	1329029	1	12	8.3	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	1327874	1	19	5.2	5.0	✔
Moisture Content by Gravimetry	E144	1327879	1	12	8.3	5.0	✔
Matrix Spikes (MS)							
Mercury by CVAAS (TCLP)	E512	1329028	1	12	8.3	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	1329029	1	12	8.3	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
pH by Meter (1:2 Soil:Water Extraction)	E108 ALS Environmental - Vancouver	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally $20 \pm 5^{\circ}\text{C}$), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at $<60^{\circ}\text{C}$) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Moisture Content by Gravimetry	E144 ALS Environmental - Vancouver	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C . Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Metals in Soil/Solid by CRC ICPMS	E440 ALS Environmental - Vancouver	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl . Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Metals by CRC ICPMS (TCLP)	E444 ALS Environmental - Vancouver	Soil/Solid	EPA 1311/6020B (mod)	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 ALS Environmental - Vancouver	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl , followed by CVAAS analysis.
Mercury by CVAAS (TCLP)	E512 ALS Environmental - Vancouver	Soil/Solid	SW 846 -1311/245.1 CVAA ON TCLP LEACHATE	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by CVAAS.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Vancouver	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at $<60^{\circ}\text{C}$) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Metals and Mercury	EP440 ALS Environmental - Vancouver	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available.
TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)	EPP444 ALS Environmental - Vancouver	Soil/Solid	EPA 1311	Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests.



QUALITY CONTROL REPORT

Work Order	: VA24A2417	Page	: 1 of 11
Client	: Covanta Burnaby Renewable Energy, ULC	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Victor	Account Manager	: Ian Chen
Address	: 5150 Riverbend Drive Burnaby BC Canada V3N 4V3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 07-Feb-2024 12:15
PO	: VANCO0000052919	Date Analysis Commenced	: 08-Feb-2024
C-O-C number	: ----	Issue Date	: 12-Feb-2024 09:27
Sampler	: ---- ----		
Site	: ----		
Quote number	: Standing Offer (BC work)		
No. of samples received	: 12		
No. of samples analysed	: 12		

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
- Reference Material (RM) 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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Thornton	Analyst	Vancouver Metals, Burnaby, British Columbia
Ghazaleh Khanmirzaei	Analyst	Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Organics, Burnaby, British Columbia



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: Soil/Solid

					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: 1327877)											
VA24A2263-002	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	6.84	6.85	0.1%	5%	----
Physical Tests (QC Lot: 1327879)											
VA24A2417-001	BA 2405-A-1	Moisture	----	E144	0.25	%	23.5	23.2	1.40%	20%	----
Metals (QC Lot: 1327873)											
VA24A2263-002	Anonymous	Mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 1327874)											
VA24A2263-002	Anonymous	Aluminum	7429-90-5	E440	50	mg/kg	13900	13300	3.96%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	0.12	<0.10	0.02	Diff <2x LOR	----
		Arsenic	7440-38-2	E440	0.10	mg/kg	4.14	3.52	16.3%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	93.2	91.2	2.07%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.22	0.20	0.02	Diff <2x LOR	----
		Bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Boron	7440-42-8	E440	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	----
		Calcium	7440-70-2	E440	50	mg/kg	4260	4360	2.37%	30%	----
		Chromium	7440-47-3	E440	0.50	mg/kg	23.1	22.8	1.29%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	5.65	5.33	5.82%	30%	----
		Copper	7440-50-8	E440	0.50	mg/kg	17.3	16.2	6.56%	30%	----
		Iron	7439-89-6	E440	50	mg/kg	20400	18100	12.1%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	1.86	1.68	0.18	Diff <2x LOR	----
		Lithium	7439-93-2	E440	2.0	mg/kg	7.9	7.3	0.7	Diff <2x LOR	----
		Magnesium	7439-95-4	E440	20	mg/kg	4920	4800	2.32%	30%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	264	223	16.8%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	0.40	0.30	0.09	Diff <2x LOR	----
		Nickel	7440-02-0	E440	0.50	mg/kg	19.6	20.2	2.91%	30%	----
		Phosphorus	7723-14-0	E440	50	mg/kg	329	292	37	Diff <2x LOR	----
		Potassium	7440-09-7	E440	100	mg/kg	340	320	30	Diff <2x LOR	----
		Selenium	7782-49-2	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Sodium	7440-23-5	E440	50	mg/kg	484	466	3.71%	40%	----



Sub-Matrix: Soil/Solid					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
Metals (QC Lot: 1327874) - continued											
VA24A2263-002	Anonymous	Strontium	7440-24-6	E440	0.50	mg/kg	25.7	24.2	5.85%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		Thallium	7440-28-0	E440	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		Titanium	7440-32-6	E440	1.0	mg/kg	1020	953	6.60%	40%	----
		Tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		Uranium	7440-61-1	E440	0.050	mg/kg	0.287	0.266	0.021	Diff <2x LOR	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	60.0	53.6	11.3%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	25.4	23.6	7.23%	30%	----
		Zirconium	7440-67-7	E440	1.0	mg/kg	2.4	2.2	0.2	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: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1327879)						
Moisture	---	E144	0.25	%	<0.25	---
Metals (QCLot: 1327873)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	---
Metals (QCLot: 1327874)						
Aluminum	7429-90-5	E440	50	mg/kg	<50	---
Antimony	7440-36-0	E440	0.1	mg/kg	<0.10	---
Arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	---
Barium	7440-39-3	E440	0.5	mg/kg	<0.50	---
Beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	---
Bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	---
Boron	7440-42-8	E440	5	mg/kg	<5.0	---
Cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	---
Calcium	7440-70-2	E440	50	mg/kg	<50	---
Chromium	7440-47-3	E440	0.5	mg/kg	<0.50	---
Cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	---
Copper	7440-50-8	E440	0.5	mg/kg	<0.50	---
Iron	7439-89-6	E440	50	mg/kg	<50	---
Lead	7439-92-1	E440	0.5	mg/kg	<0.50	---
Lithium	7439-93-2	E440	2	mg/kg	<2.0	---
Magnesium	7439-95-4	E440	20	mg/kg	<20	---
Manganese	7439-96-5	E440	1	mg/kg	<1.0	---
Molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	---
Nickel	7440-02-0	E440	0.5	mg/kg	<0.50	---
Phosphorus	7723-14-0	E440	50	mg/kg	<50	---
Potassium	7440-09-7	E440	100	mg/kg	<100	---
Selenium	7782-49-2	E440	0.2	mg/kg	<0.20	---
Silver	7440-22-4	E440	0.1	mg/kg	<0.10	---
Sodium	7440-23-5	E440	50	mg/kg	<50	---
Strontium	7440-24-6	E440	0.5	mg/kg	<0.50	---
Sulfur	7704-34-9	E440	1000	mg/kg	<1000	---
Thallium	7440-28-0	E440	0.05	mg/kg	<0.050	---
Tin	7440-31-5	E440	2	mg/kg	<2.0	---



Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 1327874) - continued						
Titanium	7440-32-6	E440	1	mg/kg	<1.0	----
Tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Zirconium	7440-67-7	E440	1	mg/kg	<1.0	----
TCLP Metals (QCLot: 1329028)						
Mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----
TCLP Metals (QCLot: 1329029)						
Antimony, TCLP	7440-36-0	E444	0.1	mg/L	<0.10	----
Arsenic, TCLP	7440-38-2	E444	1	mg/L	<1.0	----
Barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	----
Beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	----
Boron, TCLP	7440-42-8	E444	0.5	mg/L	<0.50	----
Cadmium, TCLP	7440-43-9	E444	0.05	mg/L	<0.050	----
Calcium, TCLP	7440-70-2	E444	10	mg/L	<10	----
Chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	----
Cobalt, TCLP	7440-48-4	E444	0.05	mg/L	<0.050	----
Copper, TCLP	7440-50-8	E444	0.05	mg/L	<0.050	----
Iron, TCLP	7439-89-6	E444	5	mg/L	<5.0	----
Lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	----
Magnesium, TCLP	7439-95-4	E444	2.5	mg/L	<2.5	----
Nickel, TCLP	7440-02-0	E444	0.25	mg/L	<0.25	----
Selenium, TCLP	7782-49-2	E444	0.1	mg/L	<0.10	----
Silver, TCLP	7440-22-4	E444	0.05	mg/L	<0.050	----
Thallium, TCLP	7440-28-0	E444	1	mg/L	<1.0	----
Uranium, TCLP	7440-61-1	E444	0.2	mg/L	<0.20	----
Vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	----
Zinc, TCLP	7440-66-6	E444	0.5	mg/L	<0.50	----
Zirconium, TCLP	7440-67-7	E444	10	mg/L	<10	----



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: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1327877)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.7	95.0	105	----
Physical Tests (QCLot: 1327879)									
Moisture	----	E144	0.25	%	50 %	99.9	90.0	110	----
Metals (QCLot: 1327873)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	105	80.0	120	----
Metals (QCLot: 1327874)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	102	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	97.6	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	102	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	96.1	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	101	80.0	120	----
Bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	99.3	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	101	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	97.4	80.0	120	----
Calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	100.0	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	98.6	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	96.1	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	95.5	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	97.2	80.0	120	----
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	102	80.0	120	----
Lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	103	80.0	120	----
Magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	102	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	99.6	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	101	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	95.4	80.0	120	----
Phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	88.7	80.0	120	----
Potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	100	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	94.9	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	93.0	80.0	120	----
Sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	99.8	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	102	80.0	120	----



Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1327874) - continued									
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	98.9	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	97.2	80.0	120	----
Titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	93.4	80.0	120	----
Tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	104	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	106	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	98.7	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	97.9	80.0	120	----
Zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	97.9	80.0	120	----



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: Soil/Solid

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
TCLP Metals (QCLot: 1329028)										
VA24A2417-001	BA 2405-A-1	Mercury, TCLP	7439-97-6	E512	0.0009 mg/L	0.001 mg/L	94.7	50.0	140	----
TCLP Metals (QCLot: 1329029)										
VA24A2417-001	BA 2405-A-1	Antimony, TCLP	7440-36-0	E444	4.73 mg/L	5 mg/L	94.6	50.0	140	----
		Arsenic, TCLP	7440-38-2	E444	4.7 mg/L	5 mg/L	93.4	50.0	140	----
		Barium, TCLP	7440-39-3	E444	13.0 mg/L	12.5 mg/L	104	50.0	140	----
		Beryllium, TCLP	7440-41-7	E444	0.227 mg/L	0.25 mg/L	91.0	50.0	140	----
		Boron, TCLP	7440-42-8	E444	10.2 mg/L	10 mg/L	102	50.0	140	----
		Cadmium, TCLP	7440-43-9	E444	0.219 mg/L	0.25 mg/L	87.6	50.0	140	----
		Calcium, TCLP	7440-70-2	E444	ND mg/L	250 mg/L	ND	50.0	140	----
		Chromium, TCLP	7440-47-3	E444	1.12 mg/L	1.25 mg/L	90.0	50.0	140	----
		Cobalt, TCLP	7440-48-4	E444	ND mg/L	0.25 mg/L	ND	50.0	140	----
		Copper, TCLP	7440-50-8	E444	2.13 mg/L	2.5 mg/L	85.1	50.0	140	----
		Iron, TCLP	7439-89-6	E444	223 mg/L	250 mg/L	89.2	50.0	140	----
		Lead, TCLP	7439-92-1	E444	8.94 mg/L	10 mg/L	89.4	50.0	140	----
		Magnesium, TCLP	7439-95-4	E444	238 mg/L	250 mg/L	95.1	50.0	140	----
		Nickel, TCLP	7440-02-0	E444	2.23 mg/L	2.5 mg/L	89.3	50.0	140	----
		Selenium, TCLP	7782-49-2	E444	4.80 mg/L	5 mg/L	96.1	50.0	140	----
		Silver, TCLP	7440-22-4	E444	0.077 mg/L	0.1 mg/L	77.2	50.0	140	----
		Thallium, TCLP	7440-28-0	E444	4.4 mg/L	5 mg/L	88.7	50.0	140	----
		Uranium, TCLP	7440-61-1	E444	4.46 mg/L	5 mg/L	89.2	50.0	150	----
		Vanadium, TCLP	7440-62-2	E444	0.68 mg/L	0.75 mg/L	91.3	50.0	140	----
		Zinc, TCLP	7440-66-6	E444	8.66 mg/L	10 mg/L	86.6	50.0	140	----
		Zirconium, TCLP	7440-67-7	E444	0.7 mg/L	1 mg/L	71.6	50.0	150	----



Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 1327873)									
	SCP SS-2	Mercury	7439-97-6	E510	0.059 mg/kg	106	70.0	130	----
Metals (QCLot: 1327874)									
	SCP SS-2	Aluminum	7429-90-5	E440	9817 mg/kg	108	70.0	130	----
	SCP SS-2	Antimony	7440-36-0	E440	3.99 mg/kg	95.3	70.0	130	----
	SCP SS-2	Arsenic	7440-38-2	E440	3.73 mg/kg	106	70.0	130	----
	SCP SS-2	Barium	7440-39-3	E440	105 mg/kg	96.5	70.0	130	----
	SCP SS-2	Beryllium	7440-41-7	E440	0.349 mg/kg	101	70.0	130	----
	SCP SS-2	Boron	7440-42-8	E440	8.5 mg/kg	120	40.0	160	----
	SCP SS-2	Cadmium	7440-43-9	E440	0.91 mg/kg	97.8	70.0	130	----
	SCP SS-2	Calcium	7440-70-2	E440	31082 mg/kg	94.6	70.0	130	----
	SCP SS-2	Chromium	7440-47-3	E440	101 mg/kg	111	70.0	130	----
	SCP SS-2	Cobalt	7440-48-4	E440	6.9 mg/kg	99.0	70.0	130	----
	SCP SS-2	Copper	7440-50-8	E440	123 mg/kg	98.5	70.0	130	----
	SCP SS-2	Iron	7439-89-6	E440	23558 mg/kg	98.8	70.0	130	----
	SCP SS-2	Lead	7439-92-1	E440	267 mg/kg	100	70.0	130	----
	SCP SS-2	Lithium	7439-93-2	E440	9.5 mg/kg	102	70.0	130	----
	SCP SS-2	Magnesium	7439-95-4	E440	5509 mg/kg	104	70.0	130	----
	SCP SS-2	Manganese	7439-96-5	E440	269 mg/kg	108	70.0	130	----
	SCP SS-2	Molybdenum	7439-98-7	E440	1.03 mg/kg	103	70.0	130	----
	SCP SS-2	Nickel	7440-02-0	E440	26.7 mg/kg	99.8	70.0	130	----
	SCP SS-2	Phosphorus	7723-14-0	E440	752 mg/kg	87.7	70.0	130	----
	SCP SS-2	Potassium	7440-09-7	E440	1587 mg/kg	114	70.0	130	----
	SCP SS-2	Sodium	7440-23-5	E440	797 mg/kg	107	70.0	130	----
	SCP SS-2	Strontium	7440-24-6	E440	86.1 mg/kg	98.3	70.0	130	----
	SCP SS-2	Thallium	7440-28-0	E440	0.0786 mg/kg	98.9	40.0	160	----
	SCP SS-2	Tin	7440-31-5	E440	10.6 mg/kg	93.4	70.0	130	----
	SCP SS-2	Titanium	7440-32-6	E440	839 mg/kg	115	70.0	130	----

Page : 11 of 11
 Work Order : VA24A2417
 Client : Covanta Burnaby Renewable Energy, ULC
 Project : Weekly Bottom Ash - Suite



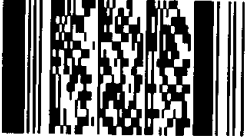
Sub-Matrix:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 1327874) - continued									
	SCP SS-2	Uranium	7440-61-1	E440	0.52 mg/kg	114	70.0	130	----
	SCP SS-2	Vanadium	7440-62-2	E440	32.7 mg/kg	104	70.0	130	----
	SCP SS-2	Zinc	7440-66-6	E440	297 mg/kg	100	70.0	130	----
	SCP SS-2	Zirconium	7440-67-7	E440	5.73 mg/kg	104	70.0	130	----



Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)	
Company:	Covanta Energy	<input type="checkbox"/> Standard	<input type="checkbox"/> Other	<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)	
Contact:	Nicole Victor / Dan Skrypnik	<input checked="" type="checkbox"/> PDF	<input type="checkbox"/> Excel	<input type="checkbox"/> Digital	<input type="checkbox"/> Fax
Address:	5150 Riverbend Drive Burnaby BC	Email 1:	invictor@covanta.com		
Phone:	604-521-1025	Email 2:	rminchin@covanta.com		
	<input type="checkbox"/> Yes <input type="checkbox"/> No	Email 3:	dskrypnik@covanta.com		
			brent.kirkpatrick@metrovancover.org		
			Sarah.Wellman@metrovancover.org		

Invoice To Same as Report ?		Client / Project Information		Analysis Request	
Hardcopy of Invoice with Report?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Job #:	Please indicate below Filtered, Preserved or both (F, P, F/P)		
Company:		PO / AFE:	PO# _VANCO 00000 Weekly Bottom Ash -		
Contact:		LSD:	(includes 2:1 pH)		
Address:		Quote #:			
Phone:					

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	MET-TCLP-VA (all metals, Hg)		MOISTURE	Chrome 6	MET-CSR+FULL-VA (all metals)		Number of Containers
					X	X			X	X	
BA 2405-A-1	Environmental Division Vancouver Work Order Reference VA24A2417  Telephone : + 1 604 253 4188	31-Jan-24	9:00	Soil	X	X			X		1
BA 2405-A-2		31-Jan-24	9:00	Soil	X	X			X		1
BA 2405-A-3		31-Jan-24	9:00	Soil	X	X			X		1
BA 2405-A-4		31-Jan-24	9:00	Soil	X	X			X		1
BA 2405-A-5		31-Jan-24	9:00	Soil	X	X			X		1
BA 2405-A-6		31-Jan-24	9:00	Soil	X	X			X		1
BA 2405-A-7		31-Jan-24	9:00	Soil	X	X			X		1
BA 2405-A-8		31-Jan-24	9:00	Soil	X	X			X		1
BA 2405-A-9		31-Jan-24	9:00	Soil	X	X			X		1
BA 2405-A-10		31-Jan-24	9:00	Soil	X	X			X		1
BA 2405-A-11		31-Jan-24	9:00	Soil	X	X			X		1
BA 2405-A-12		31-Jan-24	9:00	Soil	X	X			X		1

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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 provided on a separate Excel tab.
 Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:
KINGLIS	7-Feb-24	9:00	RK	02/07	12:15	18.8, °C				Yes / No ? If Yes add SIF