

Bottom Ash Data

2020 Week 48

The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on December 9, 2020. The data represents bottom ash composite results for week 48 of 2020 (November 22, 2020 to November 28, 2020).

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



CERTIFICATE OF ANALYSIS

Work Order : **VA20C2226**
Client : **Covanta Burnaby Renewable Energy, ULC**
Contact : Steve McKinney
Address : 5150 Riverbend Drive
Burnaby BC Canada V3N 4V3
Telephone : 604 521 1025
Project : Weekly Bottom Ash - Suite
PO : VANCO 0000049378
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 11
Laboratory : Vancouver - Environmental
Account Manager : Brent Mack
Address : 8081 Lougheed Highway
Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 01-Dec-2020 12:35
Date Analysis Commenced : 05-Dec-2020
Issue Date : 08-Dec-2020 16:35

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).

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>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Cristina Alexandre	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Ophelia Chiu	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia



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 in reports identified as "Preliminary Report" are considered authorized for use.



Analytical Results

Sub-Matrix: Soil					Client sample ID	BA2048-A-1	BA2048-A-2	BA2048-A-3	BA2048-A-4	BA2048-A-5
(Matrix: Soil/Solid)					Client sampling date / time	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00
Analyte	CAS Number	Method	LOR	Unit	VA20C2226-001	VA20C2226-002	VA20C2226-003	VA20C2226-004	VA20C2226-005	
					Result	Result	Result	Result	Result	
Physical Tests										
moisture	----	E144	0.25	%	20.6	19.1	20.0	18.7	19.2	
pH (1:2 soil:water)	----	E108	0.10	pH units	11.3	10.9	11.0	10.8	11.0	
Metals										
aluminum	7429-90-5	E440	50	mg/kg	25300	30800	35800	28000	34400	
antimony	7440-36-0	E440	0.10	mg/kg	103	119	2210	116	106	
arsenic	7440-38-2	E440	0.10	mg/kg	56.2	30.8	28.1	29.8	25.8	
barium	7440-39-3	E440	0.50	mg/kg	428	539	544	456	547	
beryllium	7440-41-7	E440	0.10	mg/kg	0.30	0.36	0.31	0.38	0.36	
bismuth	7440-69-9	E440	0.20	mg/kg	7.74	12.8	12.0	11.0	7.97	
boron	7440-42-8	E440	5.0	mg/kg	164	148	118	139	117	
cadmium	7440-43-9	E440	0.020	mg/kg	14.6	15.0	11.8	18.3	13.1	
calcium	7440-70-2	E440	50	mg/kg	107000	128000	107000	122000	114000	
chromium	7440-47-3	E440	0.50	mg/kg	130	154	141	164	151	
cobalt	7440-48-4	E440	0.10	mg/kg	43.8	29.8	49.0	122	77.6	
copper	7440-50-8	E440	0.50	mg/kg	2980	2260	2090	14000	1390	
iron	7439-89-6	E440	50	mg/kg	55900	70600	61300	89500	73600	
lead	7439-92-1	E440	0.50	mg/kg	852	487	13400	878	357	
lithium	7439-93-2	E440	2.0	mg/kg	42.2	18.4	18.1	22.1	17.5	
magnesium	7439-95-4	E440	20	mg/kg	8800	11100	9740	10400	9520	
manganese	7439-96-5	E440	1.0	mg/kg	662	864	900	1150	821	
mercury	7439-97-6	E510	0.0500	mg/kg	0.0716	0.0691	0.0527	0.116	0.350	
molybdenum	7439-98-7	E440	0.10	mg/kg	14.6	16.0	15.4	26.1	15.6	
nickel	7440-02-0	E440	0.50	mg/kg	211	122	147	284	124	
phosphorus	7723-14-0	E440	50	mg/kg	7220	10400	10700	10400	10200	
potassium	7440-09-7	E440	100	mg/kg	3200	4600	4160	4980	4510	
selenium	7782-49-2	E440	0.20	mg/kg	0.32	0.40	0.53	0.45	0.37	
silver	7440-22-4	E440	0.10	mg/kg	3.45	5.08	10.1	15.7	4.11	
sodium	7440-23-5	E440	50	mg/kg	10400	13300	12600	13900	13000	
strontium	7440-24-6	E440	0.50	mg/kg	233	302	262	278	271	
sulfur	7704-34-9	E440	1000	mg/kg	10400	12700	11700	13200	12700	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2048-A-1	BA2048-A-2	BA2048-A-3	BA2048-A-4	BA2048-A-5
Client sampling date / time					25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	
Analyte	CAS Number	Method	LOR	Unit	VA20C2226-001	VA20C2226-002	VA20C2226-003	VA20C2226-004	VA20C2226-005	
					Result	Result	Result	Result	Result	
Metals										
thallium	7440-28-0	E440	0.050	mg/kg	<0.050	0.059	0.128	0.073	0.053	
tin	7440-31-5	E440	2.0	mg/kg	117	512	225	164	104	
titanium	7440-32-6	E440	1.0	mg/kg	202	494	623	340	491	
tungsten	7440-33-7	E440	0.50	mg/kg	2.42	3.93	3.32	3.64	3.68	
uranium	7440-61-1	E440	0.050	mg/kg	3.16	5.43	4.37	5.82	4.75	
vanadium	7440-62-2	E440	0.20	mg/kg	48.9	76.2	71.4	68.2	62.3	
zinc	7440-66-6	E440	2.0	mg/kg	4820	4800	4540	9030	4360	
zirconium	7440-67-7	E440	1.0	mg/kg	2.3	1.4	1.4	1.3	1.3	
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	11.6	11.6	11.5	11.6	11.6	
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	8.95	8.82	8.55	8.75	8.89	
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.88	2.88	2.88	2.88	2.88	
pH, TCLP final	----	EPP444	0.010	pH units	6.06	5.82	6.02	5.88	5.81	
antimony, TCLP	7440-36-0	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	<2.5	<2.5	<2.5	
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025	
boron, TCLP	7440-42-8	E444	0.50	mg/L	1.83	1.94	1.91	2.01	1.93	
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.185	0.244	0.179	0.188	0.210	
calcium, TCLP	7440-70-2	E444	10	mg/L	2060	1930	1940	2030	1980	
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	
cobalt, TCLP	7440-48-4	E444	0.050	mg/L	0.899	1.35	0.537	0.656	0.849	
copper, TCLP	7440-50-8	E444	0.050	mg/L	1.20	0.768	1.37	2.15	2.35	
iron, TCLP	7439-89-6	E444	5.0	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	
lead, TCLP	7439-92-1	E444	0.25	mg/L	0.65	<0.25	<0.25	0.44	<0.25	
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	134	127	131	134	123	
mercury, TCLP	7439-97-6	E512	0.0100	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.67	0.73	0.42	0.60	0.71	
selenium, TCLP	7782-49-2	E444	1.00	mg/L	<1.00	<1.00	<1.00	<1.00	<1.00	
silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	
thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2048-A-1	BA2048-A-2	BA2048-A-3	BA2048-A-4	BA2048-A-5
Client sampling date / time					25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00
Analyte	CAS Number	Method	LOR	Unit	VA20C2226-001	VA20C2226-002	VA20C2226-003	VA20C2226-004	VA20C2226-005	
					Result	Result	Result	Result	Result	
TCLP Metals										
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
zinc, TCLP	7440-66-6	E444	0.50	mg/L	39.0	42.7	55.1	64.1	51.4	

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



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2048-A-6	BA2048-A-7	BA2048-A-8	BA2048-A-9	BA2048-A-10
Client sampling date / time					25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	
Analyte	CAS Number	Method	LOR	Unit	VA20C2226-006	VA20C2226-007	VA20C2226-008	VA20C2226-009	VA20C2226-010	
					Result	Result	Result	Result	Result	
Physical Tests										
moisture	----	E144	0.25	%	20.7	19.1	19.4	19.7	19.9	
pH (1:2 soil:water)	----	E108	0.10	pH units	10.9	11.0	10.8	11.0	10.8	
Metals										
aluminum	7429-90-5	E440	50	mg/kg	29900	27700	28300	32400	32400	
antimony	7440-36-0	E440	0.10	mg/kg	80.7	98.2	112	82.2	98.4	
arsenic	7440-38-2	E440	0.10	mg/kg	21.2	27.5	27.3	18.6	24.1	
barium	7440-39-3	E440	0.50	mg/kg	602	569	448	425	428	
beryllium	7440-41-7	E440	0.10	mg/kg	0.34	0.36	0.35	0.29	0.31	
bismuth	7440-69-9	E440	0.20	mg/kg	6.90	8.81	13.8	28.4	9.64	
boron	7440-42-8	E440	5.0	mg/kg	138	172	140	164	121	
cadmium	7440-43-9	E440	0.020	mg/kg	9.61	15.0	15.7	9.90	13.2	
calcium	7440-70-2	E440	50	mg/kg	111000	120000	127000	106000	115000	
chromium	7440-47-3	E440	0.50	mg/kg	149	137	181	202	139	
cobalt	7440-48-4	E440	0.10	mg/kg	88.2	36.4	114	43.8	53.9	
copper	7440-50-8	E440	0.50	mg/kg	1910	5480	4190	1900	3370	
iron	7439-89-6	E440	50	mg/kg	78000	61100	53200	69100	76100	
lead	7439-92-1	E440	0.50	mg/kg	447	600	545	364	1000	
lithium	7439-93-2	E440	2.0	mg/kg	19.2	17.8	21.6	20.3	18.1	
magnesium	7439-95-4	E440	20	mg/kg	10800	10400	10800	8580	10400	
manganese	7439-96-5	E440	1.0	mg/kg	824	707	800	873	809	
mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	0.0746	0.186	<0.0500	0.109	
molybdenum	7439-98-7	E440	0.10	mg/kg	13.1	15.6	17.8	13.4	17.5	
nickel	7440-02-0	E440	0.50	mg/kg	596	162	142	159	132	
phosphorus	7723-14-0	E440	50	mg/kg	9030	9750	10500	7410	9700	
potassium	7440-09-7	E440	100	mg/kg	4170	4150	4540	3810	4490	
selenium	7782-49-2	E440	0.20	mg/kg	0.33	0.38	0.43	0.29	0.42	
silver	7440-22-4	E440	0.10	mg/kg	2.90	3.76	3.96	3.26	4.77	
sodium	7440-23-5	E440	50	mg/kg	13000	12300	12900	11800	12800	
strontium	7440-24-6	E440	0.50	mg/kg	316	288	304	241	267	
sulfur	7704-34-9	E440	1000	mg/kg	9800	11200	12200	9800	11900	
thallium	7440-28-0	E440	0.050	mg/kg	<0.050	0.059	0.069	<0.050	0.061	



Analytical Results

Sub-Matrix: Soil					Client sample ID				
(Matrix: Soil/Solid)					BA2048-A-6	BA2048-A-7	BA2048-A-8	BA2048-A-9	BA2048-A-10
Client sampling date / time					25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00
Analyte	CAS Number	Method	LOR	Unit	VA20C2226-006	VA20C2226-007	VA20C2226-008	VA20C2226-009	VA20C2226-010
					Result	Result	Result	Result	Result
Metals									
tin	7440-31-5	E440	2.0	mg/kg	248	112	150	117	148
titanium	7440-32-6	E440	1.0	mg/kg	466	393	258	370	393
tungsten	7440-33-7	E440	0.50	mg/kg	3.65	4.14	4.92	2.70	3.54
uranium	7440-61-1	E440	0.050	mg/kg	4.44	5.46	6.14	3.93	5.88
vanadium	7440-62-2	E440	0.20	mg/kg	52.8	66.6	61.1	66.1	57.1
zinc	7440-66-6	E440	2.0	mg/kg	3430	4320	4050	3140	4680
zirconium	7440-67-7	E440	1.0	mg/kg	<1.0	1.1	1.5	2.0	2.0
TCLP Metals									
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	11.5	11.6	11.6	11.6	11.5
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	8.90	9.05	8.57	8.78	8.75
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.88	2.88	2.88	2.88	2.88
pH, TCLP final	----	EPP444	0.010	pH units	5.98	5.82	5.95	5.99	5.97
antimony, TCLP	7440-36-0	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	<2.5	<2.5	<2.5
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025
boron, TCLP	7440-42-8	E444	0.50	mg/L	1.99	1.91	2.03	1.96	2.34
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.201	0.174	0.172	0.183	0.987
calcium, TCLP	7440-70-2	E444	10	mg/L	1990	1940	2090	2020	2000
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25
cobalt, TCLP	7440-48-4	E444	0.050	mg/L	1.18	0.651	0.974	1.11	1.96
copper, TCLP	7440-50-8	E444	0.050	mg/L	2.11	0.992	1.00	2.01	1.68
iron, TCLP	7439-89-6	E444	5.0	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	<0.25	0.25	<0.25	<0.25
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	129	127	133	127	128
mercury, TCLP	7439-97-6	E512	0.0100	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.42	0.56	0.58	0.53	0.52
selenium, TCLP	7782-49-2	E444	1.00	mg/L	<1.00	<1.00	<1.00	<1.00	<1.00
silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	<0.15	<0.15	<0.15



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2048-A-6	BA2048-A-7	BA2048-A-8	BA2048-A-9	BA2048-A-10
Client sampling date / time					25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00	25-Nov-2020 09:00
Analyte	CAS Number	Method	LOR	Unit	VA20C2226-006	VA20C2226-007	VA20C2226-008	VA20C2226-009	VA20C2226-010	
					Result	Result	Result	Result	Result	
TCLP Metals										
zinc, TCLP	7440-66-6	E444	0.50	mg/L	45.2	61.5	52.0	56.5	41.0	

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



Analytical Results

Sub-Matrix: Soil					Client sample ID				
(Matrix: Soil/Solid)					BA2048-A-11	BA2048-A-12	----	----	----
Client sampling date / time					25-Nov-2020 09:00	25-Nov-2020 09:00	---	---	---
Analyte	CAS Number	Method	LOR	Unit	VA20C2226-011	VA20C2226-012	-----	-----	-----
					Result	Result	---	---	---
Physical Tests									
moisture	----	E144	0.25	%	20.1	17.9	----	----	----
pH (1:2 soil:water)	----	E108	0.10	pH units	10.8	10.8	----	----	----
Metals									
aluminum	7429-90-5	E440	50	mg/kg	37100	33100	----	----	----
antimony	7440-36-0	E440	0.10	mg/kg	104	89.3	----	----	----
arsenic	7440-38-2	E440	0.10	mg/kg	20.9	22.6	----	----	----
barium	7440-39-3	E440	0.50	mg/kg	576	542	----	----	----
beryllium	7440-41-7	E440	0.10	mg/kg	0.42	0.42	----	----	----
bismuth	7440-69-9	E440	0.20	mg/kg	7.02	11.2	----	----	----
boron	7440-42-8	E440	5.0	mg/kg	205	292	----	----	----
cadmium	7440-43-9	E440	0.020	mg/kg	9.75	980	----	----	----
calcium	7440-70-2	E440	50	mg/kg	126000	142000	----	----	----
chromium	7440-47-3	E440	0.50	mg/kg	167	161	----	----	----
cobalt	7440-48-4	E440	0.10	mg/kg	44.2	23.2	----	----	----
copper	7440-50-8	E440	0.50	mg/kg	3330	1920	----	----	----
iron	7439-89-6	E440	50	mg/kg	44800	62100	----	----	----
lead	7439-92-1	E440	0.50	mg/kg	357	395	----	----	----
lithium	7439-93-2	E440	2.0	mg/kg	21.8	20.0	----	----	----
magnesium	7439-95-4	E440	20	mg/kg	9650	9980	----	----	----
manganese	7439-96-5	E440	1.0	mg/kg	628	783	----	----	----
mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	0.0813	----	----	----
molybdenum	7439-98-7	E440	0.10	mg/kg	13.4	15.6	----	----	----
nickel	7440-02-0	E440	0.50	mg/kg	177	116	----	----	----
phosphorus	7723-14-0	E440	50	mg/kg	9070	10600	----	----	----
potassium	7440-09-7	E440	100	mg/kg	4720	4290	----	----	----
selenium	7782-49-2	E440	0.20	mg/kg	0.33	0.38	----	----	----
silver	7440-22-4	E440	0.10	mg/kg	2.36	4.54	----	----	----
sodium	7440-23-5	E440	50	mg/kg	13500	13400	----	----	----
strontium	7440-24-6	E440	0.50	mg/kg	276	300	----	----	----
sulfur	7704-34-9	E440	1000	mg/kg	11600	12400	----	----	----
thallium	7440-28-0	E440	0.050	mg/kg	0.052	0.063	----	----	----



Analytical Results

Sub-Matrix: Soil					Client sample ID				
(Matrix: Soil/Solid)					BA2048-A-11	BA2048-A-12	----	----	----
Client sampling date / time					25-Nov-2020 09:00	25-Nov-2020 09:00	---	---	---
Analyte	CAS Number	Method	LOR	Unit	VA20C2226-011	VA20C2226-012	-----	-----	-----
					Result	Result	---	---	---
Metals									
tin	7440-31-5	E440	2.0	mg/kg	84.1	133	----	----	----
titanium	7440-32-6	E440	1.0	mg/kg	1520	806	----	----	----
tungsten	7440-33-7	E440	0.50	mg/kg	3.54	6.26	----	----	----
uranium	7440-61-1	E440	0.050	mg/kg	4.24	4.93	----	----	----
vanadium	7440-62-2	E440	0.20	mg/kg	115	53.2	----	----	----
zinc	7440-66-6	E440	2.0	mg/kg	3510	7100	----	----	----
zirconium	7440-67-7	E440	1.0	mg/kg	2.1	1.3	----	----	----
TCLP Metals									
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	11.7	11.7	----	----	----
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	9.28	9.23	----	----	----
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.88	2.88	----	----	----
pH, TCLP final	----	EPP444	0.010	pH units	6.03	5.81	----	----	----
antimony, TCLP	7440-36-0	E444	1.0	mg/L	<1.0	<1.0	----	----	----
arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	----	----	----
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	----	----	----
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	----	----	----
boron, TCLP	7440-42-8	E444	0.50	mg/L	2.07	2.07	----	----	----
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.303	0.178	----	----	----
calcium, TCLP	7440-70-2	E444	10	mg/L	2130	1870	----	----	----
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	----	----	----
cobalt, TCLP	7440-48-4	E444	0.050	mg/L	0.957	1.37	----	----	----
copper, TCLP	7440-50-8	E444	0.050	mg/L	1.43	1.36	----	----	----
iron, TCLP	7439-89-6	E444	5.0	mg/L	<5.0	<5.0	----	----	----
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	<0.25	----	----	----
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	125	121	----	----	----
mercury, TCLP	7439-97-6	E512	0.0100	mg/L	<0.0100	<0.0100	----	----	----
nickel, TCLP	7440-02-0	E444	0.25	mg/L	1.11	0.60	----	----	----
selenium, TCLP	7782-49-2	E444	1.00	mg/L	<1.00	<1.00	----	----	----
silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	----	----	----
thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	----	----	----
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	----	----	----



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2048-A-11	BA2048-A-12	----	----	----
Client sampling date / time					25-Nov-2020 09:00	25-Nov-2020 09:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20C2226-011	VA20C2226-012	-----	-----	-----	
TCLP Metals					Result	Result	---	---	---	
zinc, TCLP	7440-66-6	E444	0.50	mg/L	46.6	53.9	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA20C2226	Page	: 1 of 16
Client	: Covanta Burnaby Renewable Energy, ULC	Laboratory	: Vancouver - Environmental
Contact	: Steve McKinney	Account Manager	: Brent Mack
Address	: 5150 Riverbend Drive Burnaby BC Canada V3N 4V3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604 521 1025	Telephone	: +1 604 253 4188
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 01-Dec-2020 12:35
PO	: VANCO 0000049378	Issue Date	: 08-Dec-2020 16:35
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer (BC work)		
No. of samples received	: 12		
No. of samples analysed	: 12		

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.

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- Reference Material (RM) Sample outliers occur - please see the following pages for full details.

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.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Duplicate (DUP) RPDs								
Metals	VA20C2226-011	BA2048-A-11	arsenic	7440-38-2	E440	30.6 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA20C2226-011	BA2048-A-11	bismuth	7440-69-9	E440	50.6 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA20C2226-011	BA2048-A-11	cobalt	7440-48-4	E440	60.3 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA20C2226-011	BA2048-A-11	molybdenum	7439-98-7	E440	41.9 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA20C2226-011	BA2048-A-11	nickel	7440-02-0	E440	35.9 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA20C2226-011	BA2048-A-11	tin	7440-31-5	E440	41.7 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA20C2226-011	BA2048-A-11	tungsten	7440-33-7	E440	35.0 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA20C2226-011	BA2048-A-11	vanadium	7440-62-2	E440	60.4 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.

Result Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Reference Material (RM) Sample								
Metals	QC-MRG2-1269880 03	----	tin	7440-31-5	E440	135 % MES	70.0-130%	Recovery greater than upper control limit

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 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: **Soil/Solid**

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

Analyte Group 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 BA2048-A-1	E510	25-Nov-2020	07-Dec-2020	28 days	12 days	✓	08-Dec-2020	15 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2048-A-10	E510	25-Nov-2020	07-Dec-2020	28 days	12 days	✓	08-Dec-2020	15 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2048-A-11	E510	25-Nov-2020	08-Dec-2020	28 days	12 days	✓	08-Dec-2020	15 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2048-A-12	E510	25-Nov-2020	08-Dec-2020	28 days	12 days	✓	08-Dec-2020	15 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2048-A-2	E510	25-Nov-2020	07-Dec-2020	28 days	12 days	✓	08-Dec-2020	15 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2048-A-3	E510	25-Nov-2020	07-Dec-2020	28 days	12 days	✓	08-Dec-2020	15 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2048-A-4	E510	25-Nov-2020	07-Dec-2020	28 days	12 days	✓	08-Dec-2020	15 days	0 days	✓	



Matrix: Soil/Solid

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

Analyte Group 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 BA2048-A-5	E510	25-Nov-2020	07-Dec-2020	28 days	12 days	✔	08-Dec-2020	15 days	0 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2048-A-6	E510	25-Nov-2020	07-Dec-2020	28 days	12 days	✔	08-Dec-2020	15 days	0 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2048-A-7	E510	25-Nov-2020	07-Dec-2020	28 days	12 days	✔	08-Dec-2020	15 days	0 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2048-A-8	E510	25-Nov-2020	07-Dec-2020	28 days	12 days	✔	08-Dec-2020	15 days	0 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2048-A-9	E510	25-Nov-2020	07-Dec-2020	28 days	12 days	✔	08-Dec-2020	15 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA2048-A-1	E440	25-Nov-2020	07-Dec-2020	180 days	12 days	✔	07-Dec-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA2048-A-10	E440	25-Nov-2020	07-Dec-2020	180 days	12 days	✔	07-Dec-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA2048-A-11	E440	25-Nov-2020	08-Dec-2020	180 days	12 days	✔	08-Dec-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA2048-A-12	E440	25-Nov-2020	08-Dec-2020	180 days	12 days	✔	08-Dec-2020	167 days	0 days	✔	



Matrix: **Soil/Solid**

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

Analyte Group 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 ICPCS											
LDPE bag BA2048-A-2	E440	25-Nov-2020	07-Dec-2020	180 days	12 days	✔	07-Dec-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2048-A-3	E440	25-Nov-2020	07-Dec-2020	180 days	12 days	✔	07-Dec-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2048-A-4	E440	25-Nov-2020	07-Dec-2020	180 days	12 days	✔	07-Dec-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2048-A-5	E440	25-Nov-2020	07-Dec-2020	180 days	12 days	✔	07-Dec-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2048-A-6	E440	25-Nov-2020	07-Dec-2020	180 days	12 days	✔	07-Dec-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2048-A-7	E440	25-Nov-2020	07-Dec-2020	180 days	12 days	✔	07-Dec-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2048-A-8	E440	25-Nov-2020	07-Dec-2020	180 days	12 days	✔	07-Dec-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2048-A-9	E440	25-Nov-2020	07-Dec-2020	180 days	12 days	✔	07-Dec-2020	167 days	0 days	✔	
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2048-A-1	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----		



Matrix: Soil/Solid

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

Analyte Group 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 BA2048-A-10	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2048-A-11	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2048-A-12	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2048-A-2	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2048-A-3	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2048-A-4	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2048-A-5	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2048-A-6	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2048-A-7	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----	



Matrix: Soil/Solid

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

Analyte Group 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 BA2048-A-8	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2048-A-9	E144	25-Nov-2020	----	----	----		07-Dec-2020	----	----		
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2048-A-1	E108	25-Nov-2020	07-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2048-A-10	E108	25-Nov-2020	07-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2048-A-11	E108	25-Nov-2020	08-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2048-A-12	E108	25-Nov-2020	08-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2048-A-2	E108	25-Nov-2020	07-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2048-A-3	E108	25-Nov-2020	07-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2048-A-4	E108	25-Nov-2020	07-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	



Matrix: Soil/Solid

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

Analyte Group 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 BA2048-A-5	E108	25-Nov-2020	07-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2048-A-6	E108	25-Nov-2020	07-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2048-A-7	E108	25-Nov-2020	07-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2048-A-8	E108	25-Nov-2020	07-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2048-A-9	E108	25-Nov-2020	07-Dec-2020	30 days	12 days	✔	08-Dec-2020	17 days	0 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2048-A-1	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2048-A-10	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2048-A-11	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2048-A-12	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	



Matrix: Soil/Solid

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

Analyte Group 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) BA2048-A-2	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2048-A-3	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2048-A-4	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2048-A-5	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2048-A-6	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2048-A-7	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2048-A-8	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2048-A-9	E512	05-Dec-2020	----	----	----		08-Dec-2020	37 days	13 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2048-A-1	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✔	



Matrix: Soil/Solid

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

Analyte Group 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) BA2048-A-10	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2048-A-11	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2048-A-12	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2048-A-2	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2048-A-3	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2048-A-4	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2048-A-5	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2048-A-6	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2048-A-7	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✔	



Matrix: Soil/Solid

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

Analyte Group 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) BA2048-A-8	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2048-A-9	E444	05-Dec-2020	----	----	----		08-Dec-2020	189 days	13 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2048-A-1	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2048-A-10	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2048-A-11	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2048-A-12	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2048-A-2	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2048-A-3	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2048-A-4	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	



Matrix: **Soil/Solid**

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

Analyte Group 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) BA2048-A-5	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2048-A-6	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2048-A-7	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2048-A-8	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2048-A-9	EPP444	25-Nov-2020	05-Dec-2020	----	----		----	----	----	

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 (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Mercury in Soil/Solid by CVAAS	E510	126998	2	35	5.7	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	126988	2	40	5.0	5.0	✔
Moisture Content by Gravimetry	E144	127002	2	37	5.4	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	126999	2	38	5.2	5.0	✔
Laboratory Control Samples (LCS)							
Mercury in Soil/Solid by CVAAS	E510	126998	4	35	11.4	10.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	126988	4	40	10.0	10.0	✔
Moisture Content by Gravimetry	E144	127002	2	37	5.4	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	126999	2	38	5.2	5.0	✔
Method Blanks (MB)							
Mercury by CVAAS (TCLP)	E512	127470	1	12	8.3	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	126998	2	35	5.7	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	127477	1	12	8.3	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	126988	2	40	5.0	5.0	✔
Moisture Content by Gravimetry	E144	127002	2	37	5.4	5.0	✔
Matrix Spikes (MS)							
Mercury by CVAAS (TCLP)	E512	127470	1	12	8.3	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	127477	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 Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°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 °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 Vancouver - Environmental	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 Vancouver - Environmental	Soil/Solid	EPA 6020B (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. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Analysis is by Collision/Reaction Cell ICPMS.
Metals by CRC ICPMS (TCLP)	E444 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Digestion for Metals and Mercury	EP440 Vancouver - Environmental	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.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)	EPP444 Vancouver - Environmental	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 : VA20C2226

Page : 1 of 15

Client : Covanta Burnaby Renewable Energy, ULC
Contact : Steve McKinney
Address : 5150 Riverbend Drive
Burnaby BC Canada V3N 4V3
Telephone : 604 521 1025
Project : Weekly Bottom Ash - Suite
PO : VANCO 0000049378
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Standing Offer (BC work)
No. of samples received : 12
No. of samples analysed : 12

Laboratory : Vancouver - Environmental
Account Manager : Brent Mack
Address : 8081 Lougheed Highway
Burnaby, British Columbia Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 01-Dec-2020 12:35
Date Analysis Commenced : 05-Dec-2020
Issue Date : 08-Dec-2020 16:35

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.

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Angela Ren (Team Leader - Metals), Cristina Alexandre (Supervisor - Metals ICP Instrumentation), Dee Lee (Analyst), Kim Jensen (Department Manager - Metals), and Ophelia Chiu (Supervisor - Organics Instrumentation).

Page : 2 of 15
Work Order : VA20C2226
Client : Covanta Burnaby Renewable Energy, ULC
Project : Weekly Bottom Ash - Suite



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.



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: 126990)											
VA20C2208-001	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	6.69	6.75	0.893%	5%	----
Physical Tests (QC Lot: 126996)											
VA20C2208-001	Anonymous	moisture	----	E144	0.25	%	17.6	18.2	2.90%	20%	----
Physical Tests (QC Lot: 126999)											
VA20C2226-011	BA2048-A-11	pH (1:2 soil:water)	----	E108	0.10	pH units	10.8	10.7	1.20%	5%	----
Physical Tests (QC Lot: 127002)											
VA20C2226-011	BA2048-A-11	moisture	----	E144	0.25	%	20.1	20.3	1.06%	20%	----
Metals (QC Lot: 126988)											
VA20C0374-018	Anonymous	aluminum	7429-90-5	E440	50	mg/kg	24500	22000	10.7%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.10	mg/kg	2.95	2.61	12.0%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	8.42	7.92	6.15%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.26	0.25	0.006	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	5.3	<5.0	0.3	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.067	0.058	0.010	Diff <2x LOR	----
		calcium	7440-70-2	E440	50	mg/kg	20200	17900	12.1%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	25.6	24.5	4.51%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	15.0	14.0	6.86%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	55.9	51.7	7.72%	30%	----
		iron	7439-89-6	E440	50	mg/kg	36200	33700	7.13%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	0.82	0.69	0.13	Diff <2x LOR	----
		lithium	7439-93-2	E440	2.0	mg/kg	34.5	31.0	10.7%	30%	----
		magnesium	7439-95-4	E440	20	mg/kg	9600	8930	7.22%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	440	408	7.61%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	0.43	0.44	0.003	Diff <2x LOR	----
		nickel	7440-02-0	E440	0.50	mg/kg	27.3	25.9	5.14%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	629	543	14.8%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	320	290	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	551	560	1.56%	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: 126988) - continued											
VA20C0374-018	Anonymous	strontium	7440-24-6	E440	0.50	mg/kg	30.2	27.2	10.2%	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	3740	3220	14.7%	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	1.40	1.18	16.6%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	138	132	4.32%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	41.6	39.9	4.28%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	16.6	15.2	8.71%	30%	----
Metals (QC Lot: 126989)											
VA20C2208-001	Anonymous	mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 126997)											
VA20C2226-011	BA2048-A-11	aluminum	7429-90-5	E440	50	mg/kg	37100	37900	2.24%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	104	111	6.67%	30%	----
		arsenic	7440-38-2	E440	0.10	mg/kg	20.9	28.5	30.6%	30%	DUP-H
		barium	7440-39-3	E440	0.50	mg/kg	576	540	6.37%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.42	0.36	0.06	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	7.02	11.8	50.6%	30%	DUP-H
		boron	7440-42-8	E440	5.0	mg/kg	205	263	24.5%	30%	----
		cadmium	7440-43-9	E440	0.020	mg/kg	9.75	10.4	6.74%	30%	----
		calcium	7440-70-2	E440	50	mg/kg	126000	129000	2.87%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	167	146	13.3%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	44.2	23.7	60.3%	30%	DUP-H
		copper	7440-50-8	E440	0.50	mg/kg	3330	2840	15.7%	30%	----
		iron	7439-89-6	E440	50	mg/kg	44800	59900	28.9%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	357	411	14.2%	40%	----
		lithium	7439-93-2	E440	2.0	mg/kg	21.8	19.2	12.9%	30%	----
		magnesium	7439-95-4	E440	20	mg/kg	9650	10000	3.67%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	628	824	26.9%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	13.4	20.4	41.9%	40%	DUP-H
		nickel	7440-02-0	E440	0.50	mg/kg	177	123	35.9%	30%	DUP-H
		phosphorus	7723-14-0	E440	50	mg/kg	9070	9880	8.50%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	4720	4680	0.840%	40%	----
		selenium	7782-49-2	E440	0.20	mg/kg	0.33	0.36	0.03	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	2.36	2.88	19.6%	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: 126997) - continued											
VA20C2226-011	BA2048-A-11	sodium	7440-23-5	E440	50	mg/kg	13500	13900	2.89%	40%	----
		strontium	7440-24-6	E440	0.50	mg/kg	276	278	0.728%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	11600	12900	9.87%	30%	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.052	<0.050	0.002	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	84.1	128	41.7%	40%	DUP-H
		titanium	7440-32-6	E440	1.0	mg/kg	1520	1390	8.72%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	3.54	5.04	35.0%	30%	DUP-H
		uranium	7440-61-1	E440	0.050	mg/kg	4.24	4.57	7.36%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	115	61.8	60.4%	30%	DUP-H
		zinc	7440-66-6	E440	2.0	mg/kg	3510	3070	13.5%	30%	----
zirconium	7440-67-7	E440	1.0	mg/kg	2.1	1.8	0.3	Diff <2x LOR	----		
Metals (QC Lot: 126998)											
VA20C2226-011	BA2048-A-11	mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----

Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.



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: 126996)						
moisture	----	E144	0.25	%	<0.25	----
Physical Tests (QCLot: 127002)						
moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 126988)						
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	----
titanium	7440-32-6	E440	1	mg/kg	<1.0	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 126988) - continued						
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	----
Metals (QCLot: 126989)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 126997)						
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: 126997) - 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	----
Metals (QCLot: 126998)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
TCLP Metals (QCLot: 127470)						
mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----
TCLP Metals (QCLot: 127477)						
antimony, TCLP	7440-36-0	E444	1	mg/L	<1.0	----
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	----
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	----
zinc, TCLP	7440-66-6	E444	0.5	mg/L	<0.50	----



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 126990)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.7	95.0	105	----
Physical Tests (QCLot: 126996)									
moisture	----	E144	0.25	%	50 %	101	90.0	110	----
Physical Tests (QCLot: 126999)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.7	95.0	105	----
Physical Tests (QCLot: 127002)									
moisture	----	E144	0.25	%	50 %	101	90.0	110	----
Metals (QCLot: 126988)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	105	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	102	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	104	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	106	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	91.1	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	104	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	86.1	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	98.4	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	94.2	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	100	80.0	120	----
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	99.2	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	101	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	105	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	91.4	80.0	120	----
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	104	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	103	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	102	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	101	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	105	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	102	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	104	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	96.9	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	104	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	98.4	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: 126988) - continued									
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	96.1	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	98.2	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	101	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	104	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	101	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	107	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	103	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	96.9	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	103	80.0	120	----
Metals (QCLot: 126989)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	99.8	80.0	120	----
Metals (QCLot: 126997)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	96.1	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	99.3	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	97.1	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	99.1	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	99.9	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	99.6	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	106	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	98.6	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	100	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	96.3	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	98.1	80.0	120	----
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	95.8	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	95.5	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	97.2	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	95.8	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	95.8	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	97.2	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	94.6	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	97.6	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	99.5	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	93.9	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	93.5	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	97.4	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	98.3	80.0	120	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Metals (QCLot: 126997) - continued									
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	102	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	96.8	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	97.5	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	94.0	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	98.6	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	104	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	99.4	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	97.6	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	94.7	80.0	120	----
Metals (QCLot: 126998)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	103	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**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	Target	MS	Low	High	
TCLP Metals (QCLot: 127470)										
VA20C2226-001	BA2048-A-1	mercury, TCLP	7439-97-6	E512	0.0010 mg/L	0.001 mg/L	95.0	50.0	140	----
TCLP Metals (QCLot: 127477)										
VA20C2226-001	BA2048-A-1	antimony, TCLP	7440-36-0	E444	4.9 mg/L	5 mg/L	98.5	50.0	140	----
		arsenic, TCLP	7440-38-2	E444	4.7 mg/L	5 mg/L	94.8	50.0	140	----
		barium, TCLP	7440-39-3	E444	12.9 mg/L	12.5 mg/L	104	50.0	140	----
		beryllium, TCLP	7440-41-7	E444	0.239 mg/L	0.25 mg/L	95.7	50.0	140	----
		boron, TCLP	7440-42-8	E444	9.14 mg/L	10 mg/L	91.4	50.0	140	----
		cadmium, TCLP	7440-43-9	E444	0.244 mg/L	0.25 mg/L	97.8	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	1.16 mg/L	1.25 mg/L	93.2	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	2.36 mg/L	2.5 mg/L	94.3	50.0	140	----
		iron, TCLP	7439-89-6	E444	220 mg/L	250 mg/L	88.1	50.0	140	----
		lead, TCLP	7439-92-1	E444	9.59 mg/L	10 mg/L	95.9	50.0	140	----
		magnesium, TCLP	7439-95-4	E444	243 mg/L	250 mg/L	97.3	50.0	140	----
		nickel, TCLP	7440-02-0	E444	2.34 mg/L	2.5 mg/L	93.5	50.0	140	----
		selenium, TCLP	7782-49-2	E444	4.54 mg/L	5 mg/L	90.8	50.0	140	----
		silver, TCLP	7440-22-4	E444	0.106 mg/L	0.1 mg/L	106	50.0	140	----
		thallium, TCLP	7440-28-0	E444	4.5 mg/L	5 mg/L	89.6	50.0	140	----
		vanadium, TCLP	7440-62-2	E444	0.72 mg/L	0.75 mg/L	95.9	50.0	140	----
		zinc, TCLP	7440-66-6	E444	ND mg/L	10 mg/L	ND	50.0	140	----



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: **Soil/Solid**

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: 126988)									
QC-126988-003	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	111	70.0	130	----
QC-126988-003	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	103	70.0	130	----
QC-126988-003	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	105	70.0	130	----
QC-126988-003	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	107	70.0	130	----
QC-126988-003	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	96.6	70.0	130	----
QC-126988-003	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	112	40.0	160	----
QC-126988-003	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	104	70.0	130	----
QC-126988-003	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	93.7	70.0	130	----
QC-126988-003	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	115	70.0	130	----
QC-126988-003	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	104	70.0	130	----
QC-126988-003	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	101	70.0	130	----
QC-126988-003	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	105	70.0	130	----
QC-126988-003	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	104	70.0	130	----
QC-126988-003	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	99.4	70.0	130	----
QC-126988-003	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	105	70.0	130	----
QC-126988-003	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	113	70.0	130	----
QC-126988-003	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	106	70.0	130	----
QC-126988-003	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	106	70.0	130	----
QC-126988-003	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	102	70.0	130	----
QC-126988-003	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	116	70.0	130	----
QC-126988-003	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	105	70.0	130	----
QC-126988-003	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	102	70.0	130	----
QC-126988-003	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	105	40.0	160	----
QC-126988-003	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	# 135	70.0	130	MES
QC-126988-003	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	126	70.0	130	----
QC-126988-003	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	120	70.0	130	----
QC-126988-003	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	109	70.0	130	----
QC-126988-003	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	99.2	70.0	130	----
QC-126988-003	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	109	70.0	130	----



Sub-Matrix: Soil/Solid

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: 126989)									
QC-126989-003	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	99.5	70.0	130	----
Metals (QCLot: 126997)									
QC-126997-003	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	97.8	70.0	130	----
QC-126997-003	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	99.6	70.0	130	----
QC-126997-003	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	97.6	70.0	130	----
QC-126997-003	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	99.2	70.0	130	----
QC-126997-003	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	95.7	70.0	130	----
QC-126997-003	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	103	40.0	160	----
QC-126997-003	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	92.8	70.0	130	----
QC-126997-003	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	99.5	70.0	130	----
QC-126997-003	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	96.7	70.0	130	----
QC-126997-003	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	97.0	70.0	130	----
QC-126997-003	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	98.2	70.0	130	----
QC-126997-003	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	101	70.0	130	----
QC-126997-003	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	99.0	70.0	130	----
QC-126997-003	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	95.7	70.0	130	----
QC-126997-003	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	95.3	70.0	130	----
QC-126997-003	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	97.8	70.0	130	----
QC-126997-003	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	101	70.0	130	----
QC-126997-003	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	97.3	70.0	130	----
QC-126997-003	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	93.7	70.0	130	----
QC-126997-003	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	97.3	70.0	130	----
QC-126997-003	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	95.7	70.0	130	----
QC-126997-003	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	97.3	70.0	130	----
QC-126997-003	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	95.2	40.0	160	----
QC-126997-003	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	96.5	70.0	130	----
QC-126997-003	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	101	70.0	130	----
QC-126997-003	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	104	70.0	130	----
QC-126997-003	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	97.8	70.0	130	----
QC-126997-003	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	96.0	70.0	130	----
QC-126997-003	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	91.5	70.0	130	----
Metals (QCLot: 126998)									

Page : 15 of 15
 Work Order : VA20C2226
 Client : Covanta Burnaby Renewable Energy, ULC
 Project : Weekly Bottom Ash - Suite



Sub-Matrix: **Soil/Solid**

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: 126998) - continued									
QC-126998-003	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	101	70.0	130	----


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).



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:	Steve Mckinney / 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:	smckinney@covanta.com		<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT	
Phone:	604-521-1025	Email 2:	rjohnson4@covanta.com		<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	Email 3:	dskrypnik@covanta.com		<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT	
			brent.kirkpatrick@metrovancover.org		Analysis Request	
			Sarah.Wellman@metrovancover.org			

Invoice To	Same as Report ?	Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)									
Hardcopy of Invoice with Report?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Job #:											
Company:		PO / AFE:	PO# 46693 Weekly Bottom Ash - Suite										
Contact:		LSD:	(includes 2:1 pH)										
Address:		Quote #:											
Phone:													

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	MET-TCLP-VA (all metals, Hg)	MOISTURE	Chrome 6	MET-CSR+FULL-VA (all metals)					Number of Containers
BA2048-A-1	Environmental Division Vancouver Work Order Reference VA20C2226  Telephone : +1 604 253 4188	25-Nov-20	9:00	Soil	X	X		X					1
BA2048-A-2		25-Nov-20	9:00	Soil	X	X		X					1
BA2048-A-3		25-Nov-20	9:00	Soil	X	X		X					1
BA2048-A-4		25-Nov-20	9:00	Soil	X	X		X					1
BA2048-A-5		25-Nov-20	9:00	Soil	X	X		X					1
BA2048-A-6		25-Nov-20	9:00	Soil	X	X		X					1
BA2048-A-7		25-Nov-20	9:00	Soil	X	X		X					1
BA2048-A-8		25-Nov-20	9:00	Soil	X	X		X					1
BA2048-A-9		25-Nov-20	9:00	Soil	X	X		X					1
BA2048-A-10		25-Nov-20	9:00	Soil	X	X		X					1
BA2048-A-11		25-Nov-20	9:00	Soil	X	X		X					1
BA2048-A-12		25-Nov-20	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: Yes / No ? If Yes add SIF
Kel	01/12/2020		em	01/12/20	12:35 pm	14 °C				