

## Bottom Ash Data

2019 Week 11

---

The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on April 4, 2019. The data represents bottom ash composite results for week 11 of 2019 (March 10, 2019 to March 16, 2019).

The bottom ash meets the requirements of Metro Vancouver's Bottom Ash Management Plan and is suitable for beneficial use during Coquitlam Landfill closure works.



Covanta Burnaby R.E., ULC  
ATTN: Steve McKinney  
5150 Riverbend Drive  
Burnaby BC V3N 4V3

Date Received: 19-MAR-19  
Report Date: 26-MAR-19 12:32 (MT)  
Version: FINAL

Client Phone: 604-521-1025

## Certificate of Analysis

Lab Work Order #: L2246123  
Project P.O. #: VANCO-0000048466  
Job Reference:  
C of C Numbers:  
Legal Site Desc:

---

Brent Mack, B.Sc.  
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L2246123-1 soil 13-MAR-19 09:00 BA1911-A-1	L2246123-2 soil 13-MAR-19 09:00 BA1911-A-2	L2246123-3 soil 13-MAR-19 09:00 BA1911-A-3	L2246123-4 soil 13-MAR-19 09:00 BA1911-A-4	L2246123-5 soil 13-MAR-19 09:00 BA1911-A-5	
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	22.2	22.3	20.8	19.3	21.7
	pH (1:2 soil:water) (pH)	11.64	11.20	11.47	11.22	11.31
<b>Metals</b>	Aluminum (Al) (mg/kg)	34500	35100	39600	33700	31600
	Antimony (Sb) (mg/kg)	127	127	182	140	181
	Arsenic (As) (mg/kg)	27.7	26.4	25.9	25.7	22.8
	Barium (Ba) (mg/kg)	656	732	697	578	671
	Beryllium (Be) (mg/kg)	0.47	0.41	0.47	0.39	0.51
	Bismuth (Bi) (mg/kg)	9.94	9.80	9.17	8.60	7.74
	Boron (B) (mg/kg)	367	294	584	402	364
	Cadmium (Cd) (mg/kg)	15.1	11.9	13.9	18.3	14.2
	Calcium (Ca) (mg/kg)	138000	127000	126000	127000	124000
	Chromium (Cr) (mg/kg)	354	174	143	164	528
	Cobalt (Co) (mg/kg)	166	21.4	28.7	22.6	32.2
	Copper (Cu) (mg/kg)	2280	7880	2590	4400	2020
	Iron (Fe) (mg/kg)	61900	86000	49100	67700	58500
	Lead (Pb) (mg/kg)	477	648	5260	1160	4860
	Lithium (Li) (mg/kg)	80.8	18.9	18.6	18.7	21.7
	Magnesium (Mg) (mg/kg)	11600	10400	10500	10700	12100
	Manganese (Mn) (mg/kg)	2000	922	824	1030	770
	Mercury (Hg) (mg/kg)	0.253	0.147	0.196	0.191	0.160
	Molybdenum (Mo) (mg/kg)	33.9	37.1	30.6	46.2	35.7
	Nickel (Ni) (mg/kg)	496	598	291	206	254
	Phosphorus (P) (mg/kg)	10500	8990	11000	11000	11000
	Potassium (K) (mg/kg)	5770	4980	4990	5090	4820
	Selenium (Se) (mg/kg)	0.40	0.40	0.45	0.41	0.69
	Silver (Ag) (mg/kg)	4.77	5.37	5.04	7.42	4.77
	Sodium (Na) (mg/kg)	16900	15400	15700	15300	15000
	Strontium (Sr) (mg/kg)	341	343	301	326	318
	Sulfur (S) (mg/kg)	12500	10800	12100	12300	11300
	Thallium (Tl) (mg/kg)	0.070	0.072	0.080	0.072	0.071
	Tin (Sn) (mg/kg)	146	526	171	372	122
	Titanium (Ti) (mg/kg)	1110	1280	1580	729	854
	Tungsten (W) (mg/kg)	9.05	4.41	4.37	4.92	6.29
	Uranium (U) (mg/kg)	5.40	4.89	5.01	5.14	4.94
	Vanadium (V) (mg/kg)	56.2	50.2	70.1	51.7	44.8
	Zinc (Zn) (mg/kg)	3850	4390	4910	4170	4680
	Zirconium (Zr) (mg/kg)	1.7	1.6	3.1	1.8	1.6

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L2246123-6 soil 13-MAR-19 09:00 BA1911-A-6	L2246123-7 soil 13-MAR-19 09:00 BA1911-A-7	L2246123-8 soil 13-MAR-19 09:00 BA1911-A-8	L2246123-9 soil 13-MAR-19 09:00 BA1911-A-9	L2246123-10 soil 13-MAR-19 09:00 BA1911-A-10	
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	19.8	22.2	21.7	21.1	21.5
	pH (1:2 soil:water) (pH)	11.40	11.64	11.76	11.79	11.74
<b>Metals</b>	Aluminum (Al) (mg/kg)	37100	31700	35000	53000	39400
	Antimony (Sb) (mg/kg)	136	136	130	159	208
	Arsenic (As) (mg/kg)	27.0	28.0	24.6	34.9	31.9
	Barium (Ba) (mg/kg)	726	655	702	718	715
	Beryllium (Be) (mg/kg)	0.44	0.38	0.44	0.48	0.39
	Bismuth (Bi) (mg/kg)	9.42	5.96	52.2	34.1	9.39
	Boron (B) (mg/kg)	530	291	468	415	440
	Cadmium (Cd) (mg/kg)	16.5	13.4	13.1	20.6	24.0
	Calcium (Ca) (mg/kg)	133000	122000	135000	149000	147000
	Chromium (Cr) (mg/kg)	245	139	469	157	159
	Cobalt (Co) (mg/kg)	21.7	18.7	37.8	28.0	103
	Copper (Cu) (mg/kg)	4270	5220	1530	2980	5510
	Iron (Fe) (mg/kg)	71300	82800	62400	59400	78400
	Lead (Pb) (mg/kg)	1060	917	672	605	1180
	Lithium (Li) (mg/kg)	21.3	15.4	18.7	22.3	27.8
	Magnesium (Mg) (mg/kg)	9860	10400	12100	12700	15100
	Manganese (Mn) (mg/kg)	829	721	883	993	925
	Mercury (Hg) (mg/kg)	0.264	0.183	0.230	0.278	0.239
	Molybdenum (Mo) (mg/kg)	50.4	27.5	72.0	31.5	30.8
	Nickel (Ni) (mg/kg)	318	116	164	662	150
	Phosphorus (P) (mg/kg)	9940	8640	10300	11800	10100
	Potassium (K) (mg/kg)	5400	4730	5020	6290	5440
	Selenium (Se) (mg/kg)	0.54	0.37	0.39	0.50	0.45
	Silver (Ag) (mg/kg)	7.13	6.38	8.02	5.72	5.17
	Sodium (Na) (mg/kg)	15900	13300	15400	17100	15800
	Strontium (Sr) (mg/kg)	336	301	327	355	353
	Sulfur (S) (mg/kg)	12200	11600	10400	14100	13300
	Thallium (Tl) (mg/kg)	0.076	0.064	0.072	0.098	0.080
	Tin (Sn) (mg/kg)	195	165	140	130	465
	Titanium (Ti) (mg/kg)	1170	1050	802	1080	1150
	Tungsten (W) (mg/kg)	4.91	4.27	4.18	5.13	7.64
	Uranium (U) (mg/kg)	5.49	4.46	5.32	6.17	5.19
	Vanadium (V) (mg/kg)	64.1	47.7	50.6	60.3	54.1
	Zinc (Zn) (mg/kg)	3680	4110	5010	7820	6130
	Zirconium (Zr) (mg/kg)	2.0	1.1	1.3	1.8	1.4

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2246123-11	L2246123-12		
		Description	soil	soil		
		Sampled Date	13-MAR-19	13-MAR-19		
		Sampled Time	09:00	09:00		
		Client ID	BA1911-A-11	BA1911-A-12		
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	19.9	21.1			
	pH (1:2 soil:water) (pH)	11.70	11.72			
<b>Metals</b>	Aluminum (Al) (mg/kg)	37500	34200			
	Antimony (Sb) (mg/kg)	133	155			
	Arsenic (As) (mg/kg)	26.5	26.9			
	Barium (Ba) (mg/kg)	620	580			
	Beryllium (Be) (mg/kg)	0.38	0.42			
	Bismuth (Bi) (mg/kg)	827	14.6			
	Boron (B) (mg/kg)	555	322			
	Cadmium (Cd) (mg/kg)	22.9	17.8			
	Calcium (Ca) (mg/kg)	130000	141000			
	Chromium (Cr) (mg/kg)	354	184			
	Cobalt (Co) (mg/kg)	24.8	32.3			
	Copper (Cu) (mg/kg)	3320	2490			
	Iron (Fe) (mg/kg)	72400	54300			
	Lead (Pb) (mg/kg)	499	7600			
	Lithium (Li) (mg/kg)	19.6	18.7			
	Magnesium (Mg) (mg/kg)	12000	11500			
	Manganese (Mn) (mg/kg)	847	956			
	Mercury (Hg) (mg/kg)	0.319	0.241			
	Molybdenum (Mo) (mg/kg)	77.1	50.6			
	Nickel (Ni) (mg/kg)	402	143			
	Phosphorus (P) (mg/kg)	10200	10600			
	Potassium (K) (mg/kg)	5250	5810			
	Selenium (Se) (mg/kg)	0.42	0.38			
	Silver (Ag) (mg/kg)	9.72	8.26			
	Sodium (Na) (mg/kg)	15400	16400			
	Strontium (Sr) (mg/kg)	314	385			
	Sulfur (S) (mg/kg)	11900	13000			
	Thallium (Tl) (mg/kg)	0.094	0.084			
	Tin (Sn) (mg/kg)	138	121			
	Titanium (Ti) (mg/kg)	1090	808			
	Tungsten (W) (mg/kg)	7.65	6.39			
	Uranium (U) (mg/kg)	5.17	6.03			
Vanadium (V) (mg/kg)	55.8	62.7				
Zinc (Zn) (mg/kg)	15200	4130				
Zirconium (Zr) (mg/kg)	2.2	1.8				

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2246123-1	L2246123-2	L2246123-3	L2246123-4	L2246123-5
		Description	soil	soil	soil	soil	soil
		Sampled Date	13-MAR-19	13-MAR-19	13-MAR-19	13-MAR-19	13-MAR-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1911-A-1	BA1911-A-2	BA1911-A-3	BA1911-A-4	BA1911-A-5
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.53	11.36	11.60	11.42	11.46
	2nd Preliminary pH (pH)		8.75	8.29	8.44	6.76	8.55
	Final pH (pH)		6.23	6.26	6.12	6.12	6.12
	Extraction Solution Initial pH (pH)		2.88	2.88	2.88	2.88	2.88
	Antimony (Sb)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba)-Leachable (mg/L)		<2.5	<2.5	<2.5	<2.5	<2.5
	Beryllium (Be)-Leachable (mg/L)		<0.025	<0.025	<0.025	<0.025	<0.025
	Boron (B)-Leachable (mg/L)		4.06	5.69	4.61	4.63	4.52
	Cadmium (Cd)-Leachable (mg/L)		0.348	0.222	0.282	0.228	0.697
	Calcium (Ca)-Leachable (mg/L)		2060	2140	2030	1980	2100
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.316	0.603	0.346	0.607	0.816
	Copper (Cu)-Leachable (mg/L)		0.782	0.536	0.647	0.955	0.544
	Iron (Fe)-Leachable (mg/L)		<5.0	<5.0	<5.0	<5.0	<5.0
	Lead (Pb)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	1.11
	Magnesium (Mg)-Leachable (mg/L)		133	139	132	125	134
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		2.26	0.56	0.47	0.47	0.45
	Selenium (Se)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag)-Leachable (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Thallium (Tl)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Vanadium (V)-Leachable (mg/L)		<0.15	<0.15	<0.15	<0.15	<0.15
	Zinc (Zn)-Leachable (mg/L)		44.4	36.8	41.1	34.8	38.5

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2246123-6	L2246123-7	L2246123-8	L2246123-9	L2246123-10
		Description	soil	soil	soil	soil	soil
		Sampled Date	13-MAR-19	13-MAR-19	13-MAR-19	13-MAR-19	13-MAR-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1911-A-6	BA1911-A-7	BA1911-A-8	BA1911-A-9	BA1911-A-10
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.55	11.58	11.66	11.74	11.69
	2nd Preliminary pH (pH)		8.44	8.58	8.08	8.79	9.15
	Final pH (pH)		6.25	6.22	6.24	6.32	6.47
	Extraction Solution Initial pH (pH)		2.88	2.88	2.88	2.88	2.88
	Antimony (Sb)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba)-Leachable (mg/L)		<2.5	<2.5	<2.5	<2.5	<2.5
	Beryllium (Be)-Leachable (mg/L)		<0.025	<0.025	<0.025	<0.025	<0.025
	Boron (B)-Leachable (mg/L)		4.41	4.03	4.17	4.22	4.40
	Cadmium (Cd)-Leachable (mg/L)		0.452	0.216	0.261	0.220	0.251
	Calcium (Ca)-Leachable (mg/L)		2170	2030	2060	2020	2230
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.967	1.28	0.381	1.28	0.372
	Copper (Cu)-Leachable (mg/L)		0.165	0.610	1.19	0.902	0.541
	Iron (Fe)-Leachable (mg/L)		<5.0	<5.0	<5.0	<5.0	<5.0
	Lead (Pb)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Magnesium (Mg)-Leachable (mg/L)		136	127	128	132	132
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.57	0.50	0.48	0.49	0.40
	Selenium (Se)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag)-Leachable (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Thallium (Tl)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Vanadium (V)-Leachable (mg/L)		<0.15	<0.15	0.15	<0.15	<0.15
	Zinc (Zn)-Leachable (mg/L)		34.3	27.7	29.9	29.8	24.8

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L2246123-11 soil 13-MAR-19 09:00 BA1911-A-11	L2246123-12 soil 13-MAR-19 09:00 BA1911-A-12		
Grouping	Analyte				
<b>SOIL</b>					
<b>TCLP Metals</b>	1st Preliminary pH (pH)	11.60	11.65		
	2nd Preliminary pH (pH)	8.39	8.98		
	Final pH (pH)	6.22	6.27		
	Extraction Solution Initial pH (pH)	2.88	2.88		
	Antimony (Sb)-Leachable (mg/L)	<1.0	<1.0		
	Arsenic (As)-Leachable (mg/L)	<1.0	<1.0		
	Barium (Ba)-Leachable (mg/L)	<2.5	<2.5		
	Beryllium (Be)-Leachable (mg/L)	<0.025	<0.025		
	Boron (B)-Leachable (mg/L)	4.25	4.56		
	Cadmium (Cd)-Leachable (mg/L)	0.274	0.370		
	Calcium (Ca)-Leachable (mg/L)	2070	2020		
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25		
	Cobalt (Co)-Leachable (mg/L)	0.372	0.597		
	Copper (Cu)-Leachable (mg/L)	0.555	0.720		
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0		
	Lead (Pb)-Leachable (mg/L)	<0.25	<0.25		
	Magnesium (Mg)-Leachable (mg/L)	131	127		
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010		
	Nickel (Ni)-Leachable (mg/L)	0.46	0.64		
	Selenium (Se)-Leachable (mg/L)	<1.0	<1.0		
	Silver (Ag)-Leachable (mg/L)	<0.050	<0.050		
	Thallium (Tl)-Leachable (mg/L)	<1.0	<1.0		
	Vanadium (V)-Leachable (mg/L)	<0.15	<0.15		
	Zinc (Zn)-Leachable (mg/L)	33.6	39.0		

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.



## Reference Information

### QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Calcium (Ca)-Leachable	B	L2246123-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Magnesium (Mg)-Leachable	B	L2246123-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cadmium (Cd)	DUP-H,J	L2246123-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cadmium (Cd)-Leachable	MS-B	L2246123-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Leachable	MS-B	L2246123-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Leachable	MS-B	L2246123-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Leachable	MS-B	L2246123-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9

### Qualifiers for Individual Parameters Listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DUP-H,J	Duplicate results outside ALS DQO, due to sample heterogeneity. Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>AG-200.2-A-CCMS-VA</b>	Soil	Elevated Ag in Soil by CRC ICPMS	EPA 200.2/6020A
		Soil/sediment is dried, disaggregated, and sieved (2 mm). Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.	
<b>HG-200.2-CVAF-VA</b>	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (mod)
		Soil samples are digested with hot nitric and hydrochloric acids, followed by CVAAS analysis. This method is fully compliant with the BC SALM strong acid leachable metals digestion method.	
<b>HG-TCLP-CVAFS-VA</b>	Soil	Mercury by CVAAS (TCLP)	EPA 1311/245.7
		This analysis is carried out in accordance with the extraction procedure outlined in "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods Volume 1C" SW-846 EPA Method 1311, published by the United States Environmental Protection Agency (EPA). In summary, the sample is extracted at a 20:1 liquid to solids ratio for 16 to 20 hours using either extraction fluid #1 (glacial acetic acid, water and sodium hydroxide) or extraction fluid #2 (glacial acetic acid), depending on the pH of the original sample. The extract is then filtered through a 0.6 to 0.8 micron glass fibre filter and analysed using atomic absorption spectrophotometry (EPA 245.7).	
<b>MET-200.2-CCMS-VA</b>	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)
		Soil/sediment is dried, disaggregated, and sieved (2 mm). Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.	
		Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, Tl, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H <sub>2</sub> S) may be excluded if lost during sampling, storage, or digestion.	
<b>MET-TCLP-CCMS-VA</b>	Soil	Metals by ICPMS (TCLP)	EPA 1311/6020A
		This analysis is carried out in accordance with the extraction procedure outlined in "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods Volume 1C" SW-846 EPA Method 1311, published by the United States Environmental Protection Agency (EPA). In summary, the sample is extracted at a 20:1 liquid to solids ratio for 16 to 20 hours using either extraction fluid #1 (glacial acetic acid, water and sodium hydroxide) or extraction fluid #2 (glacial acetic acid), depending on the pH of the original sample. The extract is then filtered through a 0.6 to 0.8 micron glass fibre filter. Instrumental analysis of the digested extract is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).	
<b>MOISTURE-VA</b>	Soil	Moisture content	CCME PHC in Soil - Tier 1 (mod)
		This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of two hours.	
<b>PH-1:2-VA</b>	Soil	pH in Soil (1:2 Soil:Water Extraction)	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL
		This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. 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. The pH of the solution is then measured using a standard pH probe.	

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

## Reference Information

### Chain of Custody Numbers:

---

#### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour 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.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg wwt* - milligrams per kilogram based on wet weight of sample.

*mg/kg lwt* - milligrams per kilogram based on lipid-adjusted weight of sample.

*mg/L* - milligrams per litre.

*<* - Less than.

*D.L.* - The reported Detection Limit, also known as the Limit of Reporting (LOR).

*N/A* - Result not available. Refer to qualifier code and definition for explanation.

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

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



L2246123-COFC

COC # \_\_\_\_\_

Page \_\_\_\_ of \_\_\_\_

<b>Report To</b>		<b>Rep</b>		<b>Service Requested</b> (Rush for routine analysis subject to availability)					
Company: Covanta Energy		<input type="checkbox"/> Standard <input type="checkbox"/> Other		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		Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT					
Address: 5150 Riverbend Drive		Email 1: smckinney@covanta.com		Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT					
Burnaby BC		Email 2: rjohnson4@covanta.com		Same Day or Weekend Emergency - Contact ALS to Confirm TAT					
Phone: 604-521-1025		Email 3: dskrypnik@covanta.com		<b>Analysis Request</b>					
Fax: <input type="checkbox"/> Yes <input type="checkbox"/> No		brent.kirkpatrick@metrovancover.org							
		Sarah.Wellman@metrovancover.org							

<b>Invoice To</b> Same as Report ?		<b>Client / Project Information</b>				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:											

Lab Work Order # (lab use only)	ALS Contact:	Sampler:													Number of Containers
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)							
BA1911-A-1		13-Mar-19	9:00	Soil	X	X		X							1
BA1911-A-2		13-Mar-19	9:00	Soil	X	X		X							1
BA1911-A-3		13-Mar-19	9:00	Soil	X	X		X							1
BA1911-A-4		13-Mar-19	9:00	Soil	X	X		X							1
BA1911-A-5		13-Mar-19	9:00	Soil	X	X		X							1
BA1911-A-6		13-Mar-19	9:00	Soil	X	X		X							1
BA1911-A-7		13-Mar-19	9:00	Soil	X	X		X							1
BA1911-A-8		13-Mar-19	9:00	Soil	X	X		X							1
BA1911-A-9		13-Mar-19	9:00	Soil	X	X		X							1
BA1911-A-10		13-Mar-19	9:00	Soil	X	X		X							1
BA1911-A-11		13-Mar-19	9:00	Soil	X	X		X							1
BA1911-A-12		13-Mar-19	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-mmm-yy): 19-Mar-19	Time (hh-mm): 0730	Received by: HA	Date: 3/19	Time: 11:58am	Temperature: 22°C	Verified by:	Date:	Time:	Observations:
										Yes / No ?
										If Yes add SIF