

## Bottom Ash Data

2019 Week 18

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The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on May 15, 2019. The data represents bottom ash composite results for week 18 of 2019 (April 28, 2019 to May 4, 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.



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Date Received: 07-MAY-19  
Report Date: 14-MAY-19 15:48 (MT)  
Version: FINAL

Client Phone: 604-521-1025

## Certificate of Analysis

Lab Work Order #: L2268780  
Project P.O. #: VANCO-0000048466  
Job Reference:  
C of C Numbers:  
Legal Site Desc:

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Brent Mack, B.Sc.  
Account Manager

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## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L2268780-1 Soil 01-MAY-19 09:00 BA1918-A-1	L2268780-2 Soil 01-MAY-19 09:00 BA1918-A-2	L2268780-3 Soil 01-MAY-19 09:00 BA1918-A-3	L2268780-4 Soil 01-MAY-19 09:00 BA1918-A-4	L2268780-5 Soil 01-MAY-19 09:00 BA1918-A-5	
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	17.3	17.1	16.7	16.5	17.7
	pH (1:2 soil:water) (pH)	11.39	11.50	11.38	11.43	11.35
<b>Metals</b>	Aluminum (Al) (mg/kg)	35000	42100	31400	30500	32300
	Antimony (Sb) (mg/kg)	134	181	131	136	136
	Arsenic (As) (mg/kg)	37.1	42.7	33.6	32.1	34.2
	Barium (Ba) (mg/kg)	575	497	582	592	550
	Beryllium (Be) (mg/kg)	0.37	0.40	0.38	0.57	0.43
	Bismuth (Bi) (mg/kg)	6.34	7.06	4.83	19.6	6.25
	Boron (B) (mg/kg)	242	267	236	213	260
	Cadmium (Cd) (mg/kg)	9.93	16.7	15.2	17.1	77.9
	Calcium (Ca) (mg/kg)	125000	133000	129000	130000	137000
	Chromium (Cr) (mg/kg)	139	177	163	176	177
	Cobalt (Co) (mg/kg)	25.8	42.0	30.7	78.5	45.4
	Copper (Cu) (mg/kg)	20100	3600	5640	9870	4170
	Iron (Fe) (mg/kg)	64700	60800	69900	63400	58600
	Lead (Pb) (mg/kg)	1140	2550	472	477	733
	Lithium (Li) (mg/kg)	14.5	18.3	15.8	24.9	17.2
	Magnesium (Mg) (mg/kg)	10300	10900	11000	11100	10900
	Manganese (Mn) (mg/kg)	785	942	1010	833	886
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	29.5	45.1	40.3	37.3	42.1
	Nickel (Ni) (mg/kg)	241	291	123	194	149
	Phosphorus (P) (mg/kg)	9960	10400	13200	9550	10600
	Potassium (K) (mg/kg)	4860	5070	4620	5130	5310
	Selenium (Se) (mg/kg)	0.35	0.32	0.57	1.35	0.37
	Silver (Ag) (mg/kg)	12.7	5.03	4.23	4.32	5.58
	Sodium (Na) (mg/kg)	13000	13800	13000	13800	12600
	Strontium (Sr) (mg/kg)	275	315	321	297	442
	Sulfur (S) (mg/kg)	10800	12200	13100	12300	12800
	Thallium (Tl) (mg/kg)	0.063	0.068	0.068	0.095	0.075
	Tin (Sn) (mg/kg)	413	353	98.4	129	108
	Titanium (Ti) (mg/kg)	808	472	566	670	376
	Tungsten (W) (mg/kg)	6.20	5.76	7.04	12.3	8.36
	Uranium (U) (mg/kg)	4.62	5.09	4.94	5.23	5.43
	Vanadium (V) (mg/kg)	51.9	55.4	54.6	60.8	58.6
	Zinc (Zn) (mg/kg)	11000	5470	7220	19600	4700
	Zirconium (Zr) (mg/kg)	1.3	1.7	1.2	1.0	<1.0

\* 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	L2268780-6 Soil 01-MAY-19 09:00 BA1918-A-6	L2268780-7 Soil 01-MAY-19 09:00 BA1918-A-7	L2268780-8 Soil 01-MAY-19 09:00 BA1918-A-8	L2268780-9 Soil 01-MAY-19 09:00 BA1918-A-9	L2268780-10 Soil 01-MAY-19 09:00 BA1918-A-10	
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	17.4	16.9	17.1	17.6	17.7
	pH (1:2 soil:water) (pH)	11.43	11.57	11.40	11.43	11.96
<b>Metals</b>	Aluminum (Al) (mg/kg)	44900	34200	38400	36000	32300
	Antimony (Sb) (mg/kg)	154	133	191	144	143
	Arsenic (As) (mg/kg)	32.6	28.9	95.6	32.6	32.9
	Barium (Ba) (mg/kg)	655	578	597	562	707
	Beryllium (Be) (mg/kg)	0.39	0.39	0.39	0.39	0.44
	Bismuth (Bi) (mg/kg)	6.63	19.3	6.07	6.76	59.3
	Boron (B) (mg/kg)	257	230	233	282	242
	Cadmium (Cd) (mg/kg)	11.8	11.3	13.0	13.0	12.6
	Calcium (Ca) (mg/kg)	133000	128000	132000	130000	136000
	Chromium (Cr) (mg/kg)	197	151	723	282	428
	Cobalt (Co) (mg/kg)	98.2	48.6	67.2	46.9	41.4
	Copper (Cu) (mg/kg)	37500	7160	5850	16700	25100
	Iron (Fe) (mg/kg)	48900	57800	71300	78200	60000
	Lead (Pb) (mg/kg)	1330	808	651	423	1490
	Lithium (Li) (mg/kg)	22.5	20.3	18.9	17.0	19.1
	Magnesium (Mg) (mg/kg)	10700	11500	11000	10200	11300
	Manganese (Mn) (mg/kg)	919	755	4340	914	845
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	38.5	36.8	46.2	44.1	49.6
	Nickel (Ni) (mg/kg)	321	169	135	156	295
	Phosphorus (P) (mg/kg)	10900	9280	10300	10100	10600
	Potassium (K) (mg/kg)	4970	5170	4660	5300	4620
	Selenium (Se) (mg/kg)	0.35	0.35	0.38	0.37	0.40
	Silver (Ag) (mg/kg)	5.79	9.30	5.20	9.12	7.66
	Sodium (Na) (mg/kg)	13600	13100	13300	13300	13300
	Strontium (Sr) (mg/kg)	312	308	323	328	332
	Sulfur (S) (mg/kg)	11100	11600	12300	12500	11300
	Thallium (Tl) (mg/kg)	0.069	0.070	0.069	0.071	0.075
	Tin (Sn) (mg/kg)	1850	211	367	124	265
	Titanium (Ti) (mg/kg)	617	609	697	621	1270
	Tungsten (W) (mg/kg)	7.01	9.22	9.40	38.0	13.1
	Uranium (U) (mg/kg)	5.01	5.30	5.52	5.84	5.60
	Vanadium (V) (mg/kg)	59.6	60.2	56.1	58.0	55.4
	Zinc (Zn) (mg/kg)	4120	5300	4980	5540	12000
	Zirconium (Zr) (mg/kg)	1.3	1.1	1.5	1.5	2.0

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2268780-11	L2268780-12		
		Description	Soil	Soil		
		Sampled Date	01-MAY-19	01-MAY-19		
		Sampled Time	09:00	09:00		
		Client ID	BA1918-A-11	BA1918-A-12		
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	16.5	17.0			
	pH (1:2 soil:water) (pH)	11.97	11.87			
<b>Metals</b>	Aluminum (Al) (mg/kg)	40300	38800			
	Antimony (Sb) (mg/kg)	136	133			
	Arsenic (As) (mg/kg)	32.7	34.9			
	Barium (Ba) (mg/kg)	721	644			
	Beryllium (Be) (mg/kg)	0.39	0.43			
	Bismuth (Bi) (mg/kg)	4.58	5.20			
	Boron (B) (mg/kg)	250	213			
	Cadmium (Cd) (mg/kg)	11.0	497			
	Calcium (Ca) (mg/kg)	134000	133000			
	Chromium (Cr) (mg/kg)	609	190			
	Cobalt (Co) (mg/kg)	52.5	143			
	Copper (Cu) (mg/kg)	2760	4020			
	Iron (Fe) (mg/kg)	81700	57200			
	Lead (Pb) (mg/kg)	359	1500			
	Lithium (Li) (mg/kg)	19.8	17.1			
	Magnesium (Mg) (mg/kg)	10900	10600			
	Manganese (Mn) (mg/kg)	848	821			
	Mercury (Hg) (mg/kg)	<0.050	<0.050			
	Molybdenum (Mo) (mg/kg)	35.5	83.3			
	Nickel (Ni) (mg/kg)	318	205			
	Phosphorus (P) (mg/kg)	9950	9870			
	Potassium (K) (mg/kg)	4750	4570			
	Selenium (Se) (mg/kg)	0.39	0.35			
	Silver (Ag) (mg/kg)	3.94	7.74			
	Sodium (Na) (mg/kg)	13700	15200			
	Strontium (Sr) (mg/kg)	883	347			
	Sulfur (S) (mg/kg)	10900	12000			
	Thallium (Tl) (mg/kg)	0.065	0.063			
	Tin (Sn) (mg/kg)	98.2	112			
	Titanium (Ti) (mg/kg)	1670	1060			
	Tungsten (W) (mg/kg)	8.13	13.5			
	Uranium (U) (mg/kg)	5.13	5.40			
Vanadium (V) (mg/kg)	56.8	58.3				
Zinc (Zn) (mg/kg)	4070	3840				
Zirconium (Zr) (mg/kg)	3.5	1.7				

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2268780-1	L2268780-2	L2268780-3	L2268780-4	L2268780-5
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	01-MAY-19	01-MAY-19	01-MAY-19	01-MAY-19	01-MAY-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1918-A-1	BA1918-A-2	BA1918-A-3	BA1918-A-4	BA1918-A-5
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.47	11.61	11.59	11.61	11.56
	2nd Preliminary pH (pH)		8.36	7.84	8.90	8.40	8.58
	Final pH (pH)		6.21	7.07	6.19	6.99	6.66
	Extraction Solution Initial pH (pH)		2.86	2.86	2.86	2.86	2.86
	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)		2.89	2.81	2.68	2.47	2.45
	Cadmium (Cd)-Leachable (mg/L)		0.162	0.134	0.350	0.151	0.149
	Calcium (Ca)-Leachable (mg/L)		2010	1910	2040	1910	1690
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.568	0.759	0.763	1.64	0.496
	Copper (Cu)-Leachable (mg/L)		0.884	0.622	0.873	0.639	0.600
	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)		133	129	145	126	117
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.52	0.58	0.48	0.45	0.41
	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)		43.2	25.0	37.8	25.9	24.8

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2268780-6	L2268780-7	L2268780-8	L2268780-9	L2268780-10
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	01-MAY-19	01-MAY-19	01-MAY-19	01-MAY-19	01-MAY-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1918-A-6	BA1918-A-7	BA1918-A-8	BA1918-A-9	BA1918-A-10
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.60	11.51	11.57	11.63	11.54
	2nd Preliminary pH (pH)		8.26	8.18	8.38	8.77	8.00
	Final pH (pH)		6.59	6.43	6.15	6.47	6.46
	Extraction Solution Initial pH (pH)		2.86	2.86	2.86	2.86	2.86
	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)		2.71	2.70	2.70	2.43	2.61
	Cadmium (Cd)-Leachable (mg/L)		0.252	0.238	0.235	0.160	0.145
	Calcium (Ca)-Leachable (mg/L)		1980	1900	2110	1800	1930
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.692	0.483	0.580	0.899	0.541
	Copper (Cu)-Leachable (mg/L)		0.725	0.694	0.945	0.650	0.559
	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)		126	120	133	116	121
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.83	0.48	0.49	0.46	0.36
	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)		24.0	41.3	41.2	51.0	25.2

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2268780-11	L2268780-12			
		Description	Soil	Soil			
		Sampled Date	01-MAY-19	01-MAY-19			
		Sampled Time	09:00	09:00			
		Client ID	BA1918-A-11	BA1918-A-12			
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)	11.63	11.57				
	2nd Preliminary pH (pH)	8.54	8.23				
	Final pH (pH)	6.07	6.70				
	Extraction Solution Initial pH (pH)	2.86	2.86				
	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)	2.83	2.58				
	Cadmium (Cd)-Leachable (mg/L)	0.859	0.153				
	Calcium (Ca)-Leachable (mg/L)	2010	1850				
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25				
	Cobalt (Co)-Leachable (mg/L)	0.501	0.464				
	Copper (Cu)-Leachable (mg/L)	1.00	0.459				
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0				
	Lead (Pb)-Leachable (mg/L)	<0.25	<0.25				
	Magnesium (Mg)-Leachable (mg/L)	130	121				
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010				
	Nickel (Ni)-Leachable (mg/L)	0.47	0.38				
	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)	39.5	28.4				

\* 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)
Duplicate	Bismuth (Bi)	DUP-H	L2268780-10, -11, -12
Duplicate	Chromium (Cr)	DUP-H	L2268780-10, -11, -12
Duplicate	Cobalt (Co)	DUP-H	L2268780-10, -11, -12
Duplicate	Copper (Cu)	DUP-H	L2268780-10, -11, -12
Duplicate	Lead (Pb)	DUP-H	L2268780-10, -11, -12
Duplicate	Molybdenum (Mo)	DUP-H	L2268780-10, -11, -12
Duplicate	Nickel (Ni)	DUP-H	L2268780-10, -11, -12
Duplicate	Silver (Ag)	DUP-H	L2268780-10, -11, -12
Duplicate	Tin (Sn)	DUP-H	L2268780-10, -11, -12
Duplicate	Tungsten (W)	DUP-H	L2268780-10, -11, -12
Duplicate	Zinc (Zn)	DUP-H	L2268780-10, -11, -12
Laboratory Control Sample	Antimony (Sb)	MES	L2268780-10, -11, -12
Matrix Spike	Calcium (Ca)-Leachable	MS-B	L2268780-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Leachable	MS-B	L2268780-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Leachable	MS-B	L2268780-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9

### Qualifiers for Individual Parameters Listed:

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

## Reference Information

(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

### 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.*



Cl



L2268780-COFC

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

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

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

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Analysis Request				Number of Containers
					ALS Contact:	Sampler:	MET-TCLP-VA (all metals, Hg)	MOISTURE	
BA1918-A-1		01-May-19	9:00	Soil	X	X		X	1
BA1918-A-2		01-May-19	9:00	Soil	X	X		X	1
BA1918-A-3		01-May-19	9:00	Soil	X	X		X	1
BA1918-A-4		01-May-19	9:00	Soil	X	X		X	1
BA1918-A-5		01-May-19	9:00	Soil	X	X		X	1
BA1918-A-6		01-May-19	9:00	Soil	X	X		X	1
BA1918-A-7		01-May-19	9:00	Soil	X	X		X	1
BA1918-A-8		01-May-19	9:00	Soil	X	X		X	1
BA1918-A-9		01-May-19	9:00	Soil	X	X		X	1
BA1918-A-10		01-May-19	9:00	Soil	X	X		X	1
BA1918-A-11		01-May-19	9:00	Soil	X	X		X	1
BA1918-A-12		01-May-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)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:
[Signature]	7-May-19	07:00	HA	5/7	11:30	23 °C				Yes / No ? If Yes add SIF