

## Bottom Ash Data

2019 Week 25

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The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on July 2, 2019. The data represents bottom ash composite results for week 25 of 2019 (June 16, 2019 to June 22, 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: 26-JUN-19  
Report Date: 28-JUN-19 17:55 (MT)  
Version: FINAL

Client Phone: 604-521-1025

## Certificate of Analysis

Lab Work Order #: L2299139  
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		L2299139-1 Soil 19-JUN-19 09:00 BA1925-A-1	L2299139-2 Soil 19-JUN-19 09:00 BA1925-A-2	L2299139-3 Soil 19-JUN-19 09:00 BA1925-A-3	L2299139-4 Soil 19-JUN-19 09:00 BA1925-A-4	L2299139-5 Soil 19-JUN-19 09:00 BA1925-A-5
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	18.5	18.0	18.6	18.3	18.0
	pH (1:2 soil:water) (pH)	11.42	11.42	11.35	11.33	11.60
<b>Metals</b>	Aluminum (Al) (mg/kg)	34400	42200	38600	29800	35600
	Antimony (Sb) (mg/kg)	176	273	188	237	172
	Arsenic (As) (mg/kg)	49.4	47.2	75.9	63.1	47.6
	Barium (Ba) (mg/kg)	627	618	555	514	608
	Beryllium (Be) (mg/kg)	0.37	0.40	0.47	0.39	0.39
	Bismuth (Bi) (mg/kg)	13.2	8.64	7.64	9.14	8.48
	Boron (B) (mg/kg)	303	257	274	206	261
	Cadmium (Cd) (mg/kg)	17.5	16.8	16.0	17.5	20.1
	Calcium (Ca) (mg/kg)	141000	130000	127000	129000	139000
	Chromium (Cr) (mg/kg)	183	242	223	313	203
	Cobalt (Co) (mg/kg)	36.5	87.7	156	314	30.6
	Copper (Cu) (mg/kg)	7090	17700	6770	2250	2930
	Iron (Fe) (mg/kg)	60300	61300	51500	82700	70500
	Lead (Pb) (mg/kg)	485	2730	598	4430	599
	Lithium (Li) (mg/kg)	17.4	16.5	18.7	24.9	19.1
	Magnesium (Mg) (mg/kg)	11400	10900	10500	9920	11900
	Manganese (Mn) (mg/kg)	869	897	1250	984	793
	Mercury (Hg) (mg/kg)	0.053	0.056	<0.050	0.054	<0.050
	Molybdenum (Mo) (mg/kg)	67.3	51.1	62.8	138	57.3
	Nickel (Ni) (mg/kg)	441	131	248	290	112
	Phosphorus (P) (mg/kg)	11200	10300	10700	10300	12800
	Potassium (K) (mg/kg)	6470	6770	6970	6120	6920
	Selenium (Se) (mg/kg)	0.52	0.61	0.42	0.43	0.44
	Silver (Ag) (mg/kg)	4.57	6.35	4.71	5.17	4.52
	Sodium (Na) (mg/kg)	14700	14200	14600	13100	15400
	Strontium (Sr) (mg/kg)	335	319	299	299	327
	Sulfur (S) (mg/kg)	14800	14100	12900	13600	14800
Thallium (Tl) (mg/kg)	0.057	0.060	0.056	0.068	0.064	
Tin (Sn) (mg/kg)	120	354	176	4300	140	
Titanium (Ti) (mg/kg)	746	840	522	523	587	
Tungsten (W) (mg/kg)	6.62	28.9	7.35	6.96	7.61	
Uranium (U) (mg/kg)	6.25	5.85	5.77	6.06	6.36	
Vanadium (V) (mg/kg)	52.4	49.1	47.8	50.4	53.0	
Zinc (Zn) (mg/kg)	4940	4840	5970	4510	4870	
Zirconium (Zr) (mg/kg)	1.2	1.3	1.4	1.2	1.3	

\* 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	L2299139-6 Soil 19-JUN-19 09:00 BA1925-A-6	L2299139-7 Soil 19-JUN-19 09:00 BA1925-A-7	L2299139-8 Soil 19-JUN-19 09:00 BA1925-A-8	L2299139-9 Soil 19-JUN-19 09:00 BA1925-A-9	L2299139-10 Soil 19-JUN-19 09:00 BA1925-A-10	
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	17.6	18.6	18.4	17.8	18.4
	pH (1:2 soil:water) (pH)	11.41	11.45	11.47	11.48	11.31
<b>Metals</b>	Aluminum (Al) (mg/kg)	36100	36500	31600	33200	34200
	Antimony (Sb) (mg/kg)	169	157	157	148	143
	Arsenic (As) (mg/kg)	44.1	43.8	42.2	42.0	40.3
	Barium (Ba) (mg/kg)	669	636	515	540	499
	Beryllium (Be) (mg/kg)	0.38	0.40	0.33	0.37	0.37
	Bismuth (Bi) (mg/kg)	9.44	10.3	8.69	8.79	7.93
	Boron (B) (mg/kg)	384	231	257	309	291
	Cadmium (Cd) (mg/kg)	15.7	15.6	16.1	15.4	14.8
	Calcium (Ca) (mg/kg)	147000	142000	133000	132000	128000
	Chromium (Cr) (mg/kg)	223	150	156	173	195
	Cobalt (Co) (mg/kg)	18.7	26.8	42.8	23.1	69.4
	Copper (Cu) (mg/kg)	2100	2420	1940	3260	2340
	Iron (Fe) (mg/kg)	66700	64400	58200	63700	57300
	Lead (Pb) (mg/kg)	588	406	388	970	841
	Lithium (Li) (mg/kg)	17.2	16.7	16.4	20.5	51.7
	Magnesium (Mg) (mg/kg)	11700	12200	12500	9400	11400
	Manganese (Mn) (mg/kg)	821	899	832	814	945
	Mercury (Hg) (mg/kg)	<0.050	<0.050	0.070	<0.050	0.052
	Molybdenum (Mo) (mg/kg)	67.5	71.4	53.8	374	56.1
	Nickel (Ni) (mg/kg)	150	88.3	193	105	482
	Phosphorus (P) (mg/kg)	11500	9500	10800	9600	9750
	Potassium (K) (mg/kg)	6520	6270	5830	6070	6250
	Selenium (Se) (mg/kg)	0.38	0.41	0.48	0.74	0.39
	Silver (Ag) (mg/kg)	9.37	3.72	3.78	3.31	7.27
	Sodium (Na) (mg/kg)	16100	14400	13900	14100	14000
	Strontium (Sr) (mg/kg)	350	520	311	326	302
	Sulfur (S) (mg/kg)	13500	12900	13000	12900	13300
	Thallium (Tl) (mg/kg)	<0.050	0.060	0.063	<0.050	0.053
	Tin (Sn) (mg/kg)	118	164	103	181	169
	Titanium (Ti) (mg/kg)	694	859	364	452	464
	Tungsten (W) (mg/kg)	15.8	4.05	4.05	4.16	4.63
	Uranium (U) (mg/kg)	6.05	5.71	5.78	5.77	5.60
	Vanadium (V) (mg/kg)	51.0	48.1	47.0	46.5	47.5
	Zinc (Zn) (mg/kg)	4240	4140	5550	4090	4500
	Zirconium (Zr) (mg/kg)	1.4	1.3	1.1	1.3	1.4

\* 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	L2299139-11 Soil 19-JUN-19 09:00 BA1925-A-11	L2299139-12 Soil 19-JUN-19 09:00 BA1925-A-12		
Grouping	Analyte				
<b>SOIL</b>					
<b>Physical Tests</b>	Moisture (%)	18.8	18.9		
	pH (1:2 soil:water) (pH)	11.48	11.32		
<b>Metals</b>	Aluminum (Al) (mg/kg)	27700	36300		
	Antimony (Sb) (mg/kg)	156	152		
	Arsenic (As) (mg/kg)	40.5	39.0		
	Barium (Ba) (mg/kg)	524	653		
	Beryllium (Be) (mg/kg)	0.37	0.37		
	Bismuth (Bi) (mg/kg)	7.22	7.82		
	Boron (B) (mg/kg)	286	300		
	Cadmium (Cd) (mg/kg)	23.4	15.5		
	Calcium (Ca) (mg/kg)	128000	138000		
	Chromium (Cr) (mg/kg)	183	182		
	Cobalt (Co) (mg/kg)	24.1	52.7		
	Copper (Cu) (mg/kg)	7310	1270		
	Iron (Fe) (mg/kg)	55400	47400		
	Lead (Pb) (mg/kg)	1120	495		
	Lithium (Li) (mg/kg)	16.1	16.4		
	Magnesium (Mg) (mg/kg)	10100	11800		
	Manganese (Mn) (mg/kg)	916	733		
	Mercury (Hg) (mg/kg)	<0.050	<0.050		
	Molybdenum (Mo) (mg/kg)	44.5	3660		
	Nickel (Ni) (mg/kg)	300	296		
	Phosphorus (P) (mg/kg)	10900	10200		
	Potassium (K) (mg/kg)	6370	6250		
	Selenium (Se) (mg/kg)	0.43	0.34		
	Silver (Ag) (mg/kg)	4.35	3.26		
	Sodium (Na) (mg/kg)	14700	14300		
	Strontium (Sr) (mg/kg)	325	324		
	Sulfur (S) (mg/kg)	13100	11900		
	Thallium (Tl) (mg/kg)	0.051	0.056		
	Tin (Sn) (mg/kg)	148	93.1		
	Titanium (Ti) (mg/kg)	328	940		
	Tungsten (W) (mg/kg)	13.3	10.3		
	Uranium (U) (mg/kg)	5.97	5.24		
	Vanadium (V) (mg/kg)	45.7	45.7		
	Zinc (Zn) (mg/kg)	5140	4290		
	Zirconium (Zr) (mg/kg)	1.2	1.8		

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2299139-1	L2299139-2	L2299139-3	L2299139-4	L2299139-5
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	19-JUN-19	19-JUN-19	19-JUN-19	19-JUN-19	19-JUN-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1925-A-1	BA1925-A-2	BA1925-A-3	BA1925-A-4	BA1925-A-5
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.62	11.60	11.60	11.66	11.70
	2nd Preliminary pH (pH)		9.78	9.87	9.73	9.88	10.01
	Final pH (pH)		6.23	6.03	6.01	6.02	6.32
	Extraction Solution Initial pH (pH)		2.87	2.87	2.87	2.87	2.87
	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)		3.80	2.96	2.86	2.84	3.24
	Cadmium (Cd)-Leachable (mg/L)		0.358	0.260	0.261	0.275	0.262
	Calcium (Ca)-Leachable (mg/L)		2010	2120	2120	2080	2210
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.338	0.518	0.295	0.648	0.760
	Copper (Cu)-Leachable (mg/L)		0.641	1.07	1.46	0.781	0.711
	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)		122	135	138	137	142
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.68	0.51	0.49	0.54	0.50
	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)		45.7	70.3	43.3	68.8	32.6

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2299139-6	L2299139-7	L2299139-8	L2299139-9	L2299139-10
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	19-JUN-19	19-JUN-19	19-JUN-19	19-JUN-19	19-JUN-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1925-A-6	BA1925-A-7	BA1925-A-8	BA1925-A-9	BA1925-A-10
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.68	11.67	11.65	11.67	11.64
	2nd Preliminary pH (pH)		10.05	10.02	9.94	9.99	9.84
	Final pH (pH)		6.04	6.12	6.04	6.26	6.28
	Extraction Solution Initial pH (pH)		2.87	2.87	2.87	2.87	2.87
	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)		3.48	2.81	2.81	2.97	2.91
	Cadmium (Cd)-Leachable (mg/L)		0.260	0.435	0.278	0.362	0.797
	Calcium (Ca)-Leachable (mg/L)		2100	2090	2050	2040	2140
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.505	0.414	0.387	0.788	0.378
	Copper (Cu)-Leachable (mg/L)		1.02	1.29	1.05	0.833	0.989
	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)		135	140	134	142	135
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.57	0.47	0.50	0.46	0.59
	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)		57.1	38.2	40.7	36.5	33.4

\* 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	L2299139-11 Soil 19-JUN-19 09:00 BA1925-A-11	L2299139-12 Soil 19-JUN-19 09:00 BA1925-A-12		
Grouping	Analyte				
<b>SOIL</b>					
<b>TCLP Metals</b>	1st Preliminary pH (pH)	11.68	11.64		
	2nd Preliminary pH (pH)	9.92	9.88		
	Final pH (pH)	6.25	6.10		
	Extraction Solution Initial pH (pH)	2.87	2.87		
	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)	3.12	2.90		
	Cadmium (Cd)-Leachable (mg/L)	0.248	0.265		
	Calcium (Ca)-Leachable (mg/L)	2190	2090		
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25		
	Cobalt (Co)-Leachable (mg/L)	0.500	1.17		
	Copper (Cu)-Leachable (mg/L)	0.877	1.24		
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0		
	Lead (Pb)-Leachable (mg/L)	<0.25	<0.25		
	Magnesium (Mg)-Leachable (mg/L)	138	131		
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010		
	Nickel (Ni)-Leachable (mg/L)	0.47	0.60		
	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)	35.5	66.7		

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



## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Antimony (Sb)	DUP-H	L2299139-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Bismuth (Bi)	DUP-H	L2299139-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cobalt (Co)	DUP-H	L2299139-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Copper (Cu)	DUP-H	L2299139-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Nickel (Ni)	DUP-H	L2299139-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tin (Sn)	DUP-H	L2299139-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Titanium (Ti)	DUP-H	L2299139-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tungsten (W)	DUP-H	L2299139-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cadmium (Cd)-Leachable	MS-B	L2299139-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Leachable	MS-B	L2299139-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Leachable	MS-B	L2299139-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Leachable	MS-B	L2299139-1, -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.
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>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:

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#### 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.



L2299139-COFC

of Custody / Analytical Request Form  
 Canada Toll Free: 1 800 668 9878  
 www.alsglobal.com

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

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

**Report To**

Company: Covanta Energy  
 Contact: Steve McKinney / Dan Skrypnik  
 Address: 5150 Riverbend Drive  
 Burnaby BC  
 Phone: 604-521-1025 Fax: \_\_\_\_\_  
 Yes  No

**Format / Distribution**

Other  
 PDF  Excel  Digital  Fax  
 Email 1: smckinney@covanta.com  
 Email 2: rjohnson4@covanta.com  
 Email 3: dskrypnik@covanta.com  
 Email 4: brent.kirkpatrick@metrovancover.org  
 Email 5: Sarah.Weilman@metrovancover.org

**Service Requested** (Rush for routine analysis subject to availability)

Regular (Standard Turnaround Times - Business Days)  
 Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT  
 Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT  
 Same Day or Weekend Emergency - Contact ALS to Confirm TAT

**Analysis Request**

Invoice To Same as Report?  Yes  No  
 Hardcopy of Invoice with Report?  Yes  No  
 Company: \_\_\_\_\_  
 Contact: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

**Client / Project Information**  
 Job #: \_\_\_\_\_  
 PO / AFE: PO# 46693 Weekly Bottom Ash - Suite  
 LSD: (includes 2:1 pH)  
 Quote #: \_\_\_\_\_

Please indicate below Filtered, Preserved or both (F, P, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	Analysis Request					Number of Containers
					MET-TCLP-VA (all metals, Hg)	MOISTURE	Chrome 6	MET-CSR+FULL-VA (all metals)		
BA1925-A-1		19-Jun-19	9:00	Soil	X	X		X		1
BA1925-A-2		19-Jun-19	9:00	Soil	X	X		X		1
BA1925-A-3		19-Jun-19	9:00	Soil	X	X		X		1
BA1925-A-4		19-Jun-19	9:00	Soil	X	X		X		1
BA1925-A-5		19-Jun-19	9:00	Soil	X	X		X		1
BA1925-A-6		19-Jun-19	9:00	Soil	X	X		X		1
BA1925-A-7		19-Jun-19	9:00	Soil	X	X		X		1
BA1925-A-8		19-Jun-19	9:00	Soil	X	X		X		1
BA1925-A-9		19-Jun-19	9:00	Soil	X	X		X		1
BA1925-A-10		19-Jun-19	9:00	Soil	X	X		X		1
BA1925-A-11		19-Jun-19	9:00	Soil	X	X		X		1
BA1925-A-12		19-Jun-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-mm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:
	25-Jun-19	0800	JC	JUN 26 2019	11:45Am	23.22°C				Yes / No ? If Yes add SIF