

Bottom Ash Data

2018 Week 1

The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on January 17, 2018. The data represents bottom ash composite results for week 1 of 2018 (December 31, 2017 to January 6, 2018).

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: 10-JAN-18
Report Date: 17-JAN-18 13:41 (MT)
Version: FINAL

Client Phone: 604-521-1025

Certificate of Analysis

Lab Work Order #: L2043415
Project P.O. #: VANCO-0000040506
Job Reference:
C of C Numbers:
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L2043415-1 Soil 03-JAN-18 09:00 BA1801-A-1	L2043415-2 Soil 03-JAN-18 09:00 BA1801-A-2	L2043415-3 Soil 03-JAN-18 09:00 BA1801-A-3	L2043415-4 Soil 03-JAN-18 09:00 BA1801-A-4	L2043415-5 Soil 03-JAN-18 09:00 BA1801-A-5	
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	22.8	21.9	22.3	23.9	22.9
	pH (1:2 soil:water) (pH)	10.80	10.65	10.60	10.73	10.78
Metals	Aluminum (Al) (mg/kg)	41900	33200	36200	37000	40400
	Antimony (Sb) (mg/kg)	187	212	177	195	191
	Arsenic (As) (mg/kg)	35.9	28.9	28.5	30.5	25.5
	Barium (Ba) (mg/kg)	566	597	525	539	587
	Beryllium (Be) (mg/kg)	0.42	0.50	0.46	0.45	0.44
	Bismuth (Bi) (mg/kg)	6.98	6.21	5.20	6.01	7.02
	Boron (B) (mg/kg)	208	183	243	272	215
	Cadmium (Cd) (mg/kg)	14.8	14.1	13.4	72.7	15.3
	Calcium (Ca) (mg/kg)	148000	145000	142000	138000	147000
	Chromium (Cr) (mg/kg)	192	148	158	148	153
	Cobalt (Co) (mg/kg)	81.6	19.8	40.1	77.6	174
	Copper (Cu) (mg/kg)	3630	4840	2250	2980	3690
	Iron (Fe) (mg/kg)	59600	70600	56200	69100	62300
	Lead (Pb) (mg/kg)	438	1170	620	520	545
	Lithium (Li) (mg/kg)	19.5	18.2	19.7	32.2	22.5
	Magnesium (Mg) (mg/kg)	12300	10700	11600	9920	10900
	Manganese (Mn) (mg/kg)	745	1100	665	860	779
	Mercury (Hg) (mg/kg)	0.093	0.083	0.091	0.096	0.110
	Molybdenum (Mo) (mg/kg)	22.1	25.4	21.9	28.8	20.8
	Nickel (Ni) (mg/kg)	715	202	172	215	148
	Phosphorus (P) (mg/kg)	15900	15000	15200	16000	15900
	Potassium (K) (mg/kg)	6740	7040	6720	6620	6180
	Selenium (Se) (mg/kg)	0.55	0.50	0.43	0.52	0.40
	Silver (Ag) (mg/kg)	9.95	10.5	5.22	6.12	12.7
	Sodium (Na) (mg/kg)	17400	16900	17100	16100	17000
	Strontium (Sr) (mg/kg)	349	336	333	333	335
	Sulfur (S) (mg/kg)	16100	14400	12900	15100	14300
	Thallium (Tl) (mg/kg)	0.118	0.094	0.088	0.097	0.094
	Tin (Sn) (mg/kg)	300	199	136	242	192
	Titanium (Ti) (mg/kg)	756	685	396	509	626
	Tungsten (W) (mg/kg)	16.8	6.15	6.11	6.19	9.78
	Uranium (U) (mg/kg)	6.81	7.41	6.74	7.48	6.65
	Vanadium (V) (mg/kg)	58.3	52.2	51.5	53.7	50.4
	Zinc (Zn) (mg/kg)	4390	4990	3620	5320	5270
	Zirconium (Zr) (mg/kg)	2.0	1.2	2.3	2.0	1.7

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2043415-6	L2043415-7	L2043415-8	L2043415-9	L2043415-10
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	03-JAN-18	03-JAN-18	03-JAN-18	03-JAN-18	03-JAN-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1801-A-6	BA1801-A-7	BA1801-A-8	BA1801-A-9	BA1801-A-10
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)		22.8	21.8	22.7	22.1	22.2
	pH (1:2 soil:water) (pH)		10.78	10.65	10.67	10.59	10.59
Metals	Aluminum (Al) (mg/kg)		34600	35900	42400	35500	46000
	Antimony (Sb) (mg/kg)		200	304	215	202	197
	Arsenic (As) (mg/kg)		26.5	28.2	59.1	27.5	31.7
	Barium (Ba) (mg/kg)		615	608	638	542	503
	Beryllium (Be) (mg/kg)		0.44	0.44	0.47	0.40	0.45
	Bismuth (Bi) (mg/kg)		6.16	6.55	6.41	6.65	10.3
	Boron (B) (mg/kg)		230	317	266	207	183
	Cadmium (Cd) (mg/kg)		18.3	14.4	17.1	81.1	16.6
	Calcium (Ca) (mg/kg)		137000	136000	152000	138000	144000
	Chromium (Cr) (mg/kg)		152	150	140	135	163
	Cobalt (Co) (mg/kg)		16.3	29.3	81.1	34.5	40.7
	Copper (Cu) (mg/kg)		1320	2630	8190	3810	20200
	Iron (Fe) (mg/kg)		57600	96000	56700	68200	61400
	Lead (Pb) (mg/kg)		480	3170	1770	645	1830
	Lithium (Li) (mg/kg)		18.5	20.6	99.3	17.6	23.6
	Magnesium (Mg) (mg/kg)		10200	10700	10900	9930	10400
	Manganese (Mn) (mg/kg)		1110	926	688	1240	820
	Mercury (Hg) (mg/kg)		0.082	0.104	0.092	0.317	0.111
	Molybdenum (Mo) (mg/kg)		19.9	19.8	19.7	19.0	24.7
	Nickel (Ni) (mg/kg)		86.7	91.6	119	110	96.2
	Phosphorus (P) (mg/kg)		15400	13100	17500	14900	16100
	Potassium (K) (mg/kg)		6420	6430	7360	6590	6820
	Selenium (Se) (mg/kg)		0.46	0.52	0.49	0.52	0.47
	Silver (Ag) (mg/kg)		5.83	7.72	7.21	8.33	19.6
	Sodium (Na) (mg/kg)		17200	16600	18500	16700	16900
	Strontium (Sr) (mg/kg)		328	363	328	345	340
	Sulfur (S) (mg/kg)		13100	13900	14500	15700	15400
Thallium (Tl) (mg/kg)		0.083	0.092	0.098	0.100	0.105	
Tin (Sn) (mg/kg)		149	147	704	250	182	
Titanium (Ti) (mg/kg)		455	807	607	642	653	
Tungsten (W) (mg/kg)		8.95	10.3	6.42	6.17	7.38	
Uranium (U) (mg/kg)		7.21	6.49	7.78	7.31	8.26	
Vanadium (V) (mg/kg)		52.0	47.6	53.6	49.8	56.4	
Zinc (Zn) (mg/kg)		4230	3990	3960	5030	3840	
Zirconium (Zr) (mg/kg)		1.4	1.5	1.6	1.5	3.3	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2043415-11	L2043415-12		
		Description	Soil	Soil		
		Sampled Date	03-JAN-18	03-JAN-18		
		Sampled Time	09:00	09:00		
		Client ID	BA1801-A-11	BA1801-A-12		
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	22.3	22.1			
	pH (1:2 soil:water) (pH)	10.62	10.57			
Metals	Aluminum (Al) (mg/kg)	44000	41400			
	Antimony (Sb) (mg/kg)	176	180			
	Arsenic (As) (mg/kg)	32.1	27.7			
	Barium (Ba) (mg/kg)	562	608			
	Beryllium (Be) (mg/kg)	0.49	0.41			
	Bismuth (Bi) (mg/kg)	5.66	5.81			
	Boron (B) (mg/kg)	178	254			
	Cadmium (Cd) (mg/kg)	14.1	16.0			
	Calcium (Ca) (mg/kg)	148000	140000			
	Chromium (Cr) (mg/kg)	193	145			
	Cobalt (Co) (mg/kg)	605	32.2			
	Copper (Cu) (mg/kg)	1790	2650			
	Iron (Fe) (mg/kg)	51200	72200			
	Lead (Pb) (mg/kg)	516	437			
	Lithium (Li) (mg/kg)	85.6	16.7			
	Magnesium (Mg) (mg/kg)	9340	9480			
	Manganese (Mn) (mg/kg)	683	800			
	Mercury (Hg) (mg/kg)	0.124	0.089			
	Molybdenum (Mo) (mg/kg)	20.2	20.6			
	Nickel (Ni) (mg/kg)	190	96.9			
	Phosphorus (P) (mg/kg)	16300	15500			
	Potassium (K) (mg/kg)	6600	6500			
	Selenium (Se) (mg/kg)	0.51	0.51			
	Silver (Ag) (mg/kg)	5.74	5.85			
	Sodium (Na) (mg/kg)	17100	17300			
	Strontium (Sr) (mg/kg)	326	314			
	Sulfur (S) (mg/kg)	13800	13800			
	Thallium (Tl) (mg/kg)	0.091	0.094			
	Tin (Sn) (mg/kg)	142	135			
	Titanium (Ti) (mg/kg)	703	760			
	Tungsten (W) (mg/kg)	5.55	12.5			
	Uranium (U) (mg/kg)	7.57	7.11			
Vanadium (V) (mg/kg)	58.6	51.8				
Zinc (Zn) (mg/kg)	3660	7230				
Zirconium (Zr) (mg/kg)	2.1	2.0				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2043415-1	L2043415-2	L2043415-3	L2043415-4	L2043415-5
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	03-JAN-18	03-JAN-18	03-JAN-18	03-JAN-18	03-JAN-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1801-A-1	BA1801-A-2	BA1801-A-3	BA1801-A-4	BA1801-A-5
Grouping	Analyte						
SOIL							
Speciated Metals	Hexavalent Chromium (mg/kg)		0.30				
TCLP Metals	1st Preliminary pH (pH)		11.43	11.27	11.46	11.41	11.51
	2nd Preliminary pH (pH)		8.64	8.50	8.85	9.01	8.92
	Final pH (pH)		6.25	6.09	6.02	5.98	6.07
	Extraction Solution Initial pH (pH)		2.91	2.91	2.91	2.91	2.91
	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)		2.24	2.15	2.17	2.14	2.19
	Cadmium (Cd)-Leachable (mg/L)		0.186	0.215	0.251	0.178	0.170
	Calcium (Ca)-Leachable (mg/L)		2120	2010	2010	1980	1970
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.921	0.550	0.391	0.355	1.38
	Copper (Cu)-Leachable (mg/L)		0.664	1.25	1.52	1.08	1.53
	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)		116	111	110	113	111
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.78	0.49	0.48	0.43	0.48
	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)		41.9	46.9	35.3	39.0	34.3

* 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	L2043415-6	L2043415-7	L2043415-8	L2043415-9	L2043415-10
					Soil	Soil	Soil	Soil	Soil
		03-JAN-18	09:00	BA1801-A-6	03-JAN-18	09:00	03-JAN-18	09:00	03-JAN-18
					BA1801-A-6	BA1801-A-7	BA1801-A-8	BA1801-A-9	BA1801-A-10
Grouping	Analyte								
SOIL									
Speciated Metals	Hexavalent Chromium (mg/kg)								
TCLP Metals	1st Preliminary pH (pH)	11.42	11.46	11.42	11.52	11.50			
	2nd Preliminary pH (pH)	8.85	9.07	9.03	8.92	8.78			
	Final pH (pH)	6.34	6.00	6.04	6.28	6.39			
	Extraction Solution Initial pH (pH)	2.91	2.91	2.91	2.91	2.91			
	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)	2.28	2.19	2.22	2.43	3.18			
	Cadmium (Cd)-Leachable (mg/L)	0.223	0.205	0.205	0.172	0.259			
	Calcium (Ca)-Leachable (mg/L)	2060	1970	2090	2010	2010			
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25	<0.25	<0.25	<0.25			
	Cobalt (Co)-Leachable (mg/L)	0.530	0.330	0.469	0.513	0.594			
	Copper (Cu)-Leachable (mg/L)	0.894	1.79	1.30	1.11	1.26			
	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)	118	108	114	119	135			
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010			
	Nickel (Ni)-Leachable (mg/L)	0.47	0.43	0.39	0.45	0.42			
	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)	29.1	41.8	34.4	33.0	36.9			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2043415-11	L2043415-12		
		Description	Soil	Soil		
		Sampled Date	03-JAN-18	03-JAN-18		
		Sampled Time	09:00	09:00		
		Client ID	BA1801-A-11	BA1801-A-12		
Grouping	Analyte					
SOIL						
Speciated Metals	Hexavalent Chromium (mg/kg)					
TCLP Metals	1st Preliminary pH (pH)	11.52	11.46			
	2nd Preliminary pH (pH)	9.11	9.02			
	Final pH (pH)	6.23	6.09			
	Extraction Solution Initial pH (pH)	2.91	2.91			
	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)	2.61	2.57			
	Cadmium (Cd)-Leachable (mg/L)	0.190	0.231			
	Calcium (Ca)-Leachable (mg/L)	2080	2000			
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25			
	Cobalt (Co)-Leachable (mg/L)	0.499	1.48			
	Copper (Cu)-Leachable (mg/L)	1.73	1.05			
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0			
	Lead (Pb)-Leachable (mg/L)	<0.25	<0.25			
	Magnesium (Mg)-Leachable (mg/L)	112	113			
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010			
	Nickel (Ni)-Leachable (mg/L)	0.48	0.45			
	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)	58.0	72.6			

* 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	Copper (Cu)	DUP-H	L2043415-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Manganese (Mn)	DUP-H	L2043415-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Molybdenum (Mo)	DUP-H	L2043415-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Nickel (Ni)	DUP-H	L2043415-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Zinc (Zn)	DUP-H	L2043415-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Leachable	MS-B	L2043415-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Leachable	MS-B	L2043415-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Leachable	MS-B	L2043415-1, -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**
AG-200.2-A-CCMS-VA	Soil	Elevated Ag in Soil by CRC ICPMS	EPA 200.2/6020A
This method uses a heated strong acid digestion with HNO ₃ and HCl and 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. Analysis is by Collision/Reaction Cell ICPMS.			
CR-CR6-3060-ED	Soil	Chromium, Hexavalent (Cr +6)	APHA 3500-CR C, EPA 3060A ALKALINE
Field moist samples are digested with a sodium hydroxide/sodium carbonate solution. After cooling and filtration, the rinsate is adjusted to pH 9, and injected on an ion chromatograph to separate the hexavalent chromium ion. A post column color reaction with diphenylcarbohydrazide and absorbance measurement at 530 nm completes the quantitation.			
HG-200.2-CVAF-VA	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.			
HG-TCLP-CVAFS-VA	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).			
MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)
This method uses a heated strong acid digestion with HNO ₃ and HCl and 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.			
MET-TCLP-ICP-VA	Soil	Metals by ICPOES (TCLP)	EPA 1311/6010B
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 inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MOISTURE-VA	Soil	Moisture content	CWS for PHC in Soil - Tier 1
This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.			
PH-1:2-VA	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
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Reference Information

ED ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
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.



L2043415-COFC

Chain 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 Skrypyk
 Address: 5150 Riverbend Drive
 Burnaby BC
 Phone: 604-521-1025 Fax: Yes No

Report Format / Distribution

Standard Other
 PDF Excel Digital Fax
 Email 1: smckinney@covanta.com
 Email 2: rjohnson4@covanta.com
 Email 3: dskrypyk@covanta.com
 brent.kirkpatrick@metrovancover.org
 Sarah.Wellman@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 ?

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-mmm-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)	
BA1801-A-1		03-Jan-18	9:00	Soil	X	X	X	X	1
BA1801-A-2		03-Jan-18	9:00	Soil	X	X		X	1
BA1801-A-3		03-Jan-18	9:00	Soil	X	X		X	1
BA1801-A-4		03-Jan-18	9:00	Soil	X	X		X	1
BA1801-A-5		03-Jan-18	9:00	Soil	X	X		X	1
BA1801-A-6		03-Jan-18	9:00	Soil	X	X		X	1
BA1801-A-7		03-Jan-18	9:00	Soil	X	X		X	1
BA1801-A-8		03-Jan-18	9:00	Soil	X	X		X	1
BA1801-A-9		03-Jan-18	9:00	Soil	X	X		X	1
BA1801-A-10		03-Jan-18	9:00	Soil	X	X		X	1
BA1801-A-11		03-Jan-18	9:00	Soil	X	X		X	1
BA1801-A-12		03-Jan-18	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): 10-Jan-18	Time (hh-mm): 08:00	Received by: JK	Date: JAN 10 2018	Time: 12 pm	Temperature: 19.3°C	Verified by:	Date:	Time:	Observations: Yes / No ?
										If Yes add SIF