

Bottom Ash Data

2018 Week 52

The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on January 10, 2019. The data represents bottom ash composite results for week 52 of 2018 (December 23, 2018 to December 29, 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: 02-JAN-19
Report Date: 09-JAN-19 11:07 (MT)
Version: FINAL

Client Phone: 604-521-1025

Certificate of Analysis

Lab Work Order #: L2215557
Project P.O. #: VANCO-0000047506
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	L2215557-1 Soil 26-DEC-18 09:00 BA1852-A-1	L2215557-2 Soil 26-DEC-18 09:00 BA1852-A-2	L2215557-3 Soil 26-DEC-18 09:00 BA1852-A-3	L2215557-4 Soil 26-DEC-18 09:00 BA1852-A-4	L2215557-5 Soil 26-DEC-18 09:00 BA1852-A-5
Grouping	Analyte				
SOIL					
Physical Tests	Moisture (%)	22.2	21.7	24.9	23.1
	pH (1:2 soil:water) (pH)	12.39	12.37	12.20	12.16
Metals	Aluminum (Al) (mg/kg)	51300	45200	29800	44000
	Antimony (Sb) (mg/kg)	229	151	131	139
	Arsenic (As) (mg/kg)	25.4	20.9	19.5	22.7
	Barium (Ba) (mg/kg)	592	629	604	636
	Beryllium (Be) (mg/kg)	0.42	0.36	0.44	0.44
	Bismuth (Bi) (mg/kg)	9.89	6.75	7.71	7.75
	Boron (B) (mg/kg)	193	166	302	203
	Cadmium (Cd) (mg/kg)	14.7	10.6	12.3	12.5
	Calcium (Ca) (mg/kg)	144000	150000	132000	141000
	Chromium (Cr) (mg/kg)	129	146	106	133
	Cobalt (Co) (mg/kg)	56.5	57.1	36.0	39.5
	Copper (Cu) (mg/kg)	6890	1640	1780	1820
	Iron (Fe) (mg/kg)	39500	41000	60200	48500
	Lead (Pb) (mg/kg)	622	498	540	486
	Lithium (Li) (mg/kg)	16.8	25.3	22.2	17.7
	Magnesium (Mg) (mg/kg)	11500	11000	10400	12300
	Manganese (Mn) (mg/kg)	762	689	687	716
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	25.2	32.8	20.7	33.8
	Nickel (Ni) (mg/kg)	115	273	97.3	120
	Phosphorus (P) (mg/kg)	11500	12300	10500	12000
	Potassium (K) (mg/kg)	6250	5210	5440	6090
	Selenium (Se) (mg/kg)	0.40	0.90	0.42	0.45
	Silver (Ag) (mg/kg)	5.13	3.68	4.13	4.25
	Sodium (Na) (mg/kg)	15500	13800	14400	15700
	Strontium (Sr) (mg/kg)	395	311	327	435
	Sulfur (S) (mg/kg)	14200	12000	12100	12900
	Thallium (Tl) (mg/kg)	0.070	0.063	0.069	0.069
	Tin (Sn) (mg/kg)	225	132	119	135
	Titanium (Ti) (mg/kg)	1900	1620	1560	1690
	Tungsten (W) (mg/kg)	6.39	8.91	5.08	7.13
	Uranium (U) (mg/kg)	4.40	3.91	4.64	4.69
	Vanadium (V) (mg/kg)	41.4	41.7	38.9	45.3
	Zinc (Zn) (mg/kg)	4010	4510	3320	6460
	Zirconium (Zr) (mg/kg)	6.4	5.6	2.8	4.2

* 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	L2215557-6 Soil 26-DEC-18 09:00 BA1852-A-6	L2215557-7 Soil 26-DEC-18 09:00 BA1852-A-7	L2215557-8 Soil 26-DEC-18 09:00 BA1852-A-8	L2215557-9 Soil 26-DEC-18 09:00 BA1852-A-9	L2215557-10 Soil 26-DEC-18 09:00 BA1852-A-10	
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	24.2	22.8	24.2	24.0	23.3
	pH (1:2 soil:water) (pH)	12.21	12.26	12.19	12.33	12.24
Metals	Aluminum (Al) (mg/kg)	39100	33500	34100	41200	34200
	Antimony (Sb) (mg/kg)	137	149	126	165	152
	Arsenic (As) (mg/kg)	22.3	24.4	21.7	34.1	23.6
	Barium (Ba) (mg/kg)	608	560	619	636	577
	Beryllium (Be) (mg/kg)	0.41	0.38	0.43	0.36	0.40
	Bismuth (Bi) (mg/kg)	9.15	8.44	13.0	8.09	235
	Boron (B) (mg/kg)	196	201	360	191	210
	Cadmium (Cd) (mg/kg)	10.8	13.6	17.3	11.0	14.5
	Calcium (Ca) (mg/kg)	147000	147000	135000	145000	149000
	Chromium (Cr) (mg/kg)	141	125	127	228	178
	Cobalt (Co) (mg/kg)	71.6	28.9	37.0	19.6	74.7
	Copper (Cu) (mg/kg)	16000	1560	3190	3000	2520
	Iron (Fe) (mg/kg)	52800	45900	55500	41200	66400
	Lead (Pb) (mg/kg)	1060	457	427	349	416
	Lithium (Li) (mg/kg)	17.6	16.1	21.3	17.6	21.3
	Magnesium (Mg) (mg/kg)	11100	11000	10200	9550	10700
	Manganese (Mn) (mg/kg)	974	616	820	727	739
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	22.2	21.7	21.8	31.9	40.2
	Nickel (Ni) (mg/kg)	102	118	125	128	887
	Phosphorus (P) (mg/kg)	13600	12800	13800	11900	13300
	Potassium (K) (mg/kg)	5630	5940	5850	6130	6230
	Selenium (Se) (mg/kg)	0.38	0.45	0.41	0.57	0.47
	Silver (Ag) (mg/kg)	4.40	4.45	5.80	7.51	6.87
	Sodium (Na) (mg/kg)	15100	16000	16000	14300	16100
	Strontium (Sr) (mg/kg)	318	355	300	340	343
	Sulfur (S) (mg/kg)	12600	14700	11800	12700	14400
	Thallium (Tl) (mg/kg)	0.072	0.054	0.062	0.061	0.066
	Tin (Sn) (mg/kg)	133	184	168	161	182
	Titanium (Ti) (mg/kg)	1180	1250	1300	1660	1460
	Tungsten (W) (mg/kg)	4.68	8.45	4.74	9.11	8.31
	Uranium (U) (mg/kg)	4.73	3.74	4.47	3.68	4.42
	Vanadium (V) (mg/kg)	44.8	38.0	40.1	45.7	41.6
	Zinc (Zn) (mg/kg)	3300	3230	3660	3310	3600
	Zirconium (Zr) (mg/kg)	2.1	2.2	5.9	7.9	3.3

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2215557-11	L2215557-12		
		Description	Soil	Soil		
		Sampled Date	26-DEC-18	26-DEC-18		
		Sampled Time	09:00	09:00		
		Client ID	BA1852-A-11	BA1852-A-12		
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	22.9	24.4			
	pH (1:2 soil:water) (pH)	12.34	12.34			
Metals	Aluminum (Al) (mg/kg)	29700	30900			
	Antimony (Sb) (mg/kg)	160	199			
	Arsenic (As) (mg/kg)	25.9	24.1			
	Barium (Ba) (mg/kg)	622	564			
	Beryllium (Be) (mg/kg)	1.30	0.38			
	Bismuth (Bi) (mg/kg)	7.56	9.01			
	Boron (B) (mg/kg)	230	238			
	Cadmium (Cd) (mg/kg)	11.5	12.3			
	Calcium (Ca) (mg/kg)	150000	142000			
	Chromium (Cr) (mg/kg)	230	146			
	Cobalt (Co) (mg/kg)	88.2	50.2			
	Copper (Cu) (mg/kg)	1750	8540			
	Iron (Fe) (mg/kg)	45100	50800			
	Lead (Pb) (mg/kg)	533	457			
	Lithium (Li) (mg/kg)	24.5	17.1			
	Magnesium (Mg) (mg/kg)	10900	11700			
	Manganese (Mn) (mg/kg)	728	664			
	Mercury (Hg) (mg/kg)	<0.050	<0.050			
	Molybdenum (Mo) (mg/kg)	40.4	21.8			
	Nickel (Ni) (mg/kg)	245	143			
	Phosphorus (P) (mg/kg)	10300	12500			
	Potassium (K) (mg/kg)	6310	5880			
	Selenium (Se) (mg/kg)	0.46	0.42			
	Silver (Ag) (mg/kg)	4.12	8.19			
	Sodium (Na) (mg/kg)	16300	15100			
	Strontium (Sr) (mg/kg)	483	372			
	Sulfur (S) (mg/kg)	13400	13100			
	Thallium (Tl) (mg/kg)	0.059	0.061			
	Tin (Sn) (mg/kg)	114	227			
	Titanium (Ti) (mg/kg)	1600	1310			
	Tungsten (W) (mg/kg)	8.29	6.82			
	Uranium (U) (mg/kg)	3.74	4.66			
Vanadium (V) (mg/kg)	41.7	40.3				
Zinc (Zn) (mg/kg)	6520	2970				
Zirconium (Zr) (mg/kg)	5.0	2.4				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2215557-1	L2215557-2	L2215557-3	L2215557-4	L2215557-5
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	26-DEC-18	26-DEC-18	26-DEC-18	26-DEC-18	26-DEC-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1852-A-1	BA1852-A-2	BA1852-A-3	BA1852-A-4	BA1852-A-5
Grouping	Analyte						
SOIL							
TCLP Metals	1st Preliminary pH (pH)		11.99	12.00	11.92	11.89	11.91
	2nd Preliminary pH (pH)		9.74	10.46	10.28	10.32	10.32
	Final pH (pH)		6.64	6.76	6.48	6.71	6.74
	Extraction Solution Initial pH (pH)		2.84	2.84	2.84	2.84	2.84
	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)		2.30	2.28	2.25	2.59	2.44
	Cadmium (Cd)-Leachable (mg/L)		0.116	0.107	0.140	0.179	0.153
	Calcium (Ca)-Leachable (mg/L)		2050	2090	2070	2100	2070
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.266	0.254	0.410	0.449	0.343
	Copper (Cu)-Leachable (mg/L)		1.03	1.06	1.09	1.08	0.719
	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	116	122	120	123
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.29	0.32	0.31	0.27	0.31
	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)		26.2	21.3	31.8	17.5	17.1

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2215557-6	L2215557-7	L2215557-8	L2215557-9	L2215557-10
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	26-DEC-18	26-DEC-18	26-DEC-18	26-DEC-18	26-DEC-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1852-A-6	BA1852-A-7	BA1852-A-8	BA1852-A-9	BA1852-A-10
Grouping	Analyte						
SOIL							
TCLP Metals	1st Preliminary pH (pH)		11.87	11.98	11.96	11.93	11.94
	2nd Preliminary pH (pH)		10.16	10.41	10.28	10.42	10.28
	Final pH (pH)		6.76	6.74	6.79	6.96	6.81
	Extraction Solution Initial pH (pH)		2.84	2.84	2.84	2.84	2.84
	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)		2.36	2.36	2.33	2.35	2.44
	Cadmium (Cd)-Leachable (mg/L)		0.217	0.119	0.258	0.248	0.129
	Calcium (Ca)-Leachable (mg/L)		2120	2140	2080	2130	2180
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.374	0.295	0.259	0.359	0.432
	Copper (Cu)-Leachable (mg/L)		0.733	0.871	0.832	0.680	0.846
	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)		123	114	118	115	119
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.35	0.30	<0.25	0.30	0.29
	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)		14.9	21.3	14.5	10.8	16.3

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2215557-11	L2215557-12		
		Description	Soil	Soil		
		Sampled Date	26-DEC-18	26-DEC-18		
		Sampled Time	09:00	09:00		
		Client ID	BA1852-A-11	BA1852-A-12		
Grouping	Analyte					
SOIL						
TCLP Metals	1st Preliminary pH (pH)	11.97	11.93			
	2nd Preliminary pH (pH)	10.27	10.41			
	Final pH (pH)	6.95	6.76			
	Extraction Solution Initial pH (pH)	2.84	2.84			
	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)	2.35	2.44			
	Cadmium (Cd)-Leachable (mg/L)	0.171	0.121			
	Calcium (Ca)-Leachable (mg/L)	2150	2210			
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25			
	Cobalt (Co)-Leachable (mg/L)	0.171	0.296			
	Copper (Cu)-Leachable (mg/L)	0.879	0.872			
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0			
	Lead (Pb)-Leachable (mg/L)	<0.25	<0.25			
	Magnesium (Mg)-Leachable (mg/L)	116	125			
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010			
	Nickel (Ni)-Leachable (mg/L)	<0.25	0.34			
	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)	16.7	14.1			

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

Reference Information

Qualifiers for Individual Samples Listed:

Sample Number	Client Sample ID	Qualifier	Description
L2215557-5	BA1852-A-5	L1S	Less than 1 gram of sieved soil or sediment was available for metals digestion. No significant impact on results is expected.

QC Samples with Qualifiers & Comments:

QC Type	Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate		Boron (B)	DUP-H	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate		Cobalt (Co)	DUP-H	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate		Copper (Cu)	DUP-H	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate		Lithium (Li)	DUP-H	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate		Manganese (Mn)	DUP-H	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate		Nickel (Ni)	DUP-H	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate		Phosphorus (P)	DUP-H	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate		Tungsten (W)	DUP-H	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate		Zinc (Zn)	DUP-H	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate		Zirconium (Zr)	DUP-H	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike		Calcium (Ca)-Leachable	MS-B	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike		Cobalt (Co)-Leachable	MS-B	L2215557-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike		Zinc (Zn)-Leachable	MS-B	L2215557-1, -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**
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)
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 ₂ S) may be excluded if lost during sampling, storage, or digestion.			
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	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.			
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.			

Reference Information

** 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.



L2215557-COFC

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

COC #

Page ___ of ___

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
Fax:	<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:		ALS Contact:	Sampler:		

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
BA1852-A-1		26-Dec-18	9:00	Soil	X	X		X	1
BA1852-A-2		26-Dec-18	9:00	Soil	X	X		X	1
BA1852-A-3		26-Dec-18	9:00	Soil	X	X		X	1
BA1852-A-4		26-Dec-18	9:00	Soil	X	X		X	1
BA1852-A-5		26-Dec-18	9:00	Soil	X	X		X	1
BA1852-A-6		26-Dec-18	9:00	Soil	X	X		X	1
BA1852-A-7		26-Dec-18	9:00	Soil	X	X		X	1
BA1852-A-8		26-Dec-18	9:00	Soil	X	X		X	1
BA1852-A-9		26-Dec-18	9:00	Soil	X	X		X	1
BA1852-A-10		26-Dec-18	9:00	Soil	X	X		X	1
BA1852-A-11		26-Dec-18	9:00	Soil	X	X		X	1
BA1852-A-12		26-Dec-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)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:
	2-Jan-19	08:00	A2 JC	JAN 2, 2019	10:52 AM	21.22 °C				Yes / No ? If Yes add SIF