

Bottom Ash Data

2018 Week 43

The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on November 8, 2018. The data represents bottom ash composite results for week 43 of 2018 (October 21, 2018 to October 27, 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: 31-OCT-18
Report Date: 06-NOV-18 16:44 (MT)
Version: FINAL

Client Phone: 604-521-1025

Certificate of Analysis

Lab Work Order #: L2190216
Project P.O. #: VANCO-0000047506
Job Reference: WEEKLY BOTTOM ASH - SUITE (INCLUDES 2:1
PH)
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	L2190216-1 SOIL 24-OCT-18 09:00 BA1843-A-1	L2190216-2 SOIL 24-OCT-18 09:00 BA1843-A-2	L2190216-3 SOIL 24-OCT-18 09:00 BA1843-A-3	L2190216-4 SOIL 24-OCT-18 09:00 BA1843-A-4	L2190216-5 SOIL 24-OCT-18 09:00 BA1843-A-5	
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	21.3	21.6	21.0	22.6	22.3
	pH (1:2 soil:water) (pH)	11.32	11.20	11.23	11.21	11.05
Metals	Aluminum (Al) (mg/kg)	34400	36500	31700	33400	44100
	Antimony (Sb) (mg/kg)	142	137	156	134	124
	Arsenic (As) (mg/kg)	26.4	21.6	26.3	25.5	21.0
	Barium (Ba) (mg/kg)	520	490	499	604	510
	Beryllium (Be) (mg/kg)	0.43	0.36	0.38	0.41	0.34
	Bismuth (Bi) (mg/kg)	11.1	9.77	12.9	34.6	11.8
	Boron (B) (mg/kg)	301	263	238	227	293
	Cadmium (Cd) (mg/kg)	16.3	12.4	12.1	12.3	13.6
	Calcium (Ca) (mg/kg)	133000	139000	136000	132000	130000
	Chromium (Cr) (mg/kg)	176	129	155	200	150
	Cobalt (Co) (mg/kg)	91.4	38.4	23.1	30.8	21.5
	Copper (Cu) (mg/kg)	1450	1360	11400	3430	1700
	Iron (Fe) (mg/kg)	49700	42000	53300	73000	53700
	Lead (Pb) (mg/kg)	433	344	408	570	471
	Lithium (Li) (mg/kg)	17.4	15.2	20.0	18.4	15.3
	Magnesium (Mg) (mg/kg)	11000	12800	10900	10600	9990
	Manganese (Mn) (mg/kg)	3410	816	706	4980	756
	Mercury (Hg) (mg/kg)	<0.050	0.053	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	24.9	23.4	29.0	24.8	29.7
	Nickel (Ni) (mg/kg)	187	90.4	144	1020	140
	Phosphorus (P) (mg/kg)	11300	11100	10900	11800	12800
	Potassium (K) (mg/kg)	6390	5920	6260	6670	6440
	Selenium (Se) (mg/kg)	0.39	0.42	0.36	0.45	0.40
	Silver (Ag) (mg/kg)	8.11	5.54	4.54	5.93	4.99
	Sodium (Na) (mg/kg)	16500	15200	15200	16400	15800
	Strontium (Sr) (mg/kg)	328	334	435	295	346
	Sulfur (S) (mg/kg)	14000	15600	13800	13200	13900
	Thallium (Tl) (mg/kg)	0.076	0.068	0.074	0.075	0.073
	Tin (Sn) (mg/kg)	150	115	212	170	143
	Titanium (Ti) (mg/kg)	810	1090	823	914	902
	Tungsten (W) (mg/kg)	6.01	7.85	7.78	7.51	9.32
	Uranium (U) (mg/kg)	4.89	4.74	4.66	4.89	4.71
	Vanadium (V) (mg/kg)	61.9	49.1	54.7	56.6	57.3
	Zinc (Zn) (mg/kg)	4440	3610	3910	4120	4800
	Zirconium (Zr) (mg/kg)	1.3	1.8	2.2	1.3	2.1

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2190216-6	L2190216-7	L2190216-8	L2190216-9	L2190216-10
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	24-OCT-18	24-OCT-18	24-OCT-18	24-OCT-18	24-OCT-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1843-A-6	BA1843-A-7	BA1843-A-8	BA1843-A-9	BA1843-A-10
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)		21.4	23.1	22.8	21.1	20.9
	pH (1:2 soil:water) (pH)		10.98	11.02	10.84	10.59	10.88
Metals	Aluminum (Al) (mg/kg)		32400	31700	35300	36200	38100
	Antimony (Sb) (mg/kg)		152	132	131	141	159
	Arsenic (As) (mg/kg)		30.2	25.4	26.6	27.0	27.2
	Barium (Ba) (mg/kg)		422	325	427	475	478
	Beryllium (Be) (mg/kg)		0.48	0.32	0.33	0.37	0.40
	Bismuth (Bi) (mg/kg)		14.4	21.1	13.2	11.8	14.3
	Boron (B) (mg/kg)		250	206	257	240	297
	Cadmium (Cd) (mg/kg)		13.1	21.2	16.3	13.9	18.4
	Calcium (Ca) (mg/kg)		127000	128000	129000	136000	140000
	Chromium (Cr) (mg/kg)		230	170	180	192	163
	Cobalt (Co) (mg/kg)		24.6	20.3	21.0	27.9	26.3
	Copper (Cu) (mg/kg)		4310	3570	2940	3240	3380
	Iron (Fe) (mg/kg)		50400	49600	44600	51900	54300
	Lead (Pb) (mg/kg)		926	516	474	457	1030
	Lithium (Li) (mg/kg)		17.9	15.7	16.2	23.7	17.4
	Magnesium (Mg) (mg/kg)		11200	10400	11600	11200	11700
	Manganese (Mn) (mg/kg)		851	693	695	815	681
	Mercury (Hg) (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)		28.5	25.7	25.6	33.7	37.8
	Nickel (Ni) (mg/kg)		164	146	220	169	308
	Phosphorus (P) (mg/kg)		11700	11800	11400	11800	11700
	Potassium (K) (mg/kg)		5770	6120	6230	6540	6260
	Selenium (Se) (mg/kg)		0.43	0.45	0.44	0.62	0.43
	Silver (Ag) (mg/kg)		4.57	5.27	14.4	4.52	5.61
	Sodium (Na) (mg/kg)		14300	15400	15700	15700	15700
	Strontium (Sr) (mg/kg)		324	334	325	312	337
	Sulfur (S) (mg/kg)		14700	14000	14200	15500	15400
Thallium (Tl) (mg/kg)		0.087	0.082	0.089	0.088	0.137	
Tin (Sn) (mg/kg)		138	238	163	146	495	
Titanium (Ti) (mg/kg)		628	337	811	742	800	
Tungsten (W) (mg/kg)		10.2	7.54	11.2	24.0	8.61	
Uranium (U) (mg/kg)		5.14	5.11	5.01	5.46	5.61	
Vanadium (V) (mg/kg)		55.7	53.1	63.4	56.8	56.4	
Zinc (Zn) (mg/kg)		4870	6010	6130	4380	4970	
Zirconium (Zr) (mg/kg)		2.0	2.1	1.8	1.3	1.7	

* 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	L2190216-11 SOIL 24-OCT-18 09:00 BA1843-A-11	L2190216-12 SOIL 24-OCT-18 09:00 BA1843-A-12		
Grouping	Analyte				
SOIL					
Physical Tests	Moisture (%)	21.8	22.3		
	pH (1:2 soil:water) (pH)	11.08	11.08		
Metals	Aluminum (Al) (mg/kg)	42900	38900		
	Antimony (Sb) (mg/kg)	142	148		
	Arsenic (As) (mg/kg)	25.6	32.6		
	Barium (Ba) (mg/kg)	471	553		
	Beryllium (Be) (mg/kg)	0.39	0.39		
	Bismuth (Bi) (mg/kg)	11.0	7.77		
	Boron (B) (mg/kg)	242	283		
	Cadmium (Cd) (mg/kg)	13.5	11.0		
	Calcium (Ca) (mg/kg)	140000	117000		
	Chromium (Cr) (mg/kg)	169	242		
	Cobalt (Co) (mg/kg)	22.7	70.7		
	Copper (Cu) (mg/kg)	7580	2920		
	Iron (Fe) (mg/kg)	48500	63200		
	Lead (Pb) (mg/kg)	497	4300		
	Lithium (Li) (mg/kg)	16.9	17.9		
	Magnesium (Mg) (mg/kg)	11000	10600		
	Manganese (Mn) (mg/kg)	732	881		
	Mercury (Hg) (mg/kg)	<0.050	<0.050		
	Molybdenum (Mo) (mg/kg)	43.1	32.8		
	Nickel (Ni) (mg/kg)	173	107		
	Phosphorus (P) (mg/kg)	12900	8280		
	Potassium (K) (mg/kg)	6820	5580		
	Selenium (Se) (mg/kg)	0.45	0.39		
	Silver (Ag) (mg/kg)	7.00	4.43		
	Sodium (Na) (mg/kg)	16200	15100		
	Strontium (Sr) (mg/kg)	337	332		
	Sulfur (S) (mg/kg)	15000	12300		
	Thallium (Tl) (mg/kg)	0.079	0.051		
	Tin (Sn) (mg/kg)	192	124		
	Titanium (Ti) (mg/kg)	774	1370		
	Tungsten (W) (mg/kg)	7.52	14.5		
	Uranium (U) (mg/kg)	5.33	3.71		
	Vanadium (V) (mg/kg)	57.3	48.9		
	Zinc (Zn) (mg/kg)	6130	4670		
	Zirconium (Zr) (mg/kg)	2.0	1.8		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2190216-1	L2190216-2	L2190216-3	L2190216-4	L2190216-5
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	24-OCT-18	24-OCT-18	24-OCT-18	24-OCT-18	24-OCT-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1843-A-1	BA1843-A-2	BA1843-A-3	BA1843-A-4	BA1843-A-5
Grouping	Analyte						
SOIL							
TCLP Metals	1st Preliminary pH (pH)		11.35	11.45	11.29	11.36	11.26
	2nd Preliminary pH (pH)		8.60	9.01	8.28	8.77	8.63
	Final pH (pH)		6.05	6.58	6.43	6.28	6.26
	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)		3.92	4.19	4.86	3.91	4.29
	Cadmium (Cd)-Leachable (mg/L)		0.167	0.173	0.478	0.173	0.198
	Calcium (Ca)-Leachable (mg/L)		2050	2060	2110	2100	2080
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.400	0.905	0.291	0.268	1.64
	Copper (Cu)-Leachable (mg/L)		0.239	1.32	0.669	0.824	0.875
	Iron (Fe)-Leachable (mg/L)		<5.0	<5.0	<5.0	<5.0	<5.0
	Lead (Pb)-Leachable (mg/L)		<0.25	<0.25	0.32	<0.25	0.63
	Magnesium (Mg)-Leachable (mg/L)		128	128	132	128	128
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.55	0.43	0.75	0.46	0.73
	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)		32.2	42.8	30.3	34.8	35.0

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2190216-6	L2190216-7	L2190216-8	L2190216-9	L2190216-10
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	24-OCT-18	24-OCT-18	24-OCT-18	24-OCT-18	24-OCT-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1843-A-6	BA1843-A-7	BA1843-A-8	BA1843-A-9	BA1843-A-10
Grouping	Analyte						
SOIL							
TCLP Metals	1st Preliminary pH (pH)		11.22	11.34	11.32	11.22	11.23
	2nd Preliminary pH (pH)		8.75	8.53	8.37	9.28	8.96
	Final pH (pH)		6.30	6.15	6.30	6.34	6.09
	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)		3.56	3.90	3.92	3.95	4.23
	Cadmium (Cd)-Leachable (mg/L)		0.196	0.197	0.269	0.190	0.179
	Calcium (Ca)-Leachable (mg/L)		2050	2050	2100	2030	2080
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.277	0.378	0.354	0.797	0.253
	Copper (Cu)-Leachable (mg/L)		0.533	1.50	1.23	1.03	1.16
	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	0.27
	Magnesium (Mg)-Leachable (mg/L)		130	124	134	135	133
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.88	0.46	0.47	0.45	0.46
	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)		34.0	32.0	30.7	47.1	39.2

* 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	L2190216-11 SOIL 24-OCT-18 09:00 BA1843-A-11	L2190216-12 SOIL 24-OCT-18 09:00 BA1843-A-12		
Grouping	Analyte				
SOIL					
TCLP Metals	1st Preliminary pH (pH)	11.38	11.40		
	2nd Preliminary pH (pH)	8.94	9.00		
	Final pH (pH)	6.19	6.05		
	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)	3.82	4.44		
	Cadmium (Cd)-Leachable (mg/L)	0.209	0.194		
	Calcium (Ca)-Leachable (mg/L)	2100	2050		
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25		
	Cobalt (Co)-Leachable (mg/L)	0.313	1.11		
	Copper (Cu)-Leachable (mg/L)	1.24	1.05		
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0		
	Lead (Pb)-Leachable (mg/L)	<0.25	0.33		
	Magnesium (Mg)-Leachable (mg/L)	130	129		
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010		
	Nickel (Ni)-Leachable (mg/L)	0.48	0.53		
	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)	33.7	39.7		

* 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	Boron (B)	DUP-H	L2190216-1, -11, -12, -2, -3, -4, -5
Duplicate	Chromium (Cr)	DUP-H	L2190216-10, -6, -7, -8, -9
Duplicate	Cobalt (Co)	DUP-H	L2190216-1, -11, -12, -2, -3, -4, -5
Duplicate	Cobalt (Co)	DUP-H	L2190216-10, -6, -7, -8, -9
Duplicate	Copper (Cu)	DUP-H	L2190216-1, -11, -12, -2, -3, -4, -5
Duplicate	Iron (Fe)	DUP-H	L2190216-10, -6, -7, -8, -9
Duplicate	Lead (Pb)	DUP-H	L2190216-1, -11, -12, -2, -3, -4, -5
Duplicate	Tin (Sn)	DUP-H	L2190216-1, -11, -12, -2, -3, -4, -5
Duplicate	Tin (Sn)	DUP-H	L2190216-10, -6, -7, -8, -9
Duplicate	Tungsten (W)	DUP-H	L2190216-1, -11, -12, -2, -3, -4, -5
Duplicate	Zinc (Zn)	DUP-H	L2190216-1, -11, -12, -2, -3, -4, -5
Matrix Spike	Calcium (Ca)-Leachable	MS-B	L2190216-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Leachable	MS-B	L2190216-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Leachable	MS-B	L2190216-1, -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	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
----------------------------	---------------------

Reference Information

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.



Cha



L2190216-COFC

COC #

Page ___ of ___

Report To			Report For			Requested (Rush for routine analysis subject to availability)					
Company:	Covanta Energy		<input type="checkbox"/> Standard	<input type="checkbox"/> Regular (Standard Turnaround Times - Business Days)							
Contact:	Steve McKinney / Dan Skrypyk		<input type="checkbox"/> PDF	<input type="checkbox"/> Excel	<input type="checkbox"/> Digital	<input type="checkbox"/> Fax	<input type="checkbox"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT				
Address:	5150 Riverbend Drive		Email 1:	smckinney@covanta.com		<input type="checkbox"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT					
	Burnaby BC		Email 2:	rjohnson4@covanta.com		<input type="checkbox"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT					
Phone:	604-521-1025	Fax:	Email 3:	dskrypyk@covanta.com		Analysis Request					
	<input type="checkbox"/> Yes	<input type="checkbox"/> No		brent.kirkpatrick@metrovancover.org							
				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 #:			<table border="1"> <tr> <td>MET-TCLP-VA (all metals, Hg)</td> <td>MOISTURE</td> <td>Chrome 6</td> <td>MET-CSR+FULL-VA (all metals)</td> <td rowspan="5">Number of Containers</td> </tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table>						MET-TCLP-VA (all metals, Hg)	MOISTURE	Chrome 6	MET-CSR+FULL-VA (all metals)	Number of Containers																
MET-TCLP-VA (all metals, Hg)	MOISTURE	Chrome 6	MET-CSR+FULL-VA (all metals)	Number of Containers																												
Company:			PO / AFE:	PO# 46693 Weekly Bottom Ash - Suite																												
Contact:			LSD:	(includes 2:1 pH)																												
Address:			Quote #:																													
Phone:		Fax:																														
Lab Work Order # (lab use only)			ALS Contact:	Sampler:																												

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	MET-TCLP-VA (all metals, Hg)	MOISTURE	Chrome 6	MET-CSR+FULL-VA (all metals)	Number of Containers
BA1843-A-1		24/10/2018	9:00	Soil	X	X		X	1
BA1843-A-2		24/10/2018	9:00	Soil	X	X		X	1
BA1843-A-3		24/10/2018	9:00	Soil	X	X		X	1
BA1843-A-4		24/10/2018	9:00	Soil	X	X		X	1
BA1843-A-5		24/10/2018	9:00	Soil	X	X		X	1
BA1843-A-6		24/10/2018	9:00	Soil	X	X		X	1
BA1843-A-7		24/10/2018	9:00	Soil	X	X		X	1
BA1843-A-8		24/10/2018	9:00	Soil	X	X		X	1
BA1843-A-9		24/10/2018	9:00	Soil	X	X		X	1
BA1843-A-10		24/10/2018	9:00	Soil	X	X		X	1
BA1843-A-11		24/10/2018	9:00	Soil	X	X		X	1
BA1843-A-12		24/10/2018	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:
<i>[Signature]</i>	31-Oct-18	08:00	LA	10/31	12:20p	20 °C				Yes / No ? If Yes add SIF