

Bottom Ash Data

2019 Week 35

The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on September 13, 2019. The data represents bottom ash composite results for week 35 of 2019 (August 25, 2019 to August 31, 2019).

The bottom ash meets the requirements of Metro Vancouver's Bottom Ash Management Plan and is suitable for disposal.



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Date Received: 03-SEP-19
Report Date: 11-SEP-19 13:37 (MT)
Version: FINAL

Client Phone: 604-521-1025

Certificate of Analysis

Lab Work Order #: L2340095
Project P.O. #: VANCO-0000048466
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	L2340095-1	L2340095-2	L2340095-3	L2340095-4	L2340095-5
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	28-AUG-19	28-AUG-19	28-AUG-19	28-AUG-19	28-AUG-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1935-A-1	BA1935-A-2	BA1935-A-3	BA1935-A-4	BA1935-A-5
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)		17.7	18.4	18.5	19.0	18.3
	pH (1:2 soil:water) (pH)		10.61	10.60	10.59	10.61	10.66
Metals	Aluminum (Al) (mg/kg)		62500	29900	28800	42400	29100
	Antimony (Sb) (mg/kg)		209	112	108	136	112
	Arsenic (As) (mg/kg)		66.2	37.2	41.2	53.5	38.5
	Barium (Ba) (mg/kg)		579	598	610	618	552
	Beryllium (Be) (mg/kg)		0.73	0.39	0.35	0.40	0.36
	Bismuth (Bi) (mg/kg)		15.3	29.9	4.93	5.63	4.89
	Boron (B) (mg/kg)		456	296	253	310	215
	Cadmium (Cd) (mg/kg)		20.1	10.5	9.72	13.4	10.7
	Calcium (Ca) (mg/kg)		224000	127000	125000	122000	117000
	Chromium (Cr) (mg/kg)		765	230	176	202	136
	Cobalt (Co) (mg/kg)		171	26.9	53.1	87.0	464
	Copper (Cu) (mg/kg)		6110	2220	1400	2610	2570
	Iron (Fe) (mg/kg)		117000	49600	58300	70100	61500
	Lead (Pb) (mg/kg)		6770	689	2650	453	1010
	Lithium (Li) (mg/kg)		44.9	15.9	28.3	21.9	40.5
	Magnesium (Mg) (mg/kg)		18200	10200	10600	10300	9520
	Manganese (Mn) (mg/kg)		2120	1130	725	1080	724
	Mercury (Hg) (mg/kg)		<0.050	0.295	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)		84.8	54.0	39.0	45.3	53.4
	Nickel (Ni) (mg/kg)		622	145	458	129	90.4
	Phosphorus (P) (mg/kg)		18900	9610	13500	11700	10200
	Potassium (K) (mg/kg)		9340	5500	5010	5770	5510
	Selenium (Se) (mg/kg)		0.56	0.33	0.32	0.34	0.29
	Silver (Ag) (mg/kg)		11.0	6.65	5.22	6.95	5.25
	Sodium (Na) (mg/kg)		24000	13900	12300	14300	14500
	Strontium (Sr) (mg/kg)		494	285	382	309	291
	Sulfur (S) (mg/kg)		16900	11800	10600	12800	10800
Thallium (Tl) (mg/kg)		0.105	0.051	<0.050	0.052	<0.050	
Tin (Sn) (mg/kg)		468	167	154	129	123	
Titanium (Ti) (mg/kg)		348	578	427	744	471	
Tungsten (W) (mg/kg)		29.0	20.9	51.8	24.4	21.2	
Uranium (U) (mg/kg)		9.89	5.46	5.21	5.74	5.27	
Vanadium (V) (mg/kg)		84.6	50.4	41.4	48.5	42.8	
Zinc (Zn) (mg/kg)		8610	4810	3630	4630	4790	
Zirconium (Zr) (mg/kg)		3.4	1.2	1.4	1.7	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		L2340095-6 Soil 28-AUG-19 09:00 BA1935-A-6	L2340095-7 Soil 28-AUG-19 09:00 BA1935-A-7	L2340095-8 Soil 28-AUG-19 09:00 BA1935-A-8	L2340095-9 Soil 28-AUG-19 09:00 BA1935-A-9	L2340095-10 Soil 28-AUG-19 09:00 BA1935-A-10
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	18.1	17.9	18.1	17.8	17.4
	pH (1:2 soil:water) (pH)	10.59	10.61	10.68	10.77	10.68
Metals	Aluminum (Al) (mg/kg)	30700	27500	26600	33600	28500
	Antimony (Sb) (mg/kg)	107	120	146	123	109
	Arsenic (As) (mg/kg)	30.4	37.5	37.0	42.6	38.9
	Barium (Ba) (mg/kg)	527	584	541	652	576
	Beryllium (Be) (mg/kg)	0.37	0.37	0.37	0.36	0.39
	Bismuth (Bi) (mg/kg)	4.74	16.5	5.34	6.53	10.6
	Boron (B) (mg/kg)	193	251	305	198	178
	Cadmium (Cd) (mg/kg)	9.60	73.1	12.0	9.81	10.1
	Calcium (Ca) (mg/kg)	119000	120000	128000	116000	129000
	Chromium (Cr) (mg/kg)	132	328	132	245	135
	Cobalt (Co) (mg/kg)	34.6	27.2	187	31.2	25.1
	Copper (Cu) (mg/kg)	2340	7310	1900	3340	1220
	Iron (Fe) (mg/kg)	56400	66000	48900	67800	53300
	Lead (Pb) (mg/kg)	627	5670	759	357	417
	Lithium (Li) (mg/kg)	15.9	16.2	18.8	25.5	15.9
	Magnesium (Mg) (mg/kg)	9520	9710	10100	11300	10100
	Manganese (Mn) (mg/kg)	687	783	3420	946	1770
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	37.5	38.8	37.3	223	33.8
	Nickel (Ni) (mg/kg)	111	900	103	404	150
	Phosphorus (P) (mg/kg)	10400	10400	10100	8290	11000
	Potassium (K) (mg/kg)	5020	4960	5260	5120	5190
	Selenium (Se) (mg/kg)	0.29	0.36	0.36	0.29	0.30
	Silver (Ag) (mg/kg)	6.31	12.8	6.29	22.4	6.02
	Sodium (Na) (mg/kg)	13300	13300	13300	12800	13300
	Strontium (Sr) (mg/kg)	320	293	306	344	288
Sulfur (S) (mg/kg)	10600	10200	11600	10000	11300	
Thallium (Tl) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	
Tin (Sn) (mg/kg)	90.8	97.3	95.0	328	94.8	
Titanium (Ti) (mg/kg)	367	333	455	684	380	
Tungsten (W) (mg/kg)	32.1	19.5	21.0	20.1	14.1	
Uranium (U) (mg/kg)	4.89	4.73	5.42	5.01	5.04	
Vanadium (V) (mg/kg)	56.0	41.0	45.1	48.8	45.5	
Zinc (Zn) (mg/kg)	3220	4760	6530	5240	3700	
Zirconium (Zr) (mg/kg)	1.7	1.4	1.1	1.4	1.1	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2340095-11	L2340095-12		
		Description	Soil	Soil		
		Sampled Date	28-AUG-19	28-AUG-19		
		Sampled Time	09:00	09:00		
		Client ID	BA1935-A-11	BA1935-A-12		
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	18.0	17.9			
	pH (1:2 soil:water) (pH)	10.53	10.65			
Metals	Aluminum (Al) (mg/kg)	26300	29500			
	Antimony (Sb) (mg/kg)	121	126			
	Arsenic (As) (mg/kg)	38.4	35.3			
	Barium (Ba) (mg/kg)	546	582			
	Beryllium (Be) (mg/kg)	0.35	0.41			
	Bismuth (Bi) (mg/kg)	6.16	12.2			
	Boron (B) (mg/kg)	190	241			
	Cadmium (Cd) (mg/kg)	2590	14.9			
	Calcium (Ca) (mg/kg)	125000	126000			
	Chromium (Cr) (mg/kg)	132	203			
	Cobalt (Co) (mg/kg)	196	27.8			
	Copper (Cu) (mg/kg)	1040	1920			
	Iron (Fe) (mg/kg)	40900	56300			
	Lead (Pb) (mg/kg)	353	554			
	Lithium (Li) (mg/kg)	38.3	21.4			
	Magnesium (Mg) (mg/kg)	10900	11400			
	Manganese (Mn) (mg/kg)	680	734			
	Mercury (Hg) (mg/kg)	<0.050	<0.050			
	Molybdenum (Mo) (mg/kg)	92.1	45.0			
	Nickel (Ni) (mg/kg)	120	163			
	Phosphorus (P) (mg/kg)	9810	10600			
	Potassium (K) (mg/kg)	5450	5530			
	Selenium (Se) (mg/kg)	0.42	0.33			
	Silver (Ag) (mg/kg)	5.45	5.51			
	Sodium (Na) (mg/kg)	13800	13700			
	Strontium (Sr) (mg/kg)	317	314			
	Sulfur (S) (mg/kg)	12700	12700			
	Thallium (Tl) (mg/kg)	<0.050	<0.050			
	Tin (Sn) (mg/kg)	83.2	112			
	Titanium (Ti) (mg/kg)	477	592			
	Tungsten (W) (mg/kg)	17.3	19.8			
	Uranium (U) (mg/kg)	6.04	5.69			
Vanadium (V) (mg/kg)	41.3	45.6				
Zinc (Zn) (mg/kg)	3790	6510				
Zirconium (Zr) (mg/kg)	1.3	1.8				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2340095-1	L2340095-2	L2340095-3	L2340095-4	L2340095-5
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	28-AUG-19	28-AUG-19	28-AUG-19	28-AUG-19	28-AUG-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1935-A-1	BA1935-A-2	BA1935-A-3	BA1935-A-4	BA1935-A-5
Grouping	Analyte						
SOIL							
TCLP Metals	1st Preliminary pH (pH)		11.50	11.58	11.63	11.49	11.62
	2nd Preliminary pH (pH)		8.25	8.40	8.42	8.43	8.68
	Final pH (pH)		6.29	6.29	6.22	6.37	6.42
	Extraction Solution Initial pH (pH)		2.90	2.90	2.90	2.90	2.90
	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)		2.47	2.66	2.58	2.80	2.82
	Cadmium (Cd)-Leachable (mg/L)		0.204	0.213	0.160	0.354	0.196
	Calcium (Ca)-Leachable (mg/L)		1980	2030	2020	1950	2240
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.867	0.564	0.478	0.783	1.20
	Copper (Cu)-Leachable (mg/L)		1.03	0.906	0.899	0.922	0.877
	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	136	134	133	145
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.53	0.55	0.52	0.40	0.45
	Selenium (Se)-Leachable (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	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)		37.2	36.6	64.7	42.9	34.8

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2340095-6	L2340095-7	L2340095-8	L2340095-9	L2340095-10
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	28-AUG-19	28-AUG-19	28-AUG-19	28-AUG-19	28-AUG-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1935-A-6	BA1935-A-7	BA1935-A-8	BA1935-A-9	BA1935-A-10
Grouping	Analyte						
SOIL							
TCLP Metals	1st Preliminary pH (pH)		11.51	11.61	11.56	11.68	11.56
	2nd Preliminary pH (pH)		8.58	8.61	8.65	8.76	8.57
	Final pH (pH)		6.28	6.24	6.18	6.24	6.30
	Extraction Solution Initial pH (pH)		2.90	2.90	2.90	2.90	2.90
	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)		2.81	2.69	2.65	2.59	2.62
	Cadmium (Cd)-Leachable (mg/L)		0.208	0.199	0.206	0.227	0.378
	Calcium (Ca)-Leachable (mg/L)		1960	2170	2070	2010	2040
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.523	0.794	0.578	0.685	1.03
	Copper (Cu)-Leachable (mg/L)		0.778	1.26	1.14	0.887	0.765
	Iron (Fe)-Leachable (mg/L)		<5.0	<5.0	<5.0	<5.0	<5.0
	Lead (Pb)-Leachable (mg/L)		0.36	<0.25	<0.25	<0.25	<0.25
	Magnesium (Mg)-Leachable (mg/L)		141	150	144	141	135
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.52	0.79	0.82	0.58	0.51
	Selenium (Se)-Leachable (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	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)		59.4	33.7	50.7	37.7	42.9

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2340095-11	L2340095-12			
		Description	Soil	Soil			
		Sampled Date	28-AUG-19	28-AUG-19			
		Sampled Time	09:00	09:00			
		Client ID	BA1935-A-11	BA1935-A-12			
Grouping	Analyte						
SOIL							
TCLP Metals	1st Preliminary pH (pH)	11.61	11.56				
	2nd Preliminary pH (pH)	8.63	8.66				
	Final pH (pH)	6.31	6.18				
	Extraction Solution Initial pH (pH)	2.90	2.90				
	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)	2.55	2.58				
	Cadmium (Cd)-Leachable (mg/L)	0.192	0.262				
	Calcium (Ca)-Leachable (mg/L)	2090	2070				
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25				
	Cobalt (Co)-Leachable (mg/L)	1.45	0.790				
	Copper (Cu)-Leachable (mg/L)	1.06	1.11				
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0				
	Lead (Pb)-Leachable (mg/L)	<0.25	<0.25				
	Magnesium (Mg)-Leachable (mg/L)	141	139				
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010				
	Nickel (Ni)-Leachable (mg/L)	0.60	0.58				
	Selenium (Se)-Leachable (mg/L)	<0.10	<0.10				
	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)	42.2	38.8				

* 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	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Lead (Pb)	DUP-H	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Lithium (Li)	DUP-H	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Nickel (Ni)	DUP-H	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Phosphorus (P)	DUP-H	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Thallium (Tl)	DUP-H	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Titanium (Ti)	DUP-H	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tungsten (W)	DUP-H	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Zinc (Zn)	DUP-H	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cadmium (Cd)-Leachable	MS-B	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Leachable	MS-B	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Leachable	MS-B	L2340095-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Leachable	MS-B	L2340095-1, -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-CCMS-VA	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).			
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 "pH, Electrometric in Soil and Sediment - Prescriptive Method", Rev. 2005, Section B Physical, Inorganic and Misc. Constituents, BC Environmental Laboratory Manual. 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:

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.



L2340095-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 Skrypyk		<input checked="" type="checkbox"/> PDF <input type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax		<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT	
Address: 5150 Riverbend Drive		Email 1: smckinney@covanta.com		<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT	
Burnaby BC		Email 2: rjohnson4@covanta.com		<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT	
Phone: 604-521-1025		Email 3: dskrypyk@covanta.com		Analysis Request	
Fax: <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 #:			
Company:		PO / AFE: PO# 46693 Weekly Bottom Ash - Suite			
Contact:		LSD: (includes 2:1 pH)			
Address:		Quote #:			
Phone:					

Lab Work Order # (lab use only)		ALS Contact:	Sampler:								Number of Containers	
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)				
BA1935-A-1		28-Aug-19	9:00	Soil	X	X		X				1
BA1935-A-2		28-Aug-19	9:00	Soil	X	X		X				1
BA1935-A-3		28-Aug-19	9:00	Soil	X	X		X				1
BA1935-A-4		28-Aug-19	9:00	Soil	X	X		X				1
BA1935-A-5		28-Aug-19	9:00	Soil	X	X		X				1
BA1935-A-6		28-Aug-19	9:00	Soil	X	X		X				1
BA1935-A-7		28-Aug-19	9:00	Soil	X	X		X				1
BA1935-A-8		28-Aug-19	9:00	Soil	X	X		X				1
BA1935-A-9		28-Aug-19	9:00	Soil	X	X		X				1
BA1935-A-10		28-Aug-19	9:00	Soil	X	X		X				1
BA1935-A-11		28-Aug-19	9:00	Soil	X	X		X				1
BA1935-A-12		28-Aug-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:
<i>[Signature]</i>	3-SEP-19	0900	JG	3SEP19	11:55AM	22 °C				Yes / No ? If Yes add SIF