

Bottom Ash Data

2019 Week 15

The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on April 25, 2019. The data represents bottom ash composite results for week 15 of 2019 (April 7, 2019 to April 13, 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.



Covanta Burnaby R.E., ULC
ATTN: Steve McKinney
5150 Riverbend Drive
Burnaby BC V3N 4V3

Date Received: 16-APR-19
Report Date: 24-APR-19 11:34 (MT)
Version: FINAL

Client Phone: 604-521-1025

Certificate of Analysis

Lab Work Order #: L2258822
Project P.O. #: VANCO-0000048466
Job Reference:
C of C Numbers:
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2258822-1 Soil 10-APR-19 09:00 BA1915-A-1	L2258822-2 Soil 10-APR-19 09:00 BA1915-A-2	L2258822-3 Soil 10-APR-19 09:00 BA1915-A-3	L2258822-4 Soil 10-APR-19 09:00 BA1915-A-4	L2258822-5 Soil 10-APR-19 09:00 BA1915-A-5
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	21.5				
	Moisture (%)	21.9	22.5	23.8	21.7	23.7
	pH (1:2 soil:water) (pH)	11.00	10.99	10.62	10.73	10.65
Metals	Aluminum (Al) (mg/kg)	38600	46700	47800	34100	40300
	Antimony (Sb) (mg/kg)	145	217	116	129	128
	Arsenic (As) (mg/kg)	31.7	78.8	25.8	32.4	28.7
	Barium (Ba) (mg/kg)	726	608	565	690	685
	Beryllium (Be) (mg/kg)	0.36	0.40	0.36	0.39	0.37
	Bismuth (Bi) (mg/kg)	6.07	7.01	6.01	6.22	8.14
	Boron (B) (mg/kg)	299	255	166	281	194
	Cadmium (Cd) (mg/kg)	13.8	94.7	14.7	10.4	10.5
	Calcium (Ca) (mg/kg)	137000	143000	132000	138000	139000
	Chromium (Cr) (mg/kg)	354	223	156	166	335
	Cobalt (Co) (mg/kg)	56.0	39.6	48.7	82.1	43.4
	Copper (Cu) (mg/kg)	1820	1990	1930	1990	7490
	Iron (Fe) (mg/kg)	46600	60100	60100	61800	59600
	Lead (Pb) (mg/kg)	1730	822	645	621	696
	Lithium (Li) (mg/kg)	22.3	20.8	32.8	22.4	24.8
	Magnesium (Mg) (mg/kg)	11400	12600	10400	10900	11500
	Manganese (Mn) (mg/kg)	767	1490	1680	991	901
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	89.2	82.9	88.2	99.1	92.0
	Nickel (Ni) (mg/kg)	188	228	235	254	290
	Phosphorus (P) (mg/kg)	12700	15500	11600	13100	14100
	Potassium (K) (mg/kg)	5940	5800	5850	5690	6500
	Selenium (Se) (mg/kg)	0.62	0.67	0.73	0.51	0.60
	Silver (Ag) (mg/kg)	5.57	4.86	5.31	4.10	4.37
	Sodium (Na) (mg/kg)	15900	15700	14200	15300	16400
	Strontium (Sr) (mg/kg)	372	328	363	340	331
Sulfur (S) (mg/kg)	12900	13000	12400	12600	13100	
Thallium (Tl) (mg/kg)	0.081	0.082	0.070	0.067	0.075	
Tin (Sn) (mg/kg)	162	99.7	95.7	89.1	91.5	
Titanium (Ti) (mg/kg)	1080	697	940	845	683	
Tungsten (W) (mg/kg)	13.8	13.1	5.16	10.9	9.75	
Uranium (U) (mg/kg)	4.42	4.34	4.12	4.18	4.52	
Vanadium (V) (mg/kg)	60.1	53.2	47.3	48.2	51.5	
Zinc (Zn) (mg/kg)	11700	3940	3950	4610	5450	

* 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	L2258822-6 Soil 10-APR-19 09:00 BA1915-A-6	L2258822-7 Soil 10-APR-19 09:00 BA1915-A-7	L2258822-8 Soil 10-APR-19 09:00 BA1915-A-8	L2258822-9 Soil 10-APR-19 09:00 BA1915-A-9	L2258822-10 Soil 10-APR-19 09:00 BA1915-A-10
Grouping	Analyte				
SOIL					
Physical Tests	% Moisture (%)				
	Moisture (%)				
	22.7	22.7	24.7	23.5	23.1
	pH (1:2 soil:water) (pH)				
	10.63	10.76	11.06	11.02	10.96
Metals	Aluminum (Al) (mg/kg)				
	32200	46100	46400	39600	34000
	Antimony (Sb) (mg/kg)				
	137	120	129	151	133
	Arsenic (As) (mg/kg)				
	30.6	24.7	29.5	30.7	33.9
	Barium (Ba) (mg/kg)				
	565	762	679	674	675
	Beryllium (Be) (mg/kg)				
	0.38	0.48	0.38	0.39	0.40
	Bismuth (Bi) (mg/kg)				
	6.92	14.4	6.22	8.86	5.49
	Boron (B) (mg/kg)				
	264	299	315	220	222
	Cadmium (Cd) (mg/kg)				
	11.2	11.8	46.9	12.6	10.5
	Calcium (Ca) (mg/kg)				
	131000	137000	130000	147000	140000
	Chromium (Cr) (mg/kg)				
	779	165	181	193	178
	Cobalt (Co) (mg/kg)				
	72.5	174	82.6	292	28.1
	Copper (Cu) (mg/kg)				
	3780	2670	2830	2570	1480
	Iron (Fe) (mg/kg)				
	76000	67600	58600	45200	57100
	Lead (Pb) (mg/kg)				
	438	1190	1680	1000	529
	Lithium (Li) (mg/kg)				
	23.0	25.6	20.6	22.5	19.9
	Magnesium (Mg) (mg/kg)				
	12000	13600	10700	11400	10700
	Manganese (Mn) (mg/kg)				
	10000	917	6750	883	843
	Mercury (Hg) (mg/kg)				
	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)				
	153	49.2	60.5	88.9	48.8
	Nickel (Ni) (mg/kg)				
	467	142	122	170	138
	Phosphorus (P) (mg/kg)				
	10900	10300	12300	13500	11600
	Potassium (K) (mg/kg)				
	5650	6200	5650	6220	6060
	Selenium (Se) (mg/kg)				
	0.71	0.56	6.66	0.59	0.84
	Silver (Ag) (mg/kg)				
	3.74	3.43	3.81	4.54	3.69
	Sodium (Na) (mg/kg)				
	14500	16600	14300	16200	15200
	Strontium (Sr) (mg/kg)				
	347	354	369	372	376
	Sulfur (S) (mg/kg)				
	14100	12700	12600	14000	13100
	Thallium (Tl) (mg/kg)				
	0.078	0.075	0.081	0.082	0.067
	Tin (Sn) (mg/kg)				
	111	105	161	357	92.8
	Titanium (Ti) (mg/kg)				
	501	848	818	722	832
	Tungsten (W) (mg/kg)				
	6.83	6.89	5.53	6.63	7.04
	Uranium (U) (mg/kg)				
	4.20	4.44	4.21	4.80	4.36
	Vanadium (V) (mg/kg)				
	51.8	52.9	48.9	54.5	62.5
	Zinc (Zn) (mg/kg)				
	4840	4110	8040	5390	4470

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2258822-11	L2258822-12		
		Description	Soil	Soil		
		Sampled Date	10-APR-19	10-APR-19		
		Sampled Time	09:00	09:00		
		Client ID	BA1915-A-11	BA1915-A-12		
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)					
	Moisture (%)		22.5	21.8		
	pH (1:2 soil:water) (pH)		10.98	11.01		
Metals	Aluminum (Al) (mg/kg)		42000	39800		
	Antimony (Sb) (mg/kg)		131	133		
	Arsenic (As) (mg/kg)		29.6	28.8		
	Barium (Ba) (mg/kg)		590	615		
	Beryllium (Be) (mg/kg)		0.36	0.33		
	Bismuth (Bi) (mg/kg)		9.34	9.46		
	Boron (B) (mg/kg)		221	236		
	Cadmium (Cd) (mg/kg)		14.9	28.9		
	Calcium (Ca) (mg/kg)		129000	131000		
	Chromium (Cr) (mg/kg)		194	165		
	Cobalt (Co) (mg/kg)		39.7	45.4		
	Copper (Cu) (mg/kg)		9510	3160		
	Iron (Fe) (mg/kg)		55900	59000		
	Lead (Pb) (mg/kg)		1220	407		
	Lithium (Li) (mg/kg)		19.6	18.9		
	Magnesium (Mg) (mg/kg)		10200	10200		
	Manganese (Mn) (mg/kg)		1030	923		
	Mercury (Hg) (mg/kg)		<0.050	<0.050		
	Molybdenum (Mo) (mg/kg)		60.6	72.0		
	Nickel (Ni) (mg/kg)		256	151		
	Phosphorus (P) (mg/kg)		11200	11100		
	Potassium (K) (mg/kg)		5720	5660		
	Selenium (Se) (mg/kg)		0.57	0.66		
	Silver (Ag) (mg/kg)		6.21	10.1		
	Sodium (Na) (mg/kg)		15000	15100		
	Strontium (Sr) (mg/kg)		368	333		
	Sulfur (S) (mg/kg)		14000	11300		
	Thallium (Tl) (mg/kg)		0.064	0.067		
	Tin (Sn) (mg/kg)		4150	128		
	Titanium (Ti) (mg/kg)		1220	484		
	Tungsten (W) (mg/kg)		5.50	5.90		
	Uranium (U) (mg/kg)		4.34	4.12		
	Vanadium (V) (mg/kg)		52.0	52.7		
Zinc (Zn) (mg/kg)		5940	5680			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2258822-1	L2258822-2	L2258822-3	L2258822-4	L2258822-5
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	10-APR-19	10-APR-19	10-APR-19	10-APR-19	10-APR-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1915-A-1	BA1915-A-2	BA1915-A-3	BA1915-A-4	BA1915-A-5
Grouping	Analyte						
SOIL							
Metals	Zirconium (Zr) (mg/kg)		3.0	3.9	3.1	1.7	2.4
Speciated Metals	Hexavalent Chromium (mg/kg)		0.18				
TCLP Metals	1st Preliminary pH (pH)		11.47	11.31	11.22	11.20	11.21
	2nd Preliminary pH (pH)		8.87	8.93	8.75	8.61	8.68
	Final pH (pH)		5.84	5.91	6.00	5.83	5.93
	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)		2.41	2.84	2.17	2.16	2.36
	Cadmium (Cd)-Leachable (mg/L)		0.215	0.180	0.168	0.167	0.190
	Calcium (Ca)-Leachable (mg/L)		1970	2100	2010	1940	2080
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.631	0.705	0.525	0.431	0.442
	Copper (Cu)-Leachable (mg/L)		1.92	1.33	0.668	0.677	0.863
	Iron (Fe)-Leachable (mg/L)		<5.0	<5.0	<5.0	<5.0	<5.0
	Lead (Pb)-Leachable (mg/L)		<0.25	<0.25	0.60	<0.25	<0.25
	Magnesium (Mg)-Leachable (mg/L)		128	124	135	124	127
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.98	0.52	0.47	0.60	0.55
	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)		52.7	39.3	36.9	45.2	54.7

* 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	L2258822-6 Soil 10-APR-19 09:00 BA1915-A-6	L2258822-7 Soil 10-APR-19 09:00 BA1915-A-7	L2258822-8 Soil 10-APR-19 09:00 BA1915-A-8	L2258822-9 Soil 10-APR-19 09:00 BA1915-A-9	L2258822-10 Soil 10-APR-19 09:00 BA1915-A-10	
Grouping	Analyte					
SOIL						
Metals	Zirconium (Zr) (mg/kg)	1.8	1.7	1.9	1.8	2.0
Speciated Metals	Hexavalent Chromium (mg/kg)					
TCLP Metals	1st Preliminary pH (pH)	11.20	11.26	11.34	11.35	11.46
	2nd Preliminary pH (pH)	8.81	8.71	8.78	8.87	9.07
	Final pH (pH)	5.90	6.04	6.18	6.01	6.05
	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)	2.08	2.28	2.38	2.53	2.43
	Cadmium (Cd)-Leachable (mg/L)	0.191	0.259	0.338	0.194	0.159
	Calcium (Ca)-Leachable (mg/L)	2030	1980	2060	2020	2040
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)	0.398	0.544	0.419	1.68	0.686
	Copper (Cu)-Leachable (mg/L)	0.806	0.642	0.626	0.748	0.666
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Lead (Pb)-Leachable (mg/L)	0.48	<0.25	<0.25	0.26	<0.25
	Magnesium (Mg)-Leachable (mg/L)	125	122	127	129	126
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)	0.59	0.51	0.56	0.49	0.55
	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)	46.9	53.5	44.3	50.3	48.3

* 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	L2258822-11 Soil 10-APR-19 09:00 BA1915-A-11	L2258822-12 Soil 10-APR-19 09:00 BA1915-A-12		
Grouping	Analyte				
SOIL					
Metals	Zirconium (Zr) (mg/kg)	3.5	2.5		
Speciated Metals	Hexavalent Chromium (mg/kg)				
TCLP Metals	1st Preliminary pH (pH)	11.47	11.53		
	2nd Preliminary pH (pH)	8.86	9.07		
	Final pH (pH)	6.10	6.02		
	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)	2.28	2.44		
	Cadmium (Cd)-Leachable (mg/L)	0.163	0.323		
	Calcium (Ca)-Leachable (mg/L)	1980	2010		
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25		
	Cobalt (Co)-Leachable (mg/L)	0.622	0.501		
	Copper (Cu)-Leachable (mg/L)	0.648	1.23		
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0		
	Lead (Pb)-Leachable (mg/L)	<0.25	<0.25		
	Magnesium (Mg)-Leachable (mg/L)	124	130		
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010		
	Nickel (Ni)-Leachable (mg/L)	0.61	0.46		
	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)	40.9	46.6		

* 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	Antimony (Sb)	DUP-H	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Arsenic (As)	DUP-H	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cadmium (Cd)	DUP-H	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Copper (Cu)	DUP-H	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Lead (Pb)	DUP-H	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Nickel (Ni)	DUP-H	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tungsten (W)	DUP-H	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Zinc (Zn)	DUP-H	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Laboratory Control Sample	Antimony (Sb)	MES	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cadmium (Cd)-Leachable	MS-B	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Leachable	MS-B	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Leachable	MS-B	L2258822-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Leachable	MS-B	L2258822-1, -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.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
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**
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)
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 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

PREP-MOISTURE-ED Soil % Moisture CCME PHC in Soil - Tier 1 (mod)

The weighed portion of soil is placed in a 105°C oven to dry to a constant weight; the drying time will vary based on the moisture content of the soil. The dried soil weight is then used to calculate % moisture.

** 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
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.



COC # _____

Page ____ of ____

Report To		Rep		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	<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT			
Address:	5150 Riverbend Drive Burnaby BC	Email 1:	smckinney@covanta.com			<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT			
Phone:	604-521-1025	Fax:				<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT			
				Analysis Request					

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:											
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
BA1915-A-1		10-Apr-19	9:00	Soil	X	X	X	X					1
BA1915-A-2		10-Apr-19	9:00	Soil	X	X		X					1
BA1915-A-3		10-Apr-19	9:00	Soil	X	X		X					1
BA1915-A-4		10-Apr-19	9:00	Soil	X	X		X					1
BA1915-A-5		10-Apr-19	9:00	Soil	X	X		X					1
BA1915-A-6		10-Apr-19	9:00	Soil	X	X		X					1
BA1915-A-7		10-Apr-19	9:00	Soil	X	X		X					1
BA1915-A-8		10-Apr-19	9:00	Soil	X	X		X					1
BA1915-A-9		10-Apr-19	9:00	Soil	X	X		X					1
BA1915-A-10		10-Apr-19	9:00	Soil	X	X		X					1
BA1915-A-11		10-Apr-19	9:00	Soil	X	X		X					1
BA1915-A-12		10-Apr-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>	16 APR-19	0800	<i>[Signature]</i>	4/16	11:35	20 °C				Yes / No ? If Yes add SIF