

Bottom Ash Data

2019 Week 19

The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on May 23, 2019. The data represents bottom ash composite results for week 19 of 2019 (May 5, 2019 to May 11, 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.



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Date Received: 14-MAY-19
Report Date: 23-MAY-19 12:32 (MT)
Version: FINAL

Client Phone: 604-521-1025

Certificate of Analysis

Lab Work Order #: L2272803
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 Description Sampled Date Sampled Time Client ID	L2272803-1 Soil 08-MAY-19 09:00 BA1919-A-1	L2272803-2 Soil 08-MAY-19 09:00 BA1919-A-2	L2272803-3 Soil 08-MAY-19 09:00 BA1919-A-3	L2272803-4 Soil 08-MAY-19 09:00 BA1919-A-4	L2272803-5 Soil 08-MAY-19 09:00 BA1919-A-5	
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	14.5	14.1	14.8	14.5	14.5
	pH (1:2 soil:water) (pH)	11.41	11.49	11.29	11.18	10.99
Metals	Aluminum (Al) (mg/kg)	33400	31100	35500	38800	30800
	Antimony (Sb) (mg/kg)	106	157	119	144	172
	Arsenic (As) (mg/kg)	33.7	48.9	41.8	61.0	38.0
	Barium (Ba) (mg/kg)	553	487	432	485	486
	Beryllium (Be) (mg/kg)	0.38	0.39	0.35	0.36	0.40
	Bismuth (Bi) (mg/kg)	6.33	7.09	6.73	9.67	7.85
	Boron (B) (mg/kg)	307	266	302	449	319
	Cadmium (Cd) (mg/kg)	10.9	12.3	11.3	12.7	14.0
	Calcium (Ca) (mg/kg)	119000	128000	116000	121000	118000
	Chromium (Cr) (mg/kg)	202	173	206	193	199
	Cobalt (Co) (mg/kg)	23.6	25.5	25.2	65.1	59.9
	Copper (Cu) (mg/kg)	2970	3870	2420	1860	19000
	Iron (Fe) (mg/kg)	60000	63900	53200	55100	54400
	Lead (Pb) (mg/kg)	400	973	1030	838	834
	Lithium (Li) (mg/kg)	16.7	17.2	19.2	26.0	17.5
	Magnesium (Mg) (mg/kg)	9500	9900	9380	9810	9240
	Manganese (Mn) (mg/kg)	1080	844	933	925	911
	Mercury (Hg) (mg/kg)	0.091	0.128	0.132	0.140	0.205
	Molybdenum (Mo) (mg/kg)	44.9	45.9	41.6	38.4	46.4
	Nickel (Ni) (mg/kg)	186	200	273	214	234
	Phosphorus (P) (mg/kg)	8940	10700	9560	10200	9250
	Potassium (K) (mg/kg)	4540	4360	4730	4720	5020
	Selenium (Se) (mg/kg)	0.38	0.45	0.45	0.48	0.38
	Silver (Ag) (mg/kg)	8.88	4.16	22.6	6.12	7.30
	Sodium (Na) (mg/kg)	14300	14200	14100	14100	15100
	Strontium (Sr) (mg/kg)	317	322	310	302	310
	Sulfur (S) (mg/kg)	11600	13000	11900	13100	12700
	Thallium (Tl) (mg/kg)	0.066	0.072	0.067	0.070	0.093
	Tin (Sn) (mg/kg)	273	194	148	143	115
	Titanium (Ti) (mg/kg)	755	589	609	756	728
	Tungsten (W) (mg/kg)	11.2	14.2	7.18	7.73	7.88
	Uranium (U) (mg/kg)	20.7	5.66	5.35	5.89	5.50
	Vanadium (V) (mg/kg)	64.5	62.8	62.1	70.1	58.6
	Zinc (Zn) (mg/kg)	3910	4720	8110	3950	5200
	Zirconium (Zr) (mg/kg)	<1.0	1.0	1.5	1.4	1.1

* 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	L2272803-6 Soil 08-MAY-19 09:00 BA1919-A-6	L2272803-7 Soil 08-MAY-19 09:00 BA1919-A-7	L2272803-8 Soil 08-MAY-19 09:00 BA1919-A-8	L2272803-9 Soil 08-MAY-19 09:00 BA1919-A-9	L2272803-10 Soil 08-MAY-19 09:00 BA1919-A-10	
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	13.8	14.0	13.9	14.3	14.4
	pH (1:2 soil:water) (pH)	11.57	11.13	11.02	10.79	11.49
Metals	Aluminum (Al) (mg/kg)	28900	29900	33300	33800	32000
	Antimony (Sb) (mg/kg)	121	110	122	121	153
	Arsenic (As) (mg/kg)	41.2	33.2	36.7	33.3	43.6
	Barium (Ba) (mg/kg)	477	475	501	553	374
	Beryllium (Be) (mg/kg)	0.37	0.36	0.42	0.38	0.35
	Bismuth (Bi) (mg/kg)	7.65	8.77	8.61	6.65	17.5
	Boron (B) (mg/kg)	376	257	281	257	270
	Cadmium (Cd) (mg/kg)	11.8	11.0	13.3	10.3	12.1
	Calcium (Ca) (mg/kg)	118000	116000	124000	109000	108000
	Chromium (Cr) (mg/kg)	139	164	163	169	158
	Cobalt (Co) (mg/kg)	38.3	29.6	22.3	27.1	45.0
	Copper (Cu) (mg/kg)	2560	1490	4300	2970	6440
	Iron (Fe) (mg/kg)	46700	56500	43300	57600	45500
	Lead (Pb) (mg/kg)	840	2640	486	811	634
	Lithium (Li) (mg/kg)	17.7	16.5	19.1	23.3	16.6
	Magnesium (Mg) (mg/kg)	10000	9790	10500	10000	8610
	Manganese (Mn) (mg/kg)	664	721	674	800	808
	Mercury (Hg) (mg/kg)	0.099	0.156	0.123	0.102	0.130
	Molybdenum (Mo) (mg/kg)	48.5	62.9	48.3	38.8	41.7
	Nickel (Ni) (mg/kg)	261	109	140	182	188
	Phosphorus (P) (mg/kg)	9900	8880	9870	8700	9150
	Potassium (K) (mg/kg)	4220	4740	5320	5230	4080
	Selenium (Se) (mg/kg)	0.32	0.34	0.41	0.35	0.35
	Silver (Ag) (mg/kg)	5.88	6.49	5.73	5.19	9.88
	Sodium (Na) (mg/kg)	13200	14200	14800	14900	12100
	Strontium (Sr) (mg/kg)	369	314	318	275	275
	Sulfur (S) (mg/kg)	12500	12300	13200	11800	11600
	Thallium (Tl) (mg/kg)	0.073	0.109	0.070	0.070	0.064
	Tin (Sn) (mg/kg)	160	110	104	114	108
	Titanium (Ti) (mg/kg)	539	572	617	987	539
	Tungsten (W) (mg/kg)	9.82	7.87	8.10	7.60	6.31
	Uranium (U) (mg/kg)	5.47	5.02	5.82	5.16	5.19
	Vanadium (V) (mg/kg)	59.2	55.7	60.1	56.3	67.5
	Zinc (Zn) (mg/kg)	4850	3550	5010	8420	3690
	Zirconium (Zr) (mg/kg)	<1.0	<1.0	1.1	1.1	1.1

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2272803-11	L2272803-12			
		Description	Soil	Soil			
		Sampled Date	08-MAY-19	08-MAY-19			
		Sampled Time	09:00	09:00			
		Client ID	BA1919-A-11	BA1919-A-12			
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)	13.9	14.4				
	pH (1:2 soil:water) (pH)	10.81	11.59				
Metals	Aluminum (Al) (mg/kg)	34200	31100				
	Antimony (Sb) (mg/kg)	104	131				
	Arsenic (As) (mg/kg)	31.5	35.7				
	Barium (Ba) (mg/kg)	362	595				
	Beryllium (Be) (mg/kg)	0.42	0.46				
	Bismuth (Bi) (mg/kg)	6.80	9.37				
	Boron (B) (mg/kg)	224	256				
	Cadmium (Cd) (mg/kg)	15.2	45.3				
	Calcium (Ca) (mg/kg)	101000	122000				
	Chromium (Cr) (mg/kg)	179	175				
	Cobalt (Co) (mg/kg)	95.0	27.8				
	Copper (Cu) (mg/kg)	1670	2760				
	Iron (Fe) (mg/kg)	44900	62300				
	Lead (Pb) (mg/kg)	452	965				
	Lithium (Li) (mg/kg)	19.0	17.4				
	Magnesium (Mg) (mg/kg)	8320	9370				
	Manganese (Mn) (mg/kg)	712	1090				
	Mercury (Hg) (mg/kg)	0.112	0.103				
	Molybdenum (Mo) (mg/kg)	36.5	39.4				
	Nickel (Ni) (mg/kg)	124	255				
	Phosphorus (P) (mg/kg)	8110	9170				
	Potassium (K) (mg/kg)	4500	4730				
	Selenium (Se) (mg/kg)	0.40	0.40				
	Silver (Ag) (mg/kg)	5.18	8.07				
	Sodium (Na) (mg/kg)	13000	14200				
	Strontium (Sr) (mg/kg)	241	330				
	Sulfur (S) (mg/kg)	10600	11100				
	Thallium (Tl) (mg/kg)	0.058	0.057				
	Tin (Sn) (mg/kg)	96.8	701				
	Titanium (Ti) (mg/kg)	360	921				
	Tungsten (W) (mg/kg)	6.27	10.0				
	Uranium (U) (mg/kg)	4.91	4.87				
Vanadium (V) (mg/kg)	52.8	90.2					
Zinc (Zn) (mg/kg)	3430	5650					
Zirconium (Zr) (mg/kg)	1.7	1.6					

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2272803-1	L2272803-2	L2272803-3	L2272803-4	L2272803-5
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	08-MAY-19	08-MAY-19	08-MAY-19	08-MAY-19	08-MAY-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1919-A-1	BA1919-A-2	BA1919-A-3	BA1919-A-4	BA1919-A-5
Grouping	Analyte						
SOIL							
TCLP Metals	1st Preliminary pH (pH)		11.51	11.60	11.56	11.66	11.46
	2nd Preliminary pH (pH)		5.82	7.95	8.63	8.76	6.30
	Final pH (pH)		6.57	6.54	6.55	6.57	6.83
	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)		4.28	4.39	4.35	4.72	4.36
	Cadmium (Cd)-Leachable (mg/L)		0.273	0.151	0.221	0.542	0.174
	Calcium (Ca)-Leachable (mg/L)		1980	1850	2030	1970	2010
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.455	0.696	0.893	1.04	0.627
	Copper (Cu)-Leachable (mg/L)		0.870	0.731	0.794	0.805	0.758
	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	118	127	124	121
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.53	0.50	0.40	0.49	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)		30.4	31.3	29.1	32.0	30.1

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2272803-6	L2272803-7	L2272803-8	L2272803-9	L2272803-10
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	08-MAY-19	08-MAY-19	08-MAY-19	08-MAY-19	08-MAY-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1919-A-6	BA1919-A-7	BA1919-A-8	BA1919-A-9	BA1919-A-10
Grouping	Analyte						
SOIL							
TCLP Metals	1st Preliminary pH (pH)		11.70	11.44	11.52	11.27	11.69
	2nd Preliminary pH (pH)		7.16	8.45	8.93	7.80	8.69
	Final pH (pH)		6.53	6.73	6.69	6.47	6.16
	Extraction Solution Initial pH (pH)		2.88	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)		4.40	3.90	4.13	4.17	4.11
	Cadmium (Cd)-Leachable (mg/L)		0.181	0.170	0.168	0.183	0.235
	Calcium (Ca)-Leachable (mg/L)		1870	1880	2090	1850	2000
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.405	0.581	0.296	0.555	0.720
	Copper (Cu)-Leachable (mg/L)		0.684	0.469	0.850	1.11	1.45
	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)		114	116	122	116	126
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.44	0.43	0.49	0.95	0.50
	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)		33.5	29.0	38.5	50.8	42.9

* 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	L2272803-11 Soil 08-MAY-19 09:00 BA1919-A-11	L2272803-12 Soil 08-MAY-19 09:00 BA1919-A-12		
Grouping	Analyte				
SOIL					
TCLP Metals	1st Preliminary pH (pH)	11.34	11.47		
	2nd Preliminary pH (pH)	8.45	8.83		
	Final pH (pH)	6.52	6.27		
	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)	4.29	4.13		
	Cadmium (Cd)-Leachable (mg/L)	0.195	0.223		
	Calcium (Ca)-Leachable (mg/L)	2110	1970		
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25		
	Cobalt (Co)-Leachable (mg/L)	0.689	0.758		
	Copper (Cu)-Leachable (mg/L)	0.911	1.13		
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0		
	Lead (Pb)-Leachable (mg/L)	<0.25	<0.25		
	Magnesium (Mg)-Leachable (mg/L)	129	121		
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010		
	Nickel (Ni)-Leachable (mg/L)	0.60	0.52		
	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)	37.6	43.1		

* 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	Silver (Ag)	DUP-H	L2272803-2
Duplicate	Beryllium (Be)	DUP-H	L2272803-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cadmium (Cd)	DUP-H	L2272803-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Manganese (Mn)	DUP-H	L2272803-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Nickel (Ni)	DUP-H	L2272803-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tin (Sn)	DUP-H	L2272803-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tungsten (W)	DUP-H	L2272803-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Zinc (Zn)	DUP-H	L2272803-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	pH (1:2 soil:water)	DUP-H,J	L2272803-1, -10, -11, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Leachable	MS-B	L2272803-10, -11, -12, -7, -8, -9
Matrix Spike	Cobalt (Co)-Leachable	MS-B	L2272803-10, -11, -12, -7, -8, -9
Matrix Spike	Zinc (Zn)-Leachable	MS-B	L2272803-10, -11, -12, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
DUP-H,J	Duplicate results outside ALS DQO, due to sample heterogeneity. Duplicate results and limits are expressed in terms of absolute difference.
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 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.	EPA 200.2/6020A
HG-200.2-CVAF-VA	Soil	Mercury in Soil by CVAAS 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.	EPA 200.2/1631E (mod)
HG-TCLP-CVAFS-VA	Soil	Mercury by CVAAS (TCLP) 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).	EPA 1311/245.7
MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS 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.	EPA 200.2/6020A (mod)
MET-TCLP-CCMS-VA	Soil	Metals by ICPMS (TCLP) 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).	EPA 1311/6020A
MOISTURE-VA	Soil	Moisture content This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of two hours.	CCME PHC in Soil - Tier 1 (mod)
PH-1:2-VA	Soil	pH in Soil (1:2 Soil:Water Extraction) 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.	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Reference Information

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.



Report To		Report Format / Distribution				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										
	<input type="checkbox"/> Yes <input type="checkbox"/> No	Email 3:	dskrypnik@covanta.com		Analysis Request										
			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:				ALS Contact:													
Lab Work Order # (lab use only)				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
					X	X			X	X	
BA1919-A-1		08-May-19	9:00	Soil	X	X			X		1
BA1919-A-2		08-May-19	9:00	Soil	X	X			X		1
BA1919-A-3		08-May-19	9:00	Soil	X	X			X		1
BA1919-A-4		08-May-19	9:00	Soil	X	X			X		1
BA1919-A-5		08-May-19	9:00	Soil	X	X			X		1
BA1919-A-6		08-May-19	9:00	Soil	X	X			X		1
BA1919-A-7		08-May-19	9:00	Soil	X	X			X		1
BA1919-A-8		08-May-19	9:00	Soil	X	X			X		1
BA1919-A-9		08-May-19	9:00	Soil	X	X			X		1
BA1919-A-10		08-May-19	9:00	Soil	X	X			X		1
BA1919-A-11		08-May-19	9:00	Soil	X	X			X		1
BA1919-A-12		08-May-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-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:
<i>[Signature]</i>	14-May-19	0800	<i>[Signature]</i>	14-May-19	12:00pm	14.9°C				Yes / No ? If Yes add SIF