# Bottom Ash Data

2020 Week 32

The following analytical reports were sent to the Ministry of Environment and Climate Change Strategy:

- Weekly Composite Results were submitted on September 8, 2020
- Daily Composite Results were submitted on October 7, 2020

The data represents bottom ash composite results for week 32 of 2020 (August 2, 2020 to August 8, 2020).

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

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B2335** | Page | : 1 of 12 |
| **Amendment** | : **1** | | |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
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| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : ---- | Date Samples Received | : 11-Aug-2020 11:45 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 11-Aug-2020 |
| C-O-C number | : ---- | Issue Date | : 06-Sep-2020 13:26 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 20 | | |
| No. of samples analysed | : 20 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Kim Jensen | Department Manager - Metals | Metals, Burnaby, British Columbia |
| Mae Soropia | Laboratory Analyst | Metals, Burnaby, British Columbia |
| Muneeb Alam | Analyst | Metals, Burnaby, British Columbia |
| Ophelia Chiu | Supervisor - Organics Instrumentation | Organics, Burnaby, British Columbia |
| Robin Weeks | Team Leader - Metals | Metals, Burnaby, British Columbia |

## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

| *Unit* | *Description* |
|---|---|
| % | percent |
| mg/kg | milligrams per kilogram |
| mg/L | milligrams per litre |
| pH units | pH units |

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior 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.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.

## Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | BA2032-A-1 | BA2032-A-2 | BA2032-A-3 | BA2032-A-4 | BA2032-A-5 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 |
| | | | | | | VA20B2335-001 | VA20B2335-002 | VA20B2335-003 | VA20B2335-004 | VA20B2335-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **Physical Tests** | | | | | | | | | | |
| **moisture** | ---- | E144 | 0.25 | % | | 21.2 | 19.1 | 21.1 | 20.5 | 20.1 |
| **pH (1:2 soil:water)** | ---- | E108 | 0.10 | pH units | | 10.8 | 10.8 | 10.6 | 10.8 | 10.6 |
| **Metals** | | | | | | | | | | |
| **aluminum** | 7429-90-5 | E440 | 50 | mg/kg | | 31100 | 29700 | 31700 | 34100 | 41900 |
| **antimony** | 7440-36-0 | E440 | 0.10 | mg/kg | | 118 | 131 | 113 | 141 | 118 |
| **arsenic** | 7440-38-2 | E440 | 0.10 | mg/kg | | 38.7 | 40.8 | 30.9 | 38.2 | 31.5 |
| **barium** | 7440-39-3 | E440 | 0.50 | mg/kg | | 536 | 520 | 572 | 522 | 573 |
| **beryllium** | 7440-41-7 | E440 | 0.10 | mg/kg | | 0.40 | 0.42 | 0.41 | 0.40 | 0.38 |
| **bismuth** | 7440-69-9 | E440 | 0.20 | mg/kg | | 12.5 | 17.8 | 5.72 | 7.55 | 4.97 |
| **boron** | 7440-42-8 | E440 | 5.0 | mg/kg | | 203 | 191 | 181 | 239 | 176 |
| **cadmium** | 7440-43-9 | E440 | 0.020 | mg/kg | | 14.8 | 14.7 | 12.8 | 16.3 | 12.9 |
| **calcium** | 7440-70-2 | E440 | 50 | mg/kg | | 118000 | 125000 | 123000 | 122000 | 114000 |
| **chromium** | 7440-47-3 | E440 | 0.50 | mg/kg | | 133 | 145 | 140 | 170 | 160 |
| **cobalt** | 7440-48-4 | E440 | 0.10 | mg/kg | | 82.4 | 48.3 | 30.2 | 94.4 | 35.8 |
| **copper** | 7440-50-8 | E440 | 0.50 | mg/kg | | 2090 | 3070 | 5160 | 1990 | 1350 |
| **iron** | 7439-89-6 | E440 | 50 | mg/kg | | 49900 | 52000 | 69300 | 64900 | 63400 |
| **lead** | 7439-92-1 | E440 | 0.50 | mg/kg | | 533 | 543 | 608 | 1100 | 637 |
| **lithium** | 7439-93-2 | E440 | 2.0 | mg/kg | | 17.1 | 19.2 | 16.3 | 21.7 | 16.3 |
| **magnesium** | 7439-95-4 | E440 | 20 | mg/kg | | 10000 | 10900 | 9960 | 10400 | 9920 |
| **manganese** | 7439-96-5 | E440 | 1.0 | mg/kg | | 777 | 824 | 742 | 836 | 716 |
| **mercury** | 7439-97-6 | E510 | 0.0500 | mg/kg | | <0.0500 | <0.0500 | <0.0500 | <0.0500 | <0.0500 |
| **molybdenum** | 7439-98-7 | E440 | 0.10 | mg/kg | | 27.4 | 25.2 | 29.5 | 29.1 | 21.8 |
| **nickel** | 7440-02-0 | E440 | 0.50 | mg/kg | | 116 | 158 | 196 | 153 | 164 |
| **phosphorus** | 7723-14-0 | E440 | 50 | mg/kg | | 10700 | 11100 | 12400 | 10700 | 12200 |
| **potassium** | 7440-09-7 | E440 | 100 | mg/kg | | 4860 | 5330 | 4500 | 5000 | 4980 |
| **selenium** | 7782-49-2 | E440 | 0.20 | mg/kg | | 0.43 | 0.40 | 0.42 | 0.37 | 0.58 |
| **silver** | 7440-22-4 | E440 | 0.10 | mg/kg | | 5.39 | 7.50 | 6.33 | 5.57 | 4.96 |
| **sodium** | 7440-23-5 | E440 | 50 | mg/kg | | 13000 | 13800 | 12200 | 13600 | 14100 |
| **strontium** | 7440-24-6 | E440 | 0.50 | mg/kg | | 409 | 287 | 380 | 415 | 265 |
| **sulfur** | 7704-34-9 | E440 | 1000 | mg/kg | | 11100 | 12100 | 11300 | 12900 | 10800 |

## Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | BA2032-A-1 | BA2032-A-2 | BA2032-A-3 | BA2032-A-4 | BA2032-A-5 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 |
| | | | | | | VA20B2335-001 | VA20B2335-002 | VA20B2335-003 | VA20B2335-004 | VA20B2335-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **Metals** | | | | | | | | | | |
| **thallium** | 7440-28-0 | E440 | 0.050 | mg/kg | | 0.062 | 0.075 | 0.074 | 0.102 | 0.066 |
| **tin** | 7440-31-5 | E440 | 2.0 | mg/kg | | 102 | 587 | 126 | 121 | 116 |
| **titanium** | 7440-32-6 | E440 | 1.0 | mg/kg | | 405 | 390 | 322 | 403 | 668 |
| **tungsten** | 7440-33-7 | E440 | 0.50 | mg/kg | | 8.03 | 10.9 | 14.0 | 7.91 | 12.9 |
| **uranium** | 7440-61-1 | E440 | 0.050 | mg/kg | | 4.40 | 4.90 | 4.20 | 4.63 | 4.37 |
| **vanadium** | 7440-62-2 | E440 | 0.20 | mg/kg | | 38.4 | 46.7 | 42.3 | 44.2 | 41.2 |
| **zinc** | 7440-66-6 | E440 | 2.0 | mg/kg | | 4540 | 9830 | 13000 | 5660 | 3880 |
| **zirconium** | 7440-67-7 | E440 | 1.0 | mg/kg | | 2.0 | 1.4 | 1.7 | 1.5 | 1.9 |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.2 | 11.2 | 11.2 | 11.3 | 11.3 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.42 | 8.82 | 9.04 | 8.99 | 8.85 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.90 | 5.97 | 6.03 | 6.08 | 5.99 |
| **antimony, TCLP** | 7440-36-0 | E444 | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **arsenic, TCLP** | 7440-38-2 | E444 | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **barium, TCLP** | 7440-39-3 | E444 | 2.5 | mg/L | | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 |
| **beryllium, TCLP** | 7440-41-7 | E444 | 0.025 | mg/L | | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 |
| **boron, TCLP** | 7440-42-8 | E444 | 0.50 | mg/L | | 2.14 | 2.20 | 2.16 | 2.49 | 2.43 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.237 | 0.229 | 0.773 | 0.375 | 0.639 |
| **calcium, TCLP** | 7440-70-2 | E444 | 10 | mg/L | | 1910 | 1920 | 1930 | 1900 | 1910 |
| **chromium, TCLP** | 7440-47-3 | E444 | 0.25 | mg/L | | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 |
| **cobalt, TCLP** | 7440-48-4 | E444 | 0.050 | mg/L | | 1.13 | 0.901 | 0.582 | 0.462 | 0.712 |
| **copper, TCLP** | 7440-50-8 | E444 | 0.050 | mg/L | | 1.15 | 0.869 | 1.31 | 0.954 | 1.48 |
| **iron, TCLP** | 7439-89-6 | E444 | 5.0 | mg/L | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| **lead, TCLP** | 7439-92-1 | E444 | 0.25 | mg/L | | 0.30 | <0.25 | <0.25 | <0.25 | <0.25 |
| **magnesium, TCLP** | 7439-95-4 | E444 | 2.5 | mg/L | | 126 | 134 | 128 | 126 | 132 |
| **mercury, TCLP** | 7439-97-6 | E512 | 0.0100 | mg/L | | <0.0100 | <0.0100 | <0.0100 | <0.0100 | <0.0100 |
| **nickel, TCLP** | 7440-02-0 | E444 | 0.25 | mg/L | | 0.54 | 0.90 | 0.45 | 0.51 | 0.52 |
| **selenium, TCLP** | 7782-49-2 | E444 | 1.00 | mg/L | | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| **silver, TCLP** | 7440-22-4 | E444 | 0.050 | mg/L | | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| **thallium, TCLP** | 7440-28-0 | E444 | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

## Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | BA2032-A-1 | BA2032-A-2 | BA2032-A-3 | BA2032-A-4 | BA2032-A-5 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 |
| | | | | | | VA20B2335-001 | VA20B2335-002 | VA20B2335-003 | VA20B2335-004 | VA20B2335-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **vanadium, TCLP** | 7440-62-2 | E444 | 0.15 | mg/L | | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 |
| **zinc, TCLP** | 7440-66-6 | E444 | 0.50 | mg/L | | 60.2 | 45.7 | 61.6 | 56.4 | 53.0 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | BA2032-A-6 | BA2032-A-7 | BA2032-A-8 | BA2032-A-9 | BA2032-A-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 |
| | | | | | | VA20B2335-006 | VA20B2335-007 | VA20B2335-008 | VA20B2335-009 | VA20B2335-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **Physical Tests** | | | | | | | | | | |
| **moisture** | ---- | E144 | 0.25 | % | | 20.5 | 21.5 | 20.3 | 20.7 | 20.9 |
| **pH (1:2 soil:water)** | ---- | E108 | 0.10 | pH units | | 10.5 | 10.8 | 10.7 | 10.6 | 10.6 |
| **Metals** | | | | | | | | | | |
| **aluminum** | 7429-90-5 | E440 | 50 | mg/kg | | 27900 | 33500 | 27900 | 30600 | 31300 |
| **antimony** | 7440-36-0 | E440 | 0.10 | mg/kg | | 154 | 136 | 141 | 132 | 141 |
| **arsenic** | 7440-38-2 | E440 | 0.10 | mg/kg | | 42.5 | 37.5 | 40.8 | 33.6 | 40.4 |
| **barium** | 7440-39-3 | E440 | 0.50 | mg/kg | | 482 | 578 | 575 | 559 | 493 |
| **beryllium** | 7440-41-7 | E440 | 0.10 | mg/kg | | 0.44 | 0.42 | 0.44 | 0.38 | 0.41 |
| **bismuth** | 7440-69-9 | E440 | 0.20 | mg/kg | | 7.56 | 5.91 | 6.13 | 5.58 | 7.29 |
| **boron** | 7440-42-8 | E440 | 5.0 | mg/kg | | 207 | 226 | 262 | 218 | 250 |
| **cadmium** | 7440-43-9 | E440 | 0.020 | mg/kg | | 16.7 | 16.9 | 14.4 | 14.5 | 20.4 |
| **calcium** | 7440-70-2 | E440 | 50 | mg/kg | | 129000 | 131000 | 122000 | 116000 | 120000 |
| **chromium** | 7440-47-3 | E440 | 0.50 | mg/kg | | 188 | 814 | 160 | 149 | 165 |
| **cobalt** | 7440-48-4 | E440 | 0.10 | mg/kg | | 78.0 | 30.7 | 41.5 | 40.6 | 345 |
| **copper** | 7440-50-8 | E440 | 0.50 | mg/kg | | 1930 | 2010 | 3540 | 9300 | 3330 |
| **iron** | 7439-89-6 | E440 | 50 | mg/kg | | 56800 | 77000 | 51000 | 63600 | 59400 |
| **lead** | 7439-92-1 | E440 | 0.50 | mg/kg | | 614 | 517 | 467 | 1520 | 1190 |
| **lithium** | 7439-93-2 | E440 | 2.0 | mg/kg | | 17.1 | 19.9 | 21.4 | 15.2 | 17.4 |
| **magnesium** | 7439-95-4 | E440 | 20 | mg/kg | | 10400 | 12000 | 11500 | 12400 | 10800 |
| **manganese** | 7439-96-5 | E440 | 1.0 | mg/kg | | 808 | 993 | 819 | 776 | 850 |
| **mercury** | 7439-97-6 | E510 | 0.0500 | mg/kg | | <0.0500 | <0.0500 | <0.0500 | <0.0500 | <0.0500 |
| **molybdenum** | 7439-98-7 | E440 | 0.10 | mg/kg | | 30.3 | 40.2 | 32.2 | 27.3 | 33.3 |
| **nickel** | 7440-02-0 | E440 | 0.50 | mg/kg | | 189 | 681 | 136 | 477 | 173 |
| **phosphorus** | 7723-14-0 | E440 | 50 | mg/kg | | 11400 | 10800 | 12000 | 11100 | 10000 |
| **potassium** | 7440-09-7 | E440 | 100 | mg/kg | | 5300 | 5210 | 5080 | 4800 | 4700 |
| **selenium** | 7782-49-2 | E440 | 0.20 | mg/kg | | 0.54 | 0.39 | 0.43 | 0.43 | 0.32 |
| **silver** | 7440-22-4 | E440 | 0.10 | mg/kg | | 6.66 | 5.77 | 7.88 | 4.46 | 9.84 |
| **sodium** | 7440-23-5 | E440 | 50 | mg/kg | | 13700 | 16200 | 14100 | 12700 | 12500 |
| **strontium** | 7440-24-6 | E440 | 0.50 | mg/kg | | 314 | 295 | 294 | 278 | 368 |
| **sulfur** | 7704-34-9 | E440 | 1000 | mg/kg | | 13600 | 13500 | 12600 | 12200 | 13300 |
| **thallium** | 7440-28-0 | E440 | 0.050 | mg/kg | | 0.077 | 0.070 | 0.073 | 0.092 | 0.072 |

## Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | BA2032-A-6 | BA2032-A-7 | BA2032-A-8 | BA2032-A-9 | BA2032-A-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 |
| | | | | | | VA20B2335-006 | VA20B2335-007 | VA20B2335-008 | VA20B2335-009 | VA20B2335-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **Metals** | | | | | | | | | | |
| **tin** | 7440-31-5 | E440 | 2.0 | mg/kg | | 132 | 125 | 655 | 127 | 310 |
| **titanium** | 7440-32-6 | E440 | 1.0 | mg/kg | | 566 | 701 | 481 | 504 | 463 |
| **tungsten** | 7440-33-7 | E440 | 0.50 | mg/kg | | 18.0 | 11.0 | 9.79 | 10.9 | 13.4 |
| **uranium** | 7440-61-1 | E440 | 0.050 | mg/kg | | 5.07 | 4.63 | 4.46 | 4.38 | 4.56 |
| **vanadium** | 7440-62-2 | E440 | 0.20 | mg/kg | | 47.4 | 48.0 | 45.5 | 44.2 | 43.0 |
| **zinc** | 7440-66-6 | E440 | 2.0 | mg/kg | | 5400 | 6100 | 6200 | 20500 | 5730 |
| **zirconium** | 7440-67-7 | E440 | 1.0 | mg/kg | | 1.3 | 1.2 | 1.1 | 1.3 | 1.4 |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.3 | 11.3 | 11.3 | 11.3 | 11.2 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.52 | 8.25 | 8.55 | 8.02 | 7.67 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.89 | 5.97 | 5.76 | 6.06 | 6.00 |
| **antimony, TCLP** | 7440-36-0 | E444 | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **arsenic, TCLP** | 7440-38-2 | E444 | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **barium, TCLP** | 7440-39-3 | E444 | 2.5 | mg/L | | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 |
| **beryllium, TCLP** | 7440-41-7 | E444 | 0.025 | mg/L | | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 |
| **boron, TCLP** | 7440-42-8 | E444 | 0.50 | mg/L | | 2.36 | 2.22 | 2.06 | 2.50 | 2.36 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.216 | 0.247 | 0.368 | 0.237 | 0.242 |
| **calcium, TCLP** | 7440-70-2 | E444 | 10 | mg/L | | 1900 | 1920 | 1870 | 1920 | 1880 |
| **chromium, TCLP** | 7440-47-3 | E444 | 0.25 | mg/L | | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 |
| **cobalt, TCLP** | 7440-48-4 | E444 | 0.050 | mg/L | | 0.398 | 1.28 | 0.734 | 0.489 | 0.605 |
| **copper, TCLP** | 7440-50-8 | E444 | 0.050 | mg/L | | 0.652 | 1.32 | 0.708 | 1.00 | 1.56 |
| **iron, TCLP** | 7439-89-6 | E444 | 5.0 | mg/L | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| **lead, TCLP** | 7439-92-1 | E444 | 0.25 | mg/L | | 0.59 | <0.25 | <0.25 | <0.25 | 0.27 |
| **magnesium, TCLP** | 7439-95-4 | E444 | 2.5 | mg/L | | 128 | 124 | 129 | 130 | 133 |
| **mercury, TCLP** | 7439-97-6 | E512 | 0.0100 | mg/L | | <0.0100 | <0.0100 | <0.0100 | <0.0100 | <0.0100 |
| **nickel, TCLP** | 7440-02-0 | E444 | 0.25 | mg/L | | 0.48 | 0.54 | 0.65 | 1.04 | 0.54 |
| **selenium, TCLP** | 7782-49-2 | E444 | 1.00 | mg/L | | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 |
| **silver, TCLP** | 7440-22-4 | E444 | 0.050 | mg/L | | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| **thallium, TCLP** | 7440-28-0 | E444 | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **vanadium, TCLP** | 7440-62-2 | E444 | 0.15 | mg/L | | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 |

## Analytical Results

| Sub-Matrix: Soil/Solid (Matrix: Soil/Solid) | | | | | Client sample ID | BA2032-A-6 | BA2032-A-7 | BA2032-A-8 | BA2032-A-9 | BA2032-A-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 |
| Analyte | CAS Number | Method | LOR | Unit | | VA20B2335-006 | VA20B2335-007 | VA20B2335-008 | VA20B2335-009 | VA20B2335-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **zinc, TCLP** | 7440-66-6 | E444 | 0.50 | mg/L | | 59.8 | 47.4 | 63.5 | 56.8 | 57.9 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | BA2032-A-11 | BA2032-A-12 | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | ---- | ---- | ---- |
| | | | | | | VA20B2335-011 | VA20B2335-012 | -------- | -------- | -------- |
| | | | | | | Result | Result | ---- | ---- | ---- |
| **Physical Tests** | | | | | | | | | | |
| **moisture** | ---- | E144 | 0.25 | % | | 21.0 | 21.1 | ---- | ---- | ---- |
| **pH (1:2 soil:water)** | ---- | E108 | 0.10 | pH units | | 10.7 | 10.7 | ---- | ---- | ---- |
| **Metals** | | | | | | | | | | |
| **aluminum** | 7429-90-5 | E440 | 50 | mg/kg | | 26500 | 33900 | ---- | ---- | ---- |
| **antimony** | 7440-36-0 | E440 | 0.10 | mg/kg | | 101 | 126 | ---- | ---- | ---- |
| **arsenic** | 7440-38-2 | E440 | 0.10 | mg/kg | | 35.2 | 40.4 | ---- | ---- | ---- |
| **barium** | 7440-39-3 | E440 | 0.50 | mg/kg | | 547 | 515 | ---- | ---- | ---- |
| **beryllium** | 7440-41-7 | E440 | 0.10 | mg/kg | | 0.48 | 0.41 | ---- | ---- | ---- |
| **bismuth** | 7440-69-9 | E440 | 0.20 | mg/kg | | 5.00 | 6.02 | ---- | ---- | ---- |
| **boron** | 7440-42-8 | E440 | 5.0 | mg/kg | | 172 | 227 | ---- | ---- | ---- |
| **cadmium** | 7440-43-9 | E440 | 0.020 | mg/kg | | 21.2 | 14.4 | ---- | ---- | ---- |
| **calcium** | 7440-70-2 | E440 | 50 | mg/kg | | 103000 | 124000 | ---- | ---- | ---- |
| **chromium** | 7440-47-3 | E440 | 0.50 | mg/kg | | 191 | 144 | ---- | ---- | ---- |
| **cobalt** | 7440-48-4 | E440 | 0.10 | mg/kg | | 263 | 317 | ---- | ---- | ---- |
| **copper** | 7440-50-8 | E440 | 0.50 | mg/kg | | 24100 | 1460 | ---- | ---- | ---- |
| **iron** | 7439-89-6 | E440 | 50 | mg/kg | | 108000 | 62100 | ---- | ---- | ---- |
| **lead** | 7439-92-1 | E440 | 0.50 | mg/kg | | 3300 | 613 | ---- | ---- | ---- |
| **lithium** | 7439-93-2 | E440 | 2.0 | mg/kg | | 42.8 | 20.0 | ---- | ---- | ---- |
| **magnesium** | 7439-95-4 | E440 | 20 | mg/kg | | 9440 | 11000 | ---- | ---- | ---- |
| **manganese** | 7439-96-5 | E440 | 1.0 | mg/kg | | 1590 | 1130 | ---- | ---- | ---- |
| **mercury** | 7439-97-6 | E510 | 0.0500 | mg/kg | | <0.0500 | <0.0500 | ---- | ---- | ---- |
| **molybdenum** | 7439-98-7 | E440 | 0.10 | mg/kg | | 36.5 | 30.6 | ---- | ---- | ---- |
| **nickel** | 7440-02-0 | E440 | 0.50 | mg/kg | | 176 | 807 | ---- | ---- | ---- |
| **phosphorus** | 7723-14-0 | E440 | 50 | mg/kg | | 9150 | 11000 | ---- | ---- | ---- |
| **potassium** | 7440-09-7 | E440 | 100 | mg/kg | | 4570 | 5260 | ---- | ---- | ---- |
| **selenium** | 7782-49-2 | E440 | 0.20 | mg/kg | | 0.47 | 0.39 | ---- | ---- | ---- |
| **silver** | 7440-22-4 | E440 | 0.10 | mg/kg | | 3.75 | 5.18 | ---- | ---- | ---- |
| **sodium** | 7440-23-5 | E440 | 50 | mg/kg | | 11900 | 13500 | ---- | ---- | ---- |
| **strontium** | 7440-24-6 | E440 | 0.50 | mg/kg | | 263 | 290 | ---- | ---- | ---- |
| **sulfur** | 7704-34-9 | E440 | 1000 | mg/kg | | 10600 | 13100 | ---- | ---- | ---- |
| **thallium** | 7440-28-0 | E440 | 0.050 | mg/kg | | 0.075 | 0.064 | ---- | ---- | ---- |

## Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | BA2032-A-11 | BA2032-A-12 | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | ---- | ---- | ---- |
| | | | | | | VA20B2335-011 | VA20B2335-012 | -------- | -------- | -------- |
| | | | | | | Result | Result | ---- | ---- | ---- |
| **Metals** | | | | | | | | | | |
| **tin** | 7440-31-5 | E440 | 2.0 | mg/kg | | 99.9 | 111 | ---- | ---- | ---- |
| **titanium** | 7440-32-6 | E440 | 1.0 | mg/kg | | 575 | 597 | ---- | ---- | ---- |
| **tungsten** | 7440-33-7 | E440 | 0.50 | mg/kg | | 7.97 | 9.37 | ---- | ---- | ---- |
| **uranium** | 7440-61-1 | E440 | 0.050 | mg/kg | | 4.05 | 4.78 | ---- | ---- | ---- |
| **vanadium** | 7440-62-2 | E440 | 0.20 | mg/kg | | 44.3 | 43.7 | ---- | ---- | ---- |
| **zinc** | 7440-66-6 | E440 | 2.0 | mg/kg | | 13200 | 4440 | ---- | ---- | ---- |
| **zirconium** | 7440-67-7 | E440 | 1.0 | mg/kg | | 1.0 | 1.3 | ---- | ---- | ---- |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.2 | 11.2 | ---- | ---- | ---- |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.07 | 8.20 | ---- | ---- | ---- |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.90 | 2.90 | ---- | ---- | ---- |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 6.04 | 6.09 | ---- | ---- | ---- |
| **antimony, TCLP** | 7440-36-0 | E444 | 1.0 | mg/L | | <1.0 | <1.0 | ---- | ---- | ---- |
| **arsenic, TCLP** | 7440-38-2 | E444 | 1.0 | mg/L | | <1.0 | <1.0 | ---- | ---- | ---- |
| **barium, TCLP** | 7440-39-3 | E444 | 2.5 | mg/L | | <2.5 | <2.5 | ---- | ---- | ---- |
| **beryllium, TCLP** | 7440-41-7 | E444 | 0.025 | mg/L | | <0.025 | <0.025 | ---- | ---- | ---- |
| **boron, TCLP** | 7440-42-8 | E444 | 0.50 | mg/L | | 2.33 | 2.22 | ---- | ---- | ---- |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.221 | 0.294 | ---- | ---- | ---- |
| **calcium, TCLP** | 7440-70-2 | E444 | 10 | mg/L | | 1940 | 1940 | ---- | ---- | ---- |
| **chromium, TCLP** | 7440-47-3 | E444 | 0.25 | mg/L | | <0.25 | <0.25 | ---- | ---- | ---- |
| **cobalt, TCLP** | 7440-48-4 | E444 | 0.050 | mg/L | | 0.628 | 1.08 | ---- | ---- | ---- |
| **copper, TCLP** | 7440-50-8 | E444 | 0.050 | mg/L | | 1.34 | 1.30 | ---- | ---- | ---- |
| **iron, TCLP** | 7439-89-6 | E444 | 5.0 | mg/L | | <5.0 | <5.0 | ---- | ---- | ---- |
| **lead, TCLP** | 7439-92-1 | E444 | 0.25 | mg/L | | <0.25 | <0.25 | ---- | ---- | ---- |
| **magnesium, TCLP** | 7439-95-4 | E444 | 2.5 | mg/L | | 128 | 132 | ---- | ---- | ---- |
| **mercury, TCLP** | 7439-97-6 | E512 | 0.0100 | mg/L | | <0.0100 | <0.0100 | ---- | ---- | ---- |
| **nickel, TCLP** | 7440-02-0 | E444 | 0.25 | mg/L | | 0.62 | 0.52 | ---- | ---- | ---- |
| **selenium, TCLP** | 7782-49-2 | E444 | 1.00 | mg/L | | <1.00 | <1.00 | ---- | ---- | ---- |
| **silver, TCLP** | 7440-22-4 | E444 | 0.050 | mg/L | | <0.050 | <0.050 | ---- | ---- | ---- |
| **thallium, TCLP** | 7440-28-0 | E444 | 1.0 | mg/L | | <1.0 | <1.0 | ---- | ---- | ---- |
| **vanadium, TCLP** | 7440-62-2 | E444 | 0.15 | mg/L | | <0.15 | <0.15 | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: Soil/Solid (Matrix: Soil/Solid) | | | | | Client sample ID | BA2032-A-11 | BA2032-A-12 | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | ---- | ---- | ---- |
| Analyte | CAS Number | Method | LOR | Unit | | VA20B2335-011 | VA20B2335-012 | -------- | -------- | -------- |
| | | | | | | Result | Result | ---- | ---- | ---- |
| **TCLP Metals** | | | | | | | | | | |
| **zinc, TCLP** | 7440-66-6 | E444 | 0.50 | mg/L | | 46.4 | 50.4 | ---- | ---- | ---- |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

| Sub-Matrix: Soil (Matrix: Soil/Solid) | | | | | Client sample ID | BA2032-A-3 REP1 | BA2032-A-3 REP2 | BA2032-A-3 REP3 | BA2032-A-3 REP4 | BA2032-A-5 REP1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 | 05-Aug-2020 | 05-Aug-2020 | 05-Aug-2020 | 05-Aug-2020 |
| Analyte | CAS Number | Method | LOR | Unit | | VA20B2335-013 | VA20B2335-014 | VA20B2335-015 | VA20B2335-016 | VA20B2335-017 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.2 | 11.2 | 11.2 | 11.2 | 11.3 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 9.04 | 9.04 | 9.04 | 9.04 | 8.85 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.92 | 2.92 | 2.92 | 2.92 | 2.89 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.97 | 6.00 | 5.99 | 5.92 | 5.89 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.252 | 0.284 | 1.91 | 0.240 | 0.333 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | BA2032-A-5 REP2 | BA2032-A-5 REP3 | BA2032-A-5 REP4 | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 | 05-Aug-2020 | 05-Aug-2020 | ---- | ---- |
| | | | | | | VA20B2335-018 | VA20B2335-019 | VA20B2335-020 | -------- | -------- |
| | | | | | | Result | Result | Result | ---- | ---- |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.3 | 11.3 | 11.3 | ---- | ---- |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.85 | 8.85 | 8.85 | ---- | ---- |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.89 | 2.89 | 2.89 | ---- | ---- |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.94 | 5.94 | 5.98 | ---- | ---- |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 1.77 | 0.262 | 0.284 | ---- | ---- |

Please refer to the General Comments section for an explanation of any qualifiers detected.

# QUALITY CONTROL INTERPRETIVE REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B2335** | Page | : 1 of 17 |
| **Amendment** | : 1 | | |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : ---- | Date Samples Received | : 11-Aug-2020 11:45 |
| PO | : VANCO 0000049378 | Issue Date | : 06-Sep-2020 13:26 |
| C-O-C number | : ---- | | |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 20 | | |
| No. of samples analysed | : 20 | | |

**This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.**

**Key**

**Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.**
**CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.**
**DQO: Data Quality Objective.**
**LOR: Limit of Reporting (detection limit).**
**RPD: Relative Percent Difference.**

## Summary of Outliers

### Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

### Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

### Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-1 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-10 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-11 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-12 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-2 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-3 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-4 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-5 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-6 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-7 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-8 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |
| **Metals : Mercury in Soil/Solid by CVAAS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-9 | E510 | 05-Aug-2020 | 17-Aug-2020 | 28 days | 12 days | ✓ | 18-Aug-2020 | 15 days | 0 days | ✓ |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-1 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-10 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-11 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-12 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-2 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-3 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-4 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-5 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-6 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-7 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-8 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |
| **Metals : Metals in Soil/Solid by CRC ICPMS** | | | | | | | | | | |
| **LDPE bag** BA2032-A-9 | E440 | 05-Aug-2020 | 17-Aug-2020 | 180 days | 12 days | ✓ | 17-Aug-2020 | 167 days | 0 days | ✓ |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-1 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-10 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-11 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-12 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-2 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-3 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-4 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-5 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-6 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-7 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-8 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |
| **Physical Tests : Moisture Content by Gravimetry** | | | | | | | | | | |
| **LDPE bag** BA2032-A-9 | E144 | 05-Aug-2020 | ---- | ---- | ---- | | 14-Aug-2020 | ---- | ---- | |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-1 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-10 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-11 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-12 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-2 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-3 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-4 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-5 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-6 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-7 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-8 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |
| **Physical Tests : pH by Meter (1:2 Soil:Water Extraction)** | | | | | | | | | | |
| **LDPE bag** BA2032-A-9 | E108 | 05-Aug-2020 | 17-Aug-2020 | 30 days | 12 days | ✓ | 17-Aug-2020 | 17 days | 0 days | ✓ |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-1 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-10 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-11 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-12 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-2 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-3 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-4 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-5 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-6 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-7 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-8 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |
| **TCLP Metals : Mercury by CVAAS (TCLP)** | | | | | | | | | | |
| **Glass vial - total (lab preserved)** BA2032-A-9 | E512 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 0 days | 0 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-1 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-10 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-11 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-12 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-2 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-3 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-4 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-5 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-6 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-7 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-8 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-9 | E444 | 11-Aug-2020 | ---- | ---- | ---- | | 18-Aug-2020 | 186 days | 13 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-3 REP1 | E444 | 20-Aug-2020 | ---- | ---- | ---- | | 23-Aug-2020 | 194 days | 17 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-3 REP2 | E444 | 20-Aug-2020 | ---- | ---- | ---- | | 23-Aug-2020 | 194 days | 17 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-3 REP3 | E444 | 20-Aug-2020 | ---- | ---- | ---- | | 23-Aug-2020 | 194 days | 17 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-3 REP4 | E444 | 20-Aug-2020 | ---- | ---- | ---- | | 23-Aug-2020 | 194 days | 17 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-5 REP1 | E444 | 02-Sep-2020 | ---- | ---- | ---- | | 04-Sep-2020 | 207 days | 30 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-5 REP2 | E444 | 02-Sep-2020 | ---- | ---- | ---- | | 04-Sep-2020 | 207 days | 30 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-5 REP3 | E444 | 02-Sep-2020 | ---- | ---- | ---- | | 04-Sep-2020 | 207 days | 30 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - total (lab preserved)** BA2032-A-5 REP4 | E444 | 02-Sep-2020 | ---- | ---- | ---- | | 04-Sep-2020 | 207 days | 30 days | ✓ |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** BA2032-A-1 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** BA2032-A-10 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** BA2032-A-11 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** BA2032-A-12 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** BA2032-A-2 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** BA2032-A-3 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** BA2032-A-3 REP1 | EPP444 | 05-Aug-2020 | 20-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** BA2032-A-3 REP2 | EPP444 | 05-Aug-2020 | 20-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** BA2032-A-3 REP3 | EPP444 | 05-Aug-2020 | 20-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** BA2032-A-3 REP4 | EPP444 | 05-Aug-2020 | 20-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** BA2032-A-4 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** BA2032-A-5 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** BA2032-A-5 REP1 | EPP444 | 05-Aug-2020 | 02-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** BA2032-A-5 REP2 | EPP444 | 05-Aug-2020 | 02-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** BA2032-A-5 REP3 | EPP444 | 05-Aug-2020 | 02-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** BA2032-A-5 REP4 | EPP444 | 05-Aug-2020 | 02-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** BA2032-A-6 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** | | | | | | | | | | |
| BA2032-A-7 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** | | | | | | | | | | |
| BA2032-A-8 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)** | | | | | | | | | | |
| BA2032-A-9 | EPP444 | 05-Aug-2020 | 11-Aug-2020 | ---- | ---- | | ---- | ---- | ---- | |

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).

# Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

| Quality Control Sample Type | | | Count | | Frequency (%) | | |
|---|---|---|---|---|---|---|---|
| *Analytical Methods* | *Method* | *QC Lot #* | *QC* | *Regular* | *Actual* | *Expected* | *Evaluation* |
| **Laboratory Duplicates (DUP)** | | | | | | | |
| Mercury in Soil/Solid by CVAAS | E510 | 72080 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Metals in Soil/Solid by CRC ICPMS | E440 | 72081 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Moisture Content by Gravimetry | E144 | 72083 | 1 | 20 | 5.0 | 5.0 | ✓ |
| pH by Meter (1:2 Soil:Water Extraction) | E108 | 72082 | 1 | 20 | 5.0 | 5.0 | ✓ |
| **Laboratory Control Samples (LCS)** | | | | | | | |
| Mercury in Soil/Solid by CVAAS | E510 | 72080 | 2 | 20 | 10.0 | 10.0 | ✓ |
| Metals in Soil/Solid by CRC ICPMS | E440 | 72081 | 2 | 20 | 10.0 | 10.0 | ✓ |
| Moisture Content by Gravimetry | E144 | 72083 | 1 | 20 | 5.0 | 5.0 | ✓ |
| pH by Meter (1:2 Soil:Water Extraction) | E108 | 72082 | 1 | 20 | 5.0 | 5.0 | ✓ |
| **Method Blanks (MB)** | | | | | | | |
| Mercury by CVAAS (TCLP) | E512 | 72826 | 1 | 12 | 8.3 | 5.0 | ✓ |
| Mercury in Soil/Solid by CVAAS | E510 | 72080 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Metals by CRC ICPMS (TCLP) | E444 | 81654 | 3 | 20 | 15.0 | 5.0 | ✓ |
| Metals in Soil/Solid by CRC ICPMS | E440 | 72081 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Moisture Content by Gravimetry | E144 | 72083 | 1 | 20 | 5.0 | 5.0 | ✓ |
| **Matrix Spikes (MS)** | | | | | | | |
| Mercury by CVAAS (TCLP) | E512 | 72826 | 1 | 12 | 8.3 | 5.0 | ✓ |
| Metals by CRC ICPMS (TCLP) | E444 | 81654 | 3 | 20 | 15.0 | 5.0 | ✓ |

## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| pH by Meter (1:2 Soil:Water Extraction) | E108<br>Vancouver - Environmental | Soil/Solid | BC Lab Manual | pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°C), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at <60 ºC) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe. |
| Moisture Content by Gravimetry | E144<br>Vancouver - Environmental | Soil/Solid | CCME PHC in Soil - Tier 1 | Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage. |
| Metals in Soil/Solid by CRC ICPMS | E440<br>Vancouver - Environmental | Soil/Solid | EPA 6020B (mod) | Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Analysis is by Collision/Reaction Cell ICPMS. |
| Metals by CRC ICPMS (TCLP) | E444<br>Vancouver - Environmental | Soil/Solid | EPA 1311/6020B (mod) | An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS. |
| Mercury in Soil/Solid by CVAAS | E510<br>Vancouver - Environmental | Soil/Solid | EPA 200.2/1631 Appendix (mod) | Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis. |
| Mercury by CVAAS (TCLP) | E512<br>Vancouver - Environmental | Soil/Solid | SW 846 -1311/245.1 CVAA ON TCLP LEACHATE | An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by CVAAS. |

| Preparation Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Leach 1:2 Soil:Water for pH | EP108<br>Vancouver - Environmental | Soil/Solid | BC WLAP METHOD: PH, ELECTROMETRIC, SOIL | 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. |
| Digestion for Metals and Mercury | EP440<br>Vancouver - Environmental | Soil/Solid | EPA 200.2 (mod) | Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available. |

| Preparation Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| TCLP Leachate Preparation (Metals, Inorganics, and SVOCs) | EPP444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311 | Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests. |

ALS Environmental

# QUALITY CONTROL REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B2335** | Page | : 1 of 13 |
| **Amendment** | : **1** | | |

| | | | |
|---|---|---|---|
| Client | : Covanta Burnaby Renewable Energy, ULC | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : ---- | Date Samples Received | : 11-Aug-2020 11:45 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 11-Aug-2020 |
| C-O-C number | : ---- | Issue Date | : 06-Sep-2020 13:26 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 20 | | |
| No. of samples analysed | : 20 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Kim Jensen | Department Manager - Metals | Metals, Burnaby, British Columbia |
| Mae Soropia | Laboratory Analyst | Metals, Burnaby, British Columbia |
| Muneeb Alam | Analyst | Metals, Burnaby, British Columbia |
| Ophelia Chiu | Supervisor - Organics Instrumentation | Organics, Burnaby, British Columbia |
| Robin Weeks | Team Leader - Metals | Metals, Burnaby, British Columbia |

## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

## Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: **Soil/Solid**

| | | | | | Laboratory Duplicate (DUP) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Laboratory sample ID* | *Client sample ID* | *Analyte* | *CAS Number* | *Method* | *LOR* | *Unit* | *Original Result* | *Duplicate Result* | *RPD(%) or Difference* | *Duplicate Limits* | *Qualifier* |
| **Physical Tests (QC Lot: 72082)** | | | | | | | | | | | |
| VA20B2306-001 | Anonymous | pH (1:2 soil:water) | ---- | E108 | 0.10 | pH units | 9.00 | 9.11 | 1.21% | 5% | ---- |
| **Physical Tests (QC Lot: 72083)** | | | | | | | | | | | |
| VA20B2306-001 | Anonymous | moisture | ---- | E144 | 0.25 | % | 14.5 | 15.5 | 6.78% | 20% | ---- |
| **Metals (QC Lot: 72080)** | | | | | | | | | | | |
| VA20B2306-001 | Anonymous | mercury | 7439-97-6 | E510 | 0.0500 | mg/kg | <0.0500 | <0.0500 | 0 | Diff <2x LOR | ---- |
| **Metals (QC Lot: 72081)** | | | | | | | | | | | |
| VA20B2306-001 | Anonymous | aluminum | 7429-90-5 | E440 | 50 | mg/kg | 8410 | 8540 | 1.51% | 40% | ---- |
| | | antimony | 7440-36-0 | E440 | 0.10 | mg/kg | 0.20 | 0.24 | 0.03 | Diff <2x LOR | ---- |
| | | arsenic | 7440-38-2 | E440 | 0.10 | mg/kg | 2.85 | 3.21 | 12.1% | 30% | ---- |
| | | barium | 7440-39-3 | E440 | 0.50 | mg/kg | 63.4 | 63.4 | 0.0546% | 40% | ---- |
| | | beryllium | 7440-41-7 | E440 | 0.10 | mg/kg | 0.26 | 0.28 | 0.02 | Diff <2x LOR | ---- |
| | | bismuth | 7440-69-9 | E440 | 0.20 | mg/kg | <0.20 | <0.20 | 0 | Diff <2x LOR | ---- |
| | | boron | 7440-42-8 | E440 | 5.0 | mg/kg | <5.0 | <5.0 | 0 | Diff <2x LOR | ---- |
| | | cadmium | 7440-43-9 | E440 | 0.020 | mg/kg | 0.101 | 0.106 | 0.005 | Diff <2x LOR | ---- |
| | | calcium | 7440-70-2 | E440 | 50 | mg/kg | 10200 | 9210 | 10.2% | 30% | ---- |
| | | chromium | 7440-47-3 | E440 | 0.50 | mg/kg | 62.4 | 57.2 | 8.65% | 30% | ---- |
| | | cobalt | 7440-48-4 | E440 | 0.10 | mg/kg | 14.7 | 14.8 | 0.370% | 30% | ---- |
| | | copper | 7440-50-8 | E440 | 0.50 | mg/kg | 21.5 | 21.3 | 0.789% | 30% | ---- |
| | | iron | 7439-89-6 | E440 | 50 | mg/kg | 41200 | 40700 | 1.18% | 30% | ---- |
| | | lead | 7439-92-1 | E440 | 0.50 | mg/kg | 2.22 | 2.42 | 0.20 | Diff <2x LOR | ---- |
| | | lithium | 7439-93-2 | E440 | 2.0 | mg/kg | 4.9 | 4.9 | 0.03 | Diff <2x LOR | ---- |
| | | magnesium | 7439-95-4 | E440 | 20 | mg/kg | 13500 | 13700 | 1.29% | 30% | ---- |
| | | manganese | 7439-96-5 | E440 | 1.0 | mg/kg | 478 | 533 | 10.9% | 30% | ---- |
| | | molybdenum | 7439-98-7 | E440 | 0.10 | mg/kg | 0.44 | 0.53 | 0.08 | Diff <2x LOR | ---- |
| | | nickel | 7440-02-0 | E440 | 0.50 | mg/kg | 71.5 | 70.9 | 0.872% | 30% | ---- |
| | | phosphorus | 7723-14-0 | E440 | 50 | mg/kg | 840 | 778 | 7.64% | 30% | ---- |
| | | potassium | 7440-09-7 | E440 | 100 | mg/kg | 600 | 600 | 0.855% | 40% | ---- |
| | | selenium | 7782-49-2 | E440 | 0.20 | mg/kg | <0.20 | <0.20 | 0 | Diff <2x LOR | ---- |
| | | silver | 7440-22-4 | E440 | 0.10 | mg/kg | <0.10 | <0.10 | 0 | Diff <2x LOR | ---- |
| | | sodium | 7440-23-5 | E440 | 50 | mg/kg | 452 | 419 | 7.49% | 40% | ---- |
| | | strontium | 7440-24-6 | E440 | 0.50 | mg/kg | 58.2 | 52.6 | 9.96% | 40% | ---- |
| | | sulfur | 7704-34-9 | E440 | 1000 | mg/kg | <1000 | <1000 | 0 | Diff <2x LOR | ---- |

Sub-Matrix: **Soil/Solid**

| | | | | | Laboratory Duplicate (DUP) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Laboratory sample ID* | *Client sample ID* | *Analyte* | *CAS Number* | *Method* | *LOR* | *Unit* | *Original Result* | *Duplicate Result* | *RPD(%) or Difference* | *Duplicate Limits* | *Qualifier* |
| **Metals (QC Lot: 72081) - continued** | | | | | | | | | | | |
| VA20B2306-001 | Anonymous | thallium | 7440-28-0 | E440 | 0.050 | mg/kg | <0.050 | <0.050 | 0 | Diff <2x LOR | ---- |
| | | tin | 7440-31-5 | E440 | 2.0 | mg/kg | <2.0 | <2.0 | 0 | Diff <2x LOR | ---- |
| | | titanium | 7440-32-6 | E440 | 1.0 | mg/kg | 1170 | 1160 | 1.04% | 40% | ---- |
| | | tungsten | 7440-33-7 | E440 | 0.50 | mg/kg | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | uranium | 7440-61-1 | E440 | 0.050 | mg/kg | 0.374 | 0.426 | 12.8% | 30% | ---- |
| | | vanadium | 7440-62-2 | E440 | 0.20 | mg/kg | 114 | 115 | 0.985% | 30% | ---- |
| | | zinc | 7440-66-6 | E440 | 2.0 | mg/kg | 49.4 | 54.6 | 10.1% | 30% | ---- |
| | | zirconium | 7440-67-7 | E440 | 1.0 | mg/kg | 6.4 | 7.3 | 13.0% | 30% | ---- |

## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **Physical Tests (QCLot: 72083)** | | | | | | |
| moisture | ---- | E144 | 0.25 | % | <0.25 | ---- |
| **Metals (QCLot: 72080)** | | | | | | |
| mercury | 7439-97-6 | E510 | 0.005 | mg/kg | <0.0050 | ---- |
| **Metals (QCLot: 72081)** | | | | | | |
| aluminum | 7429-90-5 | E440 | 50 | mg/kg | <50 | ---- |
| antimony | 7440-36-0 | E440 | 0.1 | mg/kg | <0.10 | ---- |
| arsenic | 7440-38-2 | E440 | 0.1 | mg/kg | <0.10 | ---- |
| barium | 7440-39-3 | E440 | 0.5 | mg/kg | <0.50 | ---- |
| beryllium | 7440-41-7 | E440 | 0.1 | mg/kg | <0.10 | ---- |
| bismuth | 7440-69-9 | E440 | 0.2 | mg/kg | <0.20 | ---- |
| boron | 7440-42-8 | E440 | 5 | mg/kg | <5.0 | ---- |
| cadmium | 7440-43-9 | E440 | 0.02 | mg/kg | <0.020 | ---- |
| calcium | 7440-70-2 | E440 | 50 | mg/kg | <50 | ---- |
| chromium | 7440-47-3 | E440 | 0.5 | mg/kg | <0.50 | ---- |
| cobalt | 7440-48-4 | E440 | 0.1 | mg/kg | <0.10 | ---- |
| copper | 7440-50-8 | E440 | 0.5 | mg/kg | <0.50 | ---- |
| iron | 7439-89-6 | E440 | 50 | mg/kg | <50 | ---- |
| lead | 7439-92-1 | E440 | 0.5 | mg/kg | <0.50 | ---- |
| lithium | 7439-93-2 | E440 | 2 | mg/kg | <2.0 | ---- |
| magnesium | 7439-95-4 | E440 | 20 | mg/kg | <20 | ---- |
| manganese | 7439-96-5 | E440 | 1 | mg/kg | <1.0 | ---- |
| molybdenum | 7439-98-7 | E440 | 0.1 | mg/kg | <0.10 | ---- |
| nickel | 7440-02-0 | E440 | 0.5 | mg/kg | <0.50 | ---- |
| phosphorus | 7723-14-0 | E440 | 50 | mg/kg | <50 | ---- |
| potassium | 7440-09-7 | E440 | 100 | mg/kg | <100 | ---- |
| selenium | 7782-49-2 | E440 | 0.2 | mg/kg | <0.20 | ---- |
| silver | 7440-22-4 | E440 | 0.1 | mg/kg | <0.10 | ---- |
| sodium | 7440-23-5 | E440 | 50 | mg/kg | <50 | ---- |
| strontium | 7440-24-6 | E440 | 0.5 | mg/kg | <0.50 | ---- |
| sulfur | 7704-34-9 | E440 | 1000 | mg/kg | <1000 | ---- |
| thallium | 7440-28-0 | E440 | 0.05 | mg/kg | <0.050 | ---- |
| tin | 7440-31-5 | E440 | 2 | mg/kg | <2.0 | ---- |
| titanium | 7440-32-6 | E440 | 1 | mg/kg | <1.0 | ---- |

Sub-Matrix: **Soil/Solid**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **Metals (QCLot: 72081) - continued** | | | | | | |
| tungsten | 7440-33-7 | E440 | 0.5 | mg/kg | <0.50 | ---- |
| uranium | 7440-61-1 | E440 | 0.05 | mg/kg | <0.050 | ---- |
| vanadium | 7440-62-2 | E440 | 0.2 | mg/kg | <0.20 | ---- |
| zinc | 7440-66-6 | E440 | 2 | mg/kg | <2.0 | ---- |
| zirconium | 7440-67-7 | E440 | 1 | mg/kg | <1.0 | ---- |
| **TCLP Metals (QCLot: 72825)** | | | | | | |
| antimony, TCLP | 7440-36-0 | E444 | 1 | mg/L | <1.0 | ---- |
| arsenic, TCLP | 7440-38-2 | E444 | 1 | mg/L | <1.0 | ---- |
| barium, TCLP | 7440-39-3 | E444 | 2.5 | mg/L | <2.5 | ---- |
| beryllium, TCLP | 7440-41-7 | E444 | 0.025 | mg/L | <0.025 | ---- |
| boron, TCLP | 7440-42-8 | E444 | 0.5 | mg/L | <0.50 | ---- |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |
| calcium, TCLP | 7440-70-2 | E444 | 10 | mg/L | <10 | ---- |
| chromium, TCLP | 7440-47-3 | E444 | 0.25 | mg/L | <0.25 | ---- |
| cobalt, TCLP | 7440-48-4 | E444 | 0.05 | mg/L | <0.050 | ---- |
| copper, TCLP | 7440-50-8 | E444 | 0.05 | mg/L | <0.050 | ---- |
| iron, TCLP | 7439-89-6 | E444 | 5 | mg/L | <5.0 | ---- |
| lead, TCLP | 7439-92-1 | E444 | 0.25 | mg/L | <0.25 | ---- |
| magnesium, TCLP | 7439-95-4 | E444 | 2.5 | mg/L | <2.5 | ---- |
| nickel, TCLP | 7440-02-0 | E444 | 0.25 | mg/L | <0.25 | ---- |
| selenium, TCLP | 7782-49-2 | E444 | 0.1 | mg/L | <0.10 | ---- |
| silver, TCLP | 7440-22-4 | E444 | 0.05 | mg/L | <0.050 | ---- |
| thallium, TCLP | 7440-28-0 | E444 | 1 | mg/L | <1.0 | ---- |
| vanadium, TCLP | 7440-62-2 | E444 | 0.15 | mg/L | <0.15 | ---- |
| zinc, TCLP | 7440-66-6 | E444 | 0.5 | mg/L | <0.50 | ---- |
| **TCLP Metals (QCLot: 72826)** | | | | | | |
| mercury, TCLP | 7439-97-6 | E512 | 0.001 | mg/L | <0.0010 | ---- |
| **TCLP Metals (QCLot: 75631)** | | | | | | |
| antimony, TCLP | 7440-36-0 | E444 | 1 | mg/L | <1.0 | ---- |
| arsenic, TCLP | 7440-38-2 | E444 | 1 | mg/L | <1.0 | ---- |
| barium, TCLP | 7440-39-3 | E444 | 2.5 | mg/L | <2.5 | ---- |
| beryllium, TCLP | 7440-41-7 | E444 | 0.025 | mg/L | <0.025 | ---- |
| boron, TCLP | 7440-42-8 | E444 | 0.5 | mg/L | <0.50 | ---- |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |
| calcium, TCLP | 7440-70-2 | E444 | 10 | mg/L | <10 | ---- |
| chromium, TCLP | 7440-47-3 | E444 | 0.25 | mg/L | <0.25 | ---- |

Sub-Matrix: **Soil/Solid**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **TCLP Metals (QCLot: 75631) - continued** | | | | | | |
| cobalt, TCLP | 7440-48-4 | E444 | 0.05 | mg/L | <0.050 | ---- |
| copper, TCLP | 7440-50-8 | E444 | 0.05 | mg/L | <0.050 | ---- |
| iron, TCLP | 7439-89-6 | E444 | 5 | mg/L | <5.0 | ---- |
| lead, TCLP | 7439-92-1 | E444 | 0.25 | mg/L | <0.25 | ---- |
| magnesium, TCLP | 7439-95-4 | E444 | 2.5 | mg/L | <2.5 | ---- |
| nickel, TCLP | 7440-02-0 | E444 | 0.25 | mg/L | <0.25 | ---- |
| selenium, TCLP | 7782-49-2 | E444 | 0.1 | mg/L | <0.10 | ---- |
| silver, TCLP | 7440-22-4 | E444 | 0.05 | mg/L | <0.050 | ---- |
| thallium, TCLP | 7440-28-0 | E444 | 1 | mg/L | <1.0 | ---- |
| vanadium, TCLP | 7440-62-2 | E444 | 0.15 | mg/L | <0.15 | ---- |
| zinc, TCLP | 7440-66-6 | E444 | 0.5 | mg/L | <0.50 | ---- |
| **TCLP Metals (QCLot: 81654)** | | | | | | |
| antimony, TCLP | 7440-36-0 | E444 | 1 | mg/L | <1.0 | ---- |
| arsenic, TCLP | 7440-38-2 | E444 | 1 | mg/L | <1.0 | ---- |
| barium, TCLP | 7440-39-3 | E444 | 2.5 | mg/L | <2.5 | ---- |
| beryllium, TCLP | 7440-41-7 | E444 | 0.025 | mg/L | <0.025 | ---- |
| boron, TCLP | 7440-42-8 | E444 | 0.5 | mg/L | <0.50 | ---- |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |
| calcium, TCLP | 7440-70-2 | E444 | 10 | mg/L | <10 | ---- |
| chromium, TCLP | 7440-47-3 | E444 | 0.25 | mg/L | <0.25 | ---- |
| cobalt, TCLP | 7440-48-4 | E444 | 0.05 | mg/L | <0.050 | ---- |
| copper, TCLP | 7440-50-8 | E444 | 0.05 | mg/L | <0.050 | ---- |
| iron, TCLP | 7439-89-6 | E444 | 5 | mg/L | <5.0 | ---- |
| lead, TCLP | 7439-92-1 | E444 | 0.25 | mg/L | <0.25 | ---- |
| magnesium, TCLP | 7439-95-4 | E444 | 2.5 | mg/L | <2.5 | ---- |
| nickel, TCLP | 7440-02-0 | E444 | 0.25 | mg/L | <0.25 | ---- |
| selenium, TCLP | 7782-49-2 | E444 | 0.1 | mg/L | <0.10 | ---- |
| silver, TCLP | 7440-22-4 | E444 | 0.05 | mg/L | <0.050 | ---- |
| thallium, TCLP | 7440-28-0 | E444 | 1 | mg/L | <1.0 | ---- |
| vanadium, TCLP | 7440-62-2 | E444 | 0.15 | mg/L | <0.15 | ---- |
| zinc, TCLP | 7440-66-6 | E444 | 0.5 | mg/L | <0.50 | ---- |

## Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Concentration | LCS | Low | High | Qualifier |
| **Physical Tests (QCLot: 72082)** | | | | | | | | | |
| pH (1:2 soil:water) | ---- | E108 | ---- | pH units | 6 pH units | 99.8 | 95.0 | 105 | ---- |
| **Physical Tests (QCLot: 72083)** | | | | | | | | | |
| moisture | ---- | E144 | 0.25 | % | 50 % | 100.0 | 90.0 | 110 | ---- |
| **Metals (QCLot: 72080)** | | | | | | | | | |
| mercury | 7439-97-6 | E510 | 0.005 | mg/kg | 0.1 mg/kg | 102 | 80.0 | 120 | ---- |
| **Metals (QCLot: 72081)** | | | | | | | | | |
| aluminum | 7429-90-5 | E440 | 50 | mg/kg | 200 mg/kg | 98.6 | 80.0 | 120 | ---- |
| antimony | 7440-36-0 | E440 | 0.1 | mg/kg | 100 mg/kg | 108 | 80.0 | 120 | ---- |
| arsenic | 7440-38-2 | E440 | 0.1 | mg/kg | 100 mg/kg | 98.7 | 80.0 | 120 | ---- |
| barium | 7440-39-3 | E440 | 0.5 | mg/kg | 25 mg/kg | 107 | 80.0 | 120 | ---- |
| beryllium | 7440-41-7 | E440 | 0.1 | mg/kg | 10 mg/kg | 97.4 | 80.0 | 120 | ---- |
| bismuth | 7440-69-9 | E440 | 0.2 | mg/kg | 100 mg/kg | 107 | 80.0 | 120 | ---- |
| boron | 7440-42-8 | E440 | 5 | mg/kg | 100 mg/kg | 100 | 80.0 | 120 | ---- |
| cadmium | 7440-43-9 | E440 | 0.02 | mg/kg | 10 mg/kg | 104 | 80.0 | 120 | ---- |
| calcium | 7440-70-2 | E440 | 50 | mg/kg | 5000 mg/kg | 101 | 80.0 | 120 | ---- |
| chromium | 7440-47-3 | E440 | 0.5 | mg/kg | 25 mg/kg | 101 | 80.0 | 120 | ---- |
| cobalt | 7440-48-4 | E440 | 0.1 | mg/kg | 25 mg/kg | 97.5 | 80.0 | 120 | ---- |
| copper | 7440-50-8 | E440 | 0.5 | mg/kg | 25 mg/kg | 98.7 | 80.0 | 120 | ---- |
| iron | 7439-89-6 | E440 | 50 | mg/kg | 100 mg/kg | 102 | 80.0 | 120 | ---- |
| lead | 7439-92-1 | E440 | 0.5 | mg/kg | 50 mg/kg | 106 | 80.0 | 120 | ---- |
| lithium | 7439-93-2 | E440 | 2 | mg/kg | 25 mg/kg | 90.4 | 80.0 | 120 | ---- |
| magnesium | 7439-95-4 | E440 | 20 | mg/kg | 5000 mg/kg | 105 | 80.0 | 120 | ---- |
| manganese | 7439-96-5 | E440 | 1 | mg/kg | 25 mg/kg | 105 | 80.0 | 120 | ---- |
| molybdenum | 7439-98-7 | E440 | 0.1 | mg/kg | 25 mg/kg | 99.3 | 80.0 | 120 | ---- |
| nickel | 7440-02-0 | E440 | 0.5 | mg/kg | 50 mg/kg | 98.6 | 80.0 | 120 | ---- |
| phosphorus | 7723-14-0 | E440 | 50 | mg/kg | 1000 mg/kg | 108 | 80.0 | 120 | ---- |
| potassium | 7440-09-7 | E440 | 100 | mg/kg | 5000 mg/kg | 102 | 80.0 | 120 | ---- |
| selenium | 7782-49-2 | E440 | 0.2 | mg/kg | 100 mg/kg | 106 | 80.0 | 120 | ---- |
| silver | 7440-22-4 | E440 | 0.1 | mg/kg | 10 mg/kg | 101 | 80.0 | 120 | ---- |
| sodium | 7440-23-5 | E440 | 50 | mg/kg | 5000 mg/kg | 103 | 80.0 | 120 | ---- |
| strontium | 7440-24-6 | E440 | 0.5 | mg/kg | 25 mg/kg | 103 | 80.0 | 120 | ---- |
| sulfur | 7704-34-9 | E440 | 1000 | mg/kg | 5000 mg/kg | 96.8 | 80.0 | 120 | ---- |
| thallium | 7440-28-0 | E440 | 0.05 | mg/kg | 100 mg/kg | 105 | 80.0 | 120 | ---- |

Sub-Matrix: **Soil/Solid**

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Concentration | LCS | Low | High | Qualifier |
| **Metals (QCLot: 72081) - continued** | | | | | | | | | |
| tin | 7440-31-5 | E440 | 2 | mg/kg | 50 mg/kg | 101 | 80.0 | 120 | ---- |
| titanium | 7440-32-6 | E440 | 1 | mg/kg | 25 mg/kg | 98.0 | 80.0 | 120 | ---- |
| tungsten | 7440-33-7 | E440 | 0.5 | mg/kg | 10 mg/kg | 106 | 80.0 | 120 | ---- |
| uranium | 7440-61-1 | E440 | 0.05 | mg/kg | 0.5 mg/kg | 110 | 80.0 | 120 | ---- |
| vanadium | 7440-62-2 | E440 | 0.2 | mg/kg | 50 mg/kg | 100 | 80.0 | 120 | ---- |
| zinc | 7440-66-6 | E440 | 2 | mg/kg | 50 mg/kg | 114 | 80.0 | 120 | ---- |
| zirconium | 7440-67-7 | E440 | 1 | mg/kg | 10 mg/kg | 100 | 80.0 | 120 | ---- |

## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| **TCLP Metals (QCLot: 72825)** | | | | | | | | | | |
| VA20B2335-001 | BA2032-A-1 | antimony, TCLP | 7440-36-0 | E444 | 4.5 mg/L | 5 mg/L | 90.2 | 50.0 | 140 | ---- |
| | | arsenic, TCLP | 7440-38-2 | E444 | 4.6 mg/L | 5 mg/L | 91.3 | 50.0 | 140 | ---- |
| | | barium, TCLP | 7440-39-3 | E444 | 12.7 mg/L | 12.5 mg/L | 102 | 50.0 | 140 | ---- |
| | | beryllium, TCLP | 7440-41-7 | E444 | 0.225 mg/L | 0.25 mg/L | 90.2 | 50.0 | 140 | ---- |
| | | boron, TCLP | 7440-42-8 | E444 | 8.58 mg/L | 10 mg/L | 85.8 | 50.0 | 140 | ---- |
| | | cadmium, TCLP | 7440-43-9 | E444 | 0.215 mg/L | 0.25 mg/L | 86.0 | 50.0 | 140 | ---- |
| | | calcium, TCLP | 7440-70-2 | E444 | ND mg/L | 250 mg/L | ND | 50.0 | 140 | ---- |
| | | chromium, TCLP | 7440-47-3 | E444 | 1.16 mg/L | 1.25 mg/L | 92.6 | 50.0 | 140 | ---- |
| | | cobalt, TCLP | 7440-48-4 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |
| | | copper, TCLP | 7440-50-8 | E444 | 2.21 mg/L | 2.5 mg/L | 88.4 | 50.0 | 140 | ---- |
| | | iron, TCLP | 7439-89-6 | E444 | 230 mg/L | 250 mg/L | 92.2 | 50.0 | 140 | ---- |
| | | lead, TCLP | 7439-92-1 | E444 | 9.57 mg/L | 10 mg/L | 95.7 | 50.0 | 140 | ---- |
| | | magnesium, TCLP | 7439-95-4 | E444 | 227 mg/L | 250 mg/L | 90.7 | 50.0 | 140 | ---- |
| | | nickel, TCLP | 7440-02-0 | E444 | 2.22 mg/L | 2.5 mg/L | 89.0 | 50.0 | 140 | ---- |
| | | selenium, TCLP | 7782-49-2 | E444 | 4.48 mg/L | 5 mg/L | 89.6 | 50.0 | 140 | ---- |
| | | silver, TCLP | 7440-22-4 | E444 | 0.107 mg/L | 0.1 mg/L | 107 | 50.0 | 140 | ---- |
| | | thallium, TCLP | 7440-28-0 | E444 | 4.5 mg/L | 5 mg/L | 89.5 | 50.0 | 140 | ---- |
| | | vanadium, TCLP | 7440-62-2 | E444 | 0.71 mg/L | 0.75 mg/L | 94.2 | 50.0 | 140 | ---- |
| | | zinc, TCLP | 7440-66-6 | E444 | ND mg/L | 10 mg/L | ND | 50.0 | 140 | ---- |
| **TCLP Metals (QCLot: 72826)** | | | | | | | | | | |
| VA20B2335-001 | BA2032-A-1 | mercury, TCLP | 7439-97-6 | E512 | 0.0010 mg/L | 0.001 mg/L | 99.3 | 50.0 | 140 | ---- |
| **TCLP Metals (QCLot: 75631)** | | | | | | | | | | |
| VA20B2335-013 | BA2032-A-3 REP1 | antimony, TCLP | 7440-36-0 | E444 | 5.1 mg/L | 5 mg/L | 102 | 50.0 | 140 | ---- |
| | | arsenic, TCLP | 7440-38-2 | E444 | 4.8 mg/L | 5 mg/L | 95.4 | 50.0 | 140 | ---- |
| | | barium, TCLP | 7440-39-3 | E444 | 12.0 mg/L | 12.5 mg/L | 95.9 | 50.0 | 140 | ---- |
| | | beryllium, TCLP | 7440-41-7 | E444 | 0.250 mg/L | 0.25 mg/L | 100 | 50.0 | 140 | ---- |
| | | boron, TCLP | 7440-42-8 | E444 | 10.2 mg/L | 10 mg/L | 102 | 50.0 | 140 | ---- |
| | | cadmium, TCLP | 7440-43-9 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |
| | | calcium, TCLP | 7440-70-2 | E444 | ND mg/L | 250 mg/L | ND | 50.0 | 140 | ---- |
| | | chromium, TCLP | 7440-47-3 | E444 | 1.19 mg/L | 1.25 mg/L | 95.1 | 50.0 | 140 | ---- |
| | | cobalt, TCLP | 7440-48-4 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |

Sub-Matrix: **Soil/Solid**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| **TCLP Metals (QCLot: 75631) - continued** | | | | | | | | | | |
| VA20B2335-013 | BA2032-A-3 REP1 | copper, TCLP | 7440-50-8 | E444 | 2.29 mg/L | 2.5 mg/L | 91.7 | 50.0 | 140 | ---- |
| | | iron, TCLP | 7439-89-6 | E444 | 240 mg/L | 250 mg/L | 95.9 | 50.0 | 140 | ---- |
| | | lead, TCLP | 7439-92-1 | E444 | 10.4 mg/L | 10 mg/L | 104 | 50.0 | 140 | ---- |
| | | magnesium, TCLP | 7439-95-4 | E444 | 240 mg/L | 250 mg/L | 96.1 | 50.0 | 140 | ---- |
| | | nickel, TCLP | 7440-02-0 | E444 | 2.31 mg/L | 2.5 mg/L | 92.4 | 50.0 | 140 | ---- |
| | | selenium, TCLP | 7782-49-2 | E444 | 4.95 mg/L | 5 mg/L | 99.1 | 50.0 | 140 | ---- |
| | | silver, TCLP | 7440-22-4 | E444 | 0.103 mg/L | 0.1 mg/L | 103 | 50.0 | 140 | ---- |
| | | thallium, TCLP | 7440-28-0 | E444 | 5.2 mg/L | 5 mg/L | 104 | 50.0 | 140 | ---- |
| | | vanadium, TCLP | 7440-62-2 | E444 | 0.73 mg/L | 0.75 mg/L | 97.3 | 50.0 | 140 | ---- |
| | | zinc, TCLP | 7440-66-6 | E444 | ND mg/L | 10 mg/L | ND | 50.0 | 140 | ---- |
| **TCLP Metals (QCLot: 81654)** | | | | | | | | | | |
| VA20B2335-017 | BA2032-A-5 REP1 | antimony, TCLP | 7440-36-0 | E444 | 4.6 mg/L | 5 mg/L | 92.0 | 50.0 | 140 | ---- |
| | | arsenic, TCLP | 7440-38-2 | E444 | 4.4 mg/L | 5 mg/L | 89.1 | 50.0 | 140 | ---- |
| | | barium, TCLP | 7440-39-3 | E444 | 12.0 mg/L | 12.5 mg/L | 95.8 | 50.0 | 140 | ---- |
| | | beryllium, TCLP | 7440-41-7 | E444 | 0.234 mg/L | 0.25 mg/L | 93.4 | 50.0 | 140 | ---- |
| | | boron, TCLP | 7440-42-8 | E444 | 8.91 mg/L | 10 mg/L | 89.1 | 50.0 | 140 | ---- |
| | | cadmium, TCLP | 7440-43-9 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |
| | | calcium, TCLP | 7440-70-2 | E444 | ND mg/L | 250 mg/L | ND | 50.0 | 140 | ---- |
| | | chromium, TCLP | 7440-47-3 | E444 | 1.14 mg/L | 1.25 mg/L | 90.9 | 50.0 | 140 | ---- |
| | | cobalt, TCLP | 7440-48-4 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |
| | | copper, TCLP | 7440-50-8 | E444 | 2.11 mg/L | 2.5 mg/L | 84.4 | 50.0 | 140 | ---- |
| | | iron, TCLP | 7439-89-6 | E444 | 222 mg/L | 250 mg/L | 88.6 | 50.0 | 140 | ---- |
| | | lead, TCLP | 7439-92-1 | E444 | 9.40 mg/L | 10 mg/L | 94.0 | 50.0 | 140 | ---- |
| | | magnesium, TCLP | 7439-95-4 | E444 | 223 mg/L | 250 mg/L | 89.2 | 50.0 | 140 | ---- |
| | | nickel, TCLP | 7440-02-0 | E444 | 2.15 mg/L | 2.5 mg/L | 85.9 | 50.0 | 140 | ---- |
| | | selenium, TCLP | 7782-49-2 | E444 | 4.86 mg/L | 5 mg/L | 97.2 | 50.0 | 140 | ---- |
| | | silver, TCLP | 7440-22-4 | E444 | 0.101 mg/L | 0.1 mg/L | 101 | 50.0 | 140 | ---- |
| | | thallium, TCLP | 7440-28-0 | E444 | 4.4 mg/L | 5 mg/L | 87.1 | 50.0 | 140 | ---- |
| | | vanadium, TCLP | 7440-62-2 | E444 | 0.66 mg/L | 0.75 mg/L | 87.8 | 50.0 | 140 | ---- |
| | | zinc, TCLP | 7440-66-6 | E444 | ND mg/L | 10 mg/L | ND | 50.0 | 140 | ---- |

## Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix: **Soil/Solid**

| | | | | | Reference Material (RM) Report | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | RM Target | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Reference Material ID | Analyte | CAS Number | Method | Concentration | RM | Low | High | Qualifier |
| **Metals (QCLot: 72080)** | | | | | | | | | |
| QC-72080-003 | SCP SS-2 | mercury | 7439-97-6 | E510 | 0.059 mg/kg | 118 | 70.0 | 130 | ---- |
| **Metals (QCLot: 72081)** | | | | | | | | | |
| QC-72081-003 | SCP SS-2 | aluminum | 7429-90-5 | E440 | 9817 mg/kg | 98.8 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | antimony | 7440-36-0 | E440 | 3.99 mg/kg | 97.9 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | arsenic | 7440-38-2 | E440 | 3.73 mg/kg | 98.3 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | barium | 7440-39-3 | E440 | 105 mg/kg | 99.7 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | beryllium | 7440-41-7 | E440 | 0.349 mg/kg | 100 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | boron | 7440-42-8 | E440 | 8.5 mg/kg | 115 | 40.0 | 160 | ---- |
| QC-72081-003 | SCP SS-2 | cadmium | 7440-43-9 | E440 | 0.91 mg/kg | 99.0 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | calcium | 7440-70-2 | E440 | 31082 mg/kg | 103 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | chromium | 7440-47-3 | E440 | 101 mg/kg | 105 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | cobalt | 7440-48-4 | E440 | 6.9 mg/kg | 97.9 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | copper | 7440-50-8 | E440 | 123 mg/kg | 98.3 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | iron | 7439-89-6 | E440 | 23558 mg/kg | 102 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | lead | 7439-92-1 | E440 | 267 mg/kg | 99.2 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | lithium | 7439-93-2 | E440 | 9.5 mg/kg | 97.1 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | magnesium | 7439-95-4 | E440 | 5509 mg/kg | 98.1 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | manganese | 7439-96-5 | E440 | 269 mg/kg | 105 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | molybdenum | 7439-98-7 | E440 | 1.03 mg/kg | 102 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | nickel | 7440-02-0 | E440 | 26.7 mg/kg | 98.0 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | phosphorus | 7723-14-0 | E440 | 752 mg/kg | 106 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | potassium | 7440-09-7 | E440 | 1587 mg/kg | 106 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | silver | 7440-22-4 | E440 | 4.06 mg/kg | 96.6 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | sodium | 7440-23-5 | E440 | 797 mg/kg | 100 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | strontium | 7440-24-6 | E440 | 86.1 mg/kg | 102 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | thallium | 7440-28-0 | E440 | 0.0786 mg/kg | 96.2 | 40.0 | 160 | ---- |
| QC-72081-003 | SCP SS-2 | tin | 7440-31-5 | E440 | 10.6 mg/kg | 97.6 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | titanium | 7440-32-6 | E440 | 839 mg/kg | 109 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | uranium | 7440-61-1 | E440 | 0.52 mg/kg | 105 | 70.0 | 130 | ---- |

Sub-Matrix: **Soil/Solid**

| | | | | | Reference Material (RM) Report | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | RM Target | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Reference Material ID | Analyte | CAS Number | Method | Concentration | RM | Low | High | Qualifier |
| **Metals (QCLot: 72081) - continued** | | | | | | | | | |
| QC-72081-003 | SCP SS-2 | vanadium | 7440-62-2 | E440 | 32.7 mg/kg | 102 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | zinc | 7440-66-6 | E440 | 297 mg/kg | 110 | 70.0 | 130 | ---- |
| QC-72081-003 | SCP SS-2 | zirconium | 7440-67-7 | E440 | 5.73 mg/kg | 99.2 | 70.0 | 130 | ---- |

ALS Environmental

# 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 | | | ☐ Standard ☐ Other | | ◉ Regular (Standard Turnaround Times - Business Days) |
| Contact: | Steve Mckinney / Dan Skrypnyk | | | ☑ PDF ☐ Excel ☐ Digital ☐ Fax | | ○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT |
| Address: | 5150 Riverbend Drive | | | Email 1: | smckinney@covanta.com | ○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT |
| | Burnaby BC | | | Email 2: | rjohnson4@covanta.com | ○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT |
| Phone: | 604-521-1025 | Fax: | | Email 3: | dskrypnyk@covanta.com | |
| | | ☐ Yes | ☐ No | | brent.kirkpatrick@metrovancouver.org | |
| | | | | | Sarah.Wellman@metrovancouver.org | |
| Invoice To | Same as Report ? | | | Client / Project Information | | |
| Hardcopy of Invoice with Report? | | ☐ Yes | ☐ No | Job #: | | |
| Company: | | | | PO / AFE: | PO# 46693 Weekly Bottom Ash - Suite | |
| Contact: | | | | LSD: | (includes 2:1 pH) | |
| Address: | | | | | | |
| Phone: | | Fax: | | Quote #: | | |

| Lab Work Order # (lab use only) | B2335 | 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 |
|---|---|---|---|---|---|---|---|---|---|
| | BA2032-A-1 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |
| | BA2032-A-2 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |
| | BA2032-A-3 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |
| | BA2032-A-4 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |
| | BA2032-A-5 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |
| | BA2032-A-6 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |
| | BA2032-A-7 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |
| | BA2032-A-8 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |
| • | BA2032-A-9 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |
| | BA2032-A-10 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |
| | BA2032-A-11 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |
| | BA2032-A-12 | 05-Aug-20 | 9:00 | Soil | X | X | | X | 1 |

Environmental Division
Vancouver
Work Order Reference
VA20B2335

Telephone : +1 604 253 4188

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: Yes / No ? If Yes add SIF |
| | 11-Aug-20 | 800 | CM | 11/08/20 | 11:45am | 22 °C | | | | |

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5217** | Page | : 1 of 4 |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby BC Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 18-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 23-Sep-2020 09:58 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Robin Weeks | Team Leader - Metals | Metals, Burnaby, British Columbia |

## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

| *Unit* | *Description* |
|---|---|
| mg/L | milligrams per litre |
| pH units | pH units |

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior 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.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-01-01 | DBA2032-A-01-02 | DBA2032-A-01-03 | DBA2032-A-01-04 | DBA2032-A-01-05 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 03-Aug-2020 09:00 | 03-Aug-2020 09:00 | 03-Aug-2020 09:00 | 03-Aug-2020 09:00 | 03-Aug-2020 09:00 |
| | | | | | | VA20B5217-001 | VA20B5217-002 | VA20B5217-003 | VA20B5217-004 | VA20B5217-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.54 | 8.49 | 8.44 | 9.62 | 9.42 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.91 | 2.91 | 2.91 | 2.91 | 2.91 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 6.15 | 5.81 | 6.08 | 5.93 | 6.02 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.312 | 0.271 | 0.301 | 0.258 | 0.274 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-01-06 | DBA2032-A-01-07 | DBA2032-A-01-08 | DBA2032-A-01-09 | DBA2032-A-01-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 03-Aug-2020 09:00 | 03-Aug-2020 09:00 | 03-Aug-2020 09:00 | 03-Aug-2020 09:00 | 03-Aug-2020 09:00 |
| | | | | | | VA20B5217-006 | VA20B5217-007 | VA20B5217-008 | VA20B5217-009 | VA20B5217-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.89 | 8.87 | 8.32 | 9.32 | 9.14 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.91 | 2.91 | 2.91 | 2.91 | 2.91 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.93 | 6.22 | 6.03 | 6.29 | 6.19 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.301 | 0.530 | 0.262 | 0.432 | 0.275 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-01-11 | DBA2032-A-01-12 | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 03-Aug-2020 09:00 | 03-Aug-2020 09:00 | ---- | ---- | ---- |
| | | | | | | VA20B5217-011 | VA20B5217-012 | -------- | -------- | -------- |
| | | | | | | Result | Result | ---- | ---- | ---- |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.2 | 11.2 | ---- | ---- | ---- |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 9.88 | 9.45 | ---- | ---- | ---- |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.91 | 2.91 | ---- | ---- | ---- |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 6.31 | 5.82 | ---- | ---- | ---- |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.314 | 0.418 | ---- | ---- | ---- |

Please refer to the General Comments section for an explanation of any qualifiers detected.

# QUALITY CONTROL INTERPRETIVE REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5217** | Page | : 1 of 7 |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Issue Date | : 23-Sep-2020 09:58 |
| C-O-C number | : ---- | | |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

**This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.**

**Key**

**Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.**
**CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.**
**DQO: Data Quality Objective.**
**LOR: Limit of Reporting (detection limit).**
**RPD: Relative Percent Difference.**

## *Summary of Outliers*

### *Outliers : Quality Control Samples*

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

### *Outliers: Reference Material (RM) Samples*

- No Reference Material (RM) Sample outliers occur.

### *Outliers : Analysis Holding Time Compliance (Breaches)*

- No Analysis Holding Time Outliers exist.

### *Outliers : Frequency of Quality Control Samples*

- No Quality Control Sample Frequency Outliers occur.

# Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-01 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-02 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-03 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-04 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-05 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-06 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-07 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-08 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-09 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-10 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-11 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-01-12 | E444 | 18-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 226 days | 49 days | ✓ |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-01 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-02 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-03 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-04 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-05 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-06 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-07 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-08 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-09 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-10 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-11 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-01-12 | EPP444 | 03-Aug-2020 | 18-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).

## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

| Quality Control Sample Type | | | Count | | Frequency (%) | | |
|---|---|---|---|---|---|---|---|
| *Analytical Methods* | *Method* | *QC Lot #* | *QC* | *Regular* | *Actual* | *Expected* | *Evaluation* |
| Method Blanks (MB) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 89073 | 1 | 12 | 8.3 | 5.0 | ✓ |
| Matrix Spikes (MS) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 89073 | 1 | 12 | 8.3 | 5.0 | ✓ |

## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Metals by CRC ICPMS (TCLP) | E444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311/6020B (mod) | An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS. |

| Preparation Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Leach 1:2 Soil:Water for pH | EP108<br><br>Vancouver - Environmental | Soil/Solid | BC WLAP METHOD: PH, ELECTROMETRIC, SOIL | 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. |
| TCLP Leachate Preparation (Metals, Inorganics, and SVOCs) | EPP444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311 | Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests. |

# QUALITY CONTROL REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5217** | Page | : 1 of 3 |
| Client | : Covanta Burnaby Renewable Energy, ULC | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 18-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 23-Sep-2020 09:58 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Robin Weeks | Team Leader - Metals | Metals, Burnaby, British Columbia |

## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **TCLP Metals (QCLot: 89073)** | | | | | | |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |

## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| **TCLP Metals (QCLot: 89073)** | | | | | | | | | | |
| VA20B5217-001 | DBA2032-A-01-01 | cadmium, TCLP | 7440-43-9 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |

ALS Environmental

**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 | | | ☐ Standard ☐ Other | | | | ◉ Regular (Standard Turnaround Times - Business Days) |
| Contact: | Steve Mckinney / Dan Skrypnyk | | | ☑ PDF ☐ Excel ☐ Digital ☐ Fax | | | | ○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT |
| Address: | 5150 Riverbend Drive | | | Email 1: | smckinney@covantaenergy.com | | | ○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT |
| | Burnaby BC | | | Email 2: | dskrypnyk@covanta.com | | | ○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT |
| Phone: | 604-521-1025 | Fax: | | Email 3: | sarah.wellman@metrovancouver.org | | | **Analysis Request** |
| | | ☐ Yes | ☐ No | | brent.kirkpatrick@metrovancouver.org | | | |
| | | | | | rjohnson4@covanta.com | | | |
| **Invoice To** | Same as Report ? | | | **Client / Project Information** | | | | Please indicate below Filtered, Preserved or both (F, P, F/P) |
| Hardcopy of Invoice with Report? | | ☐ Yes | ☐ No | Job #: | | | | |
| Company: | | | | PO / AFE: | Weekly Bottom Ash - Suite | | | |
| Contact: | | | | LSD: | (includes 2:1 pH) | | | |
| Address: | | | | | | | | |
| Phone: | | Fax: | | Quote #: | | | | |

| Lab Work Order # (lab use only) | | ALS Contact: | | Sampler: | |
|---|---|---|---|---|---|

| Sample # | Sample Identification (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | CD-TCLP-VA(Cd and pH steps) | Number of Containers |
|---|---|---|---|---|---|---|
| | DBA2032-A-01-01 | Aug 3 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-01-02 | Aug 3 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-01-03 | Aug 3 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-01-04 | Aug 3 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-01-05 | Aug 3 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-01-06 | Aug 3 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-01-07 | Aug 3 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-01-08 | Aug 3 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-01-09 | Aug 3 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-01-10 | Aug 3 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-01-11 | Aug 3 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-01-12 | Aug 3 2020 | 9:00 | Soil | X | 1 |

Environmental Division
Vancouver
Work Order Reference
**VA20B5217**

Telephone : +1 604 253 4188

**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: Yes / No ? If Yes add SIF |
| | 15-Sep-20 | 0800 | | | | 19.4 °C | RK | 15/9/20 | 11:35 | |

GENF 20.00 Front

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5216** | Page | : 1 of 4 |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby BC Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 17-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 23-Sep-2020 09:58 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Kim Jensen | Department Manager - Metals | Metals, Burnaby, British Columbia |

## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

| *Unit* | *Description* |
|---|---|
| mg/L | milligrams per litre |
| pH units | pH units |

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior 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.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-02-01 | DBA2032-A-02-02 | DBA2032-A-02-03 | DBA2032-A-02-04 | DBA2032-A-02-05 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 04-Aug-2020 09:00 | 04-Aug-2020 09:00 | 04-Aug-2020 09:00 | 04-Aug-2020 09:00 | 04-Aug-2020 09:00 |
| | | | | | | VA20B5216-001 | VA20B5216-002 | VA20B5216-003 | VA20B5216-004 | VA20B5216-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.2 | 11.3 | 11.3 | 11.3 | 11.3 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 5.98 | 5.86 | 7.23 | 6.38 | 7.41 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.63 | 5.55 | 5.85 | 5.69 | 5.71 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.243 | 0.211 | 0.230 | 0.228 | 0.229 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-02-06 | DBA2032-A-02-07 | DBA2032-A-02-08 | DBA2032-A-02-09 | DBA2032-A-02-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 04-Aug-2020 09:00 | 04-Aug-2020 09:00 | 04-Aug-2020 09:00 | 04-Aug-2020 09:00 | 04-Aug-2020 09:00 |
| | | | | | | VA20B5216-006 | VA20B5216-007 | VA20B5216-008 | VA20B5216-009 | VA20B5216-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.3 | 11.2 | 11.4 | 11.4 | 11.4 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 6.24 | 6.42 | 5.87 | 6.91 | 6.31 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.54 | 5.49 | 5.54 | 5.54 | 5.56 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.220 | 0.238 | 0.215 | 0.214 | 0.231 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

| Sub-Matrix: Soil (Matrix: Soil/Solid) | | | | | Client sample ID | DBA2032-A-02-11 | DBA2032-A-02-12 | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 04-Aug-2020 09:00 | 04-Aug-2020 09:00 | ---- | ---- | ---- |
| Analyte | CAS Number | Method | LOR | Unit | | VA20B5216-011 | VA20B5216-012 | -------- | -------- | -------- |
| | | | | | | Result | Result | ---- | ---- | ---- |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.4 | 11.2 | ---- | ---- | ---- |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 6.95 | 5.78 | ---- | ---- | ---- |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.90 | 2.90 | ---- | ---- | ---- |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.81 | 5.27 | ---- | ---- | ---- |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.229 | 0.238 | ---- | ---- | ---- |

Please refer to the General Comments section for an explanation of any qualifiers detected.

# QUALITY CONTROL INTERPRETIVE REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5216** | Page | : 1 of 7 |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Issue Date | : 23-Sep-2020 09:58 |
| C-O-C number | : ---- | | |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

**This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.**

**Key**

**Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.**
**CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.**
**DQO: Data Quality Objective.**
**LOR: Limit of Reporting (detection limit).**
**RPD: Relative Percent Difference.**

## *Summary of Outliers*

### *Outliers : Quality Control Samples*

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

### *Outliers: Reference Material (RM) Samples*

- No Reference Material (RM) Sample outliers occur.

### *Outliers : Analysis Holding Time Compliance (Breaches)*

- No Analysis Holding Time Outliers exist.

### *Outliers : Frequency of Quality Control Samples*

- No Quality Control Sample Frequency Outliers occur.

# Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-01 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-02 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-03 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-04 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-05 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-06 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-07 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-08 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-09 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-10 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-11 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-02-12 | E444 | 17-Sep-2020 | ---- | ---- | ---- | | 20-Sep-2020 | 224 days | 47 days | ✓ |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-01 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-02 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-03 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-04 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-05 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-06 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-07 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-08 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-09 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-10 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-11 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-02-12 | EPP444 | 04-Aug-2020 | 17-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).

## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

| Quality Control Sample Type | | | Count | | Frequency (%) | | |
|---|---|---|---|---|---|---|---|
| *Analytical Methods* | *Method* | *QC Lot #* | *QC* | *Regular* | *Actual* | *Expected* | *Evaluation* |
| Method Blanks (MB) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 88860 | 1 | 12 | 8.3 | 5.0 | ✓ |
| Matrix Spikes (MS) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 88860 | 1 | 12 | 8.3 | 5.0 | ✓ |

## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Metals by CRC ICPMS (TCLP) | E444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311/6020B (mod) | An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS. |

| Preparation Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Leach 1:2 Soil:Water for pH | EP108<br><br>Vancouver - Environmental | Soil/Solid | BC WLAP METHOD: PH, ELECTROMETRIC, SOIL | 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. |
| TCLP Leachate Preparation (Metals, Inorganics, and SVOCs) | EPP444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311 | Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests. |

# QUALITY CONTROL REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5216** | Page | : 1 of 3 |
| Client | : Covanta Burnaby Renewable Energy, ULC | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 17-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 23-Sep-2020 09:58 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Kim Jensen | Department Manager - Metals | Metals, Burnaby, British Columbia |

## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **TCLP Metals (QCLot: 88860)** | | | | | | |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |

## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| **TCLP Metals (QCLot: 88860)** | | | | | | | | | | |
| VA20B5216-001 | DBA2032-A-02-01 | cadmium, TCLP | 7440-43-9 | E444 | 0.245 mg/L | 0.25 mg/L | 98.1 | 50.0 | 140 | ---- |

ALS Environmental

# 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 | | | ☐ Standard ☐ Other | | | | ◉ Regular (Standard Turnaround Times - Business Days) |
| Contact: | Steve Mckinney / Dan Skrypnyk | | | ☑ PDF ☐ Excel ☐ Digital ☐ Fax | | | | ○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT |
| Address: | 5150 Riverbend Drive | | | Email 1: | smckinney@covantaenergy.com | | | ○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT |
| | Burnaby BC | | | Email 2: | dskrypnyk@covanta.com | | | ○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT |
| Phone: | 604-521-1025 | Fax: | | Email 3: | sarah.wellman@metrovancouver.org | | | Analysis Request |
| | | ☐ Yes | ☐ No | | brent.kirkpatrick@metrovancouver.org | | | |
| | | | | | rjohnson4@covanta.com | | | |
| Invoice To | Same as Report ? | | | Client / Project Information | | | | Please indicate below Filtered, Preserved or both (F, P, F/P) |
| Hardcopy of Invoice with Report? | | ☐ Yes | ☐ No | Job #: | | | | |
| Company: | | | | PO / AFE: | Weekly Bottom Ash - Suite | | | |
| Contact: | | | | LSD: | (includes 2:1 pH) | | | |
| Address: | | | | | | | | |
| Phone: | | Fax: | | Quote #: | | | | |

| Lab Work Order # (lab use only) | | ALS Contact: | | Sampler: | |
|---|---|---|---|---|---|

| Sample # | Sample Identification (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | CD-TCLP-VA(Cd and pH steps) | Number of Containers |
|---|---|---|---|---|---|---|
| | DBA2032-A-02-01 | Aug 4 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-02-02 | Aug 4 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-02-03 | Aug 4 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-02-04 | Aug 4 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-02-05 | Aug 4 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-02-06 | Aug 4 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-02-07 | Aug 4 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-02-08 | Aug 4 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-02-09 | Aug 4 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-02-10 | Aug 4 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-02-11 | Aug 4 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-02-12 | Aug 4 2020 | 9:00 | Soil | X | 1 |

Environmental Division
Vancouver
Work Order Reference
VA20B5216

Telephone : +1 604 253 4188

**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: Yes / No ? If Yes add SIF |
| | 15-Sep-20 | 0800 | | | | 19.4 °C | RK | 15/9/20 | 1:35 am | |

GENF 20.00 Front

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5218** | Page | : 1 of 5 |
| **Amendment** | : **1** | | |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby BC Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 19-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 06-Oct-2020 10:20 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 26 | | |
| No. of samples analysed | : 26 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Cristina Alexandre | Supervisor - Metals ICP Instrumentation | Metals, Burnaby, British Columbia |
| Kim Jensen | Department Manager - Metals | Metals, Burnaby, British Columbia |
| Robin Weeks | Team Leader - Metals | Metals, Burnaby, British Columbia |

## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

| *Unit* | *Description* |
|---|---|
| mg/L | milligrams per litre |
| pH units | pH units |

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior 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.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-03-01 | DBA2032-A-03-02 | DBA2032-A-03-03 | DBA2032-A-03-04 | DBA2032-A-03-05 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 |
| | | | | | | VA20B5218-001 | VA20B5218-002 | VA20B5218-003 | VA20B5218-004 | VA20B5218-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.1 | 11.1 | 11.1 | 11.2 | 11.2 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.65 | 8.75 | 8.76 | 8.80 | 9.01 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.91 | 2.91 | 2.91 | 2.91 | 2.91 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.63 | 5.59 | 5.57 | 5.62 | 5.78 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.305 | 0.338 | 1.66 | 0.720 | 1.63 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-03-06 | DBA2032-A-03-07 | DBA2032-A-03-08 | DBA2032-A-03-09 | DBA2032-A-03-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 |
| | | | | | | VA20B5218-006 | VA20B5218-007 | VA20B5218-008 | VA20B5218-009 | VA20B5218-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.2 | 11.2 | 11.2 | 11.1 | 11.2 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.76 | 8.74 | 8.71 | 8.76 | 8.70 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.91 | 2.91 | 2.91 | 2.91 | 2.91 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.62 | 5.87 | 5.87 | 5.69 | 6.01 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.463 | 0.327 | 0.322 | 0.443 | 0.266 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

| Sub-Matrix: Soil (Matrix: Soil/Solid) | | | | | Client sample ID | DBA2032-A-03-11 | DBA2032-A-03-12 | DBA2032-A-03-03 REP 1 | DBA2032-A-03-03 REP 2 | DBA2032-A-03-03 REP 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 |
| Analyte | CAS Number | Method | LOR | Unit | | VA20B5218-011 | VA20B5218-012 | VA20B5218-013 | VA20B5218-014 | VA20B5218-015 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.2 | 11.2 | 11.1 | 11.1 | 11.1 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.48 | 8.55 | 8.76 | 8.76 | 8.76 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.91 | 2.91 | 2.88 | 2.88 | 2.88 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.85 | 5.96 | 5.88 | 5.77 | 5.87 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.254 | 0.333 | 0.270 | 0.229 | 0.304 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

| Sub-Matrix: Soil (Matrix: Soil/Solid) | | | | | Client sample ID | DBA2032-A-03-03 REP 4 | DBA2032-A-03-03 REP 5 | DBA2032-A-03-03 REP 6 | DBA2032-A-03-05 REP 1 | DBA2032-A-03-05 REP 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 |
| Analyte | CAS Number | Method | LOR | Unit | | VA20B5218-016 | VA20B5218-017 | VA20B5218-018 | VA20B5218-019 | VA20B5218-020 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.1 | 11.1 | 11.1 | 11.2 | 11.2 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.76 | 8.76 | 8.76 | 9.01 | 9.01 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.88 | 2.88 | 2.88 | 2.88 | 2.88 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.90 | 5.95 | 5.90 | 5.84 | 5.92 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.443 | 0.317 | 0.280 | 0.271 | 0.318 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

| Sub-Matrix: Soil (Matrix: Soil/Solid) | | | | | Client sample ID | DBA2032-A-03-05 REP 3 | DBA2032-A-03-05 REP 4 | DBA2032-A-03-05 REP 5 | DBA2032-A-03-05 REP 6 | DBA2032-A-03-04 REP 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 | 05-Aug-2020 09:00 |
| Analyte | CAS Number | Method | LOR | Unit | | VA20B5218-021 | VA20B5218-022 | VA20B5218-023 | VA20B5218-024 | VA20B5218-025 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 9.01 | 9.01 | 9.01 | 9.01 | 8.80 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.88 | 2.88 | 2.88 | 2.88 | 2.91 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.81 | 5.92 | 5.80 | 5.92 | 5.83 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.367 | 0.260 | 0.264 | 0.290 | 0.268 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

| Sub-Matrix: Soil (Matrix: Soil/Solid) | | | | | Client sample ID | DBA2032-A-03-04 REP 2 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 05-Aug-2020 09:00 | ---- | ---- | ---- | ---- |
| Analyte | CAS Number | Method | LOR | Unit | | VA20B5218-026 | -------- | -------- | -------- | -------- |
| | | | | | | Result | ---- | ---- | ---- | ---- |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.2 | ---- | ---- | ---- | ---- |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.80 | ---- | ---- | ---- | ---- |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.91 | ---- | ---- | ---- | ---- |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.93 | ---- | ---- | ---- | ---- |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.416 | ---- | ---- | ---- | ---- |

Please refer to the General Comments section for an explanation of any qualifiers detected.

# QUALITY CONTROL INTERPRETIVE REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5218** | Page | : 1 of 10 |
| **Amendment** | : 1 | | |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Issue Date | : 06-Oct-2020 10:20 |
| C-O-C number | : ---- | | |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 26 | | |
| No. of samples analysed | : 26 | | |

**This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.**

**Key**

**Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.**
**CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.**
**DQO: Data Quality Objective.**
**LOR: Limit of Reporting (detection limit).**
**RPD: Relative Percent Difference.**

## Summary of Outliers

### Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

### Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

### Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** | | | | | | | | | | |
| DBA2032-A-03-01 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** | | | | | | | | | | |
| DBA2032-A-03-02 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** | | | | | | | | | | |
| DBA2032-A-03-03 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** | | | | | | | | | | |
| DBA2032-A-03-04 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** | | | | | | | | | | |
| DBA2032-A-03-05 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** | | | | | | | | | | |
| DBA2032-A-03-06 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** | | | | | | | | | | |
| DBA2032-A-03-07 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-08 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-09 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-10 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-11 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-12 | E444 | 19-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 225 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-03 REP 1 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-03 REP 2 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-03 REP 3 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-03 REP 4 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-03 REP 5 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-03 REP 6 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-05 REP 1 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-05 REP 2 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-05 REP 3 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-05 REP 4 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-05 REP 5 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-05 REP 6 | E444 | 02-Oct-2020 | ---- | ---- | ---- | | 04-Oct-2020 | 238 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-04 REP 1 | E444 | 04-Oct-2020 | ---- | ---- | ---- | | 05-Oct-2020 | 240 days | 61 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-03-04 REP 2 | E444 | 04-Oct-2020 | ---- | ---- | ---- | | 05-Oct-2020 | 240 days | 61 days | ✓ |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-01 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-02 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-03 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-03 REP 1 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-03 REP 2 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-03 REP 3 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-03 REP 4 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-03 REP 5 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-03 REP 6 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-04 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-04 REP 1 | EPP444 | 05-Aug-2020 | 04-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-04 REP 2 | EPP444 | 05-Aug-2020 | 04-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-05 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-05 REP 1 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-05 REP 2 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-05 REP 3 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-05 REP 4 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-05 REP 5 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-05 REP 6 | EPP444 | 05-Aug-2020 | 02-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-06 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-07 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-08 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-09 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-10 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-11 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-03-12 | EPP444 | 05-Aug-2020 | 19-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).

## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

| Quality Control Sample Type | | | Count | | Frequency (%) | | |
|---|---|---|---|---|---|---|---|
| *Analytical Methods* | *Method* | *QC Lot #* | *QC* | *Regular* | *Actual* | *Expected* | *Evaluation* |
| Method Blanks (MB) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 89836 | 3 | 30 | 10.0 | 5.0 | ✓ |
| Matrix Spikes (MS) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 89836 | 3 | 30 | 10.0 | 5.0 | ✓ |

## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Metals by CRC ICPMS (TCLP) | E444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311/6020B (mod) | An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS. |

| Preparation Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Leach 1:2 Soil:Water for pH | EP108<br><br>Vancouver - Environmental | Soil/Solid | BC WLAP METHOD: PH, ELECTROMETRIC, SOIL | 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. |
| TCLP Leachate Preparation (Metals, Inorganics, and SVOCs) | EPP444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311 | Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests. |

ALS Environmental

# QUALITY CONTROL REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5218** | Page | : 1 of 3 |
| **Amendment** | : **1** | | |

| | | | |
|---|---|---|---|
| Client | : Covanta Burnaby Renewable Energy, ULC | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 19-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 06-Oct-2020 10:20 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 26 | | |
| No. of samples analysed | : 26 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Cristina Alexandre | Supervisor - Metals ICP Instrumentation | Metals, Burnaby, British Columbia |
| Kim Jensen | Department Manager - Metals | Metals, Burnaby, British Columbia |
| Robin Weeks | Team Leader - Metals | Metals, Burnaby, British Columbia |

## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **TCLP Metals (QCLot: 89836)** | | | | | | |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |
| **TCLP Metals (QCLot: 96762)** | | | | | | |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |
| **TCLP Metals (QCLot: 97274)** | | | | | | |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |

## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| **TCLP Metals (QCLot: 89836)** | | | | | | | | | | |
| VA20B5218-001 | DBA2032-A-03-01 | cadmium, TCLP | 7440-43-9 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |
| **TCLP Metals (QCLot: 96762)** | | | | | | | | | | |
| VA20B5218-013 | DBA2032-A-03-03 REP 1 | cadmium, TCLP | 7440-43-9 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |
| **TCLP Metals (QCLot: 97274)** | | | | | | | | | | |
| VA20B5218-025 | DBA2032-A-03-04 REP 1 | cadmium, TCLP | 7440-43-9 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |

ALS Environmental

# 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 | | | ☐ Standard ☐ Other | | | | ◉ Regular (Standard Turnaround Times - Business Days) |
| Contact: | Steve Mckinney / Dan Skrypnyk | | | ☑ PDF ☐ Excel ☐ Digital ☐ Fax | | | | ○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT |
| Address: | 5150 Riverbend Drive | | | Email 1: | smckinney@covantaenergy.com | | | ○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT |
| | Burnaby BC | | | Email 2: | dskrypnyk@covanta.com | | | ○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT |
| Phone: | 604-521-1025 | Fax: | | Email 3: | sarah.wellman@metrovancouver.org | | | Analysis Request |
| | | ☐ Yes | ☐ No | | brent.kirkpatrick@metrovancouver.org | | | |
| | | | | | rjohnson4@covanta.com | | | |
| **Invoice To** | Same as Report ? | | | **Client / Project Information** | | | | Please indicate below Filtered, Preserved or both (F, P, F/P) |
| Hardcopy of Invoice with Report? | | ☐ Yes | ☐ No | Job #: | | | | |
| Company: | | | | PO / AFE: | Weekly Bottom Ash - Suite | | | |
| Contact: | | | | LSD: | (includes 2:1 pH) | | | |
| Address: | | | | | | | | |
| Phone: | | Fax: | | Quote #: | | | | |
| Lab Work Order # (lab use only) | | | | **ALS Contact:** | | **Sampler:** | | |

| Sample # | Sample Identification (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | CD-TCLP-VA(Cd and pH steps) | Number of Containers |
|---|---|---|---|---|---|---|
| | DBA2032-A-03-01 | Aug 5 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-03-02 | Aug 5 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-03-03 | Aug 5 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-03-04 | Aug 5 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-03-05 | Aug 5 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-03-06 | Aug 5 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-03-07 | Aug 5 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-03-08 | Aug 5 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-03-09 | Aug 5 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-03-10 | Aug 5 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-03-11 | Aug 5 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-03-12 | Aug 5 2020 | 9:00 | Soil | X | 1 |

Environmental Division
Vancouver
Work Order Reference
VA20B5218

Telephone : +1 604 253 4188

**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: Yes / No ? If Yes add SIF |
| | 15-Sep-20 | 0800 | | | | 19.4 °C | RK | 15/9/20 | W-35am | |

GENF 20.00 Front

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5234** | Page | : 1 of 4 |
| **Amendment** | : **1** | | |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby BC Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 22-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 06-Oct-2020 10:20 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 16 | | |
| No. of samples analysed | : 16 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Cristina Alexandre | Supervisor - Metals ICP Instrumentation | Metals, Burnaby, British Columbia |
| Kim Jensen | Department Manager - Metals | Metals, Burnaby, British Columbia |
| Ophelia Chiu | Supervisor - Organics Instrumentation | Organics, Burnaby, British Columbia |

## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

| *Unit* | *Description* |
|---|---|
| mg/L | milligrams per litre |
| pH units | pH units |

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior 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.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-04-01 | DBA2032-A-04-02 | DBA2032-A-04-03 | DBA2032-A-04-04 | DBA2032-A-04-05 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 |
| | | | | | | VA20B5234-001 | VA20B5234-002 | VA20B5234-003 | VA20B5234-004 | VA20B5234-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.3 | 11.3 | 11.3 | 11.4 | 11.4 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.29 | 9.14 | 9.25 | 7.13 | 9.18 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.87 | 2.87 | 2.87 | 2.87 | 2.87 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.91 | 5.75 | 5.78 | 5.89 | 5.92 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.309 | 0.310 | 0.310 | 0.465 | 0.321 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-04-06 | DBA2032-A-04-07 | DBA2032-A-04-08 | DBA2032-A-04-09 | DBA2032-A-04-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 |
| | | | | | | VA20B5234-006 | VA20B5234-007 | VA20B5234-008 | VA20B5234-009 | VA20B5234-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.4 | 11.4 | 11.3 | 11.4 | 11.4 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 9.04 | 8.88 | 9.02 | 9.16 | 8.56 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.87 | 2.87 | 2.87 | 2.87 | 2.87 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 6.00 | 5.70 | 5.93 | 6.02 | 5.85 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.428 | 0.306 | 1.60 | 0.325 | 0.321 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-04-11 | DBA2032-A-04-12 | DBA2032-A-04-08 REP 1 | DBA2032-A-04-08 REP 2 | DBA2032-A-04-08 REP 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 | 06-Aug-2020 09:00 |
| | | | | | | VA20B5234-011 | VA20B5234-012 | VA20B5234-013 | VA20B5234-014 | VA20B5234-015 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.4 | 11.4 | 11.3 | 11.3 | 11.3 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.68 | 8.79 | 9.02 | 9.02 | 9.02 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.87 | 2.87 | 2.87 | 2.87 | 2.87 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.93 | 5.91 | 5.86 | 5.80 | 5.89 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.307 | 0.348 | 0.302 | 0.556 | 0.359 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-04-08 REP 4 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 06-Aug-2020 09:00 | ---- | ---- | ---- | ---- |
| | | | | | | VA20B5234-016 | -------- | -------- | -------- | -------- |
| | | | | | | Result | ---- | ---- | ---- | ---- |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.3 | ---- | ---- | ---- | ---- |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 9.02 | ---- | ---- | ---- | ---- |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.87 | ---- | ---- | ---- | ---- |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 6.01 | ---- | ---- | ---- | ---- |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.338 | ---- | ---- | ---- | ---- |

Please refer to the General Comments section for an explanation of any qualifiers detected.

# QUALITY CONTROL INTERPRETIVE REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5234** | Page | : 1 of 8 |
| **Amendment** | : 1 | | |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Issue Date | : 06-Oct-2020 10:20 |
| C-O-C number | : ---- | | |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 16 | | |
| No. of samples analysed | : 16 | | |

**This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.**

**Key**

**Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.**
**CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.**
**DQO: Data Quality Objective.**
**LOR: Limit of Reporting (detection limit).**
**RPD: Relative Percent Difference.**

## Summary of Outliers

### Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

### Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

### Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

### Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-01 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-02 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-03 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-04 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-05 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-06 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-07 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-08 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-09 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-10 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-11 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-12 | E444 | 23-Sep-2020 | ---- | ---- | ---- | | 24-Sep-2020 | 228 days | 49 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-08 REP 1 | E444 | 04-Oct-2020 | ---- | ---- | ---- | | 05-Oct-2020 | 239 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-08 REP 2 | E444 | 04-Oct-2020 | ---- | ---- | ---- | | 05-Oct-2020 | 239 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-08 REP 3 | E444 | 04-Oct-2020 | ---- | ---- | ---- | | 05-Oct-2020 | 239 days | 60 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-04-08 REP 4 | E444 | 04-Oct-2020 | ---- | ---- | ---- | | 05-Oct-2020 | 239 days | 60 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-01 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-02 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-03 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-04 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-05 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-06 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-07 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-08 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-08 REP 1 | EPP444 | 06-Aug-2020 | 04-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-08 REP 2 | EPP444 | 06-Aug-2020 | 04-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-08 REP 3 | EPP444 | 06-Aug-2020 | 04-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-08 REP 4 | EPP444 | 06-Aug-2020 | 04-Oct-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-09 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-10 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-11 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-04-12 | EPP444 | 06-Aug-2020 | 23-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).

## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

| Quality Control Sample Type | | | Count | | Frequency (%) | | |
|---|---|---|---|---|---|---|---|
| *Analytical Methods* | *Method* | *QC Lot #* | *QC* | *Regular* | *Actual* | *Expected* | *Evaluation* |
| Method Blanks (MB) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 91136 | 2 | 18 | 11.1 | 5.0 | ✓ |
| Matrix Spikes (MS) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 91136 | 2 | 18 | 11.1 | 5.0 | ✓ |

## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Metals by CRC ICPMS (TCLP) | E444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311/6020B (mod) | An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS. |

| Preparation Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Leach 1:2 Soil:Water for pH | EP108<br><br>Vancouver - Environmental | Soil/Solid | BC WLAP METHOD: PH, ELECTROMETRIC, SOIL | 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. |
| TCLP Leachate Preparation (Metals, Inorganics, and SVOCs) | EPP444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311 | Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests. |

ALS Environmental

# QUALITY CONTROL REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5234** | Page | : 1 of 3 |
| **Amendment** | : **1** | | |

| | | | |
|---|---|---|---|
| Client | : Covanta Burnaby Renewable Energy, ULC | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 22-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 06-Oct-2020 10:20 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 16 | | |
| No. of samples analysed | : 16 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Cristina Alexandre | Supervisor - Metals ICP Instrumentation | Metals, Burnaby, British Columbia |
| Kim Jensen | Department Manager - Metals | Metals, Burnaby, British Columbia |
| Ophelia Chiu | Supervisor - Organics Instrumentation | Organics, Burnaby, British Columbia |

## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **TCLP Metals (QCLot: 91136)** | | | | | | |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |
| **TCLP Metals (QCLot: 97274)** | | | | | | |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |

## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| **TCLP Metals (QCLot: 91136)** | | | | | | | | | | |
| VA20B5234-001 | DBA2032-A-04-01 | cadmium, TCLP | 7440-43-9 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |
| **TCLP Metals (QCLot: 97274)** | | | | | | | | | | |
| VA20B5218-025 | Anonymous | cadmium, TCLP | 7440-43-9 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |

ALS Environmental

**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 | ☐ Standard ☐ Other | | ◉ Regular (Standard Turnaround Times - Business Days) |
| Contact: | Steve Mckinney / Dan Skrypnyk | ☑ PDF ☐ Excel ☐ Digital ☐ Fax | | ○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT |
| Address: | 5150 Riverbend Drive | Email 1: | smckinney@covantaenergy.com | ○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT |
| | Burnaby BC | Email 2: | dskrypnyk@covanta.com | ○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT |
| Phone: | 604-521-1025 Fax: | Email 3: | sarah.wellman@metrovancouver.org | **Analysis Request** |
| | ☐ Yes ☐ No | | brent.kirkpatrick@metrovancouver.org | |
| | | | rjohnson4@covanta.com | |
| **Invoice To** | Same as Report ? | **Client / Project Information** | | Please indicate below Filtered, Preserved or both (F, P, F/P) |
| Hardcopy of Invoice with Report? | ☐ Yes ☐ No | Job #: | | |
| Company: | | PO / AFE: | Weekly Bottom Ash - Suite | |
| Contact: | | LSD: | (includes 2:1 pH) | |
| Address: | | | | |
| Phone: | Fax: | Quote #: | | |
| Lab Work Order # (lab use only) | | **ALS Contact:** | **Sampler:** | |

| Sample # | Sample Identification (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | CD-TCLP-VA(Cd and pH steps) | Number of Containers |
|---|---|---|---|---|---|---|
| | DBA2032-A-04-01 | Aug 6 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-04-02 | Aug 6 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-04-03 | Aug 6 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-04-04 | Aug 6 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-04-05 | Aug 6 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-04-06 | Aug 6 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-04-07 | Aug 6 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-04-08 | Aug 6 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-04-09 | Aug 6 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-04-10 | Aug 6 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-04-11 | Aug 6 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-04-12 | Aug 6 2020 | 9:00 | Soil | X | 1 |

Environmental Division
Vancouver
Work Order Reference
VA20B5234

Telephone : +1 604 253 4188

**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: Yes / No ? If Yes add SIF |
| | 15-Sep-20 | 0800 | | | | 19.4 °C | RK | 15/9/20 | 11:35 am | |

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5215** | Page | : 1 of 4 |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby BC Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 16-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 23-Sep-2020 09:57 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Kim Jensen | Department Manager - Metals | Metals, Burnaby, British Columbia |

## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

| *Unit* | *Description* |
|---|---|
| mg/L | milligrams per litre |
| pH units | pH units |

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior 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.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-05-01 | DBA2032-A-05-02 | DBA2032-A-05-03 | DBA2032-A-05-04 | DBA2032-A-05-05 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 07-Aug-2020 09:00 | 07-Aug-2020 09:00 | 07-Aug-2020 09:00 | 07-Aug-2020 09:00 | 07-Aug-2020 09:00 |
| | | | | | | VA20B5215-001 | VA20B5215-002 | VA20B5215-003 | VA20B5215-004 | VA20B5215-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.5 | 11.6 | 11.6 | 11.5 | 11.6 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.40 | 8.74 | 8.80 | 8.82 | 9.59 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 6.14 | 5.82 | 5.86 | 5.93 | 5.90 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.151 | 0.177 | 0.180 | 0.180 | 0.170 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-05-06 | DBA2032-A-05-07 | DBA2032-A-05-08 | DBA2032-A-05-09 | DBA2032-A-05-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 07-Aug-2020 09:00 | 07-Aug-2020 09:00 | 07-Aug-2020 09:00 | 07-Aug-2020 09:00 | 07-Aug-2020 09:00 |
| | | | | | | VA20B5215-006 | VA20B5215-007 | VA20B5215-008 | VA20B5215-009 | VA20B5215-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.6 | 11.6 | 11.6 | 11.5 | 11.6 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 10.3 | 9.15 | 9.38 | 9.16 | 9.26 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.85 | 5.87 | 6.08 | 6.11 | 6.02 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.185 | 0.284 | 0.151 | 0.214 | 0.214 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-05-11 | DBA2032-A-05-12 | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 07-Aug-2020 09:00 | 07-Aug-2020 09:00 | ---- | ---- | ---- |
| | | | | | | VA20B5215-011 | VA20B5215-012 | -------- | -------- | -------- |
| | | | | | | Result | Result | ---- | ---- | ---- |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.5 | 11.6 | ---- | ---- | ---- |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 9.31 | 9.35 | ---- | ---- | ---- |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.90 | 2.90 | ---- | ---- | ---- |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 6.07 | 5.92 | ---- | ---- | ---- |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.236 | 0.204 | ---- | ---- | ---- |

Please refer to the General Comments section for an explanation of any qualifiers detected.

# QUALITY CONTROL INTERPRETIVE REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5215** | Page | : 1 of 7 |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Issue Date | : 23-Sep-2020 09:57 |
| C-O-C number | : ---- | | |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

**This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.**

**Key**

**Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.**
**CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.**
**DQO: Data Quality Objective.**
**LOR: Limit of Reporting (detection limit).**
**RPD: Relative Percent Difference.**

## *Summary of Outliers*

### *Outliers : Quality Control Samples*

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

### *Outliers: Reference Material (RM) Samples*

- No Reference Material (RM) Sample outliers occur.

### *Outliers : Analysis Holding Time Compliance (Breaches)*

- No Analysis Holding Time Outliers exist.

### *Outliers : Frequency of Quality Control Samples*

- No Quality Control Sample Frequency Outliers occur.

## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-01 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-02 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-03 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-04 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-05 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-06 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-07 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-08 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-09 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-10 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-11 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-05-12 | E444 | 16-Sep-2020 | ---- | ---- | ---- | | 21-Sep-2020 | 220 days | 45 days | ✓ |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-01 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-02 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-03 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-04 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-05 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-06 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-07 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-08 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-09 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-10 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-11 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-05-12 | EPP444 | 07-Aug-2020 | 16-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).

## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

| Quality Control Sample Type | | | Count | | Frequency (%) | | |
|---|---|---|---|---|---|---|---|
| *Analytical Methods* | *Method* | *QC Lot #* | *QC* | *Regular* | *Actual* | *Expected* | *Evaluation* |
| Method Blanks (MB) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 88875 | 1 | 12 | 8.3 | 5.0 | ✓ |
| Matrix Spikes (MS) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 88875 | 1 | 12 | 8.3 | 5.0 | ✓ |

## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Metals by CRC ICPMS (TCLP) | E444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311/6020B (mod) | An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS. |

| Preparation Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Leach 1:2 Soil:Water for pH | EP108<br><br>Vancouver - Environmental | Soil/Solid | BC WLAP METHOD: PH, ELECTROMETRIC, SOIL | 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. |
| TCLP Leachate Preparation (Metals, Inorganics, and SVOCs) | EPP444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311 | Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests. |

# QUALITY CONTROL REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5215** | Page | : 1 of 3 |
| Client | : Covanta Burnaby Renewable Energy, ULC | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 16-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 23-Sep-2020 09:58 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Kim Jensen | Department Manager - Metals | Metals, Burnaby, British Columbia |

## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **TCLP Metals (QCLot: 88875)** | | | | | | |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |

## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| **TCLP Metals (QCLot: 88875)** | | | | | | | | | | |
| VA20B5215-001 | DBA2032-A-05-01 | cadmium, TCLP | 7440-43-9 | E444 | 0.230 mg/L | 0.25 mg/L | 91.9 | 50.0 | 140 | ---- |

ALS Environmental

# 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 | | | ☐ Standard ☐ Other | | | | ◉ Regular (Standard Turnaround Times - Business Days) |
| Contact: | Steve Mckinney / Dan Skrypnyk | | | ☑ PDF ☐ Excel ☐ Digital ☐ Fax | | | | ○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT |
| Address: | 5150 Riverbend Drive | | | Email 1: | smckinney@covantaenergy.com | | | ○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT |
| | Burnaby BC | | | Email 2: | dskrypnyk@covanta.com | | | ○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT |
| Phone: | 604-521-1025 | Fax: | | Email 3: | sarah.wellman@metrovancouver.org | | | Analysis Request |
| | | ☐ Yes | ☐ No | | brent.kirkpatrick@metrovancouver.org | | | |
| | | | | | rjohnson4@covanta.com | | | |
| **Invoice To** | Same as Report ? | | | **Client / Project Information** | | | | Please indicate below Filtered, Preserved or both (F, P, F/P) |
| Hardcopy of Invoice with Report? | | ☐ Yes | ☐ No | Job #: | | | | |
| Company: | | | | PO / AFE: | Weekly Bottom Ash - Suite | | | |
| Contact: | | | | LSD: | (includes 2:1 pH) | | | |
| Address: | | | | | | | | |
| Phone: | | Fax: | | Quote #: | | | | |
| Lab Work Order # (lab use only) | | | | ALS Contact: | | Sampler: | | |

| Sample # | Sample Identification (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | CD-TCLP-VA(Cd and pH steps) | Number of Containers |
|---|---|---|---|---|---|---|
| | DBA2032-A-05-01 | Aug 7 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-05-02 | Aug 7 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-05-03 | Aug 7 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-05-04 | Aug 7 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-05-05 | Aug 7 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-05-06 | Aug 7 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-05-07 | Aug 7 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-05-08 | Aug 7 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-05-09 | Aug 7 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-05-10 | Aug 7 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-05-11 | Aug 7 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-05-12 | Aug 7 2020 | 9:00 | Soil | X | 1 |

Environmental Division Vancouver
Work Order Reference
VA20B5215

Telephone : +1 604 253 4188

**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: Yes / No ? If Yes add SIF |
| | 15-Sep-20 | 0800 | | | | 19.4 °C | RK | 15/9/20 | 11:35am | |

GENF 20.00 Front

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5219** | Page | : 1 of 4 |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby BC Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 21-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 24-Sep-2020 09:51 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Robin Weeks | Team Leader - Metals | Metals, Burnaby, British Columbia |

## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

| *Unit* | *Description* |
|---|---|
| mg/L | milligrams per litre |
| pH units | pH units |

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior 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.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-06-01 | DBA2032-A-06-02 | DBA2032-A-06-03 | DBA2032-A-06-04 | DBA2032-A-06-05 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 08-Aug-2020 09:00 | 08-Aug-2020 09:00 | 08-Aug-2020 09:00 | 08-Aug-2020 09:00 | 08-Aug-2020 09:00 |
| | | | | | | VA20B5219-001 | VA20B5219-002 | VA20B5219-003 | VA20B5219-004 | VA20B5219-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.1 | 11.2 | 11.2 | 11.1 | 11.3 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.68 | 8.59 | 7.96 | 7.97 | 8.66 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.89 | 2.89 | 2.89 | 2.89 | 2.89 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.50 | 5.49 | 5.82 | 5.43 | 5.57 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.361 | 0.255 | 0.296 | 0.254 | 0.358 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-06-06 | DBA2032-A-06-07 | DBA2032-A-06-08 | DBA2032-A-06-09 | DBA2032-A-06-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 08-Aug-2020 09:00 | 08-Aug-2020 09:00 | 08-Aug-2020 09:00 | 08-Aug-2020 09:00 | 08-Aug-2020 09:00 |
| | | | | | | VA20B5219-006 | VA20B5219-007 | VA20B5219-008 | VA20B5219-009 | VA20B5219-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.3 | 11.4 | 11.2 | 11.2 | 11.4 |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.75 | 8.97 | 8.94 | 8.89 | 9.04 |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.89 | 2.89 | 2.89 | 2.89 | 2.89 |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.63 | 5.35 | 5.33 | 5.52 | 5.53 |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.606 | 0.293 | 0.255 | 0.267 | 0.230 |

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

| Analyte | CAS Number | Method | LOR | Unit | Client sample ID | DBA2032-A-06-11 | DBA2032-A-06-12 | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 08-Aug-2020 09:00 | 08-Aug-2020 09:00 | ---- | ---- | ---- |
| | | | | | | VA20B5219-011 | VA20B5219-012 | -------- | -------- | -------- |
| | | | | | | Result | Result | ---- | ---- | ---- |
| **TCLP Metals** | | | | | | | | | | |
| **pH, TCLP 1st preliminary** | ---- | EPP444 | 0.010 | pH units | | 11.4 | 11.3 | ---- | ---- | ---- |
| **pH, TCLP 2nd preliminary** | ---- | EPP444 | 0.010 | pH units | | 8.63 | 8.34 | ---- | ---- | ---- |
| **pH, TCLP extraction fluid initial** | ---- | EPP444 | 0.010 | pH units | | 2.89 | 2.89 | ---- | ---- | ---- |
| **pH, TCLP final** | ---- | EPP444 | 0.010 | pH units | | 5.62 | 5.75 | ---- | ---- | ---- |
| **cadmium, TCLP** | 7440-43-9 | E444 | 0.050 | mg/L | | 0.263 | 0.298 | ---- | ---- | ---- |

Please refer to the General Comments section for an explanation of any qualifiers detected.

# QUALITY CONTROL INTERPRETIVE REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5219** | Page | : 1 of 7 |
| Client | : **Covanta Burnaby Renewable Energy, ULC** | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Issue Date | : 24-Sep-2020 09:51 |
| C-O-C number | : ---- | | |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

**This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.**

**Key**

**Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.**
**CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.**
**DQO: Data Quality Objective.**
**LOR: Limit of Reporting (detection limit).**
**RPD: Relative Percent Difference.**

## *Summary of Outliers*

### *Outliers : Quality Control Samples*

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

### *Outliers: Reference Material (RM) Samples*

- No Reference Material (RM) Sample outliers occur.

### *Outliers : Analysis Holding Time Compliance (Breaches)*

- No Analysis Holding Time Outliers exist.

### *Outliers : Frequency of Quality Control Samples*

- No Quality Control Sample Frequency Outliers occur.

# Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-01 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-02 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-03 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-04 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-05 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-06 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-07 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-08 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-09 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-10 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-11 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |
| **TCLP Metals : Metals by CRC ICPMS (TCLP)** | | | | | | | | | | |
| **HDPE - dissolved (lab preserved)** DBA2032-A-06-12 | E444 | 21-Sep-2020 | ---- | ---- | ---- | | 23-Sep-2020 | 224 days | 46 days | ✓ |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-01 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-02 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-03 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-04 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-05 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-06 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-07 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-08 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-09 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-10 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-11 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |
| **TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)** | | | | | | | | | | |
| **Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg)** DBA2032-A-06-12 | EPP444 | 08-Aug-2020 | 21-Sep-2020 | ---- | ---- | | ---- | ---- | ---- | |

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).

## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

| Quality Control Sample Type | | | Count | | Frequency (%) | | |
|---|---|---|---|---|---|---|---|
| *Analytical Methods* | *Method* | *QC Lot #* | *QC* | *Regular* | *Actual* | *Expected* | *Evaluation* |
| Method Blanks (MB) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 89824 | 1 | 12 | 8.3 | 5.0 | ✓ |
| Matrix Spikes (MS) | | | | | | | |
| Metals by CRC ICPMS (TCLP) | E444 | 89824 | 1 | 12 | 8.3 | 5.0 | ✓ |

## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Metals by CRC ICPMS (TCLP) | E444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311/6020B (mod) | An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS. |

| Preparation Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Leach 1:2 Soil:Water for pH | EP108<br><br>Vancouver - Environmental | Soil/Solid | BC WLAP METHOD: PH, ELECTROMETRIC, SOIL | 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. |
| TCLP Leachate Preparation (Metals, Inorganics, and SVOCs) | EPP444<br><br>Vancouver - Environmental | Soil/Solid | EPA 1311 | Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests. |

# QUALITY CONTROL REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **VA20B5219** | Page | : 1 of 3 |
| Client | : Covanta Burnaby Renewable Energy, ULC | Laboratory | : Vancouver - Environmental |
| Contact | : Steve McKinney | Account Manager | : Brent Mack |
| Address | : 5150 Riverbend Drive<br>Burnaby BC Canada V3N 4V3 | Address | : 8081 Lougheed Highway<br>Burnaby, British Columbia Canada V5A 1W9 |
| Telephone | : 604 521 1025 | Telephone | : +1 604 253 4188 |
| Project | : Weekly Bottom Ash-Suite | Date Samples Received | : 15-Sep-2020 11:35 |
| PO | : VANCO 0000049378 | Date Analysis Commenced | : 21-Sep-2020 |
| C-O-C number | : ---- | Issue Date | : 24-Sep-2020 09:51 |
| Sampler | : ---- | | |
| Site | : ---- | | |
| Quote number | : Standing Offer (BC work) | | |
| No. of samples received | : 12 | | |
| No. of samples analysed | : 12 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Brieanna Allen | Department Manager - Organics | Organics, Burnaby, British Columbia |
| Robin Weeks | Team Leader - Metals | Metals, Burnaby, British Columbia |

## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **TCLP Metals (QCLot: 89824)** | | | | | | |
| cadmium, TCLP | 7440-43-9 | E444 | 0.05 | mg/L | <0.050 | ---- |

## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| **TCLP Metals (QCLot: 89824)** | | | | | | | | | | |
| VA20B5219-001 | DBA2032-A-06-01 | cadmium, TCLP | 7440-43-9 | E444 | ND mg/L | 0.25 mg/L | ND | 50.0 | 140 | ---- |

ALS Environmental

# 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 | | | ☐ Standard ☐ Other | | ◉ Regular (Standard Turnaround Times - Business Days) |
| Contact: | Steve Mckinney / Dan Skrypnyk | | | ☑ PDF ☐ Excel ☐ Digital ☐ Fax | | ○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT |
| Address: | 5150 Riverbend Drive | | | Email 1: | smckinney@covantaenergy.com | ○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT |
| | Burnaby BC | | | Email 2: | dskrypnyk@covanta.com | ○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT |
| Phone: | 604-521-1025 | Fax: | | Email 3: | sarah.wellman@metrovancouver.org | **Analysis Request** |
| | | ☐ Yes | ☐ No | | brent.kirkpatrick@metrovancouver.org | |
| | | | | | rjohnson4@covanta.com | |
| **Invoice To** | Same as Report ? | | | **Client / Project Information** | | Please indicate below Filtered, Preserved or both (F, P, F/P) |
| Hardcopy of Invoice with Report? | | ☐ Yes | ☐ No | Job #: | | |
| Company: | | | | PO / AFE: | Weekly Bottom Ash - Suite | |
| Contact: | | | | LSD: | (includes 2:1 pH) | |
| Address: | | | | | | |
| Phone: | | Fax: | | Quote #: | | |

| Lab Work Order # (lab use only) | | ALS Contact: | | Sampler: | |
|---|---|---|---|---|---|

| Sample # | Sample Identification (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | CD-TCLP-VA(Cd and pH steps) | Number of Containers |
|---|---|---|---|---|---|---|
| | DBA2032-A-06-01 | Aug 8 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-06-02 | Aug 8 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-06-03 | Aug 8 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-06-04 | Aug 8 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-06-05 | Aug 8 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-06-06 | Aug 8 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-06-07 | Aug 8 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-06-08 | Aug 8 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-06-09 | Aug 8 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-06-10 | Aug 8 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-06-11 | Aug 8 2020 | 9:00 | Soil | X | 1 |
| | DBA2032-A-06-12 | Aug 8 2020 | 9:00 | Soil | X | 1 |

Environmental Division
Vancouver
Work Order Reference
VA20B5219

Telephone : +1 604 253 4188

**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: Yes / No ? If Yes add SIF |
| | 15-Sep-20 | 0800 | | | | 19.4 °C | RK | 15/9/20 | 1135am | |

GENF 20.00 Front