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Memorandum

Date:	06 January 2021
To:	Cindy Bartlett, RG, LG
	Geosyntec Consultants, Portland, Oregon
From:	Jennifer Pinion
CC:	J. Caprio
Subject:	**Stage 2A Data Validation - Level II Data Deliverables – Pace Analytical Sample Delivery Groups L1251377 and L1253870**

SITE: Cascade TSA; Job No: PNG0564519

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of three solid samples collected on August 05, 2020, as part of the site investigation activities for the Cascade Corp., Fairview Oregon sampling event. The solid samples were analyzed by Pace National Analytical [formerly ESC Lab Sciences (ESC)], Mt. Juliet, Tennessee for the following analytical tests:

- United States (US) Environmental Protection Agency (EPA) Method 6010D - Metals by Inductively Coupled Plasma (ICP)
- US EPA Methods 1311/6010D – Toxicity Characteristic Leaching Procedure (TCLP) Chromium by ICP
- US EPA Method 7471B – Mercury
- Standard Method 2540G - Percent Moisture/Solids

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below and based on the information provided, the data are usable for supporting project objectives.

The data were reviewed based on the following documents, the pertinent methods referenced by the data packages and professional and technical judgment:

- US EPA National Functional Guidelines for Organic Superfund Methods Data Review, January 2017 (EPA-540-R-2017-002)

- US EPA National Functional Guidelines for Inorganic Superfund Data Review, January 2017 (EPA-540-R-2017-001)

The following samples were analyzed in the data sets:

Laboratory IDs	Client IDs
L1251377-01	NVWD-080520
L1251377-02	ROB-080520

Laboratory IDs	Client IDs
L1253870-01	ROB-080520

The solid samples were received at the laboratory within the temperature criteria of 0-6 degrees Celsius (ºC).

The following issues were noted on the chain of custody (COC) forms. No qualifications were applied to the data based on the issues discussed below.

Metals, mercury and total solids were not originally requested on the COCs; however, per client request, the samples were analyzed and reported by US EPA Methods 1311/6010D, 7471B and SM 2540 G.

The COCs indicate that trip blanks, both identified as TRIP BLANK LOT#448 were shipped with the sample set, but were not analyzed for metals, mercury or solids.

The case narrative indicated that the sample quantity provided was not sufficient to analyze sample ROB-080520 in report L1251377; however, results for chromium were included in the laboratory report.

Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.

1.0 METALS

The samples were analyzed for Metals by US EPA Method 6010B and TCLP Chromium by US EPA Methods 1311/6010B. Mercury was assessed separately, in section 4.0, below.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Field Duplicate
- ✓ Sensitivity

✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The metals data reported in this sample set are considered usable for supporting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on the samples submitted for these analyses, for this sample set is 100%.

1.2 Holding Times

The holding time for the metals analysis of a solid sample is 180 days from sample collection to analysis. The holding times for TCLP are 180 days from collection to TCLP extraction and 180 days from TCLP extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches WG1529875 and WG1534281). Metals were not detected in the method blanks above the method detection limits (MDLs).

1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two batch MS/MSD pairs were reported. Since these were batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Laboratory Duplicate

A laboratory duplicate was not reported with the sample set.

1.7 Field Duplicate

A field duplicate was not submitted with the sample set.

1.8 Sensitivity

The sample results were reported to the MDLs. No elevated non-detect results were reported.

1.9 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

2.0 MERCURY

The samples were analyzed for mercury by US EPA Method 7471B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

2.1 Overall Assessment

The mercury data reported in this sample set are considered usable for supporting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on the samples submitted for this analysis, for this sample set is 100%.

2.2 Holding Times

The holding time for mercury analyses of a solid sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch WG1529947). Mercury was not detected in the method blank above the MDL.

2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair was reported, using sample ROB-080520. The recovery and RPD results were within the laboratory specified acceptance criteria.

2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

2.6 Laboratory Duplicate

A laboratory duplicate was not reported with the sample set.

2.7 Field Duplicate

A field duplicate was not reported with the sample set.

2.8 Sensitivity

The samples were reported to the MDL. Elevated non-detect results were not reported.

2.9 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

3.0 TOTAL SOLIDS

The samples were analyzed for Total Solids by SM 2540G.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues

were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Time
- ✓ Method Blank
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Electronic Data Deliverable

3.1 Overall Assessment

The solids data reported in this package are considered usable for supporting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for these sample sets is 100%.

3.2 Holding Time

The holding times for total solids analysis is 7 days from sample collection to analysis. The holding times were met for the sample analyses.

3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch WG1524343). Total solids were not detected in the method blank above the reporting detection limit (RDL).

3.4 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

3.5 Laboratory Duplicate

One batch laboratory duplicate was reported. Since these were batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

3.6 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. It was noted

that the total solids data were reported in percent in the level II report. No discrepancies were identified between the level II report and the EDD.

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ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to "not detected at or above the reported result".

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits and RPD outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other