Step B Soil Characterization Program

Phase 3B Advanced Works Median Soil Removal, Peardonville Road to McCallum Road, Fraser Valley Highway 1 Corridor Improvement Program, Abbotsford, BC

Ministry of Transportation and Infrastructure

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SNC-Lavalin Project: 694890

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1 Introduction

As requested by the Ministry of Transportation and Infrastructure (MoTI), SNC-Lavalin Inc. (SNC-Lavalin) has conducted a Step B Soil Characterization program for the Phase 3B Advanced Works Median Soil Removal ("Phase 3B Advanced Works") of the Fraser Valley Highway 1 Corridor Improvement Program (FVH1CP). The Phase 3B Advanced Works of the FVH1CP extends from approximately Peardonville Road to McCallum Road, in Abbotsford, BC (i.e., the Phase 3B Advanced Work Area).

The Phase 3B Advanced Works was part of a larger program that encompassed the entire Phase 3A and 3B of the FVHICP. The location of Phase 3A and 3B within the FVH1CP is shown on the Project Area Map (Appendix I). SNC-Lavalin has completed a Draft Step B[1] Soil Characterization Report (SNC-Lavalin, 2023) for the entire Phase 3A and 3B (reported separately), and this Step B reported herein provides the soil results specifically for the sub-areas within the Phase 3B Advanced Works, as indicated below. In this report, the "Project Area" refers to the entire Phase 3A and 3B, and the "Phase 3B Advanced Work Area" refers to the Phase 3B Median Soils (i.e. Areas 1 to 5) and comprises the following sub-areas and station ranges (as obtained from MoTI Project Area descriptions):

- Area 1: STA 2051+20 to STA 2053+42
- Area 2: STA 2056+77 to STA 2060+23
- Area 3: STA 2062+47 to STA 2064+76
- Area 4: STA 2074+39 to STA 2076+06
- Area 5: STA 2079+96 to STA 2085+44

All work was completed in accordance with terms and conditions of MoTI "As and When" contract 860 CS 5298 with SNC-Lavalin. The soil characterization work was completed in general accordance with BC ENV Technical Guidance 1[2] (TG1) and MoTI's Technical Circular T-03/20[3], as described in more detail in Section 1.1 and Section 1.3 below. A Notice to Reader is provided in Section 7.

1.1 Project Objectives

As per MoTI's Technical Circular T-03/20, all MoTI projects that plan to relocate soil on and/or off site must screen project areas for the presence of *Contaminated Sites Regulation*[4] (CSR) Schedule 2 activities and high-risk sites (i.e., Step A – Screening Projects). If the Step A Screening identifies CSR Schedule 2 activities and/or high-risk sites, then additional investigation would be required to confirm the absence/presence of contamination in the soil cut area only (i.e., Step B – Soil Characterization). If the soil is found to be contaminated in the Step B, a soil management strategy will be developed in accordance with the Ministry of Environment & Climate Change Strategy (ENV) guidance and regulations and in consultation with a MoTI Geoscientist (i.e., Step C – Soil Management Strategy).

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1 *Step B Soil Characterization Program, Phases 3A and 3B of the Fraser Valley Highway 1 Corridor Improvement Program, 264th Street (Langley) to Highway 11 Interchange (Abbotsford), BC (DRAFT)*, prepared by SNC-Lavalin, dated November 8, 2023.

2 Technical Guidance Document 1: *Site Characterization and Confirmation Testing,* BC Ministry of Environment & Climate Change Strategy, March 2023.

3 *Identification and Characterization of Potentially Contaminated Soil*. Technical Circular T-03/20. Ministry of Transportation and Infrastructure, dated August 4, 2020.

4 *Contaminated Sites Regulation* (CSR), B.C. Reg. 375/96, includes amendments up to B.C. Reg. 133/2022, March 1, 2023.

Step B investigations in the Project Area were completed by others prior to SNC-Lavalin, in reports summarized in Section 1.2, and contamination above applicable standards was identified. The objective of this Step B Soil Characterization program by SNC-Lavalin was to identify any data gaps, and to further assess and/or delineate previously identified contaminated soils (or suspect contaminated soil) where soil cuts are planned, to assist with soil management decisions within the sub-areas of Phase 3B. Soil characterization was required to support soil relocation during construction and off-site disposal.

1.2 Project Area - Drawings and Reports

As indicated in the SNC-Lavalin (2023) report, SNC-Lavalin reviewed various design drawings and cross sections provided by MoTI to identify the construction boundaries, as well as the proposed extents of excavation cuts and fills, and assist with the development of investigation plans. The drawings and plans pertinent to the Phase 3B Advanced Work Area are as follows:

- *Highway 1 Abbotsford 6 Laning - Ross Road to McCallum Road, 100% Functional Design,* prepared for MoTI by Associated Engineering, dated September 12, 2022.

The following drawings were provided for this report, but after execution and completion of the field work:

- *Project No. 13254, Fraser Valley Highway 1 Corridor Improvement Program, Highway 1 – Peardonville Road to McCallum Road Median Soil Removal,* prepared for MoTI by Associated Engineering, dated November 10, 2023.

Step A and Step B reports were previously completed for the Phase 3B Advanced Work Area in 2021 and 2022. SNC-Lavalin reviewed the following documents provided by MoTI:

- *Step A Project Screening: Highway 1 Widening From 1.6km West 264 Street to 2.5km East of Whatcom Road, Abbotsford, BC (Rev.1)*, prepared by Active Earth Engineering, dated October 26, 2021 (Active Earth, 2021).
- *Highway 1: Step B Soil Characterization, 264th Street to Whatcom Road*, prepared by Associated Engineering, dated June 8, 2022 (Associated, 2022a).
- *Highway 1 Step B Soil Characterization, Application of AL Standards (DRAFT),* prepared by Associated, dated December 14, 2022 (Associated, 2022b).

The results from the previous Associated Engineering Step B investigation have been included in this Step B report.

1.3 Conceptual Site Model and Sampling Frequency

Based on the review of design drawings and previous environmental reports, soil characterization and data analysis targeted the Areas 1 to 5 (the “Phase 3B Median Soils”) within the station ranges defined in Section 1 (Introduction).

The results from previous work confirmed elevated concentrations of metals and/or chloride were found in shallow topsoil or shallow fill associated with roadways. As such, for soil relocation and characterization, soil sampling targeted the surface Stripping Material (top 0-0.3 m, generally), and Type D Material to the depth of construction.

The soil characterization work was completed in general accordance with BC ENV TG1 and MoTI’s Technical Circular T-03/20. As there are no Schedule 2 sties in close proximity to the Phase 3B Median Soils, wider delineation spacing of approximately 250 m (at minimum) was used to characterize the soil in

the cut zones in the medians. In these areas, professional judgement was used for recommended spacing to characterize the soil and delineate any impacts.

It should be noted that the soil characterization work was associated only with proposed cut areas described in the above Project drawings, in the above-defined areas, with potential for contamination. The Step B work did not characterize all unsuitable material outside the station ranges defined in Section 1 (Introduction) from embankment stripping associated with SS 201.14 in MOTI's *2020 Standard Specifications for Highway Construction Volume 1 of 2*. Additionally, any surplus material from soil stripping below the paved areas of highways/roadways was also not characterized. Any uncharacterized soil due to the above, or resulting from design changes made subsequent to this report, should be preferentially managed and re-used on site. Otherwise, the material should be characterized if off-site disposal is required.

The bermed soils in the Phase 3B Median Soils comprised native or fill soil, potentially from areas adjacent the road which were deposited to the median during initial road construction. The PCOCs were based on results from previous testing along FVH1CP and included metals and salinity associated with road salting and unknown quality fill. Testing for PCOCs was done in general accordance with the Contaminated Sites Approved Professionals (CSAP) PCOC Selection and Guidance document (2018)[5], at the discretion of the Qualified Professional (QP) for the Project, Mr. Harbey Bains, P.Eng., CSAP.

1.4 Schedule 2 Sites and Step A Summary

In 2021, Active Earth Engineering Ltd. (Active Earth) completed a Step A project screening of the FVH1CP, which includes Phase 3B Advanced Work Area. Based on the Project drawings, SNC-Lavalin determined that there are no Schedule 2 activities that intersect (or potentially intersect) the Phase 3B Advanced Work Area.

As indicated in the SNC-Lavalin (2023) report, previous Step B characterization work in the Project Area was completed by other consultants. A data gap review of the associated reports was completed by SNC-Lavalin with regards to the adequacy of investigations (PCOCs tested, depth of soils testing, and sampling frequency), along with identification and delineation of potential waste soils.

It should be noted that in June 2022, an Order in Council was approved by the Province for an amendment to the CSR (the Stage 14 CSR amendments). Notable changes (of significance to the Project) were:

- Changes to the soil relocation system:
  - New process applies to soil from Schedule 2 sites where quality meets applicable standards at receiving sites (non-waste quality soil). In summary, relocation of non-waste soil from properties with Schedule 2 activities will require the owner to notify ENV. Additional requirements in place if total volume of soil relocated form the Schedule 2 site is greater than 20,000 m^3 (high volume site).
  - Waste quality soil would now be managed through other ENV regulatory mechanisms (i.e., waste discharge authorization, Approval in Principle, or Certificate of Compliance).

[5] Society of Contaminated Sites Approved Professionals of British Columbia. (2018). *Potential Contaminants of Concern at Commercial and Industrial Land Uses*. Retrieved from: https://csapsociety.bc.ca/wpcontent/uploads/r-PCOC-Guidance-June-2018-V1.0-002.pdf.

- New requirements for soil analysis and ENV/public notifications. Sampling requirements for the new process for soil relocation were outlined in a new ENV site investigation protocol (Protocol 19[6] [P19]).
- Removal of activities E10 (“contamination or likely contamination of land by substances migrating from an industrial or commercial site”) and E12 (“single or cumulative spills to the environment greater than the reportable quantities of substances listed in the Spill Reporting Regulation”) as Schedule 2 uses/activities.

[6] Protocol 19; Protocol for Contaminated Sites – *Site Investigation and Reporting*, BC Ministry of Environment & Climate Change Strategy, Version 1, March 1, 2023.

2 Regulatory Framework

The regulatory statutes and criteria applicable to the Phase 3B Advanced Work Area for soil disposal purposes are:

- *Environmental Management Act* (EMA), B.C. Reg. 133/2022 / effective March 1, 2023;
- *Contaminated Sites Regulation* (CSR), B.C. Reg. 375/96, includes amendments up to B.C. Reg. 133/2022, March 1, 2023; and
- *Hazardous Waste Regulation* (HWR), B.C. Reg. 63/88, last amended July 7, 2023 by B.C. Reg. 170/2023.

On-Site Standards

Based on the current land use as a highway right-of-way (ROW), the applicable soil standards for the assessment of soil quality at the Project Area are the CSR industrial land use (IL) soil standards, including matrix and generic standards (Schedule 3.1).

The following site-specific factors are applicable and the most stringent of each is applied to data analysis:

- Human intake of contaminated soil (mandatory for all sites);
- Toxicity to soil invertebrates and plants (mandatory for all sites);
- Groundwater flow to surface water used by freshwater aquatic life; and
- Groundwater used for drinking water.

The HWR soil standards are also relevant to soil transported and disposed off site.

Other Standards (for Potential Relocation)

Uncontaminated soil from the Project Area may potentially be transported to an agricultural property, and as such, other standards selected for comparison are the CSR agricultural standards (AL), including matrix and generic standards (Schedule 3.1). Conservative pH values and most stringent site-specific factors were selected.

- Human intake of contaminated soil (mandatory for all sites);
- Toxicity to soil invertebrates and plants (mandatory for all sites);
- Livestock ingesting soil and fodder;
- Major microbial impairment;
- Groundwater flow to surface water used by freshwater or marine aquatic life, whichever is most stringent;
- Groundwater used for drinking water;
- Groundwater used for livestock watering; and
- Groundwater used for irrigation.

For unknown destination IL receiving sites, conservative pH values and most stringent site-specific factors from the list below for IL use were selected for the applicable standard.

- Human intake of contaminated soil (mandatory for all sites);
- Toxicity to soil invertebrates and plants (mandatory for all sites);
- Groundwater flow to surface water used by freshwater or marine aquatic life, whichever is most stringent and
- Groundwater used for drinking water.

One potential destination being considered by MoTI at the date of this report is Strong Pit, located at 1461 and 1505 Bradner Road in Abbotsford, BC ("Strong Pit Site"). The Strong Pit Site is located within the Agricultural Land Reserve (ALR) and is subject to the provisions of the *Agricultural Land Commission Act*[7] (ALCA) and associated Regulations. However, an application for the site was approved by the Agricultural Land Commission on October 1, 1998 for the continued use of the site as a gravel pit, with a requirement to be reclaimed to mine standards at its conclusion. A number of investigations were completed at the Strong Pit Site from 2009 to 2023 by Ausenco Sustainability Inc. (and formerly Hemmera Envirochem Inc.). In 2023, Ausenco completed a soil pH assessment[8] for the Strong Pit Site pursuant with Technical Guidance Document 5[9] (TG5), and the median pH was calculated to be 6.63. For the purposes of this report, the applicable land use standards for the Strong Pit Site are the AL standards. For Strong Pit, the most stringent site-specific factors were selected.

- Human intake of contaminated soil (mandatory for all sites);
- Toxicity to soil invertebrates and plants (mandatory for all sites);
- Livestock ingesting soil and fodder;
- Groundwater flow to surface water used by freshwater aquatic life (marine aquatic life pathway not applicable);
- Groundwater used for drinking water;
- Groundwater used for livestock watering; and
- Groundwater used for irrigation.

[7] *Agricultural Land Commission Act* (ALCA) [SBC 2002] Chapter 36, May 30, 2002.
[8] Ausenco. 2023. Results of Soil pH Assessment, Strong Pit, Abbotsford, BC, dated May 9, 2023.
[9] Technical Guidance Document 5*: Sampling and Determining Soil pH at Soil Relocation Receiving Sites*, BC Ministry of Environment & Climate Change Strategy, March 2023.

3 Scope of Work

As indicated in the SNC-Lavalin (2023) report, SNC-Lavalin completed field investigations between March and August 2023 to facilitate soil characterization of the Project Area. The scope of work from SNC-Lavalin (2023) report has been modified below to be specific to the Phase 3B Advanced Work Area. The general scope of work comprised of the following:

- Collection of shallow soil samples along the Highway 1 median in general accordance with the cut depths identified in the design drawings;
- Acquisition of a highway lane closure permit with MoTI;
- Preparation of a site-specific health and safety plan to MoTI and Charter Project Delivery Inc. (Charter PDI) prior to initiation of the field work activities. The HASP incorporated requirements identified MoTI's Pre-Construction QA and Health and Safety Management Plan dated April 2022;
- Completion of a BC One Call and review of utility drawings provided by MoTI or others;
- Subcontracting Go Traffic Management (Go Traffic) of Abbotsford, BC to prepare traffic management plans and provide traffic control during sampling work;
- Subcontracting VanMars Drilling Ltd. (Van Mars) of Abbotsford, BC to support SNC-Lavalin during the shallow field sampling;
- Submission of soil samples to Bureau Veritas (BV) of Burnaby, BC for laboratory analyses;
- Data reduction, tabulation of analytical results; and
- Preparation of this report.

3.1 Field Methodology

Field work activities for the Project Area were conducted by SNC-Lavalin between March and August 2023. Sampling locations specific to the Phase 3B Advanced Work Area are shown on attached Drawings 694890-301A, 694890-301B, 694890-302A and 694890-302B. This task consisted of the collection of soil samples from the organic Stripping Material along the Highway 1 median. The "A" series drawings provide the Stripping Material locations and results, and the "B" series drawings provide the Type D Material locations and results.

All field activities were completed following SNC-Lavalin's Preferred Operating Procedures (POPs), MoTI's Technical Circular T-03/20 and industry best practices. Quality Assurance/Quality Control (QA/QC) measures were implemented for all sampling and analyses to ensure that all data is representative and are summarized in Appendix II.

Between March and August 2023, the following surficial samples and BHs/MWs were collected by SNC-Lavalin across the Phase 3B Advanced Work Area:

- Surficial Samples: 10 samples (SS23-20, SS23-22, SS23-23, SS23-27, SS23-44 to SS23-46, SS23-49 to SS23-51) including 2 duplicates (SS23-21, SS23-47).

The above test locations and testing were supplemented with the locations advanced by Associated Engineering (Associated, 2022a). The results from their testing of the Type D soils have been included on the SNC-Lavalin tables and drawings, and combined results discussed in this report.

Surficial samples were collected using a hand shovel to depth of 0.1 m bgs. Sample locations (X, Y) were recorded by SNC-Lavalin using GPS.

Soil conditions at each investigation location was logged with respect to soil type, colour, density, moisture content, and evidence of contamination. Soil samples were collected at regular intervals or changes in soil stratigraphy. Soil samples were collected into plastic sampling bags. Sample selection was based upon indications of contamination (i.e., visual observations), and associated PCOCs. Samples were stored in an ice-chilled cooler and delivered with appropriate chain-of-custody documentation to BV Analytical Services in Burnaby, BC for selective analysis of saturated paste sodium and chloride and metal parameters. Following soil sampling, all boreholes were backfilled with soil cuttings.

4 Results

The results of the field activities completed in the Phase 3B Advanced Work Area are presented in the following sections. In addition, results of the previous investigation completed Associated Engineering (Associated, 2022a) as it pertains to Phase 3B Advanced Work Area are also included.

4.1 Field Observations

Soil conditions and observations at each borehole location are presented in Boreholes Logs (Appendix III) and soil sample log (Table 1). Borehole logs from the previous investigations (Associated Engineering, 2022a) are also attached.

4.2 Soil Analytical Results

Tabulated soil analytical results compared to CSR AL and IL soil standards are presented in the attached Tables 2 and 3. Soil results from previous investigations (Associated Engineering, 2022a) are also included in the tables and drawings. Laboratory soil analytical reports are included in Appendix IV. The soil analytical results are summarized on Drawings 694890-301A and 694890-302A (for Stripping Material) and Drawings 694890-301B and 694890-302B (for Type D Material).

4.2.1 Stripping Material – Medians

A total of 10 samples (and 2 duplicates) representing shallow Stripping Material within the Phase 3B Advance Work Area were collected and tested, and the following parameters exceeded the applicable standards for select metals:

Table A: Summary of Exceedances – Stripping Material (Phase 3B Advanced Work Area)

Parameter Exceeded	pH Dependent	Number of Samples Greater than CSR AL	Number of Samples Greater than CSR AL (Strong Pit pH)	Number of Samples Greater than CSR IL	CSR AL Standard (ug/g)	CSR AL Standard (Strong Pit) (ug/g)	CSR IL Standard (ug/g)
Copper	Yes	2	1	2	**75-150[c]**	**150**	**75 – 300[c]**
Lead	Yes	3	3	1	**120**	**120**	**120 – 1,000[c]**
Molybdenum	No	1	1	-	**3**	**3**	**15**
Zinc	Yes	2	2	2	**150-200[c]**	**200**	**150-450[c]**

Notes:

- [c] – Standard varies with pH.
- See Regulatory Framework section for details on the site-specific factors used for determining matrix standards for CSR AL, CSR AL (Strong Pit), and CSR IL. A number of parameters with exceedances, as noted in the table above, exhibited standards that were pH dependent, and therefore the receiving site pH could affect the number of samples that exceed for a given land use. As the receiving site location is unknown, the most stringent pH value was used for the applicable standard, except for AL (Strong Pit). Also noteworthy, the applicable site-specific groundwater use can also have significance to the applicable standards if the receiving site has pathways that are not applicable (such as groundwater used for irrigation, groundwater used for livestock watering, groundwater used for drinking water, and groundwater flow to surface water (freshwater or marine) used by aquatic life.

The applicable IL standards were exceeded for copper, lead and zinc, and the AL standards were exceeded for copper, lead, molybdenum and zinc.

4.2.2 Type D Material – Medians

A total of 20 samples (and 5 duplicates) representing Type D Material within the Phase 3B Advance Work Area were collected and tested from the highway median, and the following parameters exceeded the applicable standards for select metals:

Table B: Summary of Exceedances – Type D Material (Medians) within Areas 1 to 5

Parameter Exceeded	pH Dependent	Number of Samples Greater than CSR AL	Number of Samples Greater than CSR AL (Strong Pit pH)	Number of Samples Greater than CSR IL	CSR AL Standard (ug/g)	CSR AL Standard (Strong Pit) (ug/g)	CSR IL Standard (ug/g)
Chromium	No	1	1	1	**60**	**60**	**60**

The applicable IL and AL standards exceeded in one sample for chromium.

4.3 Statistical Analysis

In accordance with the ENV Technical Guidance Document 2[10] (ENV TG2), a statistical analysis was completed for a number of metals parameters that exhibited concentrations greater than the CSR IL and/or AL use standards. The results of the statistical analysis for metals and other parameters were completed as part of the SNC-Lavalin (2023) report. The data sets used for the statistical analyses were categorized into separate populations consistent with the conceptual site model (described in Section 1.3) including separate populations for surficial (Stripping) soil within the highway medians, and subsurface (Type D) soil within the highway medians.

For the statistical analysis, sample locations were excluded from the statistical analysis (and targeted for remediation) if the results were representative of contamination, and those samples included:

- Sample concentrations that exceeded two times the applicable standard (for IL, and/or AL use [for Strong Pit]); and
- "Hot spots" with PCOC concentrations that were elevated in comparison to the general population of samples, suggestive of potentially impacts from minor spills, road residue/run-off, and or pockets of lower quality fill, and do not pass TG2 stats.

4.3.1 Statistical Analysis – Stripping Material

The following samples from the Phase 3B Advanced Work Area were removed from the statistical populations:

Table C: Samples Removed from Statistical Analysis –Phase 3B Advanced Work Area

Sample ID	Parameters Removed	Standard Exceeded	2X Exceedance	Hot Spot
Stripping Material – Medians				
SS23-23	Pb	AL	-	Pb (376 ppm)
SS23-44	Cu, Pb	IL	-	Cu (78.6 ppm), Pb (175 ppm)

Notes: Cd – Cadmium; Pb – Lead.
ppm = parts per million, equivalent to ug/g

[10] Technical Guidance Document 2: Statistical Criteria for Characterizing a Volume of Contaminated Material, BC MoE, January 2009.

The remainder of the soil samples were considered representative of the population of soil that will remain following hot-spot remediation. As detailed in SNC-Lavalin (2023), the statistical analysis for the remaining samples is within the CSR AL standards for Strong Pit (based on the Strong Pit Site pH of 6.63) for the parameters listed in Section 4.2.1.

For other AL and/or IL disposal locations, copper does not meet the CSR AL and/or IL standards at all receiving sites. The pH of the receiving site, as well as the site-specific factors that apply to groundwater at the receiving site, will determine whether additional "hot spot" excavations would be required for copper and/or zinc before relocation to receiving sites (other than Strong Pit).

If the receiving site has a pH > 5.5, the applicable CSR AL and IL standard for copper is 100 mg/kg, and the remaining samples would then statistically meet these standards.

4.3.2 Statistical Analysis – Type D Material

All samples collected from the Phase 3B Advanced Work Area were considered representative of the statistical population. As detailed in SNC-Lavalin (2023), the statistical analysis for the Type D median soils indicates all parameters tested are within the CSR AL standards for Strong Pit (based on the Strong Pit Site pH of 6.63) and is less than AL and/or IL standards for all site-specific factors and soil pH ranges.

4.4 Quality Assurance/Quality Control

A QA/QC program was implemented to ensure the integrity of all sampling and analysis and to ensure that all data was handled accordingly. Overall, the results are considered adequate to confirm that the data is considered reliable and reproducible. Details and results of the QA/QC program are provided in Appendix II.

5 Soil Results Summary

Tabulated soil analytical results compared to CSR AL and IL soil standards are presented in Tables 2 and 3 (attached). Soil results from previous investigations (Associated Engineering, 2022a) are also included in the tables and drawings.

The Step B Soil Characterization the Phase 3B Advanced Work Area identified four soil classifications:

- IL+ Waste Quality Soils;
- AL+ / IL- Industrial Quality Soils;
- AL- Agricultural Quality Soils – Strong Pit (suitable for relocation to Strong Pit, based on site pH of 6.63); and
- AL- Agricultural Quality Soils – All Sites (i.e., meets AL standards for all receiving sites[11]).

A review of the data indicated soil should be separated into populations based on the CSM described in Section 1.3, and into two main soil categories (Stripping Material and Type D Material) within the proposed soil cuts in the highway medians.

As noted in Section 1.3, the soil characterization work was associated only with proposed cut areas described in the above Project drawings, in the above-defined areas, with potential for contamination. The Step B work did not characterize all unsuitable material outside the station ranges defined in Section 1 (Introduction) from embankment stripping associated with *SS 201.14 in MOTI's 2020 Standard Specifications for Highway Construction Volume 1 of 2*. Additionally, any surplus material from soil stripping below the paved areas of highways/roadways was also not characterized. Any uncharacterized soil due to the above or resulting from design changes made subsequent to this report, should be preferentially managed and re-used on site. Otherwise, it should be characterized if off-site disposal is required.

In general, for delineation of IL+ or AL+ soil, the lateral and vertical extents were based on approximate equal distances to the nearest boreholes or sample depths (if vertical) that had soil concentrations below those standards at similar soil units (i.e., Stripping Material or Type D Material). Delineation depths also factored in the extent of the associated soil cut in the highway medians.

The locations of Waste Quality, Industrial Quality, Agricultural Quality (Strong Pit or all) Type D Material and Stripping Material that may be encountered as a part of proposed construction activities in the Phase 3B Advance Work Area are presented on the attached Drawings 694890-301A and 694890-302A (for Stripping Material) and Drawings 694890-301B and 694890-302B (for Type D Material). The estimated volumes of Waste Quality, Industrial Quality and Agricultural Quality Type D Material and Stripping Material, associated within the Phase 3B Median Soils are summarized in in Table D, below.

[11] Applicable standards at receiving sites are dependent on pH of the receiving site, and the applicable water use pathways.

Table D: Soil Classification Summary – Phase 3B Advanced Work Area Soils

Material Type	Station Range	Classification Depth	Contaminants Remaining*	Estimated Volumes** (m^3)			
				AL- (Strong Pit)	AL- (Other	AL+/IL-	IL+
Area 1 - STA 2051+20 to STA 2053+42							
Stripping Material	2051+20 to 2053+42	0 m to 0.3 m	n/a	2,042	x		
Type D Material	2051+20 to 2053+42	0.3 m to 3 m	n/a	7,099	✓		
Area 2 - STA 2056+77 to STA 2060+23							
Stripping Material	2056+77 to 2060+23	0 m to 0.3 m	n/a	2,978	x		
Type D Material	2056+77 to 2060+23	0.3 m to 7 m	n/a	23,880	✓		
Area 3 - STA 2062+47 to STA 2064+76							
Stripping Material	2062+47 to 2064+00	0 m to 0.3 m	Pb			1,860	
	2064+00 to 2064+76	0 m to 0.3 m	n/a	924	✓		
Type D Material	2062+47 to 2064+76	0.3 m to 3 m	n/a	1,356	✓		
Area 4 - STA 2074+39 to STA 2076+06							
Stripping Material	2074+39 to 2076+06	0 m to 0.3 m	n/a	3,859	✓		
Type D Material	2074+39 to 2076+06	0.3 m to 4 m	n/a	2,898	✓		
Area 5 - STA 2079+96 to STA 2085+44							
Stripping Material	2079+96 to 2084+00	0 m to 0.3 m	n/a	8,480	✓		
	2084+00 to 2085+44	0 m to 0.3 m	Cu, Pb				3,022
Type D Material	2079+96 to 2085+44	0.3 m to 3 m	n/a	4,979	✓		

* Refers to Contaminants Remaining after application of TG2. The parameters listed exceed the applicable standards (AL and/or IL) based on sample pH.

** Soil Volumes based on MoTI Design Drawings R1-1100-201 to 212, Profile, Fraser Valley Highway 1 Corridor Improvement Program, Highway 1 – Peardonville Road to McCallum Road, Project 13254, Ministry of Transportation and Infrastructure, November 10, 2023.

✓ Suitable for relocation to all potential agricultural receiving sites. Soil meets the applicable standard (at all pH ranges and water use pathways) for potential receiving sites with the designated land use standard.

X Not suitable for relocation to other potential agricultural receiving sites. The pH of the receiving site, as well as the site-specific factors that apply to groundwater at the receiving site needs to be considered before relocation to receiving sites (other than Strong Pit).

6 Conclusions

The extent of Waste Quality, Industrial Quality, Agricultural Quality (Strong Pit or all) Type D Material and Stripping Material that may be encountered as a part of proposed construction activities at the Phase 3B Advanced Work Area are presented on the attached Drawings 694890-301A, 694890-301B, 694890-302A and 694890-302B. The estimated volumes of Waste Quality (IL+), Industrial Quality (AL+/IL-) and Agricultural Quality (AL-) Type D Material and Stripping Material associated with the proposed construction at the Phase 3B Median Soils are summarized in Table D in Section 5.

It should be noted that conservative site-specific factors for determining matrix standards for CSR AL, and CSR IL were used, as the disposal site(s) locations and receiving site pH values were not known (except for Strong Pit). A number of parameters with exceedances exhibited standards that were pH dependent, and therefore the receiving site pH could affect the number of samples that exceed for a given land use. As the receiving site location is unknown, the most stringent pH value was used for the applicable standard, except for AL (Strong Pit). Also noteworthy, the applicable site-specific groundwater use can also have significance to the applicable standards if the receiving site has pathways that are not applicable (such as groundwater used for irrigation, groundwater used for livestock watering, groundwater used for drinking water, and groundwater flow to surface water (freshwater or marine) used by aquatic life).

Based on the results of the Step B Soil Characterization program, SNC-Lavalin recommends a Step C Soil Management Strategy for the soils to be excavated the Phase 3B Advanced Work Area.

7 Notice to Reader

This report has been prepared and the work referred to in this report have been undertaken by SNC-Lavalin Inc. (SNC-Lavalin) for the exclusive use of the Ministry of Transportation and Infrastructure (MoTI), each of which has been party to the development of the scope of work and understands its limitations. The methodology, findings, conclusions and recommendations in this report are based solely upon the scope of work and subject to the time and budgetary considerations described in the proposal and/or contract pursuant to which this report was issued. MoTI may rely on this report as may any Authorized Users as defined by Contract 860-CS-5298. Any use, reliance on, or decision made by any other third party based on this report is the sole responsibility of such third party. SNC-Lavalin accepts no liability or responsibility for any damages that may be suffered or incurred by any third party as a result of the use of, reliance on, or any decision made based on this report.

The soil chemical results are based on the specific standards and conditions applicable at this site. The application of these results to prospective soil receiver sites must consider the standards and conditions applicable at those sites. It is recommended the Contractor retain an Approved Qualified Professional to assist with determining suitable soil relocation options, and to conduct further soil quality assessment as warranted.

The findings, conclusions and recommendations in this report (i) have been developed in a manner consistent with the level of skill normally exercised by professionals currently practicing under similar conditions in the area, and (ii) reflect SNC-Lavalin's best judgement based on information available at the time of preparation of this report. No other warranties, either expressed or implied, are made with respect to the professional services provided to MoTI or the findings, conclusions and recommendations contained in this report. The findings and conclusions contained in this report are valid only as of the date of this report and may be based, in part, upon information provided by others. If any of the information is inaccurate, new information is discovered or project parameters change, modifications to this report may be necessary.

This report must be read as a whole, as sections taken out of context may be misleading. If discrepancies occur between the preliminary (draft) and final version of this report, it is the final version that takes precedence. Nothing in this report is intended to constitute or provide a legal opinion.

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Tables

TABLE 1: Soil Sample Log – Phase 3B Advanced Works

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Sample Type[a]	Description	North (m)	East (m)	Depth (m)
SS23-20	SS23-20	2023 05 28	SS	SILT, grey, firm to very firm, dry, trace rootlets, some organic inclusions.	5432805	547138	0.0-0.1
	SS23-21	2023 05 28	DUP	Duplicate of SS23-20.	5432805	547138	0.0-0.1
SS23-22	SS23-22	2023 05 28	SS	SILT, grey, firm to very firm, dry, trace rootlets.	5432533.4	547560	0.0-0.1
SS23-23	SS23-23	2023 05 28	SS	SAND, fine grained, some gravel, fine to coarse, subangular, trace silt, damp, some rootlets.	5432234	547923	0.0-0.1
SS23-27	SS23-27	2023 05 28	SS	SAND, fine grained, some gravel, fine to coarse, subangular, loose, some rootlets.	5431638.9	549861	0.0-0.1
SS23-44	SS23-44	2023 05 29	SS	SILT, some gravel, fine to coarse, subangular, trace sand, fine grained, brown, soft, damp, abundant rootlets and organic inclusions.	5431636	550082	0.0-0.1
SS23-45	SS23-45	2023 05 29	SS	SAND, fine grained, trace gravel, fine to coarse, trace silt, brown, loose, dry, abundant rootlets and organic inclusions.	5431671	549614	0.0-0.1
SS23-46	SS23-46	2023 05 29	SS	SILT, trace sand, fine grained, trace gravel, subrounded, brown, soft, damp.	5431710	549092	0.0-0.1
	SS23-47	2023 05 29	DUP	Duplicate of SS23-46.	5431710	549092	0.0-0.1
SS23-49	SS23-49	2023 05 29	SS	SILT, some gravel, fine to coarse, subrounded, brown, medium soft to firm, damp, trace rootlets.	5432075	548161	0.0-0.1
SS23-50	SS23-50	2023 05 29	SS	SILT, brown, soft, damp, trace rootlets.	5432384	547775	0.0-0.1
SS23-51	SS23-51	2023 05 29	SS	SAND, fine grained, some silt, brown, loose, soft, damp, trace rootlets, trace organics.	5432699	547357	0.0-0.1

[a] SS = Surface Sample DUP = Blind Field Duplicate

TABLE 2: Summary of Analytical Results for Total Metals in Soil – Phase 3B Advanced Works

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Depth Interval (m)	pH	Total Metals																										
				pH	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Tin	Tungsten	Uranium	Vanadium	Zinc
				pH units	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
Associated Engineering																															
BH22-156	BH22-156-2	2022 02 03	0.8 - 1.0	6.18	18,700	0.32	6.20	92.2	0.31	2.9	0.098	37.6	12.5	33.0	28,100	3.98	9.20	512	< 0.040	0.49	32.9	< 0.20	< 0.10	49.8	< 0.10	0.33	< 0.20	0.366	69.0	57.4
	BH22-156-4	2022 02 03	2.8 - 3.0	6.53	18,300	0.31	6.48	90.8	0.31	2.9	0.133	43.3	13.2	32.9	28,300	4.06	9.50	598	< 0.040	0.45	33.2	< 0.20	< 0.10	48.5	< 0.10	0.34	< 0.20	0.380	67.9	59.0
BH22-167	BH22-167-2	2022 02 03	0.8 - 1.0	8.29	15,400	0.34	5.73	92.6	0.26	3.4	0.174	31.8	11.6	32.3	27,400	3.71	11.0	464	0.047	0.73	34.2	0.40	< 0.10	51.8	< 0.10	0.29	< 0.20	0.446	64.3	60.9
	BH22-167-6	2022 02 04	4.8 - 5.0	8.01	13,300	0.30	7.50	73.1	0.22	3.2	0.133	***86.7***	10.2	26.8	25,700	3.19	9.13	395	0.059	1.26	28.4	0.23	< 0.10	40.1	< 0.10	0.27	< 0.20	0.403	57.7	53.0
	BH22-167-9	2022 02 04	7.8 - 8.0	8.46	15,200	0.33	5.44	85.9	0.25	3.6	0.169	30.4	11.2	30.8	27,100	3.58	10.7	461	0.045	0.62	32.8	0.24	< 0.10	46.4	< 0.10	0.26	< 0.20	0.352	61.5	59.2
	DUP28	Duplicate	7.8 - 8.0	8.31	16,200	0.35	5.46	90.4	0.25	4.3	0.149	31.8	11.1	30.0	27,500	3.60	10.4	475	0.060	0.55	32.7	0.26	< 0.10	52.2	< 0.10	0.35	< 0.20	0.455	65.8	57.5
	QA/QC RPD%			2	6	6	0	5	0	*	13	5	1	3	1	1	3	3	29	12	0	*	*	12	*	30	*	26	7	3
BH22-168	BH22-168-1	2022 02 03	0.1 - 0.3	5.65	23,300	0.28	6.36	112	0.40	2.4	0.099	41.7	13.1	31.9	29,000	4.60	10.5	474	0.046	0.44	33.3	< 0.20	< 0.10	37.4	< 0.10	0.35	< 0.20	0.469	70.2	56.4
	BH22-168-3	2022 02 03	1.8 - 2.0	8.02	16,000	0.29	5.96	85.9	0.28	3.5	0.121	37.2	11.4	31.6	26,700	3.82	10.2	469	< 0.040	0.49	32.3	< 0.20	< 0.10	47.1	< 0.10	0.33	< 0.20	0.295	63.7	55.5
	DUP27	Duplicate	1.8 - 2.0	8.17	16,500	0.32	6.12	88.1	0.27	3.6	0.141	35.7	11.5	31.5	26,400	3.74	10.2	479	< 0.040	0.43	31.5	< 0.20	< 0.10	50.1	< 0.10	0.34	< 0.20	0.307	63.9	55.3
	QA/QC RPD%			2	3	10	3	3	4	*	15	4	1	0	1	2	0	2	*	13	3	*	*	6	*	3	*	4	0	0
BH22-171	BH22-171-1	2022 02 03	0.1 - 0.3	5.83	20,500	0.24	6.65	45.2	0.22	2.1	0.045	34.1	10.1	22.8	21,400	2.79	8.27	464	< 0.040	0.83	22.6	0.21	< 0.10	14.4	< 0.10	0.24	< 0.20	0.441	52.9	37.7
	DUP25	Duplicate	0.1 - 0.3	5.52	21,300	0.30	7.21	44.4	0.24	2.0	0.045	40.3	10.6	24.4	22,600	2.88	8.40	535	< 0.040	0.84	23.2	0.21	< 0.10	16.2	< 0.10	0.25	< 0.20	0.367	57.3	37.1
	QA/QC RPD%			5	4	22	8	2	*	*	0	17	5	7	5	3	2	14	*	1	3	*	*	12	*	*	*	18	8	2
	BH22-171-4	2022 02 03	2.8 - 3.0	7.54	13,300	0.26	8.80	70.3	0.21	2.6	0.147	37.2	10.6	27.6	30,200	3.14	8.21	509	< 0.040	0.53	33.4	< 0.20	< 0.10	38.4	< 0.10	0.25	< 0.20	0.405	68.1	47.0
BH22-175	BH22-175-1	2022 01 27	0.2 - 0.4	6.86	16,700	0.30	6.65	59.9	0.24	< 2.0	0.114	24.5	8.69	38.8	22,900	7.67	8.73	445	< 0.040	0.52	21.6	< 0.20	< 0.10	15.0	< 0.10	0.30	< 0.20	0.318	53.3	56.7
	BH22-175-2	2022 01 27	0.8 - 1.0	6.48	24,500	0.37	6.82	80.0	0.40	< 2.0	0.101	37.2	11.1	31.1	27,900	7.08	11.8	588	0.059	0.69	33.5	0.28	< 0.10	12.9	< 0.10	0.45	< 0.20	0.541	65.9	79.9
BH22-184	BH22-184-1	2022 02 04	0.1 - 0.3	5.71	27,900	0.36	6.96	101	0.48	2.5	0.155	41.5	10.0	18.4	29,000	8.40	12.8	479	0.076	0.79	29.1	0.52	0.14	16.2	0.11	0.54	< 0.20	0.567	72.7	62.1
	BH22-184-3	2022 02 04	1.8 - 2.0	5.81	13,900	0.35	7.51	61.2	0.25	2.8	0.092	37.1	8.60	20.7	22,600	2.49	6.18	244	< 0.040	0.42	35.7	< 0.20	< 0.10	23.1	< 0.10	0.28	< 0.20	0.392	61.5	32.7
	BH22-184-5	2022 02 04	3.8 - 4.0	5.88	12,000	0.33	5.43	70.4	0.23	2.8	0.079	32.0	7.39	18.6	18,900	2.08	6.06	351	< 0.040	0.37	31.7	< 0.20	< 0.10	21.4	< 0.10	0.26	< 0.20	0.302	48.8	32.1
BH22-186	BH22-186-2	2022 02 04	0.8 - 1.0	5.93	18,700	0.28	7.08	72.5	0.28	2.6	0.115	43.6	10.1	20.1	29,900	3.62	9.78	391	< 0.040	0.51	32.4	0.21	< 0.10	16.3	< 0.10	0.28	< 0.20	0.401	81.5	51.0
	BH22-186-4	2022 02 04	2.8 - 3.0	5.88	16,200	0.35	6.20	108	0.20	2.4	0.089	33.0	8.63	22.5	21,500	2.58	6.92	346	< 0.040	0.41	32.0	< 0.20	< 0.10	17.0	< 0.10	0.24	< 0.20	0.364	56.3	38.3
	DUP29	Duplicate	2.8 - 3.0	5.86	17,000	0.34	6.12	118	0.24	2.4	0.097	35.0	8.84	22.5	22,000	2.57	6.97	361	< 0.040	0.35	32.6	< 0.20	< 0.10	16.7	< 0.10	0.26	< 0.20	0.363	56.9	40.0
	QA/QC RPD%			0	5	3	1	9	*	*	9	6	2	0	2	0	1	4	*	16	2	*	*	2	*	*	*	0	1	4
BH22-187	BH22-187-1	2022 02 05	0.1 - 0.3	6.16	23,900	0.34	6.14	120	0.40	< 2.0	0.140	37.7	9.80	23.0	26,600	18.6	11.8	750	0.066	0.60	32.5	0.28	< 0.10	13.4	< 0.10	0.41	< 0.20	0.535	61.6	65.9
	BH22-187-2	2022 02 05	0.8 - 1.0	6.37	27,500	0.24	5.72	88.5	0.44	< 2.0	0.063	40.5	10.0	17.8	27,400	6.15	12.9	656	0.080	0.65	32.1	0.42	0.14	10.8	< 0.10	0.38	< 0.20	0.571	62.9	56.4
BH22-188	BH22-188-1	2022 02 05	0.1 - 0.3	6.30	24,100	0.28	5.97	105	0.43	< 2.0	0.136	36.3	10.0	19.6	27,200	9.40	10.9	657	0.063	0.59	29.9	0.33	< 0.10	16.7	< 0.10	0.37	< 0.20	0.456	59.3	59.8
	DUP19	Duplicate	0.1 - 0.3	6.48	26,000	0.31	6.64	111	0.45	2.5	0.127	39.6	10.7	20.4	29,100	9.22	11.3	666	0.069	0.57	32.1	0.39	< 0.10	17.2	0.10	0.37	< 0.20	0.491	65.1	63.3
	QA/QC RPD%			3	8	10	11	6	5	*	7	9	7	4	7	2	4	1	9	3	7	*	*	3	*	0	*	7	9	6
	BH22-188-2	2022 02 05	0.8 - 1.0	6.74	21,800	0.26	6.55	53.1	0.33	< 2.0	0.101	37.3	9.75	21.5	25,500	5.02	9.75	333	0.049	0.51	31.1	0.26	< 0.10	13.8	< 0.10	0.22	< 0.20	0.474	64.2	53.9
BC Standard																															
CSR Agricultural Land Use (AL)[a]				n/a	40,000	20	10	350	1-85[c]	8,500	1-10[c]	60[b]	25	75-150[c]	35,000	120	30	2,000	0.6	3	70-150[c]	4[d]	20	9,500	2	5	15	15	100	150-200[c]
CSR Industrial Land Use (IL)[a]				n/a	250,000	40	10	350	1-350[c]	1,000,000	1-50[c]	60[b]	25	75-300[c]	150,000	120-1,000[c]	450	2,000	75	15	70-250[c]	4[d]	40	150,000	25	300	200	30	100	150-450[c]
Strong Pit Agricultural Land Use (AL) - Median pH 6.63[a]				n/a	40,000	20	10	350	4	8,500	1	60[b]	25	150	35,000	120	30	2,000	0.6	3	70	4[d]	20	9,500	2	5	15	15	100	200

Notice to Reader: The soil chemical results shown are based on the specific standards and conditions applicable at this Site. The application of these results to prospective soil receiver sites must consider the standards and conditions applicable at those sites. It is recommended the contractor retain an Approved Qualified Professional to assist with determining suitable soil relocation options and to conduct further soil quality assessment as warranted.

Associated file(s): Historic.

Associated Bureau Veritas Laboratories file(s): C337966, C338618.

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit.

- Denotes analysis not conducted or calculation not completed.

n/a Denotes no applicable standard.

QA/QC RPD Denotes quality assurance/quality control relative percent difference.

* RPDs are not calculated where one or more concentrations are less than five times the RDL.

RDL Denotes reported detection limit.

BOLD	Concentration greater than the CSR Agricultural Land Use (AL) standard
SHADED	Concentration greater than the CSR Industrial Land Use (IL) standard
OUTLINE	Concentration greater than Strong Pit Agricultural Land Use (AL) - Median pH 6.63 standard

[a] The site-specific factors used for determining the matrix standards for this site include: intake of contaminated soil, groundwater used for drinking water, groundwater used for irrigation, groundwater used for livestock watering, livestock ingesting soil and fodder, toxicity to soil invertebrates and plants, major microbial functional impairment, and groundwater flow to surface water used by freshwater aquatic life (whichever is most stringent).

[b] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.

[c] Standard varies with pH.

[d] Regional background soil quality estimate for Selenium, as provided in Table 1 of Protocol 4; for Contaminated Sites, Establishing Local Background Concentrations in Soil.

TABLE 2: Summary of Analytical Results for Total Metals in Soil – Phase 3B Advanced Works

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Depth Interval (m)	pH	Total Metals																								
				pH	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium	Tin	Tungsten	Uranium	Vanadium	Zinc
				pH units	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
SNC-Lavalin																													
SS23-20	SS23-20	2023 05 28	0.0 - 0.1	6.06	16,700	1.01	6.01	102	0.28	2.2	0.662	35.6	12.0	64.8	23,800	111	6.92	486	0.056	1.00	26.1	< 0.50	0.164	37.6	0.075	0.98	< 0.50	0.392	58.9	146
	SS23-21	Duplicate	0.0 - 0.1	5.82	17,400	0.89	6.24	102	0.35	2.2	0.459	37.4	11.4	63.8	24,900	110	7.20	444	< 0.050	1.12	26.8	< 0.50	0.178	36.2	0.070	0.95	< 0.50	0.333	61.0	131
	QA/QC RPD%			-	4	13	4	0	*	*	36	5	5	2	5	1	4	9	*	11	3	*	*	4	*	3	*	16	4	11
SS23-22	SS23-22	2023 05 28	0.0 - 0.1	5.63	19,700	0.47	5.91	95.0	0.27	1.8	0.282	35.5	9.88	49.3	24,200	99.8	8.73	443	0.054	0.69	27.2	< 0.50	0.105	18.1	0.060	0.50	< 0.50	0.374	59.8	78.0
SS23-23	SS23-23	2023 05 28	0.0 - 0.1	6.81	10,700	1.36	5.94	77.2	< 0.20	2.3	0.813	35.0	8.12	95.5	22,600	***376***	7.65	380	< 0.050	2.06	25.2	< 0.50	0.181	19.1	< 0.050	2.92	2.07	0.237	45.0	***202***
SS23-27	SS23-27	2023 05 28	0.0 - 0.1	6.37	12,900	0.41	6.04	35.8	< 0.20	2.0	0.221	37.1	8.51	37.5	21,600	36.3	7.90	297	< 0.050	0.45	34.0	< 0.50	< 0.050	10.2	< 0.050	0.35	< 0.50	0.297	56.8	55.6
SS23-44	SS23-44	2023 05 29	0.0 - 0.1	4.92	13,800	0.56	5.58	42.1	< 0.20	2.2	0.154	29.2	6.77	***78.6***	19,900	***175***	8.83	285	0.057	1.00	24.4	< 0.50	< 0.050	13.8	< 0.050	0.73	0.67	0.381	48.6	55.8
SS23-45	SS23-45	2023 05 29	0.0 - 0.1	6.16	13,800	0.65	6.27	63.6	< 0.20	2.3	0.255	31.4	8.23	74.2	20,800	115	8.22	339	< 0.050	0.98	31.9	< 0.50	0.054	17.5	< 0.050	0.81	< 0.50	0.357	52.3	77.9
SS23-46	SS23-46	2023 05 29	0.0 - 0.1	5.70	25,300	0.47	6.22	78.7	0.34	1.4	0.195	40.6	9.88	43.6	26,900	63.0	10.4	565	0.094	1.00	28.1	< 0.50	0.108	11.6	0.083	0.68	< 0.50	0.504	63.5	67.1
	SS23-47	Duplicate	0.0 - 0.1	5.66	26,200	0.51	6.36	86.8	0.34	1.8	0.227	43.6	10.2	51.0	28,800	73.1	11.4	555	0.097	1.09	29.9	< 0.50	0.120	13.3	0.090	0.73	< 0.50	0.557	68.4	75.8
	QA/QC RPD%			-	3	*	2	10	*	*	*	7	3	16	7	15	9	2	*	9	6	*	*	14	*	7	*	10	7	12
SS23-49	SS23-49	2023 05 29	0.0 - 0.1	7.25	19,900	0.66	6.04	68.3	0.23	2.4	0.197	32.9	9.62	62.9	25,600	14.8	9.73	413	0.055	0.76	25.2	< 0.50	0.112	15.4	0.055	0.72	< 0.50	0.404	60.1	82.2
SS23-50	SS23-50	2023 05 29	0.0 - 0.1	6.30	15,600	0.27	4.86	48.1	< 0.20	1.9	0.123	27.9	7.56	27.7	21,200	14.4	6.39	248	< 0.050	0.43	24.0	< 0.50	< 0.050	14.4	< 0.050	0.23	< 0.50	0.318	59.9	41.4
SS23-51	SS23-51	2023 05 29	0.0 - 0.1	7.50	11,800	2.61	6.31	124	< 0.20	4.4	0.899	51.0	10.0	***211***	28,400	***153***	9.58	438	< 0.050	***3.32***	30.2	< 0.50	0.141	30.5	0.066	3.55	2.65	0.350	52.6	***249***
BC Standard																													
CSR Agricultural Land Use (AL)[a]				n/a	40,000	20	10	350	1-85[c]	8,500	1-10[c]	60[b]	25	75-150[c]	35,000	120	30	2,000	0.6	3	70-150[c]	4[d]	20	9,500	2	5	15	15	100	150-200[c]
CSR Industrial Land Use (IL)[a]				n/a	250,000	40	10	350	1-350[c]	1,000,000	1-50[c]	60[b]	25	75-300[c]	150,000	120-1,000[c]	450	2,000	75	15	70-250[c]	4[d]	40	150,000	25	300	200	30	100	150-450[c]
Strong Pit Agricultural Land Use (AL) - Median pH 6.63[a]				n/a	40,000	20	10	350	4	8,500	1	60[b]	25	150	35,000	120	30	2,000	0.6	3	70	4[d]	20	9,500	2	5	15	15	100	200

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Associated file(s): Historic.
Associated Bureau Veritas Laboratories file(s): C337966, C338618.
All terms defined within the body of SNC-Lavalin's report.
< Denotes concentration less than indicated detection limit.
- Denotes analysis not conducted or calculation not completed.
n/a Denotes no applicable standard.
QA/QC RPD Denotes quality assurance/quality control relative percent difference.
* RPDs are not calculated where one or more concentrations are less than five times the RDL.
RDL Denotes reported detection limit.

BOLD Concentration greater than the CSR Agricultural Land Use (AL) standard
SHADED Concentration greater than the CSR Industrial Land Use (IL) standard
OUTLINE Concentration greater than Strong Pit Agricultural Land Use (AL) - Median pH 6.63 standard

[a] The site-specific factors used for determining the matrix standards for this site include: intake of contaminated soil, groundwater used for drinking water, groundwater used for irrigation, groundwater used for livestock watering, livestock ingesting soil and fodder, toxicity to soil invertebrates and plants, major microbial functional impairment, and groundwater flow to surface water used by freshwater aquatic life (whichever is most stringent).
[b] Individual standards exist for Cr +3 and Cr +6. Reported value represents more stringent standard.
[c] Standard varies with pH.
[d] Regional background soil quality estimate for Selenium, as provided in Table 1 of Protocol 4; for Contaminated Sites, Establishing Local Background Concentrations in Soil.

TABLE 3: Summary of Analytical Results for Salinity in Soil – Phase 3B Advanced Works

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Depth Interval (m)	Soil Salinity				
				% Saturation %	Soluble Chloride mg/L	Soluble Sodium mg/L	Chloride Ion µg/g	Sodium Ion µg/g
Associated Engineering								
BH22-156	BH22-156-2	2022 02 03	0.8 - 1.0	41.2	-	-	< 25	< 5.0
	BH22-156-4	2022 02 03	2.8 - 3.0	60.5	-	-	< 25	7.8
BH22-167	BH22-167-2	2022 02 03	0.8 - 1.0	43.3	-	-	31	23.9
	BH22-167-6	2022 02 04	4.8 - 5.0	32.5	-	-	< 16	7.0
	BH22-167-9	2022 02 04	7.8 - 8.0	40.3	-	-	< 20	8.4
	DUP28	Duplicate	7.8 - 8.0	45.2	-	-	< 25	8.5
	QA/QC RPD%			11	-	-	*	-
BH22-168	BH22-168-1	2022 02 03	0.1 - 0.3	56.4	-	-	< 25	6.8
	BH22-168-3	2022 02 03	1.8 - 2.0	65.0	-	-	< 25	6.7
	DUP27	Duplicate	1.8 - 2.0	61.5	-	-	< 25	10.6
	QA/QC RPD%			6	-	-	*	45
BH22-171	BH22-171-1	2022 02 03	0.1 - 0.3	37.8	-	-	< 25	< 5.0
	DUP25	Duplicate	0.1 - 0.3	45.4	-	-	< 25	< 5.0
	QA/QC RPD%			18	-	-	*	*
	BH22-171-4	2022 02 03	2.8 - 3.0	41.0	-	-	< 25	6.8
BH22-175	BH22-175-1	2022 01 27	0.2 - 0.4	41.6	-	-	< 25	< 5.0
	BH22-175-2	2022 01 27	0.8 - 1.0	48.6	-	-	< 25	< 5.0
BH22-184	BH22-184-1	2022 02 04	0.1 - 0.3	63.7	-	-	< 32	< 6.4
	BH22-184-3	2022 02 04	1.8 - 2.0	37.6	-	-	< 19	< 5.0
	BH22-184-5	2022 02 04	3.8 - 4.0	33.7	-	-	< 17	< 5.0
BH22-186	BH22-186-2	2022 02 04	0.8 - 1.0	34.0	-	-	< 17	< 5.0
	BH22-186-4	2022 02 04	2.8 - 3.0	25.4	-	-	< 13	< 5.0
	DUP29	Duplicate	2.8 - 3.0	24.8	-	-	< 12	< 5.0
	QA/QC RPD%			2	-	-	*	*
BH22-187	BH22-187-1	2022 02 05	0.1 - 0.3	61.4	-	-	< 25	< 5.0
	BH22-187-2	2022 02 05	0.8 - 1.0	52.7	-	-	< 25	9.1
BH22-188	BH22-188-1	2022 02 05	0.1 - 0.3	58.6	-	-	< 25	< 5.0
	DUP19	Duplicate	0.1 - 0.3	52.9	-	-	< 25	< 5.0
	QA/QC RPD%			10	-	-	*	*
	BH22-188-2	2022 02 05	0.8 - 1.0	45.6	-	-	< 25	< 5.0
SNC-Lavalin								
SS23-20	SS23-20	2023 05 28	0.0 - 0.1	73.4	< 10	14.3	< 7.3	10.5
	SS23-21	Duplicate	0.0 - 0.1	68.3	< 10	11.8	< 6.8	8.0
	QA/QC RPD%			-	*	*	*	*
SS23-22	SS23-22	2023 05 28	0.0 - 0.1	64.1	< 10	7.9	< 6.4	5.1
SS23-23	SS23-23	2023 05 28	0.0 - 0.1	56.6	< 10	22.6	< 5.7	12.8
SS23-27	SS23-27	2023 05 28	0.0 - 0.1	34.2	< 10	7.8	< 3.4	2.7
SS23-44	SS23-44	2023 05 29	0.0 - 0.1	41.6	59	33.4	24.4	13.9
SS23-45	SS23-45	2023 05 29	0.0 - 0.1	66.8	14	15.7	9.2	10.5
SS23-46	SS23-46	2023 05 29	0.0 - 0.1	99.0	< 10	< 5.0	< 9.9	< 5.0
	SS23-47	Duplicate	0.0 - 0.1	80.4	12	5.3	9.6	4.3
	QA/QC RPD%			-	*	*	*	*
SS23-49	SS23-49	2023 05 29	0.0 - 0.1	53.5	20	21.8	10.8	11.7
SS23-50	SS23-50	2023 05 29	0.0 - 0.1	52.7	< 10	8.7	< 5.3	4.6
SS23-51	SS23-51	2023 05 29	0.0 - 0.1	71.9	11	35.4	8.2	25.5
BC Standard								
CSR Agricultural Land Use (AL)[a]				n/a	n/a	n/a	40	200
CSR Industrial Land Use (IL)[a]				n/a	n/a	n/a	100	1,000
Strong Pit Agricultural Land Use (AL) - Median pH 6.63[a]				n/a	n/a	n/a	40	200

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Associated file(s): Historic.

Associated Bureau Veritas Laboratories file(s): C337966, C338618.

All terms defined within the body of SNC-Lavalin's report.

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- Denotes analysis not conducted or calculation not completed.

n/a Denotes no applicable standard.

QA/QC RPD Denotes quality assurance/quality control relative percent difference.

* RPDs are not calculated where one or more concentrations are less than five times the RDL.

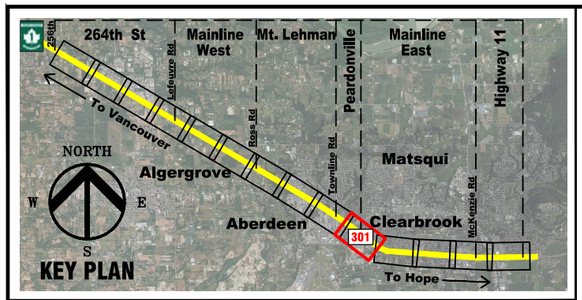
RDL Denotes reported detection limit.

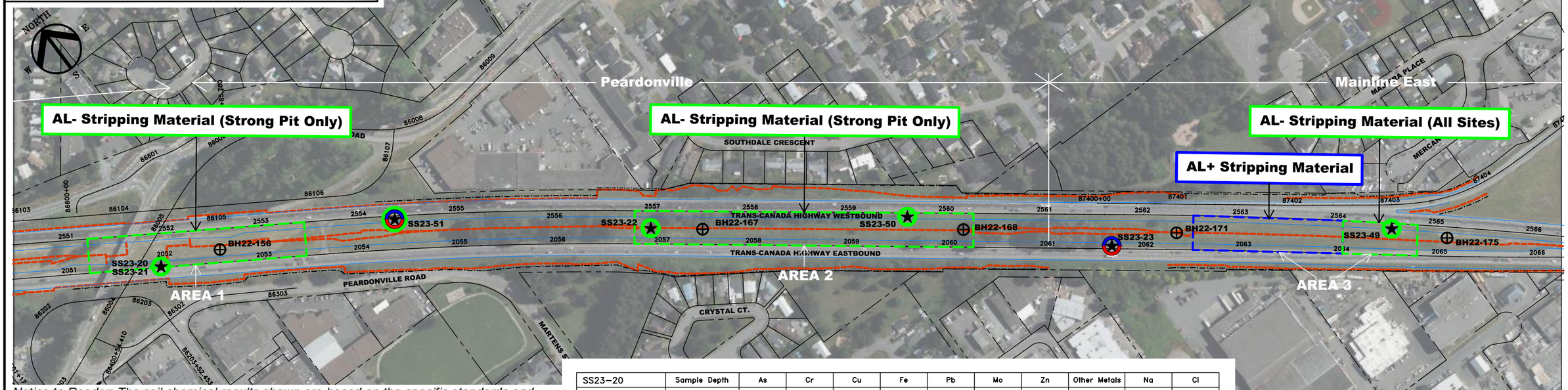
BOLD	Concentration greater than the CSR Agricultural Land Use (AL) standard
SHADED	Concentration greater than the CSR Industrial Land Use (IL) standard
OUTLINE	Concentration greater than Strong Pit Agricultural Land Use (AL) - Median pH 6.63 standard

[a] The site-specific factors used for determining the matrix standards for this site include: intake of contaminated soil, groundwater used for drinking water, groundwater used for irrigation, groundwater used for livestock watering, livestock ingesting soil and fodder, toxicity to soil invertebrates and plants, major microbial functional impairment, and groundwater flow to surface water used by freshwater aquatic life (whichever is most stringent).

Drawings

- 694890-301A – Detailed Soil Analytical Results – Phase 3B Advanced Works (Stripping)
- 694890-302A – Detailed Soil Analytical Results – Phase 3B Advanced Works (Stripping)
- 694890-301B – Detailed Soil Analytical Results – Phase 3B Advanced Works (Type D)
- 694890-302B – Detailed Soil Analytical Results – Phase 3B Advanced Works (Type D)





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LOCATION — ANALYTICAL SOIL RESULTS

SS23–23	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn
SS23–23	0.0 – 0.1	5.94	35.0	95.5	22,600	376	2.06	202[a]

SAMPLE ID
DEPTH OF SAMPLE (m)
GREEN – CONCENTRATION LESS THAN OR EQUAL TO THE APPLICABLE CSR AL/IL STANDARDS
BLUE – CONCENTRATION GREATER THAN THE APPLICABLE CSR AL STANDARD
RED – CONCENTRATION GREATER THAN THE APPLICABLE CSR IL STANDARD

	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
CSR AGRICULTURAL LAND USE (AL) STANDARD (µg/g)[b]	10	60	75–150[c]	35,000	120	3	150–200[c]	SEE TABLES	40	200
CSR INDUSTRIAL LAND USE (IL) STANDARD (µg/g)[b]	10	60	75–300[c]	150,000	120–1,000[c]	15	150–450[c]	SEE TABLES	100	1,000

SS23–20	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
SS23–20	0.0 – 0.1	6.01	35.6	64.8	23,800	111	1.00	146	<AL/IL	10.5	<7.3
SS23–21	DUP. OF ABOVE	6.24	37.4	63.8	24,900	110	1.12	131	<AL/IL	8.0	<6.8

SS23–22	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
SS23–22	0.0 – 0.1	5.91	35.5	49.3	24,200	99.8	0.69	78.0	<AL/IL	5.1	<6.4

SS23–23	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
SS23–23	0.0 – 0.1	5.94	35.0	95.5	22,600	376	2.06	202[a]	<AL/IL	12.8	<5.7

SS23–49	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
SS23–49	0.0 – 0.1	6.04	32.9	62.9	25,600	14.8	0.76	82.2	<AL/IL	11.7	10.8

SS23–50	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
SS23–50	0.0 – 0.1	4.86	27.9	27.7	21,200	14.4	0.43	41.4	<AL/IL	4.6	<5.3

SS23–51	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
SS23–51	0.0 – 0.1	6.31	51.0	211[a]	28,400	153[a]	3.32[a]	249[a]	<AL/IL	25.5	8.2

LEGEND

0 50 100 200 METRES

- LOT BOUNDARY
- RIGHT–OF–WAY
- PAVEMENT EDGE
- LOCATION OF SOIL CUT OR INFILLING
- 1020 STATION MARKER
- BOREHOLE
- MONITORING WELL
- SURFICIAL SOIL SAMPLE
- CONCENTRATION(S) LESS THAN OR EQUAL TO THE APPLICABLE CSR AL/IL STANDARDS
- CONCENTRATION(S) GREATER THAN THE APPLICABLE CSR IL STANDARDS
- CONCENTRATION(S) GREATER THAN THE APPLICABLE CSR AL STANDARD
- SAMPLE MEETS CSR AL/IL STANDARDS USING TG2 STATS
- AL– QUALITY SOIL
- AL+ / IL– QUALITY SOIL

As ARSENIC
Cl CHLORIDE
Cr CHROMIUM (TOTAL)
Cu COPPER
Fe IRON
Mo MOLYBDENUM
Na SODIUM
Pb LEAD
Zn ZINC
< DENOTES CONCENTRATION LESS THAN INDICATED DETECTION LIMIT
– NOT ANALYZED

NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. "a" DENOTES SOIL STATISTICALLY MEETS CSR AL AND/OR IL STANDARDS. SEE REPORT FOR DETAILS.
3. "b" DENOTES SEE REPORT REGULATORY FRAMEWORK AND APPLICABLE PATHWAYS AND SITE–SPECIFIC FACTORS.
4. "c" DENOTES pH DEPENDENT.
5. FOR STRONG PIT, RECEIVING SITE pH=6.63.

REFERENCE DRAWINGS

–	2023	BING AERIAL IMAGERY
FIGURE 2–3	2022–04	ASSOCIATED ENGINEERING
DWG. NO.	DATE	DESCRIPTION

REVISIONS

1	2023–11–29	ISSUED TO CLIENT	PES	SR
0	2023–11–22	ISSUED TO CLIENT	PES	SR
REV.	DATE	DESCRIPTION	BY	CHK

CLIENT NAME:
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

PROJECT LOCATION:
HIGHWAY 1 – 264th STREET TO WHATCOM ROAD, ABBOTSFORD, BC

SNC·LAVALIN

TITLE:
DETAILED SOIL ANALYTICAL RESULTS - PHASE 3B ADVANCED WORKS (STRIPPING)

DWN BY: PES	SCALE: 1:4,000	DATE: 2023–11–06	DWG No: 694890-301A REV.: 1
CHK'D: EW	PLOT: 20231129.1213	CADFILE: 694890R05	

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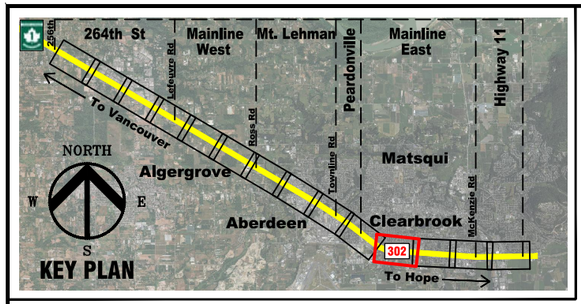

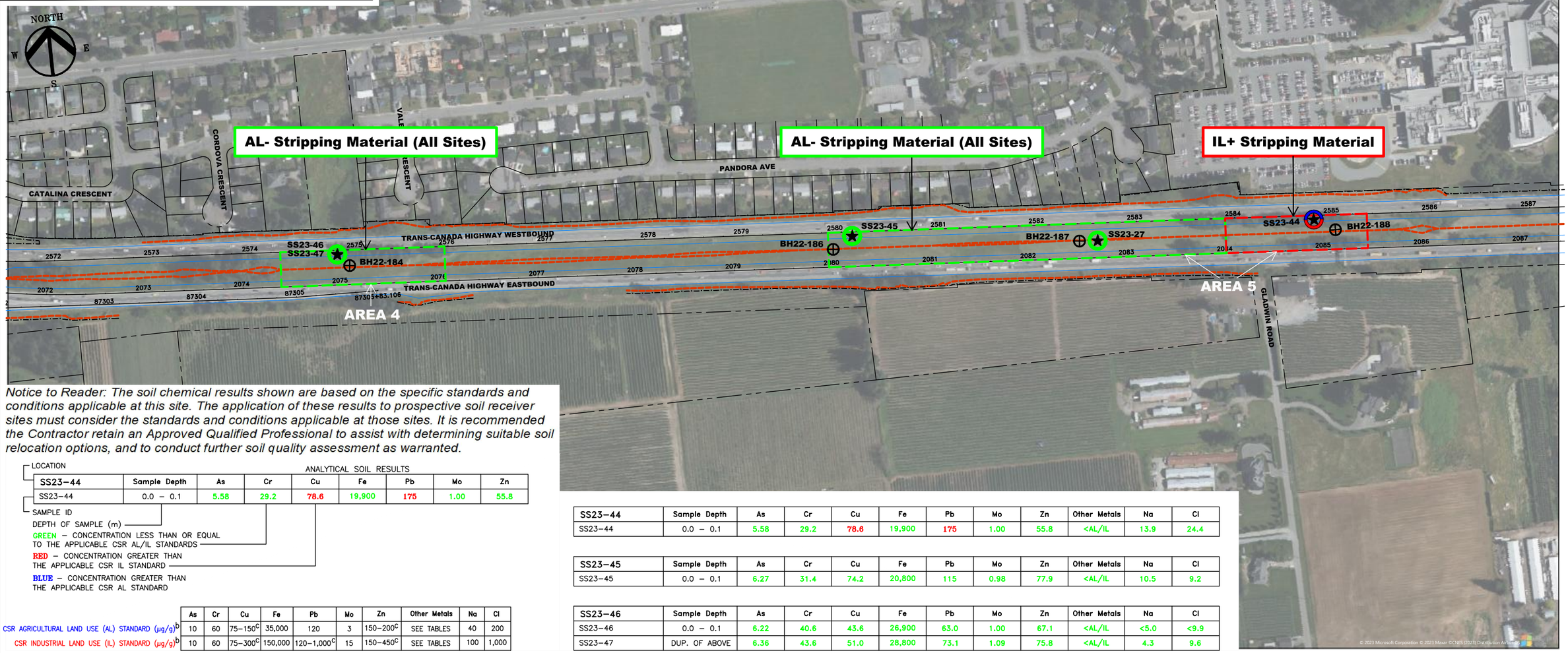

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LOCATION — ANALYTICAL SOIL RESULTS

SS23-44	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn
SS23-44	0.0 – 0.1	5.58	29.2	78.6	19,900	175	1.00	55.8

SAMPLE ID
DEPTH OF SAMPLE (m)
GREEN – CONCENTRATION LESS THAN OR EQUAL TO THE APPLICABLE CSR AL/IL STANDARDS
RED – CONCENTRATION GREATER THAN THE APPLICABLE CSR IL STANDARD
BLUE – CONCENTRATION GREATER THAN THE APPLICABLE CSR AL STANDARD

	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
CSR AGRICULTURAL LAND USE (AL) STANDARD (µg/g)[b]	10	60	75–150[c]	35,000	120	3	150–200[c]	SEE TABLES	40	200
CSR INDUSTRIAL LAND USE (IL) STANDARD (µg/g)[b]	10	60	75–300[c]	150,000	120–1,000[c]	15	150–450[c]	SEE TABLES	100	1,000

SS23-44	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
SS23-44	0.0 – 0.1	5.58	29.2	78.6	19,900	175	1.00	55.8	<AL/IL	13.9	24.4

SS23-45	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
SS23-45	0.0 – 0.1	6.27	31.4	74.2	20,800	115	0.98	77.9	<AL/IL	10.5	9.2

SS23-46	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
SS23-46	0.0 – 0.1	6.22	40.6	43.6	26,900	63.0	1.00	67.1	<AL/IL	<5.0	<9.9
SS23-47	DUP. OF ABOVE	6.36	43.6	51.0	28,800	73.1	1.09	75.8	<AL/IL	4.3	9.6

LEGEND

0 50 100 200 METRES

- LOT BOUNDARY
- RIGHT–OF–WAY
- PAVEMENT EDGE
- LOCATION OF SOIL CUT OR INFILLING
- 1020 STATION MARKER
- BOREHOLE
- MONITORING WELL
- SURFICIAL SOIL SAMPLE
- CONCENTRATION(S) LESS THAN OR EQUAL TO THE APPLICABLE CSR AL/IL STANDARDS
- CONCENTRATION(S) GREATER THAN THE APPLICABLE CSR IL STANDARDS
- CONCENTRATION(S) GREATER THAN THE APPLICABLE CSR AL STANDARD
- SAMPLE MEETS CSR AL/IL STANDARDS USING TG2 STATS
- AL– QUALITY SOIL
- IL+ QUALITY SOIL

As ARSENIC
Cl CHLORIDE
Cr CHROMIUM (TOTAL)
Cu COPPER
Fe IRON
Mo MOLYBDENUM
Na SODIUM
Pb LEAD
Zn ZINC
< DENOTES CONCENTRATION LESS THAN INDICATED DETECTION LIMIT
– NOT ANALYZED

NOTES

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3. "b" DENOTES SEE REPORT REGULATORY FRAMEWORK AND APPLICABLE PATHWAYS AND SITE–SPECIFIC FACTORS.
4. "c" DENOTES pH DEPENDENT.
5. FOR STRONG PIT, RECEIVING SITE pH=6.63.

REFERENCE DRAWINGS

–	2023	BING AERIAL IMAGERY
FIGURE 2–3	2022–04	ASSOCIATED ENGINEERING
DWG. NO.	DATE	DESCRIPTION

REVISIONS

1	2023–11–29	ISSUED TO CLIENT	PES	SR
0	2023–11–22	ISSUED TO CLIENT	PES	SR
REV.	DATE	DESCRIPTION	BY	CHK

CLIENT NAME:
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

PROJECT LOCATION:
HIGHWAY 1 – 264th STREET TO WHATCOM ROAD, ABBOTSFORD, BC

SNC·LAVALIN

TITLE:
DETAILED SOIL ANALYTICAL RESULTS - PHASE 3B ADVANCED WORKS (STRIPPING)

DWN BY: PES	SCALE: 1:4,000	DATE: 2023–11–06	DWG No: REV.: 1
CHK'D: EW	PLOT: 20231129.1216	CADFILE: 694890R05	694890-302A

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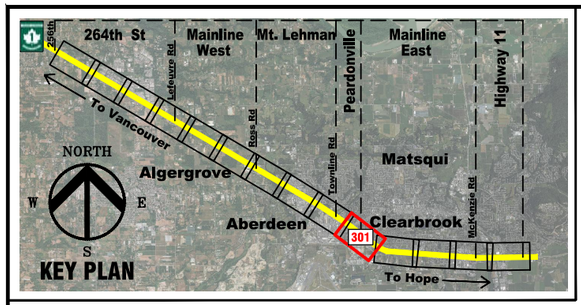

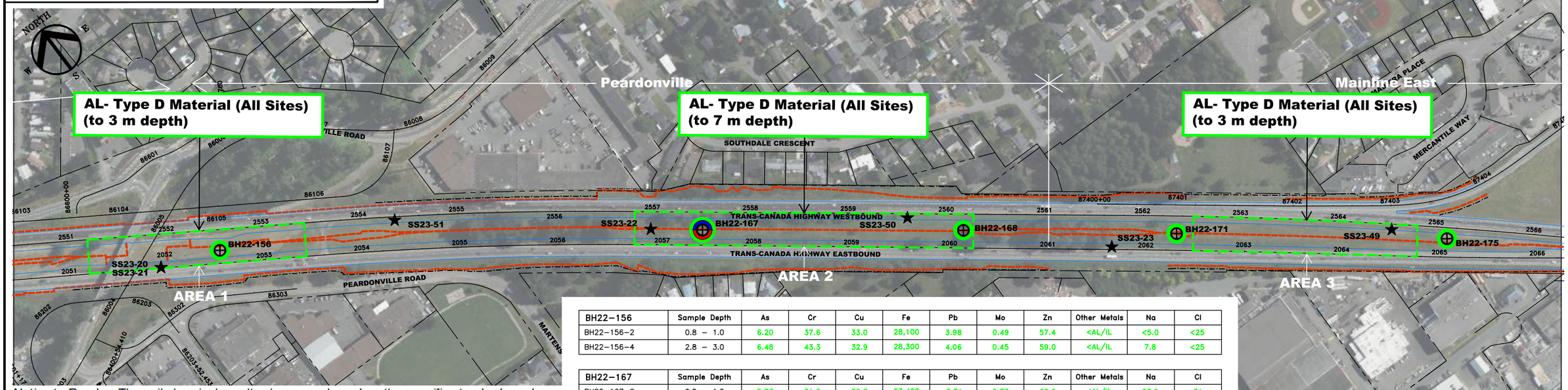

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LOCATION		ANALYTICAL SOIL RESULTS						
BH22–167 [a]	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn
BH22–167–6	4.8 – 5.0	7.50	**86.7**	26.8	25,700	3.19	1.26	53.0

SAMPLE ID
DEPTH OF SAMPLE (m)
RED – CONCENTRATION GREATER THAN THE APPLICABLE CSR IL STANDARD
GREEN – CONCENTRATION LESS THAN OR EQUAL TO THE APPLICABLE CSR AL/IL STANDARDS
BLUE – CONCENTRATION GREATER THAN THE APPLICABLE CSR AL STANDARD

	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
CSR AGRICULTURAL LAND USE (AL) STANDARD (µg/g)[b]	10	60	75–150[c]	35,000	120	3	150–200[c]	SEE TABLES	40	200
CSR INDUSTRIAL LAND USE (IL) STANDARD (µg/g)[b]	10	60	75–300[c]	150,000	120–1,000[c]	15	150–450[c]	SEE TABLES	100	1,000

BH22–156	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
BH22–156–2	0.8 – 1.0	6.20	37.6	33.0	28,100	3.98	0.49	57.4	<AL/IL	<5.0	<25
BH22–156–4	2.8 – 3.0	6.48	43.3	32.9	28,300	4.06	0.45	59.0	<AL/IL	7.8	<25

BH22–167	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
BH22–167–2	0.8 – 1.0	5.73	31.8	32.3	27,400	3.71	0.73	60.9	<AL/IL	23.9	31
BH22–167–6	4.8 – 5.0	7.50	**86.7** [a]	26.8	25,700	3.19	1.26	53.0	<AL/IL	7.0	<16
BH22–167–9	7.8 – 8.0	5.44	30.4	30.8	27,100	3.58	0.62	59.2	<AL/IL	8.4	<20
DUP28	DUP. OF ABOVE	5.46	31.8	30.0	27,500	3.60	0.55	57.5	<AL/IL	8.5	<25

BH22–168	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
BH22–168–1	0.1 – 0.3	6.36	41.7	31.9	29,000	4.60	0.44	56.4	<AL/IL	6.8	<25
BH22–168–3	1.8 – 2.0	5.96	37.2	31.6	26,700	3.82	0.49	55.5	<AL/IL	6.7	<25
DUP27	DUP. OF ABOVE	6.12	35.7	31.5	26,400	3.74	0.43	55.3	<AL/IL	10.6	<25

BH22–171	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
BH22–171–1	0.1 – 0.3	6.65	34.1	22.8	21,400	2.79	0.83	37.7	<AL/IL	<5.0	<25
DUP25	DUP. OF ABOVE	7.21	40.3	24.4	22,600	2.88	0.84	37.1	<AL/IL	<5.0	<25
BH22–171–4	2.8 – 3.0	8.80	37.2	27.6	30,200	3.14	0.53	47.0	<AL/IL	6.8	<25

BH22–175	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
BH22–175–1	0.2 – 0.4	6.65	24.5	38.8	22,900	7.67	0.52	56.7	<AL/IL	<5.0	<25
BH22–175–2	0.8 – 1.0	6.82	37.2	31.1	27,900	7.08	0.69	79.9	<AL/IL	<5.0	<25

LEGEND

0 50 100 200 METRES

- LOT BOUNDARY
- RIGHT–OF–WAY
- PAVEMENT EDGE
- LOCATION OF SOIL CUT OR INFILLING
- 1020 STATION MARKER
- BOREHOLE
- MONITORING WELL
- SURFICIAL SOIL SAMPLE
- CONCENTRATION(S) LESS THAN OR EQUAL TO THE APPLICABLE CSR AL/IL STANDARDS
- CONCENTRATION(S) GREATER THAN THE APPLICABLE CSR IL STANDARDS
- CONCENTRATION(S) GREATER THAN THE APPLICABLE CSR AL STANDARD
- SAMPLE MEETS CSR AL/IL STANDARDS USING TG2 STATS
- AL– QUALITY SOIL

As ARSENIC
Cl CHLORIDE
Cr CHROMIUM (TOTAL)
Cu COPPER
Fe IRON
Mo MOLYBDENUM
Na SODIUM
Pb LEAD
Zn ZINC
< DENOTES CONCENTRATION LESS THAN INDICATED DETECTION LIMIT
– NOT ANALYZED

NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. "a" DENOTES SOIL STATISTICALLY MEETS CSR AL AND/OR IL STANDARDS. SEE REPORT FOR DETAILS.
3. "b" DENOTES SEE REPORT REGULATORY FRAMEWORK AND APPLICABLE PATHWAYS AND SITE–SPECIFIC FACTORS.
4. "c" DENOTES pH DEPENDENT.
5. FOR STRONG PIT, RECEIVING SITE pH=6.63.

REFERENCE DRAWINGS

–	2023	BING AERIAL IMAGERY
FIGURE 2–3	2022–04	ASSOCIATED ENGINEERING
DWG. NO.	DATE	DESCRIPTION

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
1	2023–11–29	ISSUED TO CLIENT	PES	SR
0	2023–11–22	ISSUED TO CLIENT	PES	SR

CLIENT NAME:
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

PROJECT LOCATION:
HIGHWAY 1 – 264th STREET TO WHATCOM ROAD, ABBOTSFORD, BC

SNC·LAVALIN

TITLE:
DETAILED SOIL ANALYTICAL RESULTS - PHASE 3B ADVANCED WORKS (TYPE D)

DWN BY: PES	SCALE: 1:4,000	DATE: 2023–11–06	DWG No: REV.: 1
CHK'D: EW	PLOT: 20231129.1214	CADFILE: 694890R05	694890-301B

PATH: P:\CURRENT PROJECTS\MINISTRY OF TRANSPORTATION\694890 WHATCOM SOIL\40_EXECUTION\45_GIS_DWGS\CAD\694890R05.DWG

Notice to Reader: The soil chemical results shown are based on the specific standards and conditions applicable at this site. The application of these results to prospective soil receiver sites must consider the standards and conditions applicable at those sites. It is recommended the Contractor retain an Approved Qualified Professional to assist with determining suitable soil relocation options, and to conduct further soil quality assessment as warranted.

LOCATION — ANALYTICAL SOIL RESULTS

BH22-184	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn
BH22-184-1	0.1 – 0.3	6.96	41.5	18.4	29,000	8.40	0.79	62.1

SAMPLE ID

DEPTH OF SAMPLE (m)

GREEN – CONCENTRATION LESS THAN OR EQUAL TO THE APPLICABLE CSR AL/IL STANDARDS

BLUE – CONCENTRATION GREATER THAN THE APPLICABLE CSR AL STANDARD

RED – CONCENTRATION GREATER THAN THE APPLICABLE CSR IL STANDARD

	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
CSR AGRICULTURAL LAND USE (AL) STANDARD (µg/g)[b]	10	60	75–150[c]	35,000	120	3	150–200[c]	SEE TABLES	40	200
CSR INDUSTRIAL LAND USE (IL) STANDARD (µg/g)[b]	10	60	75–300[c]	150,000	120–1,000[c]	15	150–450[c]	SEE TABLES	100	1,000

BH22-184	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
BH22-184-1	0.1 – 0.3	6.96	41.5	18.4	29,000	8.40	0.79	62.1	<AL/IL	<6.4	<32
BH22-184-3	1.8 – 2.0	7.51	37.1	20.7	22,600	2.49	0.42	32.7	<AL/IL	<5.0	<19
BH22-184-5	3.8 – 4.0	5.43	32.0	18.6	18,900	2.08	0.37	32.1	<AL/IL	<5.0	<17

BH22-186	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
BH22-186-2	0.8 – 1.0	7.08	43.6	20.1	29,900	3.62	0.51	51.0	<AL/IL	<5.0	<17
BH22-186-4	2.8 – 3.0	6.20	33.0	22.5	21,500	2.58	0.41	38.3	<AL/IL	<5.0	<13
DUP29	DUP. OF ABOVE	6.12	35.0	22.5	22,000	2.57	0.35	40.0	<AL/IL	<5.0	<12

BH22-187	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
BH22-187-1	0.1 – 0.3	6.14	37.7	23.0	26,600	18.6	0.60	65.9	<AL/IL	<5.0	<25
BH22-187-2	0.8 – 1.0	5.72	40.5	17.8	27,400	6.15	0.65	56.4	<AL/IL	9.1	<25

BH22-188	Sample Depth	As	Cr	Cu	Fe	Pb	Mo	Zn	Other Metals	Na	Cl
BH22-188-1	0.1 – 0.3	5.97	36.3	19.6	27,200	9.40	0.59	59.8	<AL/IL	<5.0	<25
DUP19	DUP. OF ABOVE	6.64	39.6	20.4	29,100	9.22	0.57	63.3	<AL/IL	<5.0	<25
BH22-188-2	0.8 – 1.0	6.55	37.3	21.5	25,500	5.02	0.51	53.9	<AL/IL	<5.0	<25

LEGEND

0 50 100 200 METRES

- LOT BOUNDARY
- RIGHT-OF-WAY
- PAVEMENT EDGE
- LOCATION OF SOIL CUT OR INFILLING
- 1020 STATION MARKER
- BOREHOLE
- MONITORING WELL
- SURFICIAL SOIL SAMPLE
- CONCENTRATION(S) LESS THAN OR EQUAL TO THE APPLICABLE CSR AL/IL STANDARDS
- CONCENTRATION(S) GREATER THAN THE APPLICABLE CSR IL STANDARDS
- CONCENTRATION(S) GREATER THAN THE APPLICABLE CSR AL STANDARD
- SAMPLE MEETS CSR AL/IL STANDARDS USING TG2 STATS
- AL– QUALITY SOIL

As ARSENIC
Cl CHLORIDE
Cr CHROMIUM (TOTAL)
Cu COPPER
Fe IRON
Mo MOLYBDENUM
Na SODIUM
Pb LEAD
Zn ZINC
< DENOTES CONCENTRATION LESS THAN INDICATED DETECTION LIMIT
– NOT ANALYZED

NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. "a" DENOTES SOIL STATISTICALLY MEETS CSR AL AND/OR IL STANDARDS. SEE REPORT FOR DETAILS.
3. "b" DENOTES SEE REPORT REGULATORY FRAMEWORK AND APPLICABLE PATHWAYS AND SITE-SPECIFIC FACTORS.
4. "c" DENOTES pH DEPENDENT.
5. FOR STRONG PIT, RECEIVING SITE pH=6.63.

REFERENCE DRAWINGS

–	2023	BING AERIAL IMAGERY
FIGURE 2-3	2022-04	ASSOCIATED ENGINEERING
DWG. NO.	DATE	DESCRIPTION

REVISIONS

1	2023-11-29	ISSUED TO CLIENT	PES	SR
0	2023-11-22	ISSUED TO CLIENT	PES	SR
REV.	DATE	DESCRIPTION	BY	CHK

CLIENT NAME:
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

PROJECT LOCATION:
HIGHWAY 1 – 264th STREET TO WHATCOM ROAD, ABBOTSFORD, BC

SNC·LAVALIN

TITLE:
DETAILED SOIL ANALYTICAL RESULTS - PHASE 3B ADVANCED WORKS (TYPE D)

DWN BY: PES	SCALE: 1:4,000	DATE: 2023-11-06	DWG No: REV.: 1
CHK'D: EW	PLOT: 20231129.1218	CADFILE: 694890R05	694890-302B

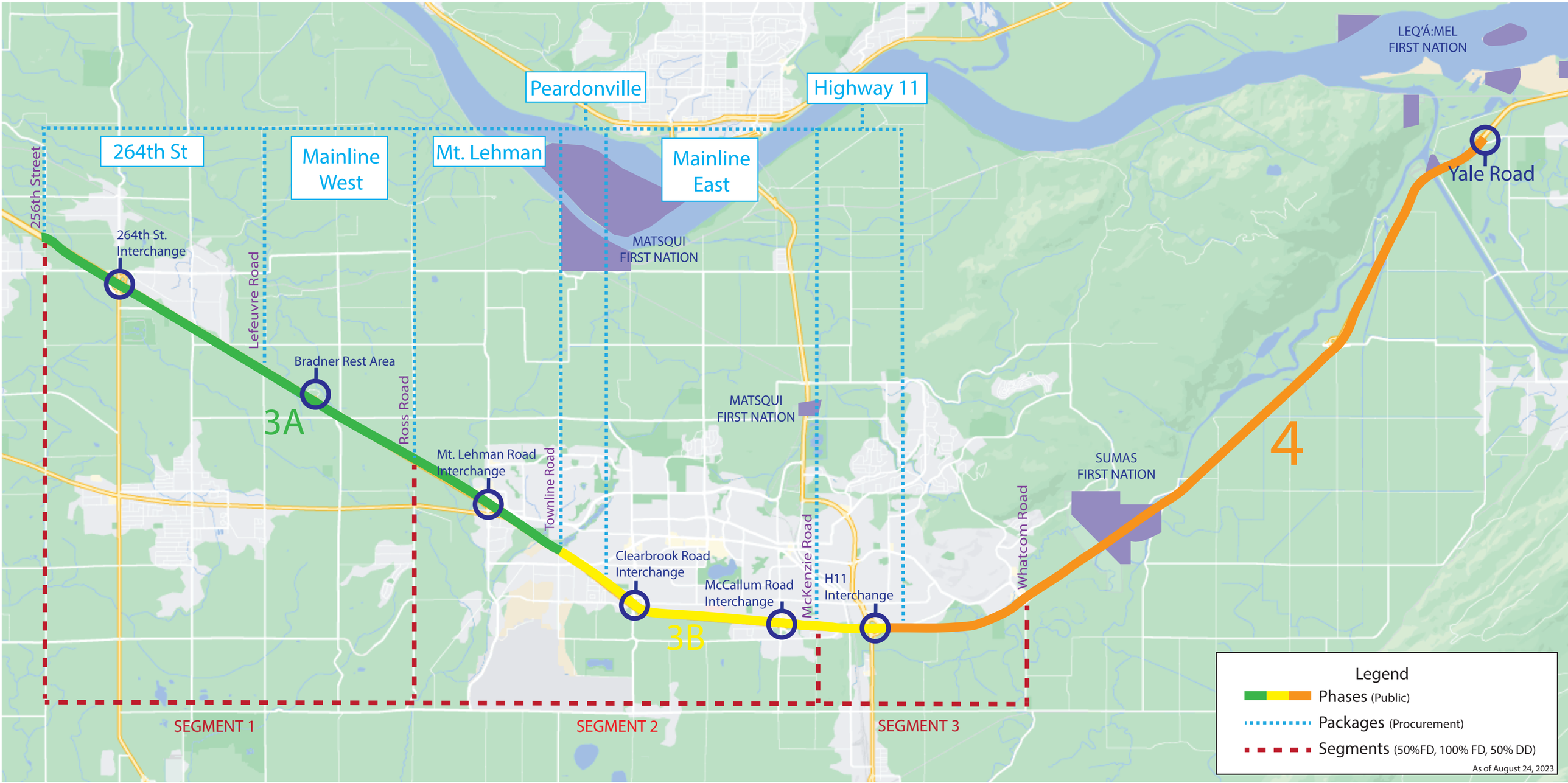
PATH: P:\CURRENT PROJECTS\MINISTRY OF TRANSPORTATION\694890 WHATCOM SOIL\40_EXECUTION\45_GIS_DWGS\CAD\694890R05.DWG

Appendix I

Project Area Map

BRITISH COLUMBIA | StrongerBC

Fraser Valley Highway 1 Corridor Improvement Program



Appendix II

Quality Assurance/Quality Control

SNC·LAVALIN

Quality Assurance / Quality Control (QA/QC)

SNC-Lavalin Inc. (SNC-Lavalin) implemented strict QA/QC measures for all sampling and analysis to ensure that all data is representative. The QA/QC program included the following:

- Senior supervision of field staff;
- Use of in house trained personnel;
- Implementation of SNC-Lavalin's Preferred Operating Procedures (POPs);
- Written field instructions;
- Documentation of all field activities;
- Samples will be collected in a manner appropriate for prevention of cross-contamination and other field sampling errors. Samples were collected using appropriate decontaminated tools, equipment, and contaminant-free containers specifically designed for such use and appropriate to the intended analyses;
- Chain-of-Custody documentation for sample submission:
  - Use of an appropriate coding system for submitting samples to the analytical laboratory to ensure that information concerning location or expected concentration is unavailable to the analyst(s). A chain-of-custody form was established to trace the movement and handling of samples from the field to their final destination.
  - Use of a Canadian Association for Laboratory Accreditation Inc. (CALA) accredited laboratory.
  - Adherence to laboratory sampling and analysis protocols (e.g., hold times, sample containers, preservatives, detection limits, and approved methodology).
  - Procedures to confirmation accurate transcription of laboratory data into tables.
  - Review of laboratory QA/QC performance (standards, spike recoveries etc.) to confirm results are within acceptable limits.
  - Submission and analysis of blind field duplicate samples at a rate of 10% of total samples.

Relative Percent Difference Calculation

The QA/QC procedure involved the calculation of the Relative Percent Difference (RPD) for each sample parameter analyzed in both the original and the duplicate samples. The calculated RPDs for samples are included in the attached tables. RPDs less than 50% is soil, groundwater and soil vapour (comparative with the acceptability targets indicated in the 2013 British Columbia Field Sampling Manual published by the BC Ministry of Environment & Climate Change Strategy) indicate that the variability is within SNC-Lavalin's target range. As analytical results are less quantifiable near the laboratory detection limits (MDLs), a RPD calculation was not applied where the measured concentrations of both the original and the duplicate sample were less than five times the MDLs.

QA/QC Results

During the investigations, a total of 10 soil samples (and 2 duplicates) were collected and analyzed for various parameters within the Phase 3B Advanced Work Area. The results of the duplicate samples indicated that the RPDs were within acceptable limits or variability could not be calculated because parameter concentrations were within the Practical Quantitation Limit (PQL).

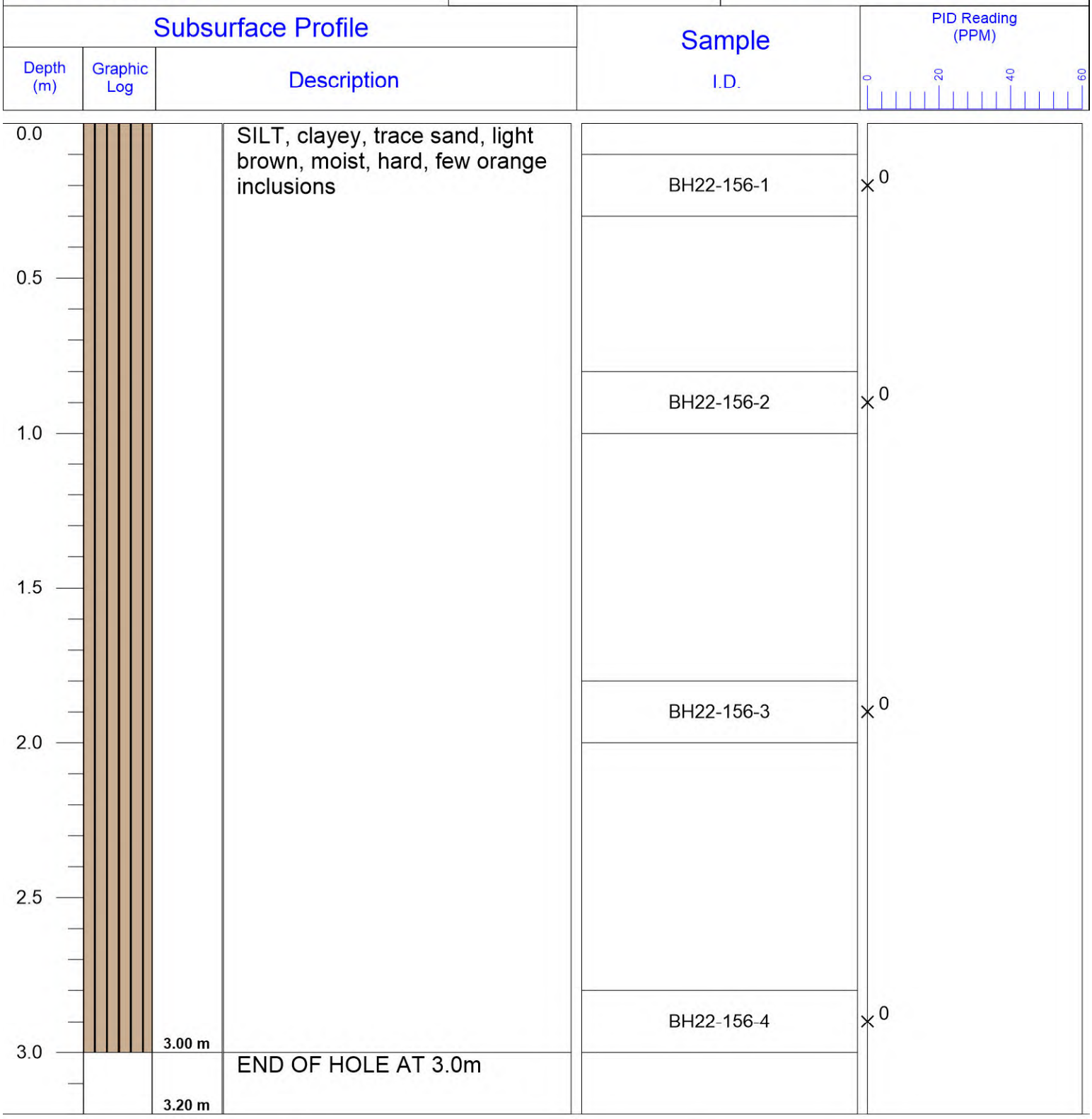
Overall, the results are considered adequate to confirm that the data is considered reliable and reproducible.

Appendix III

Borehole Logs

- Associated Engineering

Project Details	Borehole ID	Location
Project Number: 2021-2305.090 Client: Ministry of Transportation and Infrastructre Location: Abbotsford, BC	BH22-156	Northing (m): 5432782 Easting (m): 547196 NAD83 UTM Zone 10



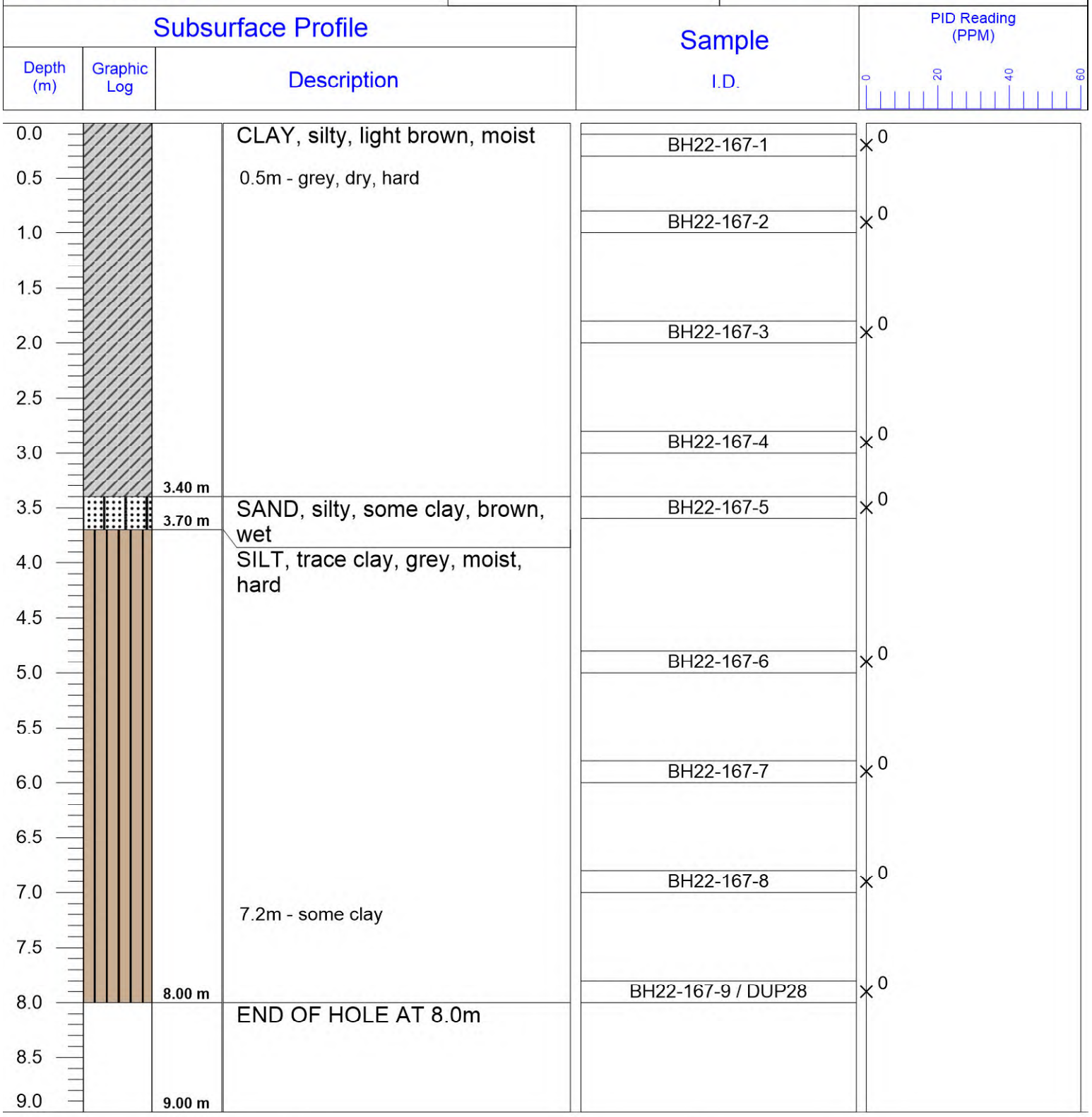
Associated Engineering

Lithology Legend

ML

Contractor:	VanMars Drilling Ltd.
Drilling method:	Solid Stem
Date:	03-Feb-22
Logged by:	RH
Drawn by:	RH
Reviewed by:	TR

Project Details	Borehole ID	Location
Project Number: 2021-2305.090 Client: Ministry of Transportation and Infrastructre Location: Abbotsford, BC	BH22-167	Northing (m): 5432500 Easting (m): 547601 NAD83 UTM Zone 10



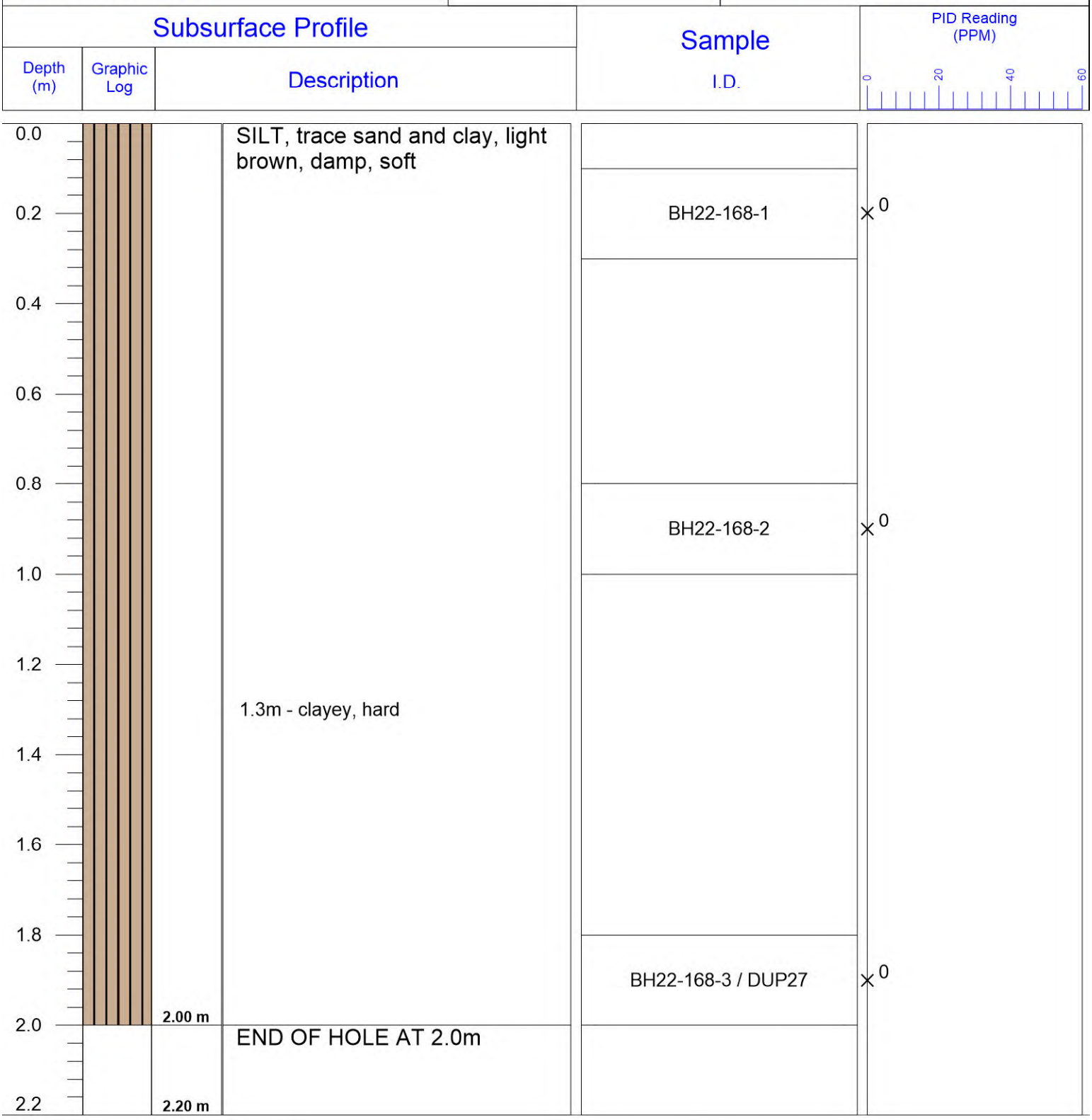
Associated Engineering

Lithology Legend

SM ML CL

Contractor:	VanMars Drilling Ltd.
Drilling method:	Solid Stem
Date:	04-Feb-22
Logged by:	RH
Drawn by:	RH
Reviewed by:	TR

Project Details	Borehole ID	Location
Project Number: 2021-2305.090 Client: Ministry of Transportation and Infrastructre Location: Abbotsford, BC	BH22-168	Northing (m): 5432339 Easting (m): 547813 NAD83 UTM Zone 10



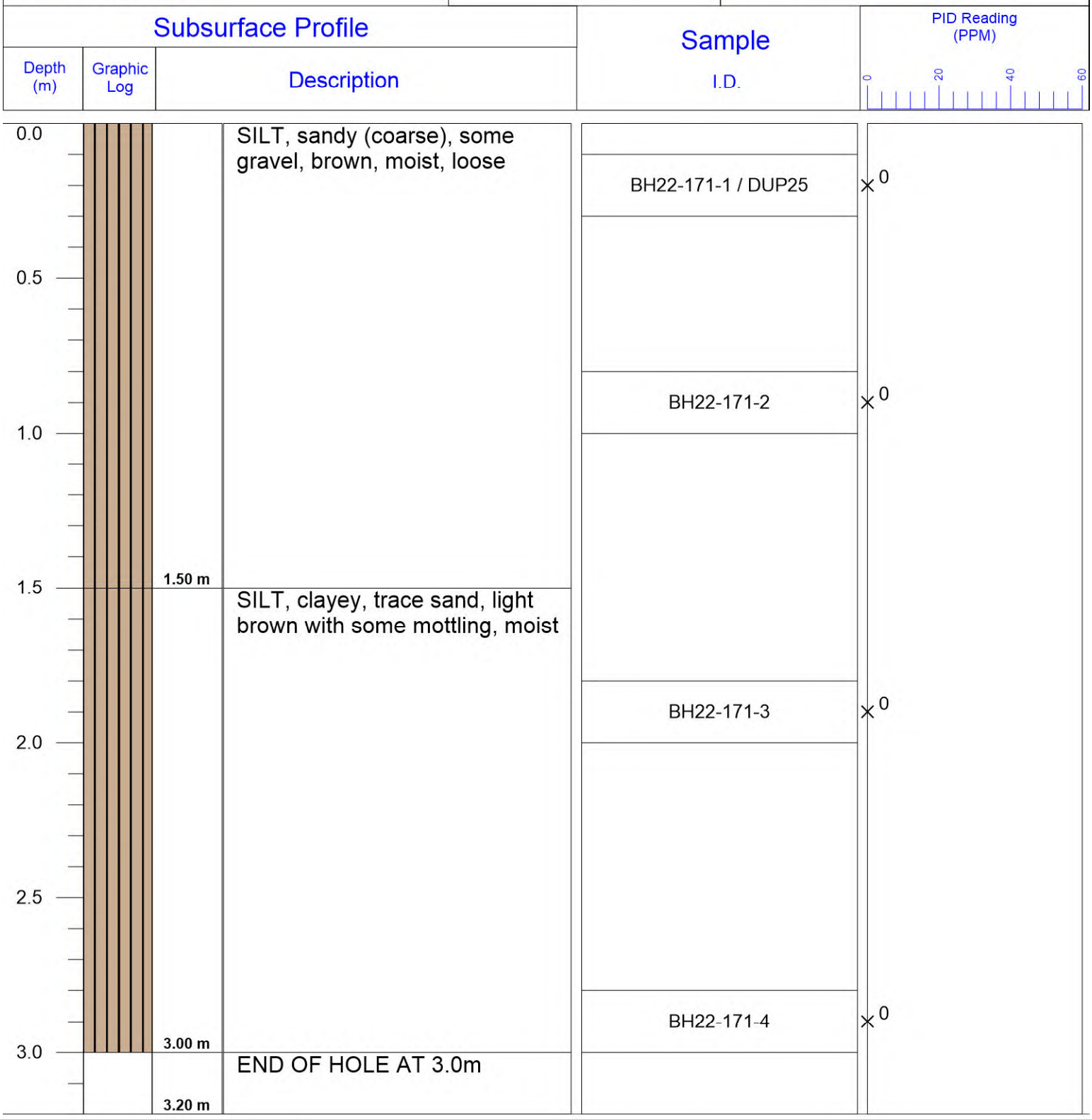
Associated Engineering

Lithology Legend

ML

Contractor:	VanMars Drilling Ltd.
Drilling method:	Solid Stem
Date:	03-Feb-22
Logged by:	RH
Drawn by:	RH
Reviewed by:	TR

Project Details	Borehole ID	Location
Project Number: 2021-2305.090 Client: Ministry of Transportation and Infrastructre Location: Abbotsford, BC	BH22-171	Northing (m): 5432204 Easting (m): 547984 NAD83 UTM Zone 10



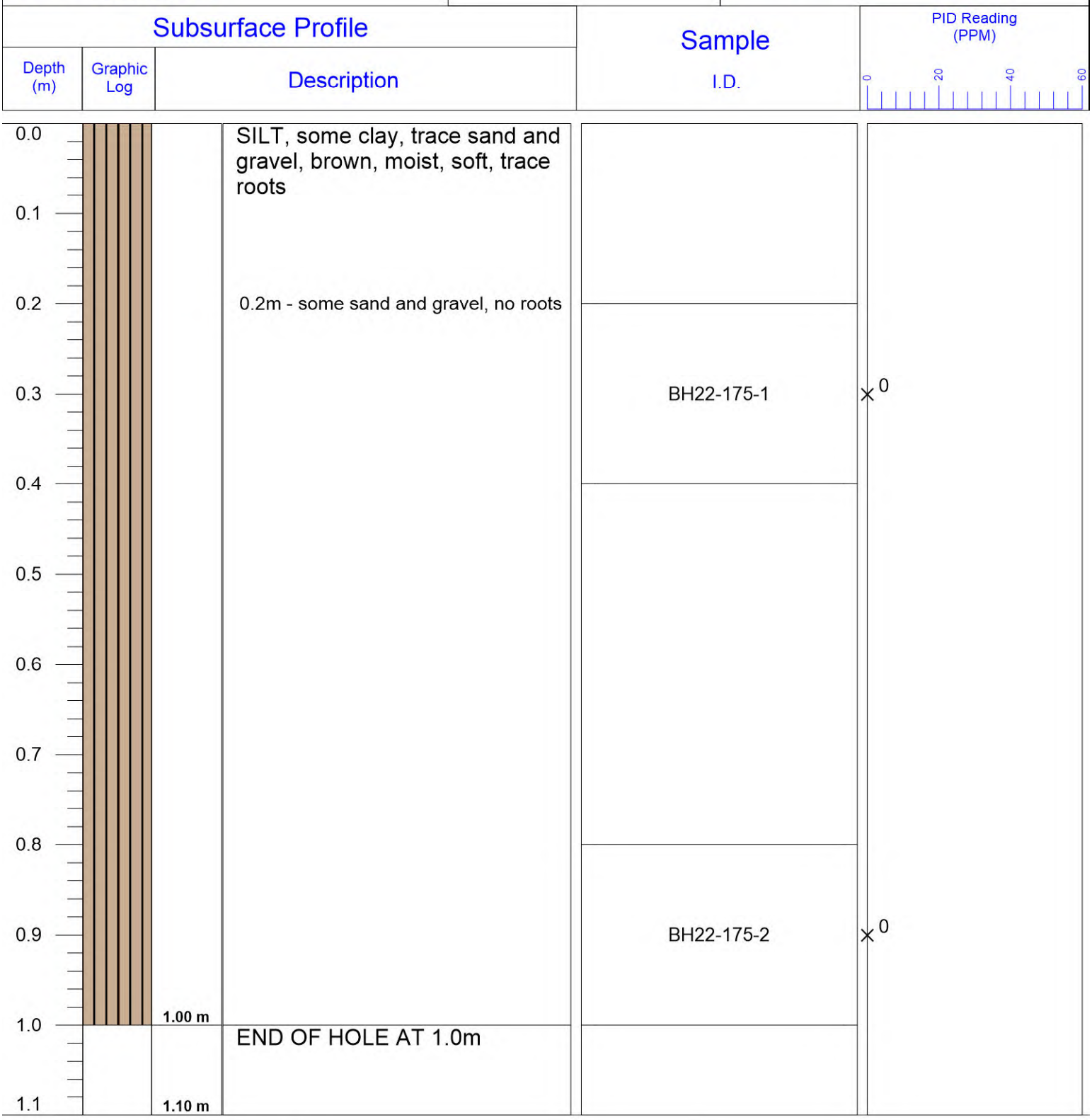
Associated Engineering

Lithology Legend

ML

Contractor:	VanMars Drilling Ltd.
Drilling method:	Solid Stem
Date:	03-Feb-22
Logged by:	RH
Drawn by:	RH
Reviewed by:	TR

Project Details	Borehole ID	Location
Project Number: 2021-2305.090 Client: Ministry of Transportation and Infrastructre Location: Abbotsford, BC	BH22-175	Northing (m): 5432033 Easting (m): 548200 NAD83 UTM Zone 10



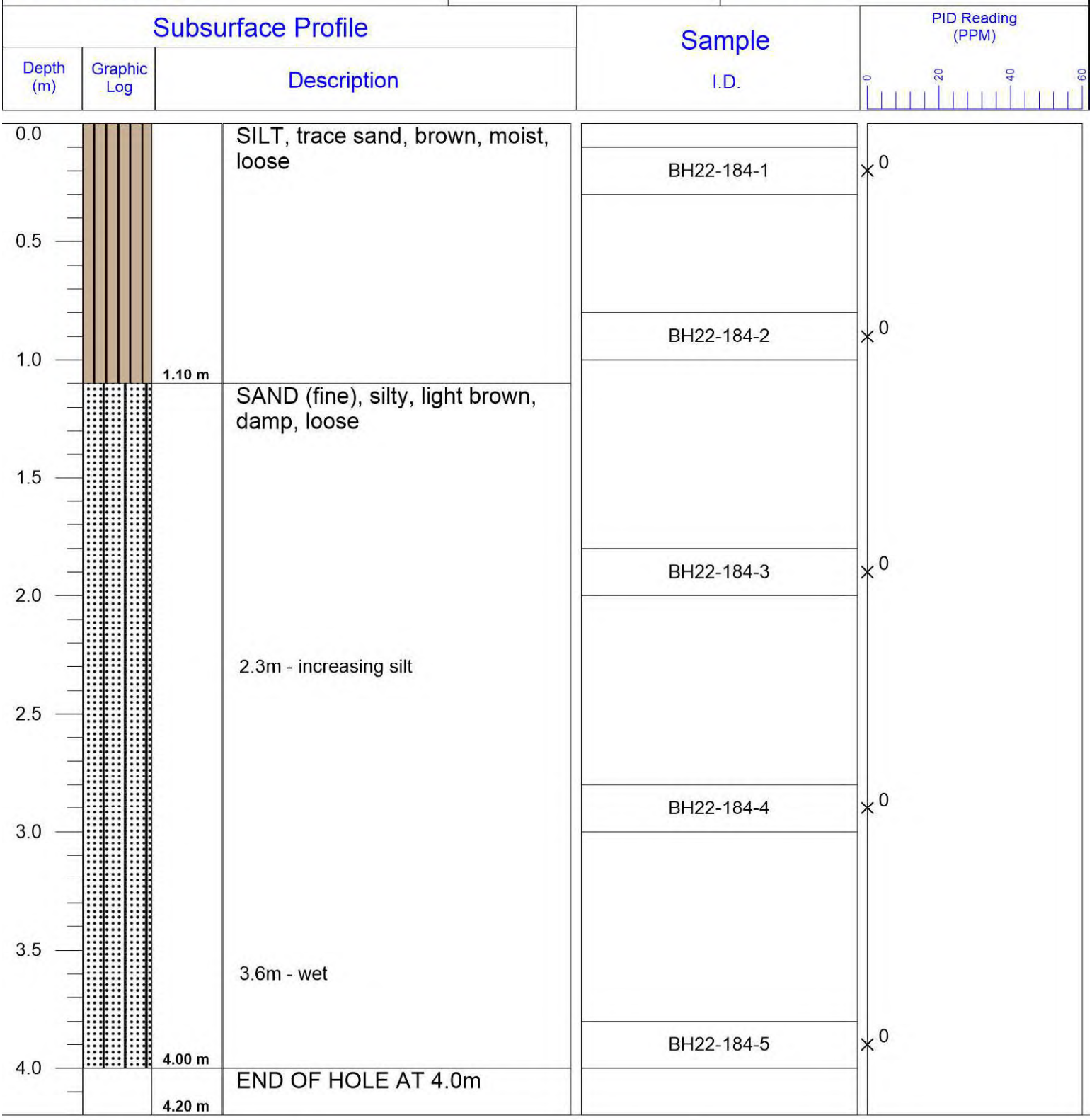
Associated Engineering

Lithology Legend

ML

Contractor:	N/A
Drilling method:	Hand Auger
Date:	27-Jan-22
Logged by:	RH
Drawn by:	RH
Reviewed by:	TR

Project Details	Borehole ID	Location
Project Number: 2021-2305.090 Client: Ministry of Transportation and Infrastructre Location: Abbotsford, BC	BH22-184	Northing (m): 5431697 Easting (m): 549103 NAD83 UTM Zone 10



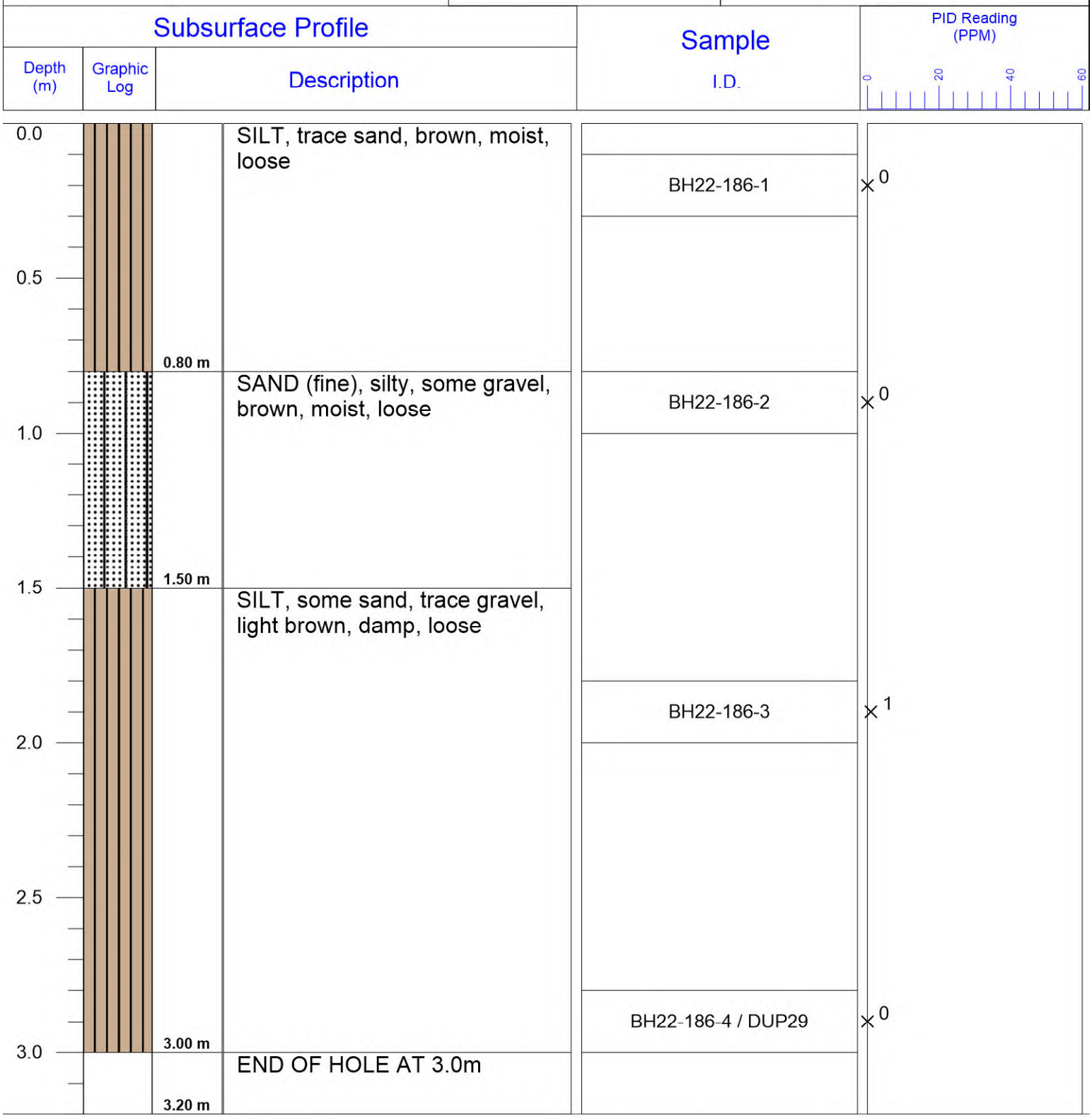
Associated Engineering

Lithology Legend

SM ML

Contractor:	VanMars Drilling Ltd.
Drilling method:	Solid Stem
Date:	04-Feb-22
Logged by:	RH
Drawn by:	RH
Reviewed by:	TR

Project Details	Borehole ID	Location
Project Number: 2021-2305.090 Client: Ministry of Transportation and Infrastructre Location: Abbotsford, BC	BH22-186	Northing (m): 5431660 Easting (m): 549593 NAD83 UTM Zone 10



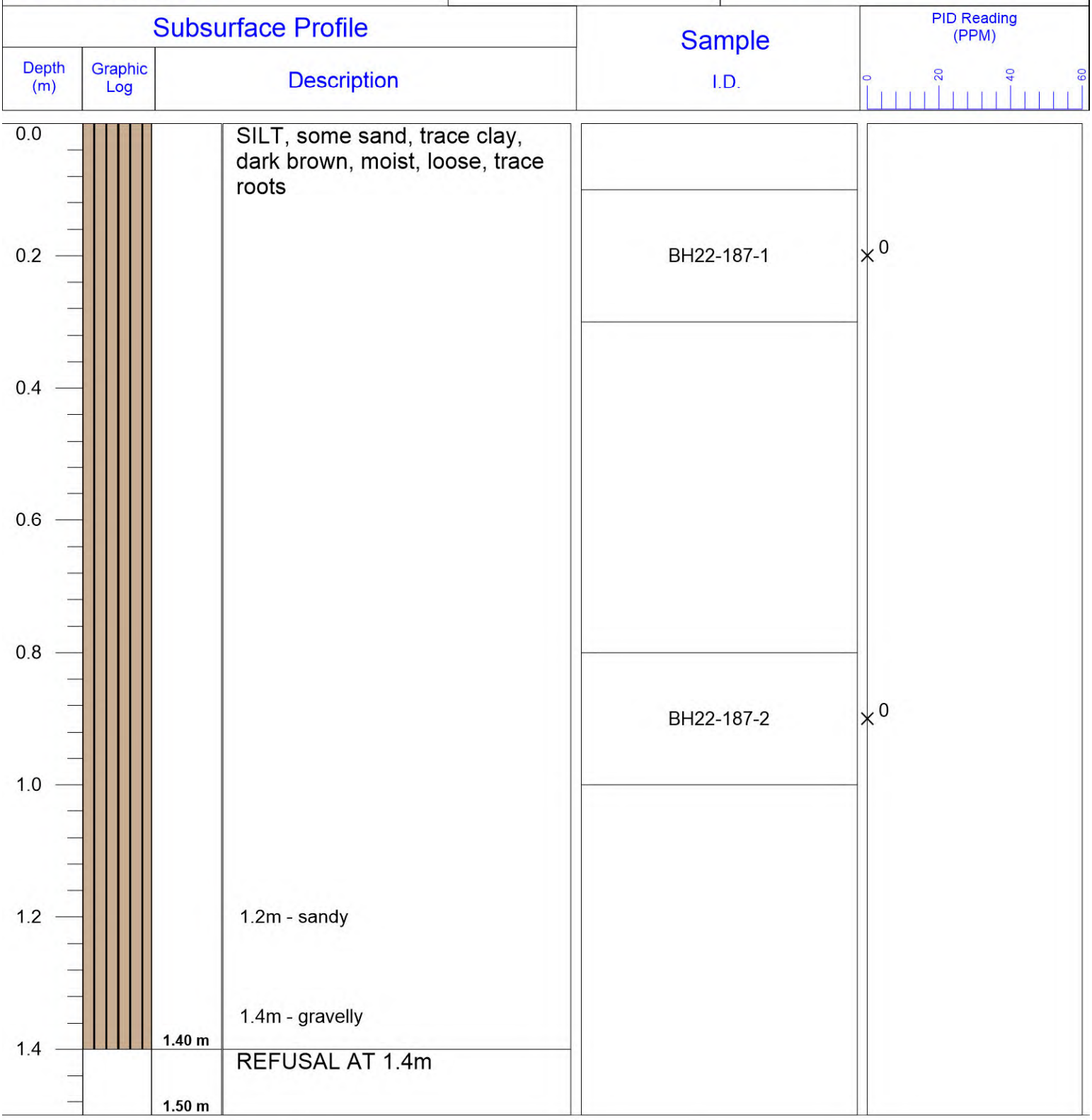
Associated Engineering

Lithology Legend

SM ML

Contractor:	VanMars Drilling Ltd.
Drilling method:	Solid Stem
Date:	04-Feb-22
Logged by:	RH
Drawn by:	RH
Reviewed by:	TR

Project Details	Borehole ID	Location
Project Number: 2021-2305.090 Client: Ministry of Transportation and Infrastructre Location: Abbotsford, BC	BH22-187	Northing (m): 5431640 Easting (m): 549843 NAD83 UTM Zone 10



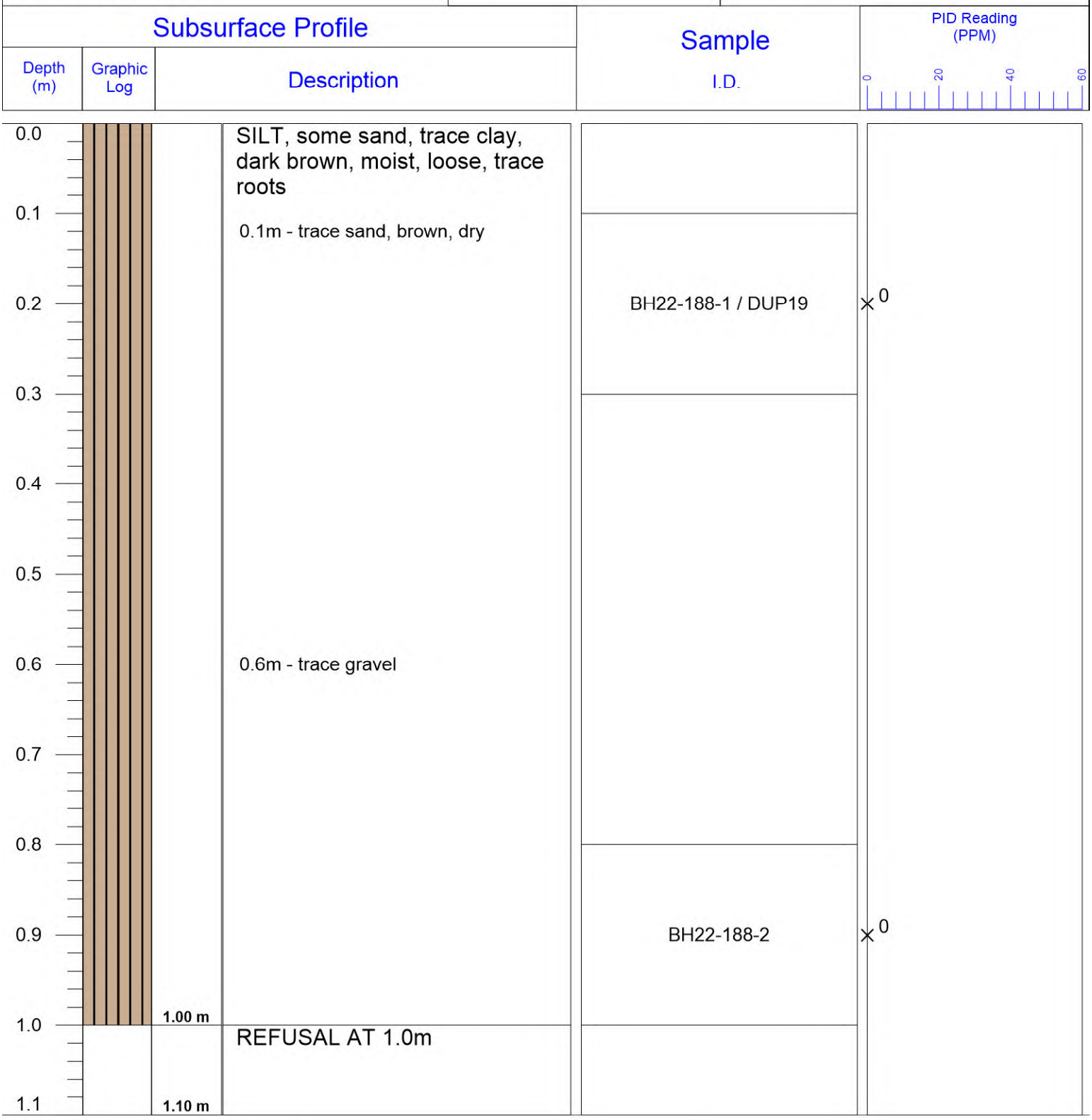
Associated Engineering

Lithology Legend

ML

Contractor:	N/A
Drilling method:	Hand Auger
Date:	05-Feb-22
Logged by:	RH
Drawn by:	RH
Reviewed by:	TR

Project Details	Borehole ID	Location
Project Number: 2021-2305.090 Client: Ministry of Transportation and Infrastructre Location: Abbotsford, BC	BH22-188	Northing (m): 5431623 Easting (m): 550103 NAD83 UTM Zone 10



Associated Engineering

Lithology Legend

ML

Contractor:	N/A
Drilling method:	Hand Auger
Date:	05-Feb-22
Logged by:	RH
Drawn by:	RH
Reviewed by:	TR

Appendix IV

Analytical Laboratory Reports

Your P.O. #: 694890
Your Project #: WHATCOM RD

Attention: Edna Wong

SNC-LAVALIN INC.
BURNABY, ENVIRONMENT DIVISION
1300-3777 Kingsway Avenue
BURNABY, BC
CANADA V5H 3Z7

Your C.O.C. #: 695069-20-01, 695069-01-01, 695069-02-01, 695069-03-01

Report Date: 2023/06/06
Report #: R3345008
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C337966
Received: 2023/05/29, 08:00

Sample Matrix: Soil
Samples Received: 34

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Chloride (soluble)	9	2023/06/01	2023/06/01	BBY6SOP-00011	SM 23 4500-Cl- E m
Chloride (soluble)	20	2023/06/02	2023/06/05	BBY6SOP-00011	SM 23 4500-Cl- E m
Chloride (soluble)	5	2023/06/05	2023/06/05	BBY6SOP-00011	SM 23 4500-Cl- E m
Soluble Chloride Ion Calc. (mg/kg)	9	N/A	2023/06/02	BBY WI-00033	Auto Calc
Soluble Chloride Ion Calc. (mg/kg)	25	N/A	2023/06/05	BBY WI-00033	Auto Calc
Elements by ICPMS (total) (1)	29	2023/06/03	2023/06/05	BBY7SOP-00004 / BBY7SOP-00001	EPA 6020b R2 m
Elements by ICPMS (total) (1)	5	2023/06/05	2023/06/05	BBY7SOP-00004 / BBY7SOP-00001	EPA 6020b R2 m
Soluble Sodium Ion Calc. (mg/kg)	9	N/A	2023/06/02	BBY WI-00033	Auto Calc
Soluble Sodium Ion Calc. (mg/kg)	25	N/A	2023/06/05	BBY WI-00033	Auto Calc
pH (2:1 DI Water Extract)	29	2023/06/03	2023/06/05	BBY6SOP-00028	BCMOE BCLM Mar2005 m
pH (2:1 DI Water Extract)	5	2023/06/05	2023/06/05	BBY6SOP-00028	BCMOE BCLM Mar2005 m
Saturated Paste	9	2023/06/01	2023/06/01	BBY6SOP-00030	BC Lab Manual 2015 m
Saturated Paste	20	2023/06/02	2023/06/02	BBY6SOP-00030	BC Lab Manual 2015 m
Saturated Paste	5	2023/06/05	2023/06/05	BBY6SOP-00030	BC Lab Manual 2015 m
Soluble Cations (Ca,K,Mg,Na,S)	9	N/A	2023/06/01	BBY7SOP-00018 / BBY7SOP-00030 / BCLM Nov 2015	EPA 6010d m
Soluble Cations (Ca,K,Mg,Na,S)	20	N/A	2023/06/02	BBY7SOP-00018 / BBY7SOP-00030 / BCLM Nov 2015	EPA 6010d m
Soluble Cations (Ca,K,Mg,Na,S)	5	N/A	2023/06/05	BBY7SOP-00018 / BBY7SOP-00030 / BCLM Nov 2015	EPA 6010d m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

Your P.O. #: 694890
Your Project #: WHATCOM RD

Attention: Edna Wong

SNC-LAVALIN INC.
BURNABY, ENVIRONMENT DIVISION
1300-3777 Kingsway Avenue
BURNABY, BC
CANADA V5H 3Z7

Your C.O.C. #: 695069-20-01, 695069-01-01, 695069-02-01, 695069-03-01

Report Date: 2023/06/06
Report #: R3345008
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C337966
Received: 2023/05/29, 08:00

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) The sample is prepaired per the BC MOE Lab Manual "Strong Acid Leachable Metals (SALM) in Soil - Prescriptive", Revision Nov 6, 2015.

Encryption Key

Bureau Veritas
06 Jun 2023 15:06:01

Please direct all questions regarding this Certificate of Analysis to:
Debbie Nordbruget, Key Account Specialist
Email: Debra.NORDBRUGET@bureauveritas.com
Phone# (250)385-6112

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This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Raphael Kwan, Senior Manager, BC and Yukon Regions responsible for British Columbia Environmental laboratory operations.

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG049	BRG050	BRG051	BRG052	BRG053	BRG054		
Sampling Date		2023/05/28 09:25	2023/05/28 09:39	2023/05/28 09:50	2023/05/28 10:18	2023/05/28 10:30	2023/05/28 10:44		
COC Number		695069-20-01	695069-20-01	695069-20-01	695069-20-01	695069-20-01	695069-20-01		
	UNITS	**SS23-35**	**SS23-36**	**SS23-37**	**SS23-04**	**SS23-05**	**SS23-06**	**RDL**	**QC Batch**
Physical Properties									
Soluble (2:1) pH	pH	5.80	6.41	6.76	5.88	6.55	6.70	N/A	A982739
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	25400	16500	21200	11300	11600	14700	100	A982738
Total Antimony (Sb)	mg/kg	0.35	0.33	0.43	0.35	1.26	1.00	0.10	A982738
Total Arsenic (As)	mg/kg	5.73	5.83	7.78	4.01	5.84	6.28	0.20	A982738
Total Barium (Ba)	mg/kg	110	80.7	124	57.9	81.1	107	0.10	A982738
Total Beryllium (Be)	mg/kg	0.44	0.35	0.45	0.27	0.23	0.30	0.20	A982738
Total Bismuth (Bi)	mg/kg	0.10	<0.10	<0.10	<0.10	0.14	0.11	0.10	A982738
Total Boron (B)	mg/kg	2.1	2.2	2.7	2.1	2.8	2.9	1.0	A982738
Total Cadmium (Cd)	mg/kg	0.162	0.158	0.122	0.132	0.761	0.761	0.050	A982738
Total Calcium (Ca)	mg/kg	1600	3180	5790	3600	4390	5580	100	A982738
Total Chromium (Cr)	mg/kg	40.8	32.1	50.5	31.0	34.9	44.3	0.50	A982738
Total Cobalt (Co)	mg/kg	10.6	9.86	14.8	6.84	8.34	10.4	0.10	A982738
Total Copper (Cu)	mg/kg	20.1	29.4	43.4	28.0	84.6	70.0	0.50	A982738
Total Iron (Fe)	mg/kg	26900	22000	32400	18600	21300	28400	100	A982738
Total Lead (Pb)	mg/kg	9.88	10.4	5.60	32.1	168	144	0.10	A982738
Total Lithium (Li)	mg/kg	13.4	10.8	12.5	8.24	8.18	10.1	0.50	A982738
Total Magnesium (Mg)	mg/kg	5270	6410	9000	5220	5790	7030	100	A982738
Total Manganese (Mn)	mg/kg	439	449	602	273	396	452	0.20	A982738
Total Mercury (Hg)	mg/kg	0.102	0.057	0.072	<0.050	<0.050	<0.050	0.050	A982738
Total Molybdenum (Mo)	mg/kg	0.78	0.43	0.54	0.51	1.80	1.73	0.10	A982738
Total Nickel (Ni)	mg/kg	32.5	33.2	44.5	24.8	24.7	32.4	0.50	A982738
Total Phosphorus (P)	mg/kg	523	483	612	487	531	670	10	A982738
Total Potassium (K)	mg/kg	577	805	1170	581	761	1250	100	A982738
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	A982738
Total Silver (Ag)	mg/kg	0.125	0.086	<0.050	<0.050	0.341	0.138	0.050	A982738
Total Sodium (Na)	mg/kg	<100	163	306	145	308	566	100	A982738
Total Strontium (Sr)	mg/kg	15.2	19.8	52.7	22.2	30.2	36.5	0.10	A982738
Total Thallium (Tl)	mg/kg	0.081	0.072	0.112	0.053	0.054	0.074	0.050	A982738
Total Tin (Sn)	mg/kg	0.48	0.29	0.38	0.31	1.95	29.5	0.10	A982738
Total Titanium (Ti)	mg/kg	914	797	1050	736	686	892	1.0	A982738

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG049	BRG050	BRG051	BRG052	BRG053	BRG054		
Sampling Date		2023/05/28 09:25	2023/05/28 09:39	2023/05/28 09:50	2023/05/28 10:18	2023/05/28 10:30	2023/05/28 10:44		
COC Number		695069-20-01	695069-20-01	695069-20-01	695069-20-01	695069-20-01	695069-20-01		
	UNITS	**SS23-35**	**SS23-36**	**SS23-37**	**SS23-04**	**SS23-05**	**SS23-06**	**RDL**	**QC Batch**
Total Tungsten (W)	mg/kg	<0.50	<0.50	<0.50	<0.50	3.30	0.55	0.50	A982738
Total Uranium (U)	mg/kg	0.574	0.345	0.512	0.320	0.299	0.336	0.050	A982738
Total Vanadium (V)	mg/kg	64.2	51.7	76.4	48.5	47.6	58.5	1.0	A982738
Total Zinc (Zn)	mg/kg	70.0	53.0	71.5	50.7	187	160	1.0	A982738
Total Zirconium (Zr)	mg/kg	2.66	1.72	8.45	1.18	0.57	1.16	0.50	A982738
RDL = Reportable Detection Limit									

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG055	BRG056	BRG057	BRG058	BRG059		
Sampling Date		2023/05/28 10:55	2023/05/28 11:08	2023/05/28 11:19	2023/05/28 11:30	2023/05/28 11:40		
COC Number		695069-20-01	695069-20-01	695069-20-01	695069-20-01	695069-01-01		
	UNITS	**SS23-07**	**SS23-08**	**SS23-09**	**SS23-10**	**SS23-11**	**RDL**	**QC Batch**
Physical Properties								
Soluble (2:1) pH	pH	6.30	6.30	5.76	6.52	6.75	N/A	A982739
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	10400	16100	17100	10100	10600	100	A982738
Total Antimony (Sb)	mg/kg	0.87	1.01	0.57	1.88	1.45	0.10	A982738
Total Arsenic (As)	mg/kg	5.15	7.40	6.35	6.31	5.99	0.20	A982738
Total Barium (Ba)	mg/kg	59.9	96.4	97.3	133	78.4	0.10	A982738
Total Beryllium (Be)	mg/kg	0.23	7.58	0.40	0.23	0.21	0.20	A982738
Total Bismuth (Bi)	mg/kg	<0.10	0.13	<0.10	0.15	0.15	0.10	A982738
Total Boron (B)	mg/kg	2.2	2.7	2.9	4.0	2.4	1.0	A982738
Total Cadmium (Cd)	mg/kg	0.599	1.51	0.306	0.981	0.858	0.050	A982738
Total Calcium (Ca)	mg/kg	3100	4740	4800	4560	4100	100	A982738
Total Chromium (Cr)	mg/kg	27.6	41.8	42.3	46.4	35.7	0.50	A982738
Total Cobalt (Co)	mg/kg	7.47	11.7	12.1	8.34	8.24	0.10	A982738
Total Copper (Cu)	mg/kg	64.5	67.5	42.5	146	177	0.50	A982738
Total Iron (Fe)	mg/kg	18700	25900	26500	24300	22200	100	A982738
Total Lead (Pb)	mg/kg	211	107	36.0	348	475	0.10	A982738
Total Lithium (Li)	mg/kg	7.62	10.6	10.9	7.65	7.47	0.50	A982738
Total Magnesium (Mg)	mg/kg	5890	7030	7270	5800	5700	100	A982738
Total Manganese (Mn)	mg/kg	339	475	549	384	372	0.20	A982738
Total Mercury (Hg)	mg/kg	<0.050	0.052	0.053	<0.050	<0.050	0.050	A982738
Total Molybdenum (Mo)	mg/kg	1.23	1.45	0.75	2.54	2.25	0.10	A982738
Total Nickel (Ni)	mg/kg	27.6	32.4	35.3	31.1	31.3	0.50	A982738
Total Phosphorus (P)	mg/kg	493	670	681	499	529	10	A982738
Total Potassium (K)	mg/kg	525	1270	1550	478	539	100	A982738
Total Selenium (Se)	mg/kg	<0.50	3.92	<0.50	<0.50	<0.50	0.50	A982738
Total Silver (Ag)	mg/kg	0.121	0.158	0.084	0.234	0.196	0.050	A982738
Total Sodium (Na)	mg/kg	240	359	264	239	218	100	A982738
Total Strontium (Sr)	mg/kg	14.8	34.2	35.7	24.9	20.8	0.10	A982738
Total Thallium (Tl)	mg/kg	<0.050	0.072	0.078	0.050	<0.050	0.050	A982738
Total Tin (Sn)	mg/kg	1.29	2.91	0.52	3.53	2.05	0.10	A982738
Total Titanium (Ti)	mg/kg	561	821	946	632	680	1.0	A982738

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG055	BRG056	BRG057	BRG058	BRG059		
Sampling Date		2023/05/28 10:55	2023/05/28 11:08	2023/05/28 11:19	2023/05/28 11:30	2023/05/28 11:40		
COC Number		695069-20-01	695069-20-01	695069-20-01	695069-20-01	695069-01-01		
	UNITS	**SS23-07**	**SS23-08**	**SS23-09**	**SS23-10**	**SS23-11**	**RDL**	**QC Batch**
Total Tungsten (W)	mg/kg	0.91	0.53	<0.50	1.32	1.06	0.50	A982738
Total Uranium (U)	mg/kg	0.233	0.435	0.471	0.265	0.329	0.050	A982738
Total Vanadium (V)	mg/kg	40.4	59.0	63.9	42.2	45.7	1.0	A982738
Total Zinc (Zn)	mg/kg	140	158	87.4	312	237	1.0	A982738
Total Zirconium (Zr)	mg/kg	<0.50	1.00	1.52	0.74	0.93	0.50	A982738
RDL = Reportable Detection Limit								

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG060	BRG061	BRG062	BRG063			BRG063		
Sampling Date		2023/05/28 11:50	2023/05/28 12:00	2023/05/28 12:20	2023/05/28 12:48			2023/05/28 12:48		
COC Number		695069-01-01	695069-01-01	695069-01-01	695069-01-01			695069-01-01		
	UNITS	SS23-12	SS23-13	SS23-14	SS23-15	RDL	QC Batch	SS23-15 Lab-Dup	RDL	QC Batch
Physical Properties										
Soluble (2:1) pH	pH	6.63	5.95	5.98	6.43	N/A	A982741			
Total Metals by ICPMS										
Total Aluminum (Al)	mg/kg	10400	25800	22700	15700	100	A982740	15900	100	A982740
Total Antimony (Sb)	mg/kg	1.11	0.34	0.30	0.53	0.10	A982740	0.55	0.10	A982740
Total Arsenic (As)	mg/kg	5.74	5.29	5.56	5.58	0.20	A982740	5.64	0.20	A982740
Total Barium (Ba)	mg/kg	58.8	102	107	95.5	0.10	A982740	95.2	0.10	A982740
Total Beryllium (Be)	mg/kg	<0.20	0.30	0.34	0.21	0.20	A982740	0.22	0.20	A982740
Total Bismuth (Bi)	mg/kg	0.13	<0.10	<0.10	<0.10	0.10	A982740	<0.10	0.10	A982740
Total Boron (B)	mg/kg	2.9	2.2	1.8	3.1	1.0	A982740	2.8	1.0	A982740
Total Cadmium (Cd)	mg/kg	0.520	0.212	0.198	0.300	0.050	A982740	0.319	0.050	A982740
Total Calcium (Ca)	mg/kg	3720	3190	2670	5850	100	A982740	6010	100	A982740
Total Chromium (Cr)	mg/kg	30.6	36.7	37.5	33.9	0.50	A982740	36.8	0.50	A982740
Total Cobalt (Co)	mg/kg	7.39	9.58	10.7	11.1	0.10	A982740	11.3	0.10	A982740
Total Copper (Cu)	mg/kg	80.4	28.9	27.1	41.5	0.50	A982740	43.8	0.50	A982740
Total Iron (Fe)	mg/kg	21500	26300	26500	25400	100	A982740	25800	100	A982740
Total Lead (Pb)	mg/kg	419	24.2	12.0	12.5	0.10	A982740	12.2	0.10	A982740
Total Lithium (Li)	mg/kg	7.41	10.0	10.5	9.39	0.50	A982740	9.45	0.50	A982740
Total Magnesium (Mg)	mg/kg	5670	6800	6040	7770	100	A982740	7910	100	A982740
Total Manganese (Mn)	mg/kg	358	379	425	438	0.20	A982740	457	0.20	A982740
Total Mercury (Hg)	mg/kg	0.068	0.067	0.053	<0.050	0.050	A982740	<0.050	0.050	A982740
Total Molybdenum (Mo)	mg/kg	1.86	0.57	0.61	0.59	0.10	A982740	0.67	0.10	A982740
Total Nickel (Ni)	mg/kg	21.8	27.1	30.4	30.6	0.50	A982740	31.8	0.50	A982740
Total Phosphorus (P)	mg/kg	540	441	524	611	10	A982740	645	10	A982740
Total Potassium (K)	mg/kg	512	903	909	1460	100	A982740	1470	100	A982740
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	A982740	<0.50	0.50	A982740
Total Silver (Ag)	mg/kg	0.136	0.058	0.071	0.081	0.050	A982740	0.104	0.050	A982740
Total Sodium (Na)	mg/kg	283	<100	114	391	100	A982740	405	100	A982740
Total Strontium (Sr)	mg/kg	19.0	29.9	24.7	41.6	0.10	A982740	42.3	0.10	A982740
Total Thallium (Tl)	mg/kg	0.058	0.071	0.073	0.072	0.050	A982740	0.068	0.050	A982740
Total Tin (Sn)	mg/kg	1.77	0.41	0.37	0.53	0.10	A982740	0.50	0.10	A982740

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG060	BRG061	BRG062	BRG063			BRG063		
Sampling Date		2023/05/28 11:50	2023/05/28 12:00	2023/05/28 12:20	2023/05/28 12:48			2023/05/28 12:48		
COC Number		695069-01-01	695069-01-01	695069-01-01	695069-01-01			695069-01-01		
	UNITS	SS23-12	SS23-13	SS23-14	SS23-15	RDL	QC Batch	SS23-15 Lab-Dup	RDL	QC Batch
Total Titanium (Ti)	mg/kg	579	1000	925	945	1.0	A982740	970	1.0	A982740
Total Tungsten (W)	mg/kg	0.96	<0.50	<0.50	<0.50	0.50	A982740	<0.50	0.50	A982740
Total Uranium (U)	mg/kg	0.390	0.396	0.432	0.326	0.050	A982740	0.343	0.050	A982740
Total Vanadium (V)	mg/kg	43.5	63.6	62.8	61.7	1.0	A982740	62.9	1.0	A982740
Total Zinc (Zn)	mg/kg	162	68.8	66.7	90.4	1.0	A982740	90.8	1.0	A982740
Total Zirconium (Zr)	mg/kg	<0.50	1.91	2.56	2.44	0.50	A982740	2.65	0.50	A982740

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG064	BRG065	BRG066	BRG067	BRG068	BRG069		
Sampling Date		2023/05/28 12:59	2023/05/28 13:08	2023/05/28 13:17	2023/05/28 13:36	2023/05/28 13:40	2023/05/28 13:49		
COC Number		695069-01-01	695069-01-01	695069-01-01	695069-01-01	695069-01-01	695069-02-01		
	UNITS	**SS23-16**	**SS23-17**	**SS23-18**	**SS23-19**	**SS23-20**	**SS23-21**	**RDL**	**QC Batch**
Physical Properties									
Soluble (2:1) pH	pH	7.30	6.15	7.18	5.79	6.06	5.82	N/A	A982741
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	18900	25200	12400	17600	16700	17400	100	A982740
Total Antimony (Sb)	mg/kg	0.63	0.24	1.61	0.72	1.01	0.89	0.10	A982740
Total Arsenic (As)	mg/kg	6.48	4.39	6.07	7.29	6.01	6.24	0.20	A982740
Total Barium (Ba)	mg/kg	114	120	95.5	89.0	102	102	0.10	A982740
Total Beryllium (Be)	mg/kg	0.29	0.40	0.22	0.25	0.28	0.35	0.20	A982740
Total Bismuth (Bi)	mg/kg	0.10	0.12	0.16	0.16	0.87	0.11	0.10	A982740
Total Boron (B)	mg/kg	4.9	2.0	3.0	2.2	2.2	2.2	1.0	A982740
Total Cadmium (Cd)	mg/kg	0.367	0.318	1.18	0.451	0.662	0.459	0.050	A982740
Total Calcium (Ca)	mg/kg	8030	2100	4630	3100	4310	4200	100	A982740
Total Chromium (Cr)	mg/kg	38.8	37.7	33.8	31.7	35.6	37.4	0.50	A982740
Total Cobalt (Co)	mg/kg	14.3	11.5	7.51	8.47	12.0	11.4	0.10	A982740
Total Copper (Cu)	mg/kg	47.0	19.3	101	63.1	64.8	63.8	0.50	A982740
Total Iron (Fe)	mg/kg	30800	29500	20400	22700	23800	24900	100	A982740
Total Lead (Pb)	mg/kg	6.93	7.94	137	154	111	110	0.10	A982740
Total Lithium (Li)	mg/kg	12.5	11.7	7.65	8.70	6.92	7.20	0.50	A982740
Total Magnesium (Mg)	mg/kg	10900	4360	4950	4840	6070	6200	100	A982740
Total Manganese (Mn)	mg/kg	553	737	390	438	486	444	0.20	A982740
Total Mercury (Hg)	mg/kg	0.073	0.083	<0.050	0.057	0.056	<0.050	0.050	A982740
Total Molybdenum (Mo)	mg/kg	0.68	0.64	1.90	1.19	1.00	1.12	0.10	A982740
Total Nickel (Ni)	mg/kg	39.9	28.6	21.0	21.8	26.1	26.8	0.50	A982740
Total Phosphorus (P)	mg/kg	666	699	724	774	553	551	10	A982740
Total Potassium (K)	mg/kg	1940	714	447	534	1140	1080	100	A982740
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	A982740
Total Silver (Ag)	mg/kg	0.125	0.174	0.629	0.115	0.164	0.178	0.050	A982740
Total Sodium (Na)	mg/kg	589	<100	322	122	196	186	100	A982740
Total Strontium (Sr)	mg/kg	49.7	18.3	22.0	20.6	37.6	36.2	0.10	A982740
Total Thallium (Tl)	mg/kg	0.099	0.086	0.051	0.054	0.075	0.070	0.050	A982740
Total Tin (Sn)	mg/kg	0.51	0.46	2.52	0.97	0.98	0.95	0.10	A982740
Total Titanium (Ti)	mg/kg	1090	971	473	656	829	881	1.0	A982740

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG064	BRG065	BRG066	BRG067	BRG068	BRG069		
Sampling Date		2023/05/28 12:59	2023/05/28 13:08	2023/05/28 13:17	2023/05/28 13:36	2023/05/28 13:40	2023/05/28 13:49		
COC Number		695069-01-01	695069-01-01	695069-01-01	695069-01-01	695069-01-01	695069-02-01		
	UNITS	**SS23-16**	**SS23-17**	**SS23-18**	**SS23-19**	**SS23-20**	**SS23-21**	**RDL**	**QC Batch**
Total Tungsten (W)	mg/kg	<0.50	<0.50	1.12	<0.50	<0.50	<0.50	0.50	A982740
Total Uranium (U)	mg/kg	0.552	0.478	0.390	0.423	0.392	0.333	0.050	A982740
Total Vanadium (V)	mg/kg	69.2	63.8	41.1	53.8	58.9	61.0	1.0	A982740
Total Zinc (Zn)	mg/kg	103	78.5	281	123	146	131	1.0	A982740
Total Zirconium (Zr)	mg/kg	4.36	1.37	<0.50	0.94	1.46	1.47	0.50	A982740
RDL = Reportable Detection Limit									

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG070	BRG071	BRG072	BRG073	BRG074	BRG075		
Sampling Date		2023/05/28 13:44	2023/05/28 13:53	2023/05/28 14:01	2023/05/28 14:10	2023/05/28 14:19	2023/05/28 14:26		
COC Number		695069-02-01	695069-02-01	695069-02-01	695069-02-01	695069-02-01	695069-02-01		
	UNITS	**SS23-22**	**SS23-23**	**SS23-24**	**SS23-25**	**SS23-26**	**SS23-27**	**RDL**	**QC Batch**
Physical Properties									
Soluble (2:1) pH	pH	5.63	6.81	6.90	6.34	6.29	6.37	N/A	A982741
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	19700	10700	15600	19400	20100	12900	100	A982740
Total Antimony (Sb)	mg/kg	0.47	1.36	0.38	0.60	0.57	0.41	0.10	A982740
Total Arsenic (As)	mg/kg	5.91	5.94	6.07	6.93	7.16	6.04	0.20	A982740
Total Barium (Ba)	mg/kg	95.0	77.2	51.8	91.5	71.4	35.8	0.10	A982740
Total Beryllium (Be)	mg/kg	0.27	<0.20	<0.20	0.30	0.30	<0.20	0.20	A982740
Total Bismuth (Bi)	mg/kg	<0.10	0.18	<0.10	0.14	0.11	<0.10	0.10	A982740
Total Boron (B)	mg/kg	1.8	2.3	1.2	1.6	1.7	2.0	1.0	A982740
Total Cadmium (Cd)	mg/kg	0.282	0.813	0.144	0.377	0.399	0.221	0.050	A982740
Total Calcium (Ca)	mg/kg	2410	3970	2430	1910	1960	2700	100	A982740
Total Chromium (Cr)	mg/kg	35.5	35.0	23.7	33.5	37.4	37.1	0.50	A982740
Total Cobalt (Co)	mg/kg	9.88	8.12	8.28	8.82	9.38	8.51	0.10	A982740
Total Copper (Cu)	mg/kg	49.3	95.5	32.5	50.3	58.0	37.5	0.50	A982740
Total Iron (Fe)	mg/kg	24200	22600	21400	24700	24700	21600	100	A982740
Total Lead (Pb)	mg/kg	99.8	376	20.6	151	133	36.3	0.10	A982740
Total Lithium (Li)	mg/kg	8.73	7.65	7.62	9.63	8.83	7.90	0.50	A982740
Total Magnesium (Mg)	mg/kg	5370	5500	5730	3990	4380	6750	100	A982740
Total Manganese (Mn)	mg/kg	443	380	369	624	555	297	0.20	A982740
Total Mercury (Hg)	mg/kg	0.054	<0.050	<0.050	<0.050	0.057	<0.050	0.050	A982740
Total Molybdenum (Mo)	mg/kg	0.69	2.06	0.53	1.21	1.03	0.45	0.10	A982740
Total Nickel (Ni)	mg/kg	27.2	25.2	20.6	24.5	31.0	34.0	0.50	A982740
Total Phosphorus (P)	mg/kg	644	580	485	1750	810	462	10	A982740
Total Potassium (K)	mg/kg	657	498	440	381	483	357	100	A982740
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	A982740
Total Silver (Ag)	mg/kg	0.105	0.181	0.051	0.094	0.124	<0.050	0.050	A982740
Total Sodium (Na)	mg/kg	128	279	177	255	205	119	100	A982740
Total Strontium (Sr)	mg/kg	18.1	19.1	12.7	12.0	11.3	10.2	0.10	A982740
Total Thallium (Tl)	mg/kg	0.060	<0.050	<0.050	0.056	0.058	<0.050	0.050	A982740
Total Tin (Sn)	mg/kg	0.50	2.92	0.36	0.97	0.74	0.35	0.10	A982740
Total Titanium (Ti)	mg/kg	782	521	652	512	783	809	1.0	A982740

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG070	BRG071	BRG072	BRG073	BRG074	BRG075		
Sampling Date		2023/05/28 13:44	2023/05/28 13:53	2023/05/28 14:01	2023/05/28 14:10	2023/05/28 14:19	2023/05/28 14:26		
COC Number		695069-02-01	695069-02-01	695069-02-01	695069-02-01	695069-02-01	695069-02-01		
	UNITS	**SS23-22**	**SS23-23**	**SS23-24**	**SS23-25**	**SS23-26**	**SS23-27**	**RDL**	**QC Batch**
Total Tungsten (W)	mg/kg	<0.50	2.07	<0.50	<0.50	<0.50	<0.50	0.50	A982740
Total Uranium (U)	mg/kg	0.374	0.237	0.283	0.455	0.407	0.297	0.050	A982740
Total Vanadium (V)	mg/kg	59.8	45.0	51.4	54.7	56.3	56.8	1.0	A982740
Total Zinc (Zn)	mg/kg	78.0	202	56.6	115	111	55.6	1.0	A982740
Total Zirconium (Zr)	mg/kg	1.27	<0.50	1.35	0.83	1.66	1.23	0.50	A982740
RDL = Reportable Detection Limit									

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG075		BRG076	BRG077		BRG078	BRG081		
Sampling Date		2023/05/28 14:26		2023/05/28 14:36	2023/05/28 14:40		2023/05/28 14:48	2023/05/28 14:58		
COC Number		695069-02-01		695069-02-01	695069-02-01		695069-02-01	695069-03-01		
	UNITS	SS23-27 Lab-Dup	QC Batch	SS23-28	SS23-29	QC Batch	SS23-30	SS23-31	RDL	QC Batch
Physical Properties										
Soluble (2:1) pH	pH	6.37	A982741	6.18	5.67	A982741	5.99	5.78	N/A	A983179
Total Metals by ICPMS										
Total Aluminum (Al)	mg/kg			16700	11000	A982740	12100	22700	100	A983173
Total Antimony (Sb)	mg/kg			0.42	0.97	A982740	0.90	0.29	0.10	A983173
Total Arsenic (As)	mg/kg			5.03	4.98	A982740	5.39	5.11	0.20	A983173
Total Barium (Ba)	mg/kg			48.7	50.7	A982740	57.4	109	0.10	A983173
Total Beryllium (Be)	mg/kg			0.24	<0.20	A982740	<0.20	0.36	0.20	A983173
Total Bismuth (Bi)	mg/kg			<0.10	<0.10	A982740	0.11	<0.10	0.10	A983173
Total Boron (B)	mg/kg			1.4	2.8	A982740	3.1	1.7	1.0	A983173
Total Cadmium (Cd)	mg/kg			0.251	0.889	A982740	0.369	0.180	0.050	A983173
Total Calcium (Ca)	mg/kg			1940	3110	A982740	3460	1540	100	A983173
Total Chromium (Cr)	mg/kg			31.9	31.8	A982740	37.9	42.1	0.50	A983173
Total Cobalt (Co)	mg/kg			8.61	7.04	A982740	7.16	11.2	0.10	A983173
Total Copper (Cu)	mg/kg			46.6	56.9	A982740	56.9	22.4	0.50	A983173
Total Iron (Fe)	mg/kg			22400	19600	A982740	22200	27800	100	A983173
Total Lead (Pb)	mg/kg			71.5	214	A982740	184	11.7	0.10	A983173
Total Lithium (Li)	mg/kg			8.12	7.26	A982740	7.59	11.0	0.50	A983173
Total Magnesium (Mg)	mg/kg			5270	5430	A982740	5670	4460	100	A983173
Total Manganese (Mn)	mg/kg			321	317	A982740	329	752	0.20	A983173
Total Mercury (Hg)	mg/kg			<0.050	0.059	A982740	0.082	0.069	0.050	A983173
Total Molybdenum (Mo)	mg/kg			0.64	2.14	A982740	1.66	0.58	0.10	A983173
Total Nickel (Ni)	mg/kg			27.4	23.9	A982740	24.9	37.6	0.50	A983173
Total Phosphorus (P)	mg/kg			540	730	A982740	789	769	10	A983173
Total Potassium (K)	mg/kg			397	452	A982740	557	618	100	A983173
Total Selenium (Se)	mg/kg			<0.50	<0.50	A982740	<0.50	<0.50	0.50	A983173
Total Silver (Ag)	mg/kg			0.069	0.077	A982740	0.085	0.096	0.050	A983173
Total Sodium (Na)	mg/kg			125	213	A982740	285	<100	100	A983173
Total Strontium (Sr)	mg/kg			10.6	18.6	A982740	21.1	12.1	0.10	A983173
Total Thallium (Tl)	mg/kg			<0.050	<0.050	A982740	0.055	0.084	0.050	A983173
Total Tin (Sn)	mg/kg			0.38	1.57	A982740	1.39	0.42	0.10	A983173

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG075		BRG076	BRG077		BRG078	BRG081		
Sampling Date		2023/05/28 14:26		2023/05/28 14:36	2023/05/28 14:40		2023/05/28 14:48	2023/05/28 14:58		
COC Number		695069-02-01		695069-02-01	695069-02-01		695069-02-01	695069-03-01		
	UNITS	**SS23-27 Lab-Dup**	**QC Batch**	**SS23-28**	**SS23-29**	**QC Batch**	**SS23-30**	**SS23-31**	**RDL**	**QC Batch**
Total Titanium (Ti)	mg/kg			774	591	A982740	732	949	1.0	A983173
Total Tungsten (W)	mg/kg			<0.50	0.92	A982740	1.43	<0.50	0.50	A983173
Total Uranium (U)	mg/kg			0.370	0.252	A982740	0.462	0.526	0.050	A983173
Total Vanadium (V)	mg/kg			57.2	48.2	A982740	58.6	59.8	1.0	A983173
Total Zinc (Zn)	mg/kg			78.5	86.3	A982740	93.2	62.3	1.0	A983173
Total Zirconium (Zr)	mg/kg			1.48	0.64	A982740	0.66	3.57	0.50	A983173

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG082	BRG083	BRG084		
Sampling Date		2023/05/28 15:03	2023/05/28 15:12	2023/05/28 15:22		
COC Number		695069-03-01	695069-03-01	695069-03-01		
	UNITS	SS23-32	SS23-33	SS23-34	RDL	QC Batch
Physical Properties						
Soluble (2:1) pH	pH	6.12	7.55	6.69	N/A	A983179
Total Metals by ICPMS						
Total Aluminum (Al)	mg/kg	20300	21700	10800	100	A983173
Total Antimony (Sb)	mg/kg	0.34	0.31	0.93	0.10	A983173
Total Arsenic (As)	mg/kg	4.78	5.19	6.20	0.20	A983173
Total Barium (Ba)	mg/kg	105	87.8	74.6	0.10	A983173
Total Beryllium (Be)	mg/kg	0.30	0.35	<0.20	0.20	A983173
Total Bismuth (Bi)	mg/kg	<0.10	<0.10	0.12	0.10	A983173
Total Boron (B)	mg/kg	1.6	2.1	2.0	1.0	A983173
Total Cadmium (Cd)	mg/kg	0.165	0.171	0.579	0.050	A983173
Total Calcium (Ca)	mg/kg	2000	8390	4300	100	A983173
Total Chromium (Cr)	mg/kg	37.3	34.6	36.3	0.50	A983173
Total Cobalt (Co)	mg/kg	9.81	12.1	8.60	0.10	A983173
Total Copper (Cu)	mg/kg	23.7	27.3	79.4	0.50	A983173
Total Iron (Fe)	mg/kg	24300	27400	21100	100	A983173
Total Lead (Pb)	mg/kg	16.6	11.3	216	0.10	A983173
Total Lithium (Li)	mg/kg	9.74	7.31	8.16	0.50	A983173
Total Magnesium (Mg)	mg/kg	5040	7140	5600	100	A983173
Total Manganese (Mn)	mg/kg	491	578	374	0.20	A983173
Total Mercury (Hg)	mg/kg	0.056	<0.050	<0.050	0.050	A983173
Total Molybdenum (Mo)	mg/kg	0.51	0.59	1.63	0.10	A983173
Total Nickel (Ni)	mg/kg	35.3	28.1	25.7	0.50	A983173
Total Phosphorus (P)	mg/kg	815	821	569	10	A983173
Total Potassium (K)	mg/kg	423	524	664	100	A983173
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	0.50	A983173
Total Silver (Ag)	mg/kg	0.071	0.070	0.091	0.050	A983173
Total Sodium (Na)	mg/kg	<100	232	231	100	A983173
Total Strontium (Sr)	mg/kg	11.7	29.4	22.7	0.10	A983173
Total Thallium (Tl)	mg/kg	0.068	0.057	0.057	0.050	A983173
Total Tin (Sn)	mg/kg	0.51	0.86	0.96	0.10	A983173
Total Titanium (Ti)	mg/kg	832	1040	599	1.0	A983173

RDL = Reportable Detection Limit
N/A = Not Applicable

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRG082	BRG083	BRG084		
Sampling Date		2023/05/28 15:03	2023/05/28 15:12	2023/05/28 15:22		
COC Number		695069-03-01	695069-03-01	695069-03-01		
	UNITS	SS23-32	SS23-33	SS23-34	RDL	QC Batch
Total Tungsten (W)	mg/kg	<0.50	<0.50	0.56	0.50	A983173
Total Uranium (U)	mg/kg	0.424	0.298	0.230	0.050	A983173
Total Vanadium (V)	mg/kg	56.5	67.3	45.6	1.0	A983173
Total Zinc (Zn)	mg/kg	60.1	58.0	138	1.0	A983173
Total Zirconium (Zr)	mg/kg	2.11	1.86	0.54	0.50	A983173
RDL = Reportable Detection Limit						

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

SOLUBLE SODIUM AND CHLORIDE IN SOIL (SOIL)

Bureau Veritas ID		BRG049		BRG050		BRG051		BRG052		
Sampling Date		2023/05/28 09:25		2023/05/28 09:39		2023/05/28 09:50		2023/05/28 10:18		
COC Number		695069-20-01		695069-20-01		695069-20-01		695069-20-01		
	UNITS	SS23-35	RDL	SS23-36	RDL	SS23-37	RDL	SS23-04	RDL	QC Batch
ANIONS										
Soluble Chloride (Cl)	mg/L	<10	10	<10	10	<10	10	<10	10	A980994
Calculated Parameters										
Soluble Chloride (Cl)	mg/kg	<6.4	6.4	<4.9	4.9	<5.1	5.1	<4.9	4.9	A977172
Soluble Sodium (Na)	mg/kg	<3.2	3.2	<2.5	2.5	<2.5	2.5	<2.4	2.4	A977174
Soluble Parameters										
Saturation %	%	63.5	N/A	49.0	N/A	50.8	N/A	48.7	N/A	A980267
Soluble Sodium (Na)	mg/L	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	A980998

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BRG053			BRG054		BRG055		BRG056		
Sampling Date		2023/05/28 10:30			2023/05/28 10:44		2023/05/28 10:55		2023/05/28 11:08		
COC Number		695069-20-01			695069-20-01		695069-20-01		695069-20-01		
	UNITS	SS23-05	RDL	QC Batch	SS23-06	RDL	SS23-07	RDL	SS23-08	RDL	QC Batch
ANIONS											
Soluble Chloride (Cl)	mg/L	<10	10	A982271	<10	10	<10	10	<10	10	A980994
Calculated Parameters											
Soluble Chloride (Cl)	mg/kg	<5.9	5.9	A977172	<6.0	6.0	<5.7	5.7	<7.3	7.3	A977172
Soluble Sodium (Na)	mg/kg	18.5	3.0	A977174	16.6	3.0	16.1	2.8	13.3	3.7	A977174
Soluble Parameters											
Saturation %	%	59.3	N/A	A981680	59.5	N/A	57.0	N/A	73.4	N/A	A980267
Soluble Sodium (Na)	mg/L	31.1	5.0	A982121	27.8	5.0	28.3	5.0	18.1	5.0	A980998

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

SOLUBLE SODIUM AND CHLORIDE IN SOIL (SOIL)

Bureau Veritas ID		BRG057		BRG058		BRG059		BRG060		BRG061		
Sampling Date		2023/05/28 11:19		2023/05/28 11:30		2023/05/28 11:40		2023/05/28 11:50		2023/05/28 12:00		
COC Number		695069-20-01		695069-20-01		695069-01-01		695069-01-01		695069-01-01		
	UNITS	**SS23-09**	**RDL**	**SS23-10**	**RDL**	**SS23-11**	**RDL**	**SS23-12**	**RDL**	**SS23-13**	**RDL**	**QC Batch**
ANIONS												
Soluble Chloride (Cl)	mg/L	14	10	<10	10	<10	10	<10	10	<10	10	A982271
Calculated Parameters												
Soluble Chloride (Cl)	mg/kg	9.9	7.2	<5.4	5.4	<4.9	4.9	<5.2	5.2	<7.8	7.8	A977172
Soluble Sodium (Na)	mg/kg	5.0	3.6	7.0	2.7	4.2	2.4	13.4	2.6	4.7	3.9	A977174
Soluble Parameters												
Saturation %	%	71.6	N/A	53.8	N/A	49.0	N/A	51.7	N/A	78.5	N/A	A981680
Soluble Sodium (Na)	mg/L	7.0	5.0	13.0	5.0	8.5	5.0	25.9	5.0	6.0	5.0	A982121

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BRG062		BRG063		BRG064		BRG065		BRG066		
Sampling Date		2023/05/28 12:20		2023/05/28 12:48		2023/05/28 12:59		2023/05/28 13:08		2023/05/28 13:17		
COC Number		695069-01-01		695069-01-01		695069-01-01		695069-01-01		695069-01-01		
	UNITS	**SS23-14**	**RDL**	**SS23-15**	**RDL**	**SS23-16**	**RDL**	**SS23-17**	**RDL**	**SS23-18**	**RDL**	**QC Batch**
ANIONS												
Soluble Chloride (Cl)	mg/L	<10	10	<10	10	<10	10	<10	10	<10	10	A982271
Calculated Parameters												
Soluble Chloride (Cl)	mg/kg	<6.4	6.4	<5.9	5.9	<6.1	6.1	<6.9	6.9	<7.3	7.3	A977172
Soluble Sodium (Na)	mg/kg	<3.2	3.2	4.4	3.0	5.5	3.1	<3.4	3.4	22.4	3.7	A977174
Soluble Parameters												
Saturation %	%	63.6	N/A	59.3	N/A	61.2	N/A	68.7	N/A	73.0	N/A	A981680
Soluble Sodium (Na)	mg/L	<5.0	5.0	7.4	5.0	9.0	5.0	<5.0	5.0	30.6	5.0	A982121

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C337966
Report Date: 2023/06/06

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

SOLUBLE SODIUM AND CHLORIDE IN SOIL (SOIL)

Bureau Veritas ID		BRG067			BRG068		BRG069		BRG070		
Sampling Date		2023/05/28 13:36			2023/05/28 13:40		2023/05/28 13:49		2023/05/28 13:44		
COC Number		695069-01-01			695069-01-01		695069-02-01		695069-02-01		
	UNITS	SS23-19	RDL	QC Batch	SS23-20	RDL	SS23-21	RDL	SS23-22	RDL	QC Batch
ANIONS											
Soluble Chloride (Cl)	mg/L	<10	10	A980994	<10	10	<10	10	<10	10	A982271
Calculated Parameters											
Soluble Chloride (Cl)	mg/kg	<8.0	8.0	A977172	<7.3	7.3	<6.8	6.8	<6.4	6.4	A977172
Soluble Sodium (Na)	mg/kg	5.6	4.0	A977174	10.5	3.7	8.0	3.4	5.1	3.2	A977174
Soluble Parameters											
Saturation %	%	80.4	N/A	A980267	73.4	N/A	68.3	N/A	64.1	N/A	A981680
Soluble Sodium (Na)	mg/L	7.0	5.0	A980998	14.3	5.0	11.8	5.0	7.9	5.0	A982121

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BRG071		BRG072		BRG073		BRG074		BRG075		
Sampling Date		2023/05/28 13:53		2023/05/28 14:01		2023/05/28 14:10		2023/05/28 14:19		2023/05/28 14:26		
COC Number		695069-02-01		695069-02-01		695069-02-01		695069-02-01		695069-02-01		
	UNITS	SS23-23	RDL	SS23-24	RDL	SS23-25	RDL	SS23-26	RDL	SS23-27	RDL	QC Batch
ANIONS												
Soluble Chloride (Cl)	mg/L	<10	10	<10	10	<10	10	<10	10	<10	10	A982271
Calculated Parameters												
Soluble Chloride (Cl)	mg/kg	<5.7	5.7	<4.4	4.4	<8.5	8.5	<7.1	7.1	<3.4	3.4	A977172
Soluble Sodium (Na)	mg/kg	12.8	2.8	4.9	2.2	15.7	4.2	12.9	3.6	2.7	1.7	A977174
Soluble Parameters												
Saturation %	%	56.6	N/A	44.0	N/A	84.6	N/A	71.4	N/A	34.2	N/A	A981680
Soluble Sodium (Na)	mg/L	22.6	5.0	11.1	5.0	18.5	5.0	18.1	5.0	7.8	5.0	A982121

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

SOLUBLE SODIUM AND CHLORIDE IN SOIL (SOIL)

Bureau Veritas ID		BRG075			BRG076			BRG077		BRG078		
Sampling Date		2023/05/28 14:26			2023/05/28 14:36			2023/05/28 14:40		2023/05/28 14:48		
COC Number		695069-02-01			695069-02-01			695069-02-01		695069-02-01		
	UNITS	SS23-27 Lab-Dup	RDL	QC Batch	SS23-28	RDL	QC Batch	SS23-29	RDL	SS23-30	RDL	QC Batch
ANIONS												
Soluble Chloride (Cl)	mg/L	<10	10	A982271	<10	10	A982271	23	10	23	10	A983860
Calculated Parameters												
Soluble Chloride (Cl)	mg/kg				<4.7	4.7	A977172	15.9	6.9	13.1	5.7	A977172
Soluble Sodium (Na)	mg/kg				4.6	2.3	A977174	29.4	3.5	26.4	2.9	A977174
Soluble Parameters												
Saturation %	%	34.7	N/A	A981680	46.9	N/A	A981680	69.1	N/A	57.1	N/A	A983245
Soluble Sodium (Na)	mg/L	7.7	5.0	A982121	9.9	5.0	A982121	42.6	5.0	46.2	5.0	A983854

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas ID		BRG081		BRG082			BRG083			BRG084		
Sampling Date		2023/05/28 14:58		2023/05/28 15:03			2023/05/28 15:12			2023/05/28 15:22		
COC Number		695069-03-01		695069-03-01			695069-03-01			695069-03-01		
	UNITS	SS23-31	RDL	SS23-32	RDL	QC Batch	SS23-33	RDL	QC Batch	SS23-34	RDL	QC Batch
ANIONS												
Soluble Chloride (Cl)	mg/L	<10	10	<10	10	A983860	<10	10	A980994	<10	10	A983860
Calculated Parameters												
Soluble Chloride (Cl)	mg/kg	<5.8	5.8	<5.0	5.0	A977172	<4.8	4.8	A977172	<6.3	6.3	A977172
Soluble Sodium (Na)	mg/kg	4.3	2.9	2.8	2.5	A977174	6.6	2.4	A977174	9.7	3.1	A977174
Soluble Parameters												
Saturation %	%	57.8	N/A	49.8	N/A	A983245	47.5	N/A	A980267	62.8	N/A	A983245
Soluble Sodium (Na)	mg/L	7.5	5.0	5.6	5.0	A983854	13.9	5.0	A980998	15.4	5.0	A983854

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

SOLUBLE SODIUM AND CHLORIDE IN SOIL (SOIL)

Bureau Veritas ID		BRG084		
Sampling Date		2023/05/28 15:22		
COC Number		695069-03-01		
	UNITS	SS23-34 Lab-Dup	RDL	QC Batch
ANIONS				
Soluble Chloride (Cl)	mg/L	<10	10	A983860
Soluble Parameters				
Saturation %	%	62.8	N/A	A983245
Soluble Sodium (Na)	mg/L	15.6	5.0	A983854

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	16.7°C
Package 2	16.0°C

Results relate only to the items tested.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A980267	Saturation %	2023/06/01					0	%	1.8	30	101	75 - 125
A980994	Soluble Chloride (Cl)	2023/06/01	109	75 - 125	103	80 - 120	<10	mg/L	0.46	30	91	75 - 125
A980998	Soluble Sodium (Na)	2023/06/01	94	80 - 120	95	80 - 120	<5.0	mg/L	0.20	40	92	75 - 125
A981680	Saturation %	2023/06/02					0	%	1.3	30	101	75 - 125
A982121	Soluble Sodium (Na)	2023/06/02	98	80 - 120	95	80 - 120	<5.0	mg/L	1.6	40	103	75 - 125
A982271	Soluble Chloride (Cl)	2023/06/05	102	75 - 125	99	80 - 120	<10	mg/L	NC	30	98	75 - 125
A982738	Total Aluminum (Al)	2023/06/05	NC	75 - 125	101	75 - 125	<100	mg/kg			89	70 - 130
A982738	Total Antimony (Sb)	2023/06/05	73 (1)	75 - 125	99	75 - 125	<0.10	mg/kg			97	70 - 130
A982738	Total Arsenic (As)	2023/06/05	101	75 - 125	102	75 - 125	<0.20	mg/kg			89	70 - 130
A982738	Total Barium (Ba)	2023/06/05	102	75 - 125	103	75 - 125	0.30, RDL=0.10 (2)	mg/kg			100	70 - 130
A982738	Total Beryllium (Be)	2023/06/05	98	75 - 125	102	75 - 125	<0.20	mg/kg			124	70 - 130
A982738	Total Bismuth (Bi)	2023/06/05	91	75 - 125	93	75 - 125	<0.10	mg/kg				
A982738	Total Boron (B)	2023/06/05	94	75 - 125	99	75 - 125	<1.0	mg/kg				
A982738	Total Cadmium (Cd)	2023/06/05	101	75 - 125	103	75 - 125	<0.050	mg/kg			101	70 - 130
A982738	Total Calcium (Ca)	2023/06/05	NC	75 - 125	102	75 - 125	<100	mg/kg			95	70 - 130
A982738	Total Chromium (Cr)	2023/06/05	97	75 - 125	104	75 - 125	<0.50	mg/kg			91	70 - 130
A982738	Total Cobalt (Co)	2023/06/05	97	75 - 125	105	75 - 125	<0.10	mg/kg			97	70 - 130
A982738	Total Copper (Cu)	2023/06/05	95	75 - 125	105	75 - 125	<0.50	mg/kg			104	70 - 130
A982738	Total Iron (Fe)	2023/06/05	NC	75 - 125	102	75 - 125	<100	mg/kg	4.3	30	96	70 - 130
A982738	Total Lead (Pb)	2023/06/05	103	75 - 125	105	75 - 125	<0.10	mg/kg			113	70 - 130
A982738	Total Lithium (Li)	2023/06/05	100	75 - 125	103	75 - 125	<0.50	mg/kg			98	70 - 130
A982738	Total Magnesium (Mg)	2023/06/05	NC	75 - 125	99	75 - 125	<100	mg/kg			99	70 - 130
A982738	Total Manganese (Mn)	2023/06/05	NC	75 - 125	103	75 - 125	<0.20	mg/kg			98	70 - 130
A982738	Total Mercury (Hg)	2023/06/05	101	75 - 125	101	75 - 125	<0.050	mg/kg			110	70 - 130
A982738	Total Molybdenum (Mo)	2023/06/05	96	75 - 125	95	75 - 125	<0.10	mg/kg			91	70 - 130
A982738	Total Nickel (Ni)	2023/06/05	93	75 - 125	101	75 - 125	<0.50	mg/kg			104	70 - 130
A982738	Total Phosphorus (P)	2023/06/05	82	75 - 125	94	75 - 125	<10	mg/kg			96	70 - 130
A982738	Total Potassium (K)	2023/06/05	105	75 - 125	101	75 - 125	<100	mg/kg			79	70 - 130
A982738	Total Selenium (Se)	2023/06/05	103	75 - 125	105	75 - 125	<0.50	mg/kg				
A982738	Total Silver (Ag)	2023/06/05	98	75 - 125	99	75 - 125	<0.050	mg/kg			92	70 - 130

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A982738	Total Sodium (Na)	2023/06/05	113	75 - 125	104	75 - 125	<100	mg/kg			86	70 - 130
A982738	Total Strontium (Sr)	2023/06/05	105	75 - 125	101	75 - 125	<0.10	mg/kg			103	70 - 130
A982738	Total Thallium (Tl)	2023/06/05	91	75 - 125	91	75 - 125	<0.050	mg/kg			86	70 - 130
A982738	Total Tin (Sn)	2023/06/05	98	75 - 125	101	75 - 125	<0.10	mg/kg			93	70 - 130
A982738	Total Titanium (Ti)	2023/06/05	NC	75 - 125	98	75 - 125	<1.0	mg/kg				
A982738	Total Tungsten (W)	2023/06/05	75	75 - 125	104	75 - 125	<0.50	mg/kg				
A982738	Total Uranium (U)	2023/06/05	100	75 - 125	101	75 - 125	<0.050	mg/kg			94	70 - 130
A982738	Total Vanadium (V)	2023/06/05	92	75 - 125	102	75 - 125	<1.0	mg/kg			97	70 - 130
A982738	Total Zinc (Zn)	2023/06/05	94	75 - 125	104	75 - 125	<1.0	mg/kg			107	70 - 130
A982738	Total Zirconium (Zr)	2023/06/05	107	75 - 125	100	75 - 125	<0.50	mg/kg				
A982739	Soluble (2:1) pH	2023/06/05			100	97 - 103			0	N/A		
A982740	Total Aluminum (Al)	2023/06/05	NC	75 - 125	100	75 - 125	<100	mg/kg	1.5	40	92	70 - 130
A982740	Total Antimony (Sb)	2023/06/05	80	75 - 125	98	75 - 125	<0.10	mg/kg	4.2	30	101	70 - 130
A982740	Total Arsenic (As)	2023/06/05	95	75 - 125	103	75 - 125	<0.20	mg/kg	1.0	30	89	70 - 130
A982740	Total Barium (Ba)	2023/06/05	104	75 - 125	106	75 - 125	0.17, RDL=0.10 (3)	mg/kg	0.29	40	101	70 - 130
A982740	Total Beryllium (Be)	2023/06/05	90	75 - 125	99	75 - 125	<0.20	mg/kg	5.5	30	84	70 - 130
A982740	Total Bismuth (Bi)	2023/06/05	84	75 - 125	92	75 - 125	<0.10	mg/kg	NC	30		
A982740	Total Boron (B)	2023/06/05	87	75 - 125	96	75 - 125	<1.0	mg/kg	8.0	30		
A982740	Total Cadmium (Cd)	2023/06/05	93	75 - 125	102	75 - 125	<0.050	mg/kg	6.1	30	104	70 - 130
A982740	Total Calcium (Ca)	2023/06/05	NC	75 - 125	99	75 - 125	<100	mg/kg	2.8	30	94	70 - 130
A982740	Total Chromium (Cr)	2023/06/05	93	75 - 125	105	75 - 125	<0.50	mg/kg	8.3	30	98	70 - 130
A982740	Total Cobalt (Co)	2023/06/05	93	75 - 125	105	75 - 125	<0.10	mg/kg	1.8	30	100	70 - 130
A982740	Total Copper (Cu)	2023/06/05	94	75 - 125	108	75 - 125	<0.50	mg/kg	5.4	30	103	70 - 130
A982740	Total Iron (Fe)	2023/06/05	NC	75 - 125	104	75 - 125	<100	mg/kg	1.8	30	97	70 - 130
A982740	Total Lead (Pb)	2023/06/05	94	75 - 125	104	75 - 125	<0.10	mg/kg	2.4	40	114	70 - 130
A982740	Total Lithium (Li)	2023/06/05	91	75 - 125	98	75 - 125	<0.50	mg/kg	0.63	30	97	70 - 130
A982740	Total Magnesium (Mg)	2023/06/05	NC	75 - 125	99	75 - 125	<100	mg/kg	1.8	30	99	70 - 130
A982740	Total Manganese (Mn)	2023/06/05	NC	75 - 125	103	75 - 125	<0.20	mg/kg	4.2	30	102	70 - 130
A982740	Total Mercury (Hg)	2023/06/05	92	75 - 125	100	75 - 125	<0.050	mg/kg	NC	40	105	70 - 130
A982740	Total Molybdenum (Mo)	2023/06/05	90	75 - 125	97	75 - 125	<0.10	mg/kg	12	40	100	70 - 130

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A982740	Total Nickel (Ni)	2023/06/05	91	75 - 125	102	75 - 125	<0.50	mg/kg	3.7	30	106	70 - 130
A982740	Total Phosphorus (P)	2023/06/05	81	75 - 125	97	75 - 125	<10	mg/kg	5.4	30	88	70 - 130
A982740	Total Potassium (K)	2023/06/05	113	75 - 125	101	75 - 125	<100	mg/kg	0.53	40	84	70 - 130
A982740	Total Selenium (Se)	2023/06/05	95	75 - 125	103	75 - 125	<0.50	mg/kg	NC	30		
A982740	Total Silver (Ag)	2023/06/05	91	75 - 125	98	75 - 125	<0.050	mg/kg	25	40	94	70 - 130
A982740	Total Sodium (Na)	2023/06/05	116	75 - 125	104	75 - 125	<100	mg/kg	3.4	40	92	70 - 130
A982740	Total Strontium (Sr)	2023/06/05	102	75 - 125	101	75 - 125	<0.10	mg/kg	1.7	40	106	70 - 130
A982740	Total Thallium (Tl)	2023/06/05	84	75 - 125	91	75 - 125	<0.050	mg/kg	6.5	30	84	70 - 130
A982740	Total Tin (Sn)	2023/06/05	90	75 - 125	100	75 - 125	<0.10	mg/kg	5.1	40	92	70 - 130
A982740	Total Titanium (Ti)	2023/06/05	NC	75 - 125	102	75 - 125	<1.0	mg/kg	2.7	40		
A982740	Total Tungsten (W)	2023/06/05	77	75 - 125	104	75 - 125	<0.50	mg/kg	NC	40		
A982740	Total Uranium (U)	2023/06/05	89	75 - 125	97	75 - 125	<0.050	mg/kg	4.9	30	91	70 - 130
A982740	Total Vanadium (V)	2023/06/05	93	75 - 125	103	75 - 125	<1.0	mg/kg	2.0	30	102	70 - 130
A982740	Total Zinc (Zn)	2023/06/05	90	75 - 125	101	75 - 125	<1.0	mg/kg	0.42	30	104	70 - 130
A982740	Total Zirconium (Zr)	2023/06/05	107	75 - 125	101	75 - 125	<0.50	mg/kg	8.3	40		
A982741	Soluble (2:1) pH	2023/06/05			100	97 - 103			0	N/A		
A983173	Total Aluminum (Al)	2023/06/05	NC	75 - 125	100	75 - 125	<100	mg/kg	2.6	40	94	70 - 130
A983173	Total Antimony (Sb)	2023/06/05	81	75 - 125	99	75 - 125	<0.10	mg/kg	3.9	30	105	70 - 130
A983173	Total Arsenic (As)	2023/06/05	101	75 - 125	104	75 - 125	<0.20	mg/kg	2.1	30	97	70 - 130
A983173	Total Barium (Ba)	2023/06/05	106	75 - 125	105	75 - 125	<0.10	mg/kg	1.5	40	104	70 - 130
A983173	Total Beryllium (Be)	2023/06/05	95	75 - 125	101	75 - 125	<0.20	mg/kg	2.5	30	87	70 - 130
A983173	Total Bismuth (Bi)	2023/06/05	91	75 - 125	94	75 - 125	<0.10	mg/kg				
A983173	Total Boron (B)	2023/06/05	93	75 - 125	97	75 - 125	<1.0	mg/kg	1.2	30		
A983173	Total Cadmium (Cd)	2023/06/05	99	75 - 125	103	75 - 125	<0.050	mg/kg	12	30	106	70 - 130
A983173	Total Calcium (Ca)	2023/06/05	NC	75 - 125	102	75 - 125	<100	mg/kg			100	70 - 130
A983173	Total Chromium (Cr)	2023/06/05	100	75 - 125	105	75 - 125	<0.50	mg/kg	3.2	30	101	70 - 130
A983173	Total Cobalt (Co)	2023/06/05	98	75 - 125	105	75 - 125	<0.10	mg/kg	2.1	30	102	70 - 130
A983173	Total Copper (Cu)	2023/06/05	97	75 - 125	108	75 - 125	<0.50	mg/kg	3.0	30	108	70 - 130
A983173	Total Iron (Fe)	2023/06/05	NC	75 - 125	103	75 - 125	<100	mg/kg	2.1	30	101	70 - 130
A983173	Total Lead (Pb)	2023/06/05	102	75 - 125	106	75 - 125	<0.10	mg/kg	1.2	40	118	70 - 130
A983173	Total Lithium (Li)	2023/06/05	99	75 - 125	100	75 - 125	<0.50	mg/kg	5.8	30	99	70 - 130

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A983173	Total Magnesium (Mg)	2023/06/05	NC	75 - 125	100	75 - 125	<100	mg/kg			103	70 - 130
A983173	Total Manganese (Mn)	2023/06/05	NC	75 - 125	103	75 - 125	<0.20	mg/kg	1.5	30	104	70 - 130
A983173	Total Mercury (Hg)	2023/06/05	99	75 - 125	101	75 - 125	<0.050	mg/kg	5.4	40	105	70 - 130
A983173	Total Molybdenum (Mo)	2023/06/05	95	75 - 125	98	75 - 125	<0.10	mg/kg	7.9	40	104	70 - 130
A983173	Total Nickel (Ni)	2023/06/05	94	75 - 125	103	75 - 125	<0.50	mg/kg	2.5	30	110	70 - 130
A983173	Total Phosphorus (P)	2023/06/05	89	75 - 125	96	75 - 125	<10	mg/kg			93	70 - 130
A983173	Total Potassium (K)	2023/06/05	120	75 - 125	102	75 - 125	<100	mg/kg			85	70 - 130
A983173	Total Selenium (Se)	2023/06/05	101	75 - 125	104	75 - 125	<0.50	mg/kg	NC	30		
A983173	Total Silver (Ag)	2023/06/05	97	75 - 125	99	75 - 125	<0.050	mg/kg	NC	40	99	70 - 130
A983173	Total Sodium (Na)	2023/06/05	115	75 - 125	104	75 - 125	<100	mg/kg			90	70 - 130
A983173	Total Strontium (Sr)	2023/06/05	104	75 - 125	102	75 - 125	<0.10	mg/kg	2.6	40	108	70 - 130
A983173	Total Thallium (Tl)	2023/06/05	89	75 - 125	92	75 - 125	<0.050	mg/kg	3.7	30	84	70 - 130
A983173	Total Tin (Sn)	2023/06/05	99	75 - 125	101	75 - 125	<0.10	mg/kg	0.95	40	105	70 - 130
A983173	Total Titanium (Ti)	2023/06/05	NC	75 - 125	101	75 - 125	<1.0	mg/kg				
A983173	Total Tungsten (W)	2023/06/05	83	75 - 125	105	75 - 125	<0.50	mg/kg	NC	40		
A983173	Total Uranium (U)	2023/06/05	98	75 - 125	99	75 - 125	<0.050	mg/kg	2.9	30	92	70 - 130
A983173	Total Vanadium (V)	2023/06/05	98	75 - 125	103	75 - 125	<1.0	mg/kg	4.1	30	105	70 - 130
A983173	Total Zinc (Zn)	2023/06/05	93	75 - 125	101	75 - 125	<1.0	mg/kg	2.7	30	108	70 - 130
A983173	Total Zirconium (Zr)	2023/06/05	111	75 - 125	101	75 - 125	<0.50	mg/kg				
A983179	Soluble (2:1) pH	2023/06/05			100	97 - 103			0.16	N/A		
A983245	Saturation %	2023/06/05					0	%	0.018	30	100	75 - 125
A983854	Soluble Sodium (Na)	2023/06/05	101	80 - 120	98	80 - 120	<5.0	mg/L	1.5	40	113	75 - 125

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A983860	Soluble Chloride (Cl)	2023/06/05	106	75 - 125	99	80 - 120	<10	mg/L	NC	30	99	75 - 125

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(2) Method Blank exceeds acceptance limits. Sample values are >10x the concentration of the method blank and the contamination is considered irrelevant.

(3) Method Blank exceeds acceptance limits for Ba. Sample values for Ba are >10x the concentration of the method blank and the contamination is considered irrelevant.

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BUREAU VERITAS

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4606 Canada Way, Burnaby, British Columbia Canada V5G 1K5 Tel:(604) 734 7276 Toll-free:800-563-6266 Fax:(604) 731 2386 www.bvna.com

C337966_COC

INVOICE TO:		Report Information		Project Information	
Company Name	#11313 SNC-LAVALIN INC.	Company Name		Quotation #	C21898
Contact Name	Edna Wong	Contact Name	Edna Wong	P.O. #	694890
Address	1300-3777 Kingsway Avenue	Address		Project #	WHATCOM RD
	BURNABY BC V5H 3Z7			Project Name	
Phone	(604) 515-5151 Fax: (604) 515-5150	Phone	Fax	Site #	
Email	edna.wong@snclavalin.com; envwestbclabdata@sncla	Email	edna.wong@snclavalin.com; envwestbclabdata@snclav	Sampled By	NI

Lab Use Only

Bottle Order #: 695069

Chain Of Custody Record: C#695069-20-01

Project Manager: Debbie Nordbrugot

Regulatory Criteria:
- [ ] CSR
- [ ] CCME
- [ ] BC Water Quality
- [ ] Other ____________

Special Instructions

ANALYSIS REQUESTED (PLEASE BE SPECIFIC): Metals Field Filtered ? (Y/N); Salinity; Metals; HOLD

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT:
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
1 DAY [ ] 2 Day [ ] 3 Day [ ] Date Required: ________ [ ]
Rush Confirmation Number: ____________ (call lab for #)

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Metals Field Filtered ? (Y/N)	Salinity	Metals	HOLD	# of Bottles	Comments
1		SS23-35	23/05/28	9:25	Soil		X	X	X	1	
2		SS23-36	↓	9:39	↓		↓	↓	↓	↓	
3		SS23-37	↓	9:50	↓		↓	↓	↓	↓	
4		SS23-04	↓	10:18	↓		↓	↓	↓	↓	
5		SS23-05	↓	10:30	↓		↓	↓	↓	↓	
6		SS23-06	↓	10:44	↓		↓	↓	↓	↓	
7		SS23-07	↓	10:55	↓		↓	↓	↓	↓	
8		SS23-08	↓	11:08	↓		↓	↓	↓	↓	
9		SS23-09	↓	11:19	↓		↓	↓	↓	↓	
10		SS23-10	↓	11:30	↓		↓	↓	↓	↓	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Nicole Wong	23/05/28	5:20	Cadelane Cacili	2023/05/29	0800	

Lab Use Only: Time Sensitive [ ] | Temperature (°C) on Receipt: 17,10,17 14,17,17 | Custody Seal Intact on Cooler? [X] Yes [ ] No

No ice

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Bureau Veritas Yellow: Client

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C337966_COC

Only

Bottle Order #: 695069

Chain Of Custody Record: C#695069-01-01

Project Manager: Debbie Nordbruget

INVOICE TO:		Report Information		Project Information	
Company Name	#11313 SNC-LAVALIN INC.	Company Name		Quotation #	C21898
Contact Name	Edna Wong	Contact Name	Edna Wong	P.O. #	694890
Address	1300-3777 Kingsway Avenue BURNABY BC V5H 3Z7	Address		Project #	WHATCOM RD
Phone	(604) 515-5151 Fax: (604) 515-5150	Phone	Fax:	Project Name	
				Site #	
Email	edna.wong@snclavalin.com; envwestbclabdata@sncla	Email	edna.wong@snclavalin.com; envwestbclabdata@snclav	Sampled By	NL

Regulatory Criteria:

- ☐ CSR
- ☐ CCME
- ☐ BC Water Quality
- ☐ Other ______

Special Instructions:

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: ☐
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
1 DAY ☐ 2 Day ☐ 3 Day ☐ Date Required: ______ ☐
Rush Confirmation Number: ______ *(call lab for #)*

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Metals Field Filtered ? (Y / N)	Metals	Salinity								HOLD	# of Bottles	Comments
1		SS23-11	23/05/28	11:40	Soil											X		
2		" " 12	↓	11:50	↓											↓		
3		" " 13	↓	12:00	↓											↓		
4		" " 14	↓	12:20	↓											↓		
5		" " 15	↓	12:48	↓											↓		
6		" " 16	↓	12:59	↓											↓		
7		" " 17	↓	1:08	↓											↓		
8		" " 18	↓	1:17	↓											↓		
9		" " 19	↓	1:36	↓											↓		
10		" " 20	↓	1:40	↓											↓		

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Nicole Watt	23/05/28	5:20	Eileane Choi	2023/05/29	0800	

Lab Use Only		
Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
☐	17,16,17 14,17,17	☒ Yes ☐ No

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White: Bureau Veritas Yellow: Client

No ice

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Page 3 of 4

C337966_COC

Only

INVOICE TO:		Report Information		Project Information	
Company Name	#11313 SNC-LAVALIN INC.	Company Name		Quotation #	C21896
Contact Name	Edna Wong	Contact Name	Edna Wong	P.O. #	694890
Address	1300-3777 Kingsway Avenue	Address		Project #	WHATCOM RD
	BURNABY BC V5H 3Z7			Project Name	
Phone	(604) 515-5151 Fax: (604) 515-5150	Phone	Fax:	Site #	
Email	edna.wong@snclavalin.com; envwestbclabdata@sncla	Email	edna.wong@snclavalin.com; envwestbclabdata@snclav	Sampled By	NL

Bottle Order #: 695069

Chain Of Custody Record: C#695069-02-01

Project Manager: Debbie Nordbruget

Regulatory Criteria:
- [ ] CSR
- [ ] CCME
- [ ] BC Water Quality
- [ ] Other ________

Special Instructions

Metals Field Filtered ? (Y / N)

ANALYSIS REQUESTED (PLEASE BE SPECIFIC): HOLD

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT:
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
1 DAY [ ] 2 Day [ ] 3 Day [ ] Date Required: ________
Rush Confirmation Number: ________ (call lab for #)

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	HOLD	# of Bottles	Comments
1		SS23-21	23/05/28	1:49	Soil	X		
2		" -22	↓	1:44	↓	↓		
3		" -23		1:53				
4		" -24		2:01				
5		" -25		2:10				
6		" -26		2:19				
7		" -27		2:26				
8		" -28		2:36				
9		" -29		2:40				
10		" -30	↓	2:48	↓	↓		

RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Nicole Walters	23/05/28	5:20	Edelene Cacili	2023/05/29	0800	

Lab Use Only
Time Sensitive [ ] | Temperature (°C) on Receipt: 17, 16, 17 14, 17, 17 | Custody Seal Intact on Cooler? [X] Yes [ ] No

No ice

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.
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C337966_COC

Lab Only — Bottle Order #: 695069

INVOICE TO:		Report Information		Project Information	
Company Name	#11313 SNC-LAVALIN INC.	Company Name		Quotation #	C21898
Contact Name	Edna Wong	Contact Name	Edna Wong	P.O. #	694890
Address	1300-3777 Kingsway Avenue BURNABY BC V5H 3Z7	Address		Project #	WHATCOM RD
Phone	(604) 515-5151 Fax (604) 515-5150	Phone	Fax:	Project Name	
Email	edna.wong@snclavalin.com; envwestbclabdata@sncla	Email	edna.wong@snclavalin.com; envwestbclabdata@snclav	Site #	
				Sampled By	

Chain Of Custody Record: C#695069-03-01 — Project Manager: Debbie Nordbruget

Regulatory Criteria: ☐ CSR ☐ CCME ☐ BC Water Quality ☐ Other _____

Special Instructions

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Metals Field Filtered ? (Y/N)	Metals	Salinity	HOLD	# of Bottles	Comments
1		SS23-31	23/05/28	2:58	Soil				X		
2		" " 32	↓	3:05	↓				↓		
3		" " 33		3:12							
4		" " 34	↓	3:22	↓				↓		
5											
6											
7											
8											
9											
10											

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: ☐
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
1 DAY ☐ 2 Day ☐ 3 Day ☐ Date Required: _____ ☐
Rush Confirmation Number: _____ (call lab for #)

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Nicole Ludzki	23/05/08	5:20	Fabiane Casili	23/05/29	09:00		☐	17.16.17 14.17.17	☒ Yes ☐ No

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* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Bureau Veritas Yellow: Client

No ice

Your P.O. #: 694890
Your Project #: WHATCOM RD

Attention: Edna Wong

SNC-LAVALIN INC.
BURNABY, ENVIRONMENT DIVISION
1300-3777 Kingsway Avenue
BURNABY, BC
CANADA V5H 3Z7

Your C.O.C. #: C#695069-18-01, \, C#695069-19-01, C#695069-17-01, C#695069-16-01, C#695069-15-01

Report Date: 2023/06/07
Report #: R3345900
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C338618
Received: 2023/05/30, 08:00

Sample Matrix: Soil
Samples Received: 38

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Chloride (soluble)	2	2023/06/01	2023/06/06	BBY6SOP-00011	SM 23 4500-Cl- E m
Chloride (soluble)	35	2023/06/06	2023/06/06	BBY6SOP-00011	SM 23 4500-Cl- E m
Chloride (soluble)	1	2023/06/06	2023/06/07	BBY6SOP-00011	SM 23 4500-Cl- E m
Soluble Chloride Ion Calc. (mg/kg)	37	N/A	2023/06/06	BBY WI-00033	Auto Calc
Soluble Chloride Ion Calc. (mg/kg)	1	N/A	2023/06/07	BBY WI-00033	Auto Calc
Elements by ICPMS (total) (1)	28	2023/06/05	2023/06/05	BBY7SOP-00004 / BBY7SOP-00001	EPA 6020b R2 m
Elements by ICPMS (total) (1)	10	2023/06/06	2023/06/06	BBY7SOP-00004 / BBY7SOP-00001	EPA 6020b R2 m
Soluble Sodium Ion Calc. (mg/kg)	3	N/A	2023/06/06	BBY WI-00033	Auto Calc
Soluble Sodium Ion Calc. (mg/kg)	35	N/A	2023/06/07	BBY WI-00033	Auto Calc
pH (2:1 DI Water Extract)	28	2023/06/05	2023/06/06	BBY6SOP-00028	BCMOE BCLM Mar2005 m
pH (2:1 DI Water Extract)	10	2023/06/06	2023/06/06	BBY6SOP-00028	BCMOE BCLM Mar2005 m
Saturated Paste	2	2023/06/01	2023/06/06	BBY6SOP-00030	BC Lab Manual 2015 m
Saturated Paste	35	2023/06/06	2023/06/06	BBY6SOP-00030	BC Lab Manual 2015 m
Saturated Paste	1	2023/06/06	2023/06/07	BBY6SOP-00030	BC Lab Manual 2015 m
Soluble Cations (Ca,K,Mg,Na,S)	37	N/A	2023/06/06	BBY7SOP-00018 / BBY7SOP-00030 / BCLM Nov 2015	EPA 6010d m
Soluble Cations (Ca,K,Mg,Na,S)	1	N/A	2023/06/07	BBY7SOP-00018 / BBY7SOP-00030 / BCLM Nov 2015	EPA 6010d m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in

Your P.O. #: 694890
Your Project #: WHATCOM RD

Attention: Edna Wong

SNC-LAVALIN INC.
BURNABY, ENVIRONMENT DIVISION
1300-3777 Kingsway Avenue
BURNABY, BC
CANADA V5H 3Z7

Your C.O.C. #: C#695069-18-01, \, C#695069-19-01, C#695069-17-01, C#695069-16-01, C#695069-15-01

Report Date: 2023/06/07
Report #: R3345900
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C338618
Received: 2023/05/30, 08:00

writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) The sample is prepaired per the BC MOE Lab Manual "Strong Acid Leachable Metals (SALM) in Soil - Prescriptive", Revision Nov 6, 2015.

Encryption Key

Bureau Veritas
07 Jun 2023 17:04:55

Please direct all questions regarding this Certificate of Analysis to:
Debbie Nordbruget, Key Account Specialist
Email: Debra.NORDBRUGET@bureauveritas.com
Phone# (250)385-6112

==========

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Raphael Kwan, Senior Manager, BC and Yukon Regions responsible for British Columbia Environmental laboratory operations.

Bureau Veritas Job #: C338618
Report Date: 2023/06/07

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ370	BRJ371	BRJ372	BRJ373	BRJ374		
Sampling Date		2023/05/29 21:29	2023/05/29 21:36	2023/05/29 21:45	2023/05/29 21:52	2023/05/29 22:03		
COC Number		\	C#695069-18-01	C#695069-18-01	C#695069-18-01	C#695069-18-01		
	UNITS	**SS23-38**	**SS23-39**	**SS23-40**	**SS23-41**	**SS23-42**	**RDL**	**QC Batch**
Physical Properties								
Soluble (2:1) pH	pH	5.99	6.71	6.12	6.73	7.03	N/A	A983729
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	16000	19100	16800	14400	22200	100	A983721
Total Antimony (Sb)	mg/kg	0.52	0.61	0.51	0.47	0.56	0.10	A983721
Total Arsenic (As)	mg/kg	6.06	5.45	5.23	4.22	4.65	0.20	A983721
Total Barium (Ba)	mg/kg	88.7	96.7	93.5	70.7	70.4	0.10	A983721
Total Beryllium (Be)	mg/kg	0.25	0.26	0.21	<0.20	0.31	0.20	A983721
Total Bismuth (Bi)	mg/kg	<0.10	0.15	<0.10	<0.10	0.10	0.10	A983721
Total Boron (B)	mg/kg	2.6	2.8	2.1	1.9	3.5	1.0	A983721
Total Cadmium (Cd)	mg/kg	0.285	0.291	0.258	0.176	0.283	0.050	A983721
Total Calcium (Ca)	mg/kg	3860	4200	3600	3210	8280	100	A983721
Total Chromium (Cr)	mg/kg	38.0	39.9	39.9	33.5	42.8	0.50	A983721
Total Cobalt (Co)	mg/kg	9.68	10.3	9.60	8.06	12.8	0.10	A983721
Total Copper (Cu)	mg/kg	36.8	50.5	39.8	36.1	59.1	0.50	A983721
Total Iron (Fe)	mg/kg	24100	25600	22600	20300	30500	100	A983721
Total Lead (Pb)	mg/kg	69.0	39.4	74.3	71.6	46.0	0.10	A983721
Total Lithium (Li)	mg/kg	8.53	9.33	8.16	6.90	7.74	0.50	A983721
Total Magnesium (Mg)	mg/kg	5630	6230	5810	5290	8510	100	A983721
Total Manganese (Mn)	mg/kg	466	552	498	401	574	0.20	A983721
Total Mercury (Hg)	mg/kg	0.076	0.059	<0.050	<0.050	<0.050	0.050	A983721
Total Molybdenum (Mo)	mg/kg	0.79	0.89	0.80	0.73	1.14	0.10	A983721
Total Nickel (Ni)	mg/kg	32.8	33.9	31.8	27.6	30.8	0.50	A983721
Total Phosphorus (P)	mg/kg	821	747	695	566	769	10	A983721
Total Potassium (K)	mg/kg	554	548	721	404	726	100	A983721
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	A983721
Total Silver (Ag)	mg/kg	0.085	0.155	0.069	<0.050	0.076	0.050	A983721
Total Sodium (Na)	mg/kg	192	208	162	212	312	100	A983721
Total Strontium (Sr)	mg/kg	21.7	19.4	24.0	16.1	37.1	0.10	A983721
Total Thallium (Tl)	mg/kg	0.069	0.071	0.068	<0.050	<0.050	0.050	A983721
Total Tin (Sn)	mg/kg	0.58	0.73	0.67	0.47	0.80	0.10	A983721
Total Titanium (Ti)	mg/kg	867	894	778	730	1020	1.0	A983721

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C338618
Report Date: 2023/06/07

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ370	BRJ371	BRJ372	BRJ373	BRJ374		
Sampling Date		2023/05/29 21:29	2023/05/29 21:36	2023/05/29 21:45	2023/05/29 21:52	2023/05/29 22:03		
COC Number		\	C#695069-18-01	C#695069-18-01	C#695069-18-01	C#695069-18-01		
	UNITS	**SS23-38**	**SS23-39**	**SS23-40**	**SS23-41**	**SS23-42**	**RDL**	**QC Batch**
Total Tungsten (W)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	A983721
Total Uranium (U)	mg/kg	0.494	0.403	0.343	0.294	0.261	0.050	A983721
Total Vanadium (V)	mg/kg	58.4	56.5	52.4	53.0	66.2	1.0	A983721
Total Zinc (Zn)	mg/kg	88.3	90.0	81.5	66.5	114	1.0	A983721
Total Zirconium (Zr)	mg/kg	1.11	1.20	1.21	0.90	0.87	0.50	A983721
RDL = Reportable Detection Limit								

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Bureau Veritas Job #: C338618
Report Date: 2023/06/07

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ375	BRJ376	BRJ377	BRJ378	BRJ379		
Sampling Date		2023/05/29 22:12	2023/05/29 22:22	2023/05/29 22:32	2023/05/29 22:40	2023/05/29 22:52		
COC Number		C#695069-18-01	C#695069-18-01	C#695069-18-01	C#695069-18-01	C#695069-18-01		
	UNITS	**SS23-43**	**SS23-44**	**SS23-45**	**SS23-46**	**SS23-47**	**RDL**	**QC Batch**
Physical Properties								
Soluble (2:1) pH	pH	7.10	4.92	6.16	5.70	5.66	N/A	A983729
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	21800	13800	13800	25300	26200	100	A983721
Total Antimony (Sb)	mg/kg	0.67	0.56	0.65	0.47	0.51	0.10	A983721
Total Arsenic (As)	mg/kg	4.49	5.58	6.27	6.22	6.36	0.20	A983721
Total Barium (Ba)	mg/kg	70.7	42.1	63.6	78.7	86.8	0.10	A983721
Total Beryllium (Be)	mg/kg	0.29	<0.20	<0.20	0.34	0.34	0.20	A983721
Total Bismuth (Bi)	mg/kg	0.10	<0.10	0.15	0.11	0.13	0.10	A983721
Total Boron (B)	mg/kg	2.7	2.2	2.3	1.4	1.8	1.0	A983721
Total Cadmium (Cd)	mg/kg	0.247	0.154	0.255	0.195	0.227	0.050	A983721
Total Calcium (Ca)	mg/kg	7250	3160	3370	1510	1840	100	A983721
Total Chromium (Cr)	mg/kg	36.0	29.2	31.4	40.6	43.6	0.50	A983721
Total Cobalt (Co)	mg/kg	12.0	6.77	8.23	9.88	10.2	0.10	A983721
Total Copper (Cu)	mg/kg	58.4	78.6	74.2	43.6	51.0	0.50	A983721
Total Iron (Fe)	mg/kg	29600	19900	20800	26900	28800	100	A983721
Total Lead (Pb)	mg/kg	43.4	175	115	63.0	73.1	0.10	A983721
Total Lithium (Li)	mg/kg	7.50	8.83	8.22	10.4	11.4	0.50	A983721
Total Magnesium (Mg)	mg/kg	7510	5960	6310	3470	3720	100	A983721
Total Manganese (Mn)	mg/kg	561	285	339	565	555	0.20	A983721
Total Mercury (Hg)	mg/kg	<0.050	0.057	<0.050	0.094	0.097	0.050	A983721
Total Molybdenum (Mo)	mg/kg	0.95	1.00	0.98	1.00	1.09	0.10	A983721
Total Nickel (Ni)	mg/kg	28.9	24.4	31.9	28.1	29.9	0.50	A983721
Total Phosphorus (P)	mg/kg	747	585	550	566	637	10	A983721
Total Potassium (K)	mg/kg	668	527	436	390	453	100	A983721
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	A983721
Total Silver (Ag)	mg/kg	0.095	<0.050	0.054	0.108	0.120	0.050	A983721
Total Sodium (Na)	mg/kg	273	161	206	<100	102	100	A983721
Total Strontium (Sr)	mg/kg	31.3	13.8	17.5	11.6	13.3	0.10	A983721
Total Thallium (Tl)	mg/kg	<0.050	<0.050	<0.050	0.083	0.090	0.050	A983721
Total Tin (Sn)	mg/kg	0.70	0.73	0.81	0.68	0.73	0.10	A983721
Total Titanium (Ti)	mg/kg	950	829	748	960	1080	1.0	A983721

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C338618
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Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ375	BRJ376	BRJ377	BRJ378	BRJ379		
Sampling Date		2023/05/29 22:12	2023/05/29 22:22	2023/05/29 22:32	2023/05/29 22:40	2023/05/29 22:52		
COC Number		C#695069-18-01	C#695069-18-01	C#695069-18-01	C#695069-18-01	C#695069-18-01		
	UNITS	**SS23-43**	**SS23-44**	**SS23-45**	**SS23-46**	**SS23-47**	**RDL**	**QC Batch**
Total Tungsten (W)	mg/kg	<0.50	0.67	<0.50	<0.50	<0.50	0.50	A983721
Total Uranium (U)	mg/kg	0.304	0.381	0.357	0.504	0.557	0.050	A983721
Total Vanadium (V)	mg/kg	62.8	48.6	52.3	63.5	68.4	1.0	A983721
Total Zinc (Zn)	mg/kg	84.8	55.8	77.9	67.1	75.8	1.0	A983721
Total Zirconium (Zr)	mg/kg	1.16	0.83	0.52	3.02	2.72	0.50	A983721
RDL = Reportable Detection Limit								

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ385	BRJ386	BRJ387			BRJ387	
Sampling Date		2023/05/29 22:55	2023/05/29 22:59	2023/05/29 23:06			2023/05/29 23:06	
COC Number		C#695069-19-01	C#695069-19-01	C#695069-19-01			C#695069-19-01	
	UNITS	SS23-48	SS23-49	SS23-50	RDL	QC Batch	SS23-50 Lab-Dup	QC Batch
Physical Properties								
Soluble (2:1) pH	pH	6.54	7.25	6.30	N/A	A983739	6.29	A983739
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	25000	19900	15600	100	A983733		
Total Antimony (Sb)	mg/kg	0.38	0.66	0.27	0.10	A983733		
Total Arsenic (As)	mg/kg	6.32	6.04	4.86	0.20	A983733		
Total Barium (Ba)	mg/kg	89.1	68.3	48.1	0.10	A983733		
Total Beryllium (Be)	mg/kg	0.38	0.23	<0.20	0.20	A983733		
Total Bismuth (Bi)	mg/kg	0.11	<0.10	<0.10	0.10	A983733		
Total Boron (B)	mg/kg	2.4	2.4	1.9	1.0	A983733		
Total Cadmium (Cd)	mg/kg	0.126	0.197	0.123	0.050	A983733		
Total Calcium (Ca)	mg/kg	2180	2770	2330	100	A983733		
Total Chromium (Cr)	mg/kg	42.6	32.9	27.9	0.50	A983733		
Total Cobalt (Co)	mg/kg	11.3	9.62	7.56	0.10	A983733		
Total Copper (Cu)	mg/kg	25.9	62.9	27.7	0.50	A983733		
Total Iron (Fe)	mg/kg	28500	25600	21200	100	A983733		
Total Lead (Pb)	mg/kg	18.4	14.8	14.4	0.10	A983733		
Total Lithium (Li)	mg/kg	11.7	9.73	6.39	0.50	A983733		
Total Magnesium (Mg)	mg/kg	5120	5710	4800	100	A983733		
Total Manganese (Mn)	mg/kg	518	413	248	0.20	A983733		
Total Mercury (Hg)	mg/kg	0.088	0.055	<0.050	0.050	A983733		
Total Molybdenum (Mo)	mg/kg	0.66	0.76	0.43	0.10	A983733		
Total Nickel (Ni)	mg/kg	32.2	25.2	24.0	0.50	A983733		
Total Phosphorus (P)	mg/kg	897	668	477	10	A983733		
Total Potassium (K)	mg/kg	475	483	424	100	A983733		
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	0.50	A983733		
Total Silver (Ag)	mg/kg	0.088	0.112	<0.050	0.050	A983733		
Total Sodium (Na)	mg/kg	175	256	133	100	A983733		
Total Strontium (Sr)	mg/kg	14.8	15.4	14.4	0.10	A983733		
Total Thallium (Tl)	mg/kg	0.089	0.055	<0.050	0.050	A983733		
Total Tin (Sn)	mg/kg	0.52	0.72	0.23	0.10	A983733		

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

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Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ385	BRJ386	BRJ387			BRJ387	
Sampling Date		2023/05/29 22:55	2023/05/29 22:59	2023/05/29 23:06			2023/05/29 23:06	
COC Number		C#695069-19-01	C#695069-19-01	C#695069-19-01			C#695069-19-01	
	UNITS	**SS23-48**	**SS23-49**	**SS23-50**	**RDL**	**QC Batch**	**SS23-50 Lab-Dup**	**QC Batch**
Total Titanium (Ti)	mg/kg	1040	830	739	1.0	A983733		
Total Tungsten (W)	mg/kg	<0.50	<0.50	<0.50	0.50	A983733		
Total Uranium (U)	mg/kg	0.638	0.404	0.318	0.050	A983733		
Total Vanadium (V)	mg/kg	69.7	60.1	59.9	1.0	A983733		
Total Zinc (Zn)	mg/kg	67.9	82.2	41.4	1.0	A983733		
Total Zirconium (Zr)	mg/kg	3.23	1.53	1.10	0.50	A983733		

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C338618
Report Date: 2023/06/07

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ388	BRJ389	BRJ390	BRJ391	BRJ392		
Sampling Date		2023/05/29 23:19	2023/05/29 23:29	2023/05/29 23:33	2023/05/29 23:48	2023/05/29 23:59		
COC Number		C#695069-19-01	C#695069-19-01	C#695069-19-01	C#695069-19-01	C#695069-19-01		
	UNITS	SS23-51	SS23-52	SS23-53	SS23-54	SS23-55	RDL	QC Batch
Physical Properties								
Soluble (2:1) pH	pH	7.50	6.55	7.32	6.81	5.98	N/A	A983739
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	11800	19800	13200	13400	28100	100	A983733
Total Antimony (Sb)	mg/kg	2.61	0.66	2.41	1.05	0.33	0.10	A983733
Total Arsenic (As)	mg/kg	6.31	8.31	6.45	7.04	5.46	0.20	A983733
Total Barium (Ba)	mg/kg	124	72.1	150	76.5	108	0.10	A983733
Total Beryllium (Be)	mg/kg	<0.20	0.23	<0.20	<0.20	0.35	0.20	A983733
Total Bismuth (Bi)	mg/kg	0.18	<0.10	0.15	0.20	<0.10	0.10	A983733
Total Boron (B)	mg/kg	4.4	2.0	4.1	2.7	2.1	1.0	A983733
Total Cadmium (Cd)	mg/kg	0.899	0.295	0.804	0.489	0.243	0.050	A983733
Total Calcium (Ca)	mg/kg	6520	3110	6090	4860	2460 (1)	100	A983733
Total Chromium (Cr)	mg/kg	51.0	28.3	51.2	38.6	38.9	0.50	A983733
Total Cobalt (Co)	mg/kg	10.0	9.97	9.99	8.95	11.3	0.10	A983733
Total Copper (Cu)	mg/kg	211	95.8	248	164	27.1	0.50	A983733
Total Iron (Fe)	mg/kg	28400	25600	31000	28400	28200	100	A983733
Total Lead (Pb)	mg/kg	153	117	122	2020	29.4	0.10	A983733
Total Lithium (Li)	mg/kg	9.58	9.55	10.0	8.64	10.9	0.50	A983733
Total Magnesium (Mg)	mg/kg	6460	6370	7050	6390	6460	100	A983733
Total Manganese (Mn)	mg/kg	438	441	506	475	448	0.20	A983733
Total Mercury (Hg)	mg/kg	<0.050	0.053	<0.050	<0.050	0.058	0.050	A983733
Total Molybdenum (Mo)	mg/kg	3.32	1.29	3.00	2.46	0.57	0.10	A983733
Total Nickel (Ni)	mg/kg	30.2	23.0	31.2	27.5	33.4	0.50	A983733
Total Phosphorus (P)	mg/kg	679	690	682	744	564	10	A983733
Total Potassium (K)	mg/kg	823	628	670	689	711	100	A983733
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	A983733
Total Silver (Ag)	mg/kg	0.141	0.076	0.157	0.109	0.103	0.050	A983733
Total Sodium (Na)	mg/kg	454	259	494	340	259	100	A983733
Total Strontium (Sr)	mg/kg	30.5	17.9	34.4	24.3	17.6	0.10	A983733
Total Thallium (Tl)	mg/kg	0.066	0.057	0.051	0.053	0.071	0.050	A983733
Total Tin (Sn)	mg/kg	3.55	0.89	3.53	2.15	0.59	0.10	A983733

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Matrix Spike outside acceptance criteria due to sample matrix interference.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C338618
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Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ388	BRJ389	BRJ390	BRJ391	BRJ392		
Sampling Date		2023/05/29 23:19	2023/05/29 23:29	2023/05/29 23:33	2023/05/29 23:48	2023/05/29 23:59		
COC Number		C#695069-19-01	C#695069-19-01	C#695069-19-01	C#695069-19-01	C#695069-19-01		
	UNITS	**SS23-51**	**SS23-52**	**SS23-53**	**SS23-54**	**SS23-55**	**RDL**	**QC Batch**
Total Titanium (Ti)	mg/kg	765	913	788	781	1070	1.0	A983733
Total Tungsten (W)	mg/kg	2.65	0.70	1.43	1.34	<0.50	0.50	A983733
Total Uranium (U)	mg/kg	0.350	0.380	0.352	0.338	0.382	0.050	A983733
Total Vanadium (V)	mg/kg	52.6	62.5	51.0	54.1	70.4	1.0	A983733
Total Zinc (Zn)	mg/kg	249	104	282	214	74.9	1.0	A983733
Total Zirconium (Zr)	mg/kg	0.61	0.94	0.59	0.52	2.15	0.50	A983733
RDL = Reportable Detection Limit								

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ392			BRJ393	BRJ394	BRJ399		
Sampling Date		2023/05/29 23:59			2023/05/30 00:29	2023/05/30 00:39	2023/05/30 00:52		
COC Number		C#695069-19-01			C#695069-19-01	C#695069-19-01	C#695069-17-01		
	UNITS	SS23-55 Lab-Dup	RDL	QC Batch	SS23-56	SS23-57	SS23-60	RDL	QC Batch
Physical Properties									
Soluble (2:1) pH	pH				6.50	6.69	6.40	N/A	A983739
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	28000	100	A983733	20900	20300	17200	100	A983733
Total Antimony (Sb)	mg/kg	0.34	0.10	A983733	0.56	0.54	0.39	0.10	A983733
Total Arsenic (As)	mg/kg	5.48	0.20	A983733	7.13	7.00	6.34	0.20	A983733
Total Barium (Ba)	mg/kg	108	0.10	A983733	125	118	95.8	0.10	A983733
Total Beryllium (Be)	mg/kg	0.34	0.20	A983733	0.26	0.29	0.22	0.20	A983733
Total Bismuth (Bi)	mg/kg	<0.10	0.10	A983733	0.11	<0.10	<0.10	0.10	A983733
Total Boron (B)	mg/kg	2.2	1.0	A983733	4.4	4.1	2.7	1.0	A983733
Total Cadmium (Cd)	mg/kg	0.233	0.050	A983733	0.251	0.245	0.172	0.050	A983733
Total Calcium (Ca)	mg/kg	2450	100	A983733	7780	7610	6210	100	A983733
Total Chromium (Cr)	mg/kg	39.3	0.50	A983733	44.5	43.0	39.3	0.50	A983733
Total Cobalt (Co)	mg/kg	11.4	0.10	A983733	16.2	14.5	11.4	0.10	A983733
Total Copper (Cu)	mg/kg	27.0	0.50	A983733	47.5	56.5	35.2	0.50	A983733
Total Iron (Fe)	mg/kg	28500	100	A983733	33600	32800	27400	100	A983733
Total Lead (Pb)	mg/kg	22.7	0.10	A983733	6.87	6.46	15.1	0.10	A983733
Total Lithium (Li)	mg/kg	10.9	0.50	A983733	12.9	12.6	9.39	0.50	A983733
Total Magnesium (Mg)	mg/kg	6510	100	A983733	10400	10000	7530	100	A983733
Total Manganese (Mn)	mg/kg	453	0.20	A983733	710	587	459	0.20	A983733
Total Mercury (Hg)	mg/kg	0.056	0.050	A983733	0.083	0.060	<0.050	0.050	A983733
Total Molybdenum (Mo)	mg/kg	0.54	0.10	A983733	0.54	0.71	0.54	0.10	A983733
Total Nickel (Ni)	mg/kg	33.2	0.50	A983733	42.2	40.5	32.5	0.50	A983733
Total Phosphorus (P)	mg/kg	591	10	A983733	734	693	692	10	A983733
Total Potassium (K)	mg/kg	708	100	A983733	1960	1830	1300	100	A983733
Total Selenium (Se)	mg/kg	<0.50	0.50	A983733	<0.50	<0.50	<0.50	0.50	A983733
Total Silver (Ag)	mg/kg	0.100	0.050	A983733	0.078	0.086	0.052	0.050	A983733
Total Sodium (Na)	mg/kg	260	100	A983733	632	567	368	100	A983733
Total Strontium (Sr)	mg/kg	17.8	0.10	A983733	61.4	52.0	42.7	0.10	A983733
Total Thallium (Tl)	mg/kg	0.069	0.050	A983733	0.100	0.095	0.080	0.050	A983733
Total Tin (Sn)	mg/kg	0.61	0.10	A983733	0.45	0.56	0.39	0.10	A983733

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C338618
Report Date: 2023/06/07

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ392			BRJ393	BRJ394	BRJ399		
Sampling Date		2023/05/29 23:59			2023/05/30 00:29	2023/05/30 00:39	2023/05/30 00:52		
COC Number		C#695069-19-01			C#695069-19-01	C#695069-19-01	C#695069-17-01		
	UNITS	SS23-55 Lab-Dup	RDL	QC Batch	SS23-56	SS23-57	SS23-60	RDL	QC Batch
Total Titanium (Ti)	mg/kg	1070	1.0	A983733	1260	1250	1050	1.0	A983733
Total Tungsten (W)	mg/kg	<0.50	0.50	A983733	<0.50	<0.50	<0.50	0.50	A983733
Total Uranium (U)	mg/kg	0.381	0.050	A983733	0.423	0.486	0.399	0.050	A983733
Total Vanadium (V)	mg/kg	70.0	1.0	A983733	79.0	77.9	68.0	1.0	A983733
Total Zinc (Zn)	mg/kg	74.3	1.0	A983733	93.7	89.1	67.6	1.0	A983733
Total Zirconium (Zr)	mg/kg	2.14	0.50	A983733	6.11	5.84	3.09	0.50	A983733

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ400		BRJ402	BRJ403	BRJ404		
Sampling Date		2023/05/30 01:05		2023/05/30 01:28	2023/05/30 01:44	2023/05/30 01:53		
COC Number		C#695069-17-01		C#695069-17-01	C#695069-17-01	C#695069-17-01		
	UNITS	SS23-61	QC Batch	SS23-63	SS23-64	SS23-65	RDL	QC Batch
Physical Properties								
Soluble (2:1) pH	pH	6.39	A983739	6.22	6.37	6.71	N/A	A984596
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	16900	A983733	30000	14800	18900	100	A984595
Total Antimony (Sb)	mg/kg	0.43	A983733	0.29	0.81	0.75	0.10	A984595
Total Arsenic (As)	mg/kg	4.99	A983733	4.73	5.44	6.56	0.20	A984595
Total Barium (Ba)	mg/kg	99.0	A983733	107	87.2	122	0.10	A984595
Total Beryllium (Be)	mg/kg	0.21	A983733	0.51	0.26	0.32	0.20	A984595
Total Bismuth (Bi)	mg/kg	<0.10	A983733	0.13	0.11	0.12	0.10	A984595
Total Boron (B)	mg/kg	3.5	A983733	2.1	3.6	3.6	1.0	A984595
Total Cadmium (Cd)	mg/kg	0.203	A983733	0.310	0.283	0.361	0.050	A984595
Total Calcium (Ca)	mg/kg	6850	A983733	2100	5340	7210	100	A984595
Total Chromium (Cr)	mg/kg	42.5	A983733	40.5	43.1	43.0	0.50	A984595
Total Cobalt (Co)	mg/kg	12.6	A983733	12.2	9.76	13.5	0.10	A984595
Total Copper (Cu)	mg/kg	38.6	A983733	17.8	91.8	93.9	0.50	A984595
Total Iron (Fe)	mg/kg	28100	A983733	33400	24400	30100	100	A984595
Total Lead (Pb)	mg/kg	4.90	A983733	8.99	77.2	43.9	0.10	A984595
Total Lithium (Li)	mg/kg	11.1	A983733	13.9	8.82	10.8	0.50	A984595
Total Magnesium (Mg)	mg/kg	10100	A983733	4620	6730	8850	100	A984595
Total Manganese (Mn)	mg/kg	476	A983733	818	426	572	0.20	A984595
Total Mercury (Hg)	mg/kg	<0.050	A983733	0.110	<0.050	<0.050	0.050	A984595
Total Molybdenum (Mo)	mg/kg	0.57	A983733	0.71	3.22	0.95	0.10	A984595
Total Nickel (Ni)	mg/kg	40.3	A983733	33.3	26.0	35.4	0.50	A984595
Total Phosphorus (P)	mg/kg	645	A983733	1520	660	840	10	A984595
Total Potassium (K)	mg/kg	1470	A983733	713	1080	1930	100	A984595
Total Selenium (Se)	mg/kg	<0.50	A983733	0.50	<0.50	<0.50	0.50	A984595
Total Silver (Ag)	mg/kg	0.077	A983733	0.210	0.112	0.118	0.050	A984595
Total Sodium (Na)	mg/kg	546	A983733	119	483	620	100	A984595
Total Strontium (Sr)	mg/kg	47.1	A983733	17.1	38.4	57.0	0.10	A984595
Total Thallium (Tl)	mg/kg	0.075	A983733	0.100	0.064	0.086	0.050	A984595
Total Tin (Sn)	mg/kg	0.41	A983733	0.57	1.19	0.79	0.10	A984595
Total Titanium (Ti)	mg/kg	1120	A983733	1100	778	1070	1.0	A984595

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ400		BRJ402	BRJ403	BRJ404		
Sampling Date		2023/05/30 01:05		2023/05/30 01:28	2023/05/30 01:44	2023/05/30 01:53		
COC Number		C#695069-17-01		C#695069-17-01	C#695069-17-01	C#695069-17-01		
	UNITS	**SS23-61**	**QC Batch**	**SS23-63**	**SS23-64**	**SS23-65**	**RDL**	**QC Batch**
Total Tungsten (W)	mg/kg	<0.50	A983733	<0.50	<0.50	<0.50	0.50	A984595
Total Uranium (U)	mg/kg	0.358	A983733	0.578	0.360	0.408	0.050	A984595
Total Vanadium (V)	mg/kg	68.2	A983733	66.7	59.0	70.8	1.0	A984595
Total Zinc (Zn)	mg/kg	71.6	A983733	101	118	111	1.0	A984595
Total Zirconium (Zr)	mg/kg	6.07	A983733	3.86	1.06	2.22	0.50	A984595
RDL = Reportable Detection Limit								

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ405	BRJ406	BRJ407		BRJ408		
Sampling Date		2023/05/30 02:07	2023/05/30 02:19	2023/05/30 02:33		2023/05/30 02:45		
COC Number		C#695069-17-01	C#695069-17-01	C#695069-16-01		C#695069-16-01		
	UNITS	SS23-66	SS23-67	SS23-68	QC Batch	SS23-69	RDL	QC Batch
Physical Properties								
Soluble (2:1) pH	pH	6.45	6.72	5.81	A983739	5.34	N/A	A984596
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	14700	13600	25800	A983733	27900	100	A984595
Total Antimony (Sb)	mg/kg	1.79	1.18	0.62	A983733	0.40	0.10	A984595
Total Arsenic (As)	mg/kg	7.95	6.78	7.31	A983733	3.91	0.20	A984595
Total Barium (Ba)	mg/kg	82.6	87.8	123	A983733	96.8	0.10	A984595
Total Beryllium (Be)	mg/kg	<0.20	<0.20	0.39	A983733	0.54	0.20	A984595
Total Bismuth (Bi)	mg/kg	0.12	0.15	0.11	A983733	0.12	0.10	A984595
Total Boron (B)	mg/kg	2.5	2.9	3.3	A983733	1.0	1.0	A984595
Total Cadmium (Cd)	mg/kg	0.524	0.666	0.189	A983733	0.191	0.050	A984595
Total Calcium (Ca)	mg/kg	3880	4630	5160	A983733	1260	100	A984595
Total Chromium (Cr)	mg/kg	42.5	42.2	53.7	A983733	37.2	0.50	A984595
Total Cobalt (Co)	mg/kg	10.0	9.75	15.0	A983733	6.01	0.10	A984595
Total Copper (Cu)	mg/kg	132	320	57.4	A983733	37.5	0.50	A984595
Total Iron (Fe)	mg/kg	27300	25600	33800	A983733	18900	100	A984595
Total Lead (Pb)	mg/kg	279	567	29.0	A983733	26.2	0.10	A984595
Total Lithium (Li)	mg/kg	9.65	9.29	14.3	A983733	10.4	0.50	A984595
Total Magnesium (Mg)	mg/kg	6320	6620	8960	A983733	2990	100	A984595
Total Manganese (Mn)	mg/kg	490	473	570	A983733	129	0.20	A984595
Total Mercury (Hg)	mg/kg	<0.050	0.051	0.060	A983733	0.058	0.050	A984595
Total Molybdenum (Mo)	mg/kg	2.01	3.01	0.81	A983733	1.10	0.10	A984595
Total Nickel (Ni)	mg/kg	32.5	25.2	45.6	A983733	23.2	0.50	A984595
Total Phosphorus (P)	mg/kg	675	753	589	A983733	1040	10	A984595
Total Potassium (K)	mg/kg	726	583	1530	A983733	444	100	A984595
Total Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	A983733	0.52	0.50	A984595
Total Silver (Ag)	mg/kg	0.103	0.262	0.072	A983733	0.112	0.050	A984595
Total Sodium (Na)	mg/kg	351	404	347	A983733	<100	100	A984595
Total Strontium (Sr)	mg/kg	20.4	24.6	40.3	A983733	11.2	0.10	A984595
Total Thallium (Tl)	mg/kg	0.055	0.060	0.090	A983733	0.084	0.050	A984595
Total Tin (Sn)	mg/kg	1.99	2.28	0.66	A983733	0.57	0.10	A984595
Total Titanium (Ti)	mg/kg	719	630	1280	A983733	782	1.0	A984595

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C338618
Report Date: 2023/06/07

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ405	BRJ406	BRJ407		BRJ408		
Sampling Date		2023/05/30 02:07	2023/05/30 02:19	2023/05/30 02:33		2023/05/30 02:45		
COC Number		C#695069-17-01	C#695069-17-01	C#695069-16-01		C#695069-16-01		
	UNITS	SS23-66	SS23-67	SS23-68	QC Batch	SS23-69	RDL	QC Batch
Total Tungsten (W)	mg/kg	0.97	1.33	<0.50	A983733	<0.50	0.50	A984595
Total Uranium (U)	mg/kg	0.347	0.311	0.468	A983733	0.669	0.050	A984595
Total Vanadium (V)	mg/kg	53.7	50.4	81.8	A983733	56.2	1.0	A984595
Total Zinc (Zn)	mg/kg	155	162	82.5	A983733	56.1	1.0	A984595
Total Zirconium (Zr)	mg/kg	0.74	0.50	2.54	A983733	1.91	0.50	A984595
RDL = Reportable Detection Limit								

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ409		BRJ410	BRJ411	BRJ412		
Sampling Date		2023/05/30 02:56		2023/05/30 03:00	2023/05/30 03:08	2023/05/30 03:19		
COC Number		C#695069-16-01		C#695069-16-01	C#695069-16-01	C#695069-16-01		
	UNITS	SS23-70	QC Batch	SS23-71	SS23-72	SS23-73	RDL	QC Batch
Physical Properties								
Soluble (2:1) pH	pH	5.50	A984596	5.61	6.50	5.32	N/A	A983739
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	26900	A984595	25300	28400	19100	100	A983733
Total Antimony (Sb)	mg/kg	0.57	A984595	0.53	0.65	0.48	0.10	A983733
Total Arsenic (As)	mg/kg	5.38	A984595	4.85	7.11	6.55	0.20	A983733
Total Barium (Ba)	mg/kg	120	A984595	107	127	79.5	0.10	A983733
Total Beryllium (Be)	mg/kg	0.44	A984595	0.32	0.33	0.27	0.20	A983733
Total Bismuth (Bi)	mg/kg	0.15	A984595	0.13	0.12	<0.10	0.10	A983733
Total Boron (B)	mg/kg	2.9	A984595	2.9	3.4	2.1	1.0	A983733
Total Cadmium (Cd)	mg/kg	0.361	A984595	0.315	0.279	0.167	0.050	A983733
Total Calcium (Ca)	mg/kg	3440	A984595	3080	4860	3620	100	A983733
Total Chromium (Cr)	mg/kg	45.2	A984595	41.7	49.1	43.4	0.50	A983733
Total Cobalt (Co)	mg/kg	11.2	A984595	10.4	12.3	12.9	0.10	A983733
Total Copper (Cu)	mg/kg	72.9	A984595	64.9	86.4	66.8	0.50	A983733
Total Iron (Fe)	mg/kg	27800	A984595	26500	29900	27000	100	A983733
Total Lead (Pb)	mg/kg	41.1	A984595	37.6	68.2	107	0.10	A983733
Total Lithium (Li)	mg/kg	13.7	A984595	12.9	13.1	11.7	0.50	A983733
Total Magnesium (Mg)	mg/kg	5520	A984595	5050	8180	7240	100	A983733
Total Manganese (Mn)	mg/kg	558	A984595	483	484	538	0.20	A983733
Total Mercury (Hg)	mg/kg	0.080	A984595	0.069	0.054	<0.050	0.050	A983733
Total Molybdenum (Mo)	mg/kg	1.32	A984595	1.27	0.95	0.76	0.10	A983733
Total Nickel (Ni)	mg/kg	33.7	A984595	31.1	40.0	36.1	0.50	A983733
Total Phosphorus (P)	mg/kg	893	A984595	854	607	508	10	A983733
Total Potassium (K)	mg/kg	1000	A984595	916	1330	981	100	A983733
Total Selenium (Se)	mg/kg	<0.50	A984595	<0.50	<0.50	<0.50	0.50	A983733
Total Silver (Ag)	mg/kg	0.140	A984595	0.135	0.093	<0.050	0.050	A983733
Total Sodium (Na)	mg/kg	151	A984595	136	223	250	100	A983733
Total Strontium (Sr)	mg/kg	24.9	A984595	21.6	35.9	25.6	0.10	A983733
Total Thallium (Tl)	mg/kg	0.089	A984595	0.076	0.086	0.072	0.050	A983733
Total Tin (Sn)	mg/kg	0.90	A984595	0.77	0.73	0.50	0.10	A983733
Total Titanium (Ti)	mg/kg	926	A984595	947	1250	1020	1.0	A983733

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ409		BRJ410	BRJ411	BRJ412		
Sampling Date		2023/05/30 02:56		2023/05/30 03:00	2023/05/30 03:08	2023/05/30 03:19		
COC Number		C#695069-16-01		C#695069-16-01	C#695069-16-01	C#695069-16-01		
	UNITS	SS23-70	QC Batch	SS23-71	SS23-72	SS23-73	RDL	QC Batch
Total Tungsten (W)	mg/kg	<0.50	A984595	<0.50	<0.50	<0.50	0.50	A983733
Total Uranium (U)	mg/kg	0.596	A984595	0.522	0.431	0.398	0.050	A983733
Total Vanadium (V)	mg/kg	65.1	A984595	61.8	74.0	65.8	1.0	A983733
Total Zinc (Zn)	mg/kg	112	A984595	102	97.4	87.8	1.0	A983733
Total Zirconium (Zr)	mg/kg	1.92	A984595	1.57	1.98	2.20	0.50	A983733
RDL = Reportable Detection Limit								

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ413		BRJ414		BRJ415	BRJ416		
Sampling Date		2023/05/30 03:33		2023/05/30 03:48		2023/05/30 04:00	2023/05/30 04:10		
COC Number		C#695069-16-01		C#695069-16-01		C#695069-16-01	C#695069-16-01		
	UNITS	SS23-74	QC Batch	SS23-75	QC Batch	SS23-76	SS23-77	RDL	QC Batch
Physical Properties									
Soluble (2:1) pH	pH	5.85	A984593	6.82	A984596	6.30	6.17	N/A	A984593
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	10800	A984587	14000	A984595	23900	20600	100	A984587
Total Antimony (Sb)	mg/kg	0.26	A984587	0.68	A984595	0.53	0.36	0.10	A984587
Total Arsenic (As)	mg/kg	3.77	A984587	5.43	A984595	7.74	4.52	0.20	A984587
Total Barium (Ba)	mg/kg	56.6	A984587	88.4	A984595	132	67.5	0.10	A984587
Total Beryllium (Be)	mg/kg	0.24	A984587	0.24	A984595	0.45	0.28	0.20	A984587
Total Bismuth (Bi)	mg/kg	<0.10	A984587	<0.10	A984595	0.11	<0.10	0.10	A984587
Total Boron (B)	mg/kg	2.2	A984587	2.6	A984595	3.3	1.3	1.0	A984587
Total Cadmium (Cd)	mg/kg	0.176	A984587	0.331	A984595	0.126	0.120	0.050	A984587
Total Calcium (Ca)	mg/kg	3510	A984587	5600	A984595	6970	2200	100	A984587
Total Chromium (Cr)	mg/kg	28.0	A984587	34.9	A984595	54.4	25.0	0.50	A984587
Total Cobalt (Co)	mg/kg	6.77	A984587	9.31	A984595	15.7	4.78	0.10	A984587
Total Copper (Cu)	mg/kg	37.7	A984587	137	A984595	54.0	13.0	0.50	A984587
Total Iron (Fe)	mg/kg	16300	A984587	24500	A984595	34300	17700	100	A984587
Total Lead (Pb)	mg/kg	21.7	A984587	167	A984595	17.9	12.6	0.10	A984587
Total Lithium (Li)	mg/kg	7.24	A984587	9.75	A984595	13.6	7.84	0.50	A984587
Total Magnesium (Mg)	mg/kg	5670	A984587	7380	A984595	9800	3100	100	A984587
Total Manganese (Mn)	mg/kg	307	A984587	398	A984595	671	220	0.20	A984587
Total Mercury (Hg)	mg/kg	<0.050	A984587	<0.050	A984595	<0.050	0.055	0.050	A984587
Total Molybdenum (Mo)	mg/kg	0.46	A984587	1.45	A984595	0.57	0.70	0.10	A984587
Total Nickel (Ni)	mg/kg	25.8	A984587	31.5	A984595	49.5	13.8	0.50	A984587
Total Phosphorus (P)	mg/kg	418	A984587	615	A984595	658	411	10	A984587
Total Potassium (K)	mg/kg	514	A984587	624	A984595	1340	327	100	A984587
Total Selenium (Se)	mg/kg	<0.50	A984587	<0.50	A984595	<0.50	<0.50	0.50	A984587
Total Silver (Ag)	mg/kg	<0.050	A984587	0.084	A984595	0.050	0.069	0.050	A984587
Total Sodium (Na)	mg/kg	138	A984587	456	A984595	477	126	100	A984587
Total Strontium (Sr)	mg/kg	16.7	A984587	36.0	A984595	61.4	17.2	0.10	A984587
Total Thallium (Tl)	mg/kg	0.052	A984587	0.070	A984595	0.100	0.061	0.050	A984587
Total Tin (Sn)	mg/kg	0.29	A984587	0.78	A984595	0.51	0.47	0.10	A984587
Total Titanium (Ti)	mg/kg	745	A984587	803	A984595	1310	708	1.0	A984587

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C338618
Report Date: 2023/06/07

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ413		BRJ414		BRJ415	BRJ416		
Sampling Date		2023/05/30 03:33		2023/05/30 03:48		2023/05/30 04:00	2023/05/30 04:10		
COC Number		C#695069-16-01		C#695069-16-01		C#695069-16-01	C#695069-16-01		
	UNITS	**SS23-74**	**QC Batch**	**SS23-75**	**QC Batch**	**SS23-76**	**SS23-77**	**RDL**	**QC Batch**
Total Tungsten (W)	mg/kg	<0.50	A984587	1.19	A984595	<0.50	<0.50	0.50	A984587
Total Uranium (U)	mg/kg	0.260	A984587	0.489	A984595	0.459	0.373	0.050	A984587
Total Vanadium (V)	mg/kg	42.2	A984587	52.9	A984595	81.5	52.1	1.0	A984587
Total Zinc (Zn)	mg/kg	44.7	A984587	94.5	A984595	77.0	37.7	1.0	A984587
Total Zirconium (Zr)	mg/kg	1.04	A984587	1.24	A984595	4.99	0.95	0.50	A984587
RDL = Reportable Detection Limit									

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ418		
Sampling Date		2023/05/30 04:20		
COC Number		C#695069-15-01		
	UNITS	SS23-78	RDL	QC Batch
Physical Properties				
Soluble (2:1) pH	pH	6.09	N/A	A984593
Total Metals by ICPMS				
Total Aluminum (Al)	mg/kg	20600	100	A984587
Total Antimony (Sb)	mg/kg	0.37	0.10	A984587
Total Arsenic (As)	mg/kg	4.29	0.20	A984587
Total Barium (Ba)	mg/kg	67.1	0.10	A984587
Total Beryllium (Be)	mg/kg	0.31	0.20	A984587
Total Bismuth (Bi)	mg/kg	<0.10	0.10	A984587
Total Boron (B)	mg/kg	1.3	1.0	A984587
Total Cadmium (Cd)	mg/kg	0.131	0.050	A984587
Total Calcium (Ca)	mg/kg	2200	100	A984587
Total Chromium (Cr)	mg/kg	24.1	0.50	A984587
Total Cobalt (Co)	mg/kg	4.59	0.10	A984587
Total Copper (Cu)	mg/kg	13.6	0.50	A984587
Total Iron (Fe)	mg/kg	17000	100	A984587
Total Lead (Pb)	mg/kg	11.7	0.10	A984587
Total Lithium (Li)	mg/kg	7.94	0.50	A984587
Total Magnesium (Mg)	mg/kg	3040	100	A984587
Total Manganese (Mn)	mg/kg	199	0.20	A984587
Total Mercury (Hg)	mg/kg	0.059	0.050	A984587
Total Molybdenum (Mo)	mg/kg	0.72	0.10	A984587
Total Nickel (Ni)	mg/kg	13.7	0.50	A984587
Total Phosphorus (P)	mg/kg	380	10	A984587
Total Potassium (K)	mg/kg	307	100	A984587
Total Selenium (Se)	mg/kg	<0.50	0.50	A984587
Total Silver (Ag)	mg/kg	0.059	0.050	A984587
Total Sodium (Na)	mg/kg	143	100	A984587
Total Strontium (Sr)	mg/kg	17.1	0.10	A984587
Total Thallium (Tl)	mg/kg	0.056	0.050	A984587
Total Tin (Sn)	mg/kg	0.46	0.10	A984587
Total Titanium (Ti)	mg/kg	657	1.0	A984587

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR/CCME METALS IN SOIL WITH HG (SOIL)

Bureau Veritas ID		BRJ418		
Sampling Date		2023/05/30 04:20		
COC Number		C#695069-15-01		
	UNITS	SS23-78	RDL	QC Batch
Total Tungsten (W)	mg/kg	<0.50	0.50	A984587
Total Uranium (U)	mg/kg	0.352	0.050	A984587
Total Vanadium (V)	mg/kg	49.2	1.0	A984587
Total Zinc (Zn)	mg/kg	35.9	1.0	A984587
Total Zirconium (Zr)	mg/kg	0.88	0.50	A984587
RDL = Reportable Detection Limit				

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

SOLUBLE SODIUM AND CHLORIDE IN SOIL (SOIL)

Bureau Veritas ID		BRJ370		BRJ371		BRJ372			BRJ373		
Sampling Date		2023/05/29 21:29		2023/05/29 21:36		2023/05/29 21:45			2023/05/29 21:52		
COC Number		\		C#695069-18-01		C#695069-18-01			C#695069-18-01		
	UNITS	SS23-38	RDL	SS23-39	RDL	SS23-40	RDL	QC Batch	SS23-41	RDL	QC Batch
ANIONS											
Soluble Chloride (Cl)	mg/L	<10	10	<10	10	28	10	A985472	<10	10	A986845
Calculated Parameters											
Soluble Chloride (Cl)	mg/kg	<5.9	5.9	<6.5	6.5	16.3	5.8	A978430	<5.7	5.7	A978430
Soluble Sodium (Na)	mg/kg	5.9	3.0	5.8	3.3	17.4	2.9	A978433	15.8	2.8	A978433
Soluble Parameters											
Saturation %	%	59.4	N/A	65.3	N/A	58.4	N/A	A984637	56.8	N/A	A986495
Soluble Sodium (Na)	mg/L	9.9	5.0	8.8	5.0	29.8	5.0	A985451	27.8	5.0	A986771

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BRJ374		BRJ375		BRJ376		BRJ377		
Sampling Date		2023/05/29 22:03		2023/05/29 22:12		2023/05/29 22:22		2023/05/29 22:32		
COC Number		C#695069-18-01		C#695069-18-01		C#695069-18-01		C#695069-18-01		
	UNITS	SS23-42	RDL	SS23-43	RDL	SS23-44	RDL	SS23-45	RDL	QC Batch
ANIONS										
Soluble Chloride (Cl)	mg/L	<10	10	11	10	59	10	14	10	A985475
Calculated Parameters										
Soluble Chloride (Cl)	mg/kg	<6.4	6.4	5.6	5.0	24.4	4.2	9.2	6.7	A978430
Soluble Sodium (Na)	mg/kg	8.1	3.2	8.6	2.5	13.9	2.1	10.5	3.3	A978433
Soluble Parameters										
Saturation %	%	64.2	N/A	49.8	N/A	41.6	N/A	66.8	N/A	A984644
Soluble Sodium (Na)	mg/L	12.6	5.0	17.3	5.0	33.4	5.0	15.7	5.0	A985457

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C338618
Report Date: 2023/06/07

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

SOLUBLE SODIUM AND CHLORIDE IN SOIL (SOIL)

Bureau Veritas ID		BRJ378		BRJ379		BRJ385		BRJ386		
Sampling Date		2023/05/29 22:40		2023/05/29 22:52		2023/05/29 22:55		2023/05/29 22:59		
COC Number		C#695069-18-01		C#695069-18-01		C#695069-19-01		C#695069-19-01		
	UNITS	SS23-46	RDL	SS23-47	RDL	SS23-48	RDL	SS23-49	RDL	QC Batch
ANIONS										
Soluble Chloride (Cl)	mg/L	<10	10	12	10	14	10	20	10	A985475
Calculated Parameters										
Soluble Chloride (Cl)	mg/kg	<9.9	9.9	9.6	8.0	7.9	5.5	10.8	5.4	A978430
Soluble Sodium (Na)	mg/kg	<5.0	5.0	4.3	4.0	7.3	2.8	11.7	2.7	A978433
Soluble Parameters										
Saturation %	%	99.0	N/A	80.4	N/A	55.5	N/A	53.5	N/A	A984644
Soluble Sodium (Na)	mg/L	<5.0	5.0	5.3	5.0	13.1	5.0	21.8	5.0	A985457

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BRJ387			BRJ387			BRJ388		
Sampling Date		2023/05/29 23:06			2023/05/29 23:06			2023/05/29 23:19		
COC Number		C#695069-19-01			C#695069-19-01			C#695069-19-01		
	UNITS	SS23-50	RDL	QC Batch	SS23-50 Lab-Dup	RDL	QC Batch	SS23-51	RDL	QC Batch
ANIONS										
Soluble Chloride (Cl)	mg/L	<10	10	A985475	<10	10	A985475	11	10	A985475
Calculated Parameters										
Soluble Chloride (Cl)	mg/kg	<5.3	5.3	A978430				8.2	7.2	A978430
Soluble Sodium (Na)	mg/kg	4.6	2.6	A978433				25.5	3.6	A978433
Soluble Parameters										
Saturation %	%	52.7	N/A	A984644	52.6	N/A	A984644	71.9	N/A	A984644
Soluble Sodium (Na)	mg/L	8.7	5.0	A985457	8.4	5.0	A985457	35.4	5.0	A985457

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

SOLUBLE SODIUM AND CHLORIDE IN SOIL (SOIL)

Bureau Veritas ID		BRJ389		BRJ390		BRJ391		BRJ392		
Sampling Date		2023/05/29 23:29		2023/05/29 23:33		2023/05/29 23:48		2023/05/29 23:59		
COC Number		C#695069-19-01		C#695069-19-01		C#695069-19-01		C#695069-19-01		
	UNITS	SS23-52	RDL	SS23-53	RDL	SS23-54	RDL	SS23-55	RDL	QC Batch
ANIONS										
Soluble Chloride (Cl)	mg/L	<10	10	17	10	14	10	116	10	A985475
Calculated Parameters										
Soluble Chloride (Cl)	mg/kg	<3.7	3.7	11.6	7.0	7.0	4.8	44.5	3.8	A978430
Soluble Sodium (Na)	mg/kg	5.6	1.9	27.2	3.5	12.7	2.4	23.3	1.9	A978433
Soluble Parameters										
Saturation %	%	37.3	N/A	69.8	N/A	48.4	N/A	38.4	N/A	A984644
Soluble Sodium (Na)	mg/L	14.9	5.0	39.0	5.0	26.2	5.0	60.6	5.0	A985457

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BRJ393		BRJ394		BRJ399		BRJ400		
Sampling Date		2023/05/30 00:29		2023/05/30 00:39		2023/05/30 00:52		2023/05/30 01:05		
COC Number		C#695069-19-01		C#695069-19-01		C#695069-17-01		C#695069-17-01		
	UNITS	SS23-56	RDL	SS23-57	RDL	SS23-60	RDL	SS23-61	RDL	QC Batch
ANIONS										
Soluble Chloride (Cl)	mg/L	15	10	13	10	11	10	12	10	A985475
Calculated Parameters										
Soluble Chloride (Cl)	mg/kg	8.5	5.6	2.6	2.0	6.3	5.7	12.3	9.9	A978430
Soluble Sodium (Na)	mg/kg	5.1	2.8	2.29	0.98	<2.8	2.8	11.8	4.9	A978433
Soluble Parameters										
Saturation %	%	55.8	N/A	19.5	N/A	56.9	N/A	99.0	N/A	A984644
Soluble Sodium (Na)	mg/L	9.1	5.0	11.7	5.0	<5.0	5.0	11.9	5.0	A985457

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C338618
Report Date: 2023/06/07

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

SOLUBLE SODIUM AND CHLORIDE IN SOIL (SOIL)

Bureau Veritas ID		BRJ402		BRJ403		BRJ404		BRJ405		
Sampling Date		2023/05/30 01:28		2023/05/30 01:44		2023/05/30 01:53		2023/05/30 02:07		
COC Number		C#695069-17-01		C#695069-17-01		C#695069-17-01		C#695069-17-01		
	UNITS	SS23-63	RDL	SS23-64	RDL	SS23-65	RDL	SS23-66	RDL	QC Batch
ANIONS										
Soluble Chloride (Cl)	mg/L	11	10	12	10	<10	10	11	10	A985482
Calculated Parameters										
Soluble Chloride (Cl)	mg/kg	8.8	7.6	9.1	7.3	<7.5	7.5	8.2	7.2	A978430
Soluble Sodium (Na)	mg/kg	4.7	3.8	20.7	3.7	23.8	3.8	15.8	3.6	A978433
Soluble Parameters										
Saturation %	%	76.4	N/A	73.3	N/A	75.0	N/A	72.5	N/A	A984646
Soluble Sodium (Na)	mg/L	6.1	5.0	28.3	5.0	31.8	5.0	21.8	5.0	A985458

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BRJ405			BRJ406		BRJ407		BRJ408		
Sampling Date		2023/05/30 02:07			2023/05/30 02:19		2023/05/30 02:33		2023/05/30 02:45		
COC Number		C#695069-17-01			C#695069-17-01		C#695069-16-01		C#695069-16-01		
	UNITS	SS23-66 Lab-Dup	RDL	QC Batch	SS23-67	RDL	SS23-68	RDL	SS23-69	RDL	QC Batch
ANIONS											
Soluble Chloride (Cl)	mg/L	<10	10	A985482	11	10	13	10	13	10	A985482
Calculated Parameters											
Soluble Chloride (Cl)	mg/kg				9.5	8.4	9.9	7.9	11.8	9.4	A978430
Soluble Sodium (Na)	mg/kg				17.6	4.2	6.5	3.9	10.5	4.7	A978433
Soluble Parameters											
Saturation %	%	72.5	N/A	A984646	83.8	N/A	78.7	N/A	94.0	N/A	A984646
Soluble Sodium (Na)	mg/L	21.7	5.0	A985458	21.0	5.0	8.3	5.0	11.2	5.0	A985458

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

SOLUBLE SODIUM AND CHLORIDE IN SOIL (SOIL)

Bureau Veritas ID		BRJ409		BRJ410		BRJ411		BRJ412		
Sampling Date		2023/05/30 02:56		2023/05/30 03:00		2023/05/30 03:08		2023/05/30 03:19		
COC Number		C#695069-16-01		C#695069-16-01		C#695069-16-01		C#695069-16-01		
	UNITS	SS23-70	RDL	SS23-71	RDL	SS23-72	RDL	SS23-73	RDL	QC Batch
ANIONS										
Soluble Chloride (Cl)	mg/L	23	10	11	10	15	10	11	10	A985482
Calculated Parameters										
Soluble Chloride (Cl)	mg/kg	22.2	9.8	10.7	9.7	13.8	9.4	6.0	5.7	A978430
Soluble Sodium (Na)	mg/kg	11.3	4.9	10.4	4.8	11.7	4.7	6.4	2.8	A978433
Soluble Parameters										
Saturation %	%	97.7	N/A	96.6	N/A	94.2	N/A	56.8	N/A	A984646
Soluble Sodium (Na)	mg/L	11.5	5.0	10.7	5.0	12.4	5.0	11.2	5.0	A985458

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas ID		BRJ413		BRJ414		BRJ415		BRJ416		
Sampling Date		2023/05/30 03:33		2023/05/30 03:48		2023/05/30 04:00		2023/05/30 04:10		
COC Number		C#695069-16-01		C#695069-16-01		C#695069-16-01		C#695069-16-01		
	UNITS	SS23-74	RDL	SS23-75	RDL	SS23-76	RDL	SS23-77	RDL	QC Batch
ANIONS										
Soluble Chloride (Cl)	mg/L	<10	10	42	10	12	10	<10	10	A985482
Calculated Parameters										
Soluble Chloride (Cl)	mg/kg	<4.2	4.2	25.0	6.0	8.7	7.5	<8.4	8.4	A978430
Soluble Sodium (Na)	mg/kg	3.8	2.1	22.1	3.0	4.9	3.8	5.8	4.2	A978433
Soluble Parameters										
Saturation %	%	42.3	N/A	59.7	N/A	75.3	N/A	83.9	N/A	A984646
Soluble Sodium (Na)	mg/L	9.0	5.0	37.0	5.0	6.6	5.0	6.9	5.0	A985458

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

SNC-LAVALIN INC.
Client Project #: WHATCOM RD
Your P.O. #: 694890
Sampler Initials: NL

SOLUBLE SODIUM AND CHLORIDE IN SOIL (SOIL)

Bureau Veritas ID		BRJ418		
Sampling Date		2023/05/30 04:20		
COC Number		C#695069-15-01		
	UNITS	SS23-78	RDL	QC Batch
ANIONS				
Soluble Chloride (Cl)	mg/L	13	10	A985482
Calculated Parameters				
Soluble Chloride (Cl)	mg/kg	12.0	9.1	A978430
Soluble Sodium (Na)	mg/kg	7.7	4.6	A978433
Soluble Parameters				
Saturation %	%	91.3	N/A	A984646
Soluble Sodium (Na)	mg/L	8.4	5.0	A985458

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	12.7°C
Package 2	15.0°C
Package 3	13.3°C

Results relate only to the items tested.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A983721	Total Aluminum (Al)	2023/06/05	NC	75 - 125	107	75 - 125	<100	mg/kg	12	40	100	70 - 130
A983721	Total Antimony (Sb)	2023/06/05	96	75 - 125	106	75 - 125	<0.10	mg/kg	2.3	30	113	70 - 130
A983721	Total Arsenic (As)	2023/06/05	105	75 - 125	112	75 - 125	<0.20	mg/kg	4.9	30	98	70 - 130
A983721	Total Barium (Ba)	2023/06/05	114	75 - 125	112	75 - 125	<0.10	mg/kg	5.3	40	109	70 - 130
A983721	Total Beryllium (Be)	2023/06/05	105	75 - 125	108	75 - 125	<0.20	mg/kg	NC	30	99	70 - 130
A983721	Total Bismuth (Bi)	2023/06/05	96	75 - 125	101	75 - 125	<0.10	mg/kg	NC	30		
A983721	Total Boron (B)	2023/06/05	99	75 - 125	103	75 - 125	<1.0	mg/kg	2.0	30		
A983721	Total Cadmium (Cd)	2023/06/05	106	75 - 125	112	75 - 125	<0.050	mg/kg	1.6	30	106	70 - 130
A983721	Total Calcium (Ca)	2023/06/05	NC	75 - 125	109	75 - 125	<100	mg/kg	6.6	30	104	70 - 130
A983721	Total Chromium (Cr)	2023/06/05	107	75 - 125	112	75 - 125	<0.50	mg/kg	5.7	30	108	70 - 130
A983721	Total Cobalt (Co)	2023/06/05	106	75 - 125	115	75 - 125	<0.10	mg/kg	7.6	30	108	70 - 130
A983721	Total Copper (Cu)	2023/06/05	115	75 - 125	113	75 - 125	<0.50	mg/kg	5.9	30	117	70 - 130
A983721	Total Iron (Fe)	2023/06/05	NC	75 - 125	112	75 - 125	<100	mg/kg	5.9	30	107	70 - 130
A983721	Total Lead (Pb)	2023/06/05	115	75 - 125	114	75 - 125	<0.10	mg/kg	9.6	40	126	70 - 130
A983721	Total Lithium (Li)	2023/06/05	102	75 - 125	108	75 - 125	<0.50	mg/kg	3.9	30	105	70 - 130
A983721	Total Magnesium (Mg)	2023/06/05	NC	75 - 125	107	75 - 125	<100	mg/kg	7.2	30	111	70 - 130
A983721	Total Manganese (Mn)	2023/06/05	NC	75 - 125	110	75 - 125	<0.20	mg/kg	6.4	30	111	70 - 130
A983721	Total Mercury (Hg)	2023/06/05	104	75 - 125	108	75 - 125	<0.050	mg/kg	7.8	40	117	70 - 130
A983721	Total Molybdenum (Mo)	2023/06/05	101	75 - 125	104	75 - 125	<0.10	mg/kg	11	40	106	70 - 130
A983721	Total Nickel (Ni)	2023/06/05	98	75 - 125	109	75 - 125	<0.50	mg/kg	6.6	30	115	70 - 130
A983721	Total Phosphorus (P)	2023/06/05	96	75 - 125	105	75 - 125	<10	mg/kg	7.1	30	100	70 - 130
A983721	Total Potassium (K)	2023/06/05	118	75 - 125	109	75 - 125	<100	mg/kg	7.1	40	91	70 - 130
A983721	Total Selenium (Se)	2023/06/05	108	75 - 125	113	75 - 125	<0.50	mg/kg	NC	30		
A983721	Total Silver (Ag)	2023/06/05	102	75 - 125	107	75 - 125	<0.050	mg/kg	1.3	40	93	70 - 130
A983721	Total Sodium (Na)	2023/06/05	141 (1)	75 - 125	116	75 - 125	<100	mg/kg	8.1	40	97	70 - 130
A983721	Total Strontium (Sr)	2023/06/05	116	75 - 125	109	75 - 125	<0.10	mg/kg	6.0	40	114	70 - 130
A983721	Total Thallium (Tl)	2023/06/05	95	75 - 125	100	75 - 125	<0.050	mg/kg	NC	30	85	70 - 130
A983721	Total Tin (Sn)	2023/06/05	102	75 - 125	108	75 - 125	<0.10	mg/kg	12	40	99	70 - 130
A983721	Total Titanium (Ti)	2023/06/05	NC	75 - 125	106	75 - 125	<1.0	mg/kg	6.7	40		
A983721	Total Tungsten (W)	2023/06/05	99	75 - 125	113	75 - 125	<0.50	mg/kg	NC	40		
A983721	Total Uranium (U)	2023/06/05	102	75 - 125	107	75 - 125	<0.050	mg/kg	5.2	30	101	70 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A983721	Total Vanadium (V)	2023/06/05	107	75 - 125	110	75 - 125	<1.0	mg/kg	6.4	30	111	70 - 130
A983721	Total Zinc (Zn)	2023/06/05	104	75 - 125	110	75 - 125	<1.0	mg/kg	7.4	30	114	70 - 130
A983721	Total Zirconium (Zr)	2023/06/05	104	75 - 125	109	75 - 125	<0.50	mg/kg	NC	40		
A983729	Soluble (2:1) pH	2023/06/06			100	97 - 103			0.15	N/A		
A983733	Total Aluminum (Al)	2023/06/05	NC	75 - 125	112	75 - 125	<100	mg/kg	0.42	40	102	70 - 130
A983733	Total Antimony (Sb)	2023/06/05	95	75 - 125	108	75 - 125	<0.10	mg/kg	3.5	30	113	70 - 130
A983733	Total Arsenic (As)	2023/06/05	107	75 - 125	113	75 - 125	<0.20	mg/kg	0.33	30	99	70 - 130
A983733	Total Barium (Ba)	2023/06/05	115	75 - 125	116	75 - 125	<0.10	mg/kg	0.67	40	107	70 - 130
A983733	Total Beryllium (Be)	2023/06/05	105	75 - 125	113	75 - 125	<0.20	mg/kg	1.2	30	102	70 - 130
A983733	Total Bismuth (Bi)	2023/06/05	97	75 - 125	102	75 - 125	<0.10	mg/kg	NC	30		
A983733	Total Boron (B)	2023/06/05	100	75 - 125	107	75 - 125	<1.0	mg/kg	5.3	30		
A983733	Total Cadmium (Cd)	2023/06/05	108	75 - 125	112	75 - 125	<0.050	mg/kg	4.3	30	112	70 - 130
A983733	Total Calcium (Ca)	2023/06/05	151 (1)	75 - 125	110	75 - 125	<100	mg/kg	0.26	30	101	70 - 130
A983733	Total Chromium (Cr)	2023/06/05	107	75 - 125	115	75 - 125	<0.50	mg/kg	1.1	30	112	70 - 130
A983733	Total Cobalt (Co)	2023/06/05	106	75 - 125	115	75 - 125	<0.10	mg/kg	0.62	30	105	70 - 130
A983733	Total Copper (Cu)	2023/06/05	103	75 - 125	118	75 - 125	0.99, RDL=0.50 (2)	mg/kg	0.43	30	107	70 - 130
A983733	Total Iron (Fe)	2023/06/05	NC	75 - 125	114	75 - 125	<100	mg/kg	0.98	30	105	70 - 130
A983733	Total Lead (Pb)	2023/06/05	105	75 - 125	116	75 - 125	<0.10	mg/kg	26	40	122	70 - 130
A983733	Total Lithium (Li)	2023/06/05	103	75 - 125	116	75 - 125	<0.50	mg/kg	0.36	30	107	70 - 130
A983733	Total Magnesium (Mg)	2023/06/05	NC	75 - 125	109	75 - 125	<100	mg/kg	0.69	30	108	70 - 130
A983733	Total Manganese (Mn)	2023/06/05	NC	75 - 125	112	75 - 125	<0.20	mg/kg	0.91	30	111	70 - 130
A983733	Total Mercury (Hg)	2023/06/05	104	75 - 125	110	75 - 125	<0.050	mg/kg	2.6	40	111	70 - 130
A983733	Total Molybdenum (Mo)	2023/06/05	100	75 - 125	105	75 - 125	<0.10	mg/kg	5.1	40	110	70 - 130
A983733	Total Nickel (Ni)	2023/06/05	100	75 - 125	110	75 - 125	1.37, RDL=0.50 (3)	mg/kg	0.53	30	109	70 - 130
A983733	Total Phosphorus (P)	2023/06/05	92	75 - 125	107	75 - 125	<10	mg/kg	4.6	30	99	70 - 130
A983733	Total Potassium (K)	2023/06/05	120	75 - 125	112	75 - 125	<100	mg/kg	0.50	40	95	70 - 130
A983733	Total Selenium (Se)	2023/06/05	106	75 - 125	112	75 - 125	<0.50	mg/kg	NC	30		
A983733	Total Silver (Ag)	2023/06/05	103	75 - 125	108	75 - 125	<0.050	mg/kg	3.1	40	96	70 - 130
A983733	Total Sodium (Na)	2023/06/05	110	75 - 125	114	75 - 125	<100	mg/kg	0.33	40	97	70 - 130

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			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A983733	Total Strontium (Sr)	2023/06/05	111	75 - 125	111	75 - 125	<0.10	mg/kg	1.3	40	112	70 - 130
A983733	Total Thallium (Tl)	2023/06/05	95	75 - 125	101	75 - 125	<0.050	mg/kg	2.7	30	88	70 - 130
A983733	Total Tin (Sn)	2023/06/05	102	75 - 125	110	75 - 125	<0.10	mg/kg	4.1	40	100	70 - 130
A983733	Total Titanium (Ti)	2023/06/05	NC	75 - 125	108	75 - 125	<1.0	mg/kg	0.36	40		
A983733	Total Tungsten (W)	2023/06/05	87	75 - 125	114	75 - 125	<0.50	mg/kg	NC	40		
A983733	Total Uranium (U)	2023/06/05	103	75 - 125	107	75 - 125	<0.050	mg/kg	0.24	30	103	70 - 130
A983733	Total Vanadium (V)	2023/06/05	101	75 - 125	113	75 - 125	<1.0	mg/kg	0.50	30	112	70 - 130
A983733	Total Zinc (Zn)	2023/06/05	98	75 - 125	110	75 - 125	<1.0	mg/kg	0.74	30	112	70 - 130
A983733	Total Zirconium (Zr)	2023/06/05	88	75 - 125	109	75 - 125	<0.50	mg/kg	0.68	40		
A983739	Soluble (2:1) pH	2023/06/06			100	97 - 103			0.16	N/A		
A984587	Total Aluminum (Al)	2023/06/06	NC	75 - 125	109	75 - 125	<100	mg/kg	3.9	40	101	70 - 130
A984587	Total Antimony (Sb)	2023/06/06	90	75 - 125	103	75 - 125	<0.10	mg/kg	0.78	30	109	70 - 130
A984587	Total Arsenic (As)	2023/06/06	101	75 - 125	107	75 - 125	<0.20	mg/kg	2.0	30	103	70 - 130
A984587	Total Barium (Ba)	2023/06/06	104	75 - 125	105	75 - 125	<0.10	mg/kg	2.2	40	106	70 - 130
A984587	Total Beryllium (Be)	2023/06/06	96	75 - 125	105	75 - 125	<0.20	mg/kg	1.4	30	107	70 - 130
A984587	Total Bismuth (Bi)	2023/06/06	89	75 - 125	96	75 - 125	<0.10	mg/kg	NC	30		
A984587	Total Boron (B)	2023/06/06	92	75 - 125	101	75 - 125	<1.0	mg/kg	2.9	30		
A984587	Total Cadmium (Cd)	2023/06/06	99	75 - 125	108	75 - 125	<0.050	mg/kg	3.4	30	112	70 - 130
A984587	Total Calcium (Ca)	2023/06/06	NC	75 - 125	106	75 - 125	<100	mg/kg	4.6	30	103	70 - 130
A984587	Total Chromium (Cr)	2023/06/06	99	75 - 125	108	75 - 125	<0.50	mg/kg	3.1	30	105	70 - 130
A984587	Total Cobalt (Co)	2023/06/06	97	75 - 125	106	75 - 125	<0.10	mg/kg	4.1	30	104	70 - 130
A984587	Total Copper (Cu)	2023/06/06	105	75 - 125	109	75 - 125	<0.50	mg/kg	2.5	30	110	70 - 130
A984587	Total Iron (Fe)	2023/06/06	NC	75 - 125	105	75 - 125	<100	mg/kg	4.0	30	103	70 - 130
A984587	Total Lead (Pb)	2023/06/06	101	75 - 125	105	75 - 125	<0.10	mg/kg	6.9	40	121	70 - 130
A984587	Total Lithium (Li)	2023/06/06	94	75 - 125	101	75 - 125	<0.50	mg/kg	0.55	30	108	70 - 130
A984587	Total Magnesium (Mg)	2023/06/06	NC	75 - 125	105	75 - 125	<100	mg/kg	2.2	30	111	70 - 130
A984587	Total Manganese (Mn)	2023/06/06	NC	75 - 125	106	75 - 125	<0.20	mg/kg	2.7	30	109	70 - 130
A984587	Total Mercury (Hg)	2023/06/06	98	75 - 125	103	75 - 125	<0.050	mg/kg	NC	40	102	70 - 130
A984587	Total Molybdenum (Mo)	2023/06/06	93	75 - 125	99	75 - 125	<0.10	mg/kg	1.2	40	109	70 - 130
A984587	Total Nickel (Ni)	2023/06/06	96	75 - 125	105	75 - 125	<0.50	mg/kg	2.4	30	112	70 - 130
A984587	Total Phosphorus (P)	2023/06/06	86	75 - 125	102	75 - 125	<10	mg/kg	5.0	30	102	70 - 130

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A984587	Total Potassium (K)	2023/06/06	108	75 - 125	104	75 - 125	<100	mg/kg	2.5	40	90	70 - 130
A984587	Total Selenium (Se)	2023/06/06	100	75 - 125	108	75 - 125	<0.50	mg/kg	NC	30		
A984587	Total Silver (Ag)	2023/06/06	93	75 - 125	101	75 - 125	<0.050	mg/kg	9.0	40	144 (4)	70 - 130
A984587	Total Sodium (Na)	2023/06/06	123	75 - 125	110	75 - 125	<100	mg/kg	1.7	40	96	70 - 130
A984587	Total Strontium (Sr)	2023/06/06	108	75 - 125	108	75 - 125	<0.10	mg/kg	2.4	40	115	70 - 130
A984587	Total Thallium (Tl)	2023/06/06	91	75 - 125	97	75 - 125	<0.050	mg/kg	7.3	30	91	70 - 130
A984587	Total Tin (Sn)	2023/06/06	101	75 - 125	105	75 - 125	<0.10	mg/kg	9.7	40	112	70 - 130
A984587	Total Titanium (Ti)	2023/06/06	NC	75 - 125	100	75 - 125	<1.0	mg/kg	3.3	40		
A984587	Total Tungsten (W)	2023/06/06	90	75 - 125	107	75 - 125	<0.50	mg/kg	NC	40		
A984587	Total Uranium (U)	2023/06/06	94	75 - 125	100	75 - 125	<0.050	mg/kg	5.2	30	101	70 - 130
A984587	Total Vanadium (V)	2023/06/06	98	75 - 125	104	75 - 125	<1.0	mg/kg	3.5	30	106	70 - 130
A984587	Total Zinc (Zn)	2023/06/06	95	75 - 125	106	75 - 125	<1.0	mg/kg	4.1	30	112	70 - 130
A984587	Total Zirconium (Zr)	2023/06/06	104	75 - 125	104	75 - 125	<0.50	mg/kg	8.8	40		
A984593	Soluble (2:1) pH	2023/06/06			100	97 - 103			0.82	N/A		
A984595	Total Aluminum (Al)	2023/06/06	NC	75 - 125	105	75 - 125	<100	mg/kg	2.4	40	106	70 - 130
A984595	Total Antimony (Sb)	2023/06/06	91	75 - 125	97	75 - 125	<0.10	mg/kg	NC	30	114	70 - 130
A984595	Total Arsenic (As)	2023/06/06	100	75 - 125	101	75 - 125	<0.20	mg/kg	1.8	30	94	70 - 130
A984595	Total Barium (Ba)	2023/06/06	101	75 - 125	101	75 - 125	<0.10	mg/kg	0.67	40	107	70 - 130
A984595	Total Beryllium (Be)	2023/06/06	95	75 - 125	101	75 - 125	<0.20	mg/kg	NC	30	112	70 - 130
A984595	Total Bismuth (Bi)	2023/06/06	90	75 - 125	94	75 - 125	<0.10	mg/kg				
A984595	Total Boron (B)	2023/06/06	88	75 - 125	96	75 - 125	<1.0	mg/kg	25	30		
A984595	Total Cadmium (Cd)	2023/06/06	100	75 - 125	102	75 - 125	<0.050	mg/kg	NC	30	115	70 - 130
A984595	Total Calcium (Ca)	2023/06/06	NC	75 - 125	103	75 - 125	<100	mg/kg			101	70 - 130
A984595	Total Chromium (Cr)	2023/06/06	99	75 - 125	105	75 - 125	<0.50	mg/kg	2.4	30	109	70 - 130
A984595	Total Cobalt (Co)	2023/06/06	97	75 - 125	104	75 - 125	<0.10	mg/kg	0.96	30	105	70 - 130
A984595	Total Copper (Cu)	2023/06/06	99	75 - 125	108	75 - 125	<0.50	mg/kg	0.23	30	111	70 - 130
A984595	Total Iron (Fe)	2023/06/06	NC	75 - 125	105	75 - 125	<100	mg/kg	0.048	30	105	70 - 130
A984595	Total Lead (Pb)	2023/06/06	102	75 - 125	107	75 - 125	<0.10	mg/kg	2.4	40	120	70 - 130
A984595	Total Lithium (Li)	2023/06/06	93	75 - 125	97	75 - 125	<0.50	mg/kg	2.0	30	109	70 - 130
A984595	Total Magnesium (Mg)	2023/06/06	NC	75 - 125	101	75 - 125	<100	mg/kg			111	70 - 130
A984595	Total Manganese (Mn)	2023/06/06	NC	75 - 125	103	75 - 125	<0.20	mg/kg	0.59	30	112	70 - 130

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			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A984595	Total Mercury (Hg)	2023/06/06	98	75 - 125	101	75 - 125	<0.050	mg/kg	NC	40	116	70 - 130
A984595	Total Molybdenum (Mo)	2023/06/06	92	75 - 125	94	75 - 125	<0.10	mg/kg	NC	40	107	70 - 130
A984595	Total Nickel (Ni)	2023/06/06	97	75 - 125	101	75 - 125	<0.50	mg/kg	1.1	30	111	70 - 130
A984595	Total Phosphorus (P)	2023/06/06	88	75 - 125	98	75 - 125	<10	mg/kg			101	70 - 130
A984595	Total Potassium (K)	2023/06/06	103	75 - 125	101	75 - 125	<100	mg/kg			95	70 - 130
A984595	Total Selenium (Se)	2023/06/06	103	75 - 125	103	75 - 125	<0.50	mg/kg	NC	30		
A984595	Total Silver (Ag)	2023/06/06	94	75 - 125	96	75 - 125	<0.050	mg/kg	NC	40	108	70 - 130
A984595	Total Sodium (Na)	2023/06/06	116	75 - 125	104	75 - 125	<100	mg/kg			104	70 - 130
A984595	Total Strontium (Sr)	2023/06/06	105	75 - 125	103	75 - 125	<0.10	mg/kg	3.8	40	115	70 - 130
A984595	Total Thallium (Tl)	2023/06/06	92	75 - 125	95	75 - 125	<0.050	mg/kg	NC	30	106	70 - 130
A984595	Total Tin (Sn)	2023/06/06	99	75 - 125	98	75 - 125	<0.10	mg/kg	33	40	99	70 - 130
A984595	Total Titanium (Ti)	2023/06/06	NC	75 - 125	99	75 - 125	<1.0	mg/kg				
A984595	Total Tungsten (W)	2023/06/06	94	75 - 125	103	75 - 125	<0.50	mg/kg	NC	40		
A984595	Total Uranium (U)	2023/06/06	95	75 - 125	100	75 - 125	<0.050	mg/kg	4.4	30	102	70 - 130
A984595	Total Vanadium (V)	2023/06/06	96	75 - 125	102	75 - 125	<1.0	mg/kg	1.1	30	110	70 - 130
A984595	Total Zinc (Zn)	2023/06/06	96	75 - 125	102	75 - 125	<1.0	mg/kg	0.88	30	111	70 - 130
A984595	Total Zirconium (Zr)	2023/06/06	107	75 - 125	100	75 - 125	<0.50	mg/kg				
A984596	Soluble (2:1) pH	2023/06/06			100	97 - 103			0	N/A		
A984637	Saturation %	2023/06/06					0	%	0.029	30	100	75 - 125
A984644	Saturation %	2023/06/06					0	%	0.037	30	101	75 - 125
A984646	Saturation %	2023/06/06					0	%	0.018	30	101	75 - 125
A985451	Soluble Sodium (Na)	2023/06/06	93	80 - 120	96	80 - 120	<5.0	mg/L	3.7	40	100	75 - 125
A985457	Soluble Sodium (Na)	2023/06/06	94	80 - 120	92	80 - 120	<5.0	mg/L	3.7	40	102	75 - 125
A985458	Soluble Sodium (Na)	2023/06/06	95	80 - 120	98	80 - 120	<5.0	mg/L	0.46	40	103	75 - 125
A985472	Soluble Chloride (Cl)	2023/06/06	108	75 - 125	101	80 - 120	<10	mg/L	2.6	30	99	75 - 125
A985475	Soluble Chloride (Cl)	2023/06/06	106	75 - 125	99	80 - 120	<10	mg/L	NC	30	103	75 - 125
A985482	Soluble Chloride (Cl)	2023/06/06	104	75 - 125	99	80 - 120	<10	mg/L	12	30	99	75 - 125
A986495	Saturation %	2023/06/07					0	%	0	30	100	75 - 125
A986771	Soluble Sodium (Na)	2023/06/07	97	80 - 120	96	80 - 120	<5.0	mg/L	1.2	40	110	75 - 125

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
A986845	Soluble Chloride (Cl)	2023/06/07	109	75 - 125	101	80 - 120	<10	mg/L	1.2	30	113	75 - 125

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(2) Method Blank exceeds acceptance limits for Cu. Sample values for Cu are >10x the concentration of the method blank and the contamination is considered irrelevant.

(3) Method Blank exceeds acceptance limits for Ni. Sample values for Ni are >10x the concentration of the method blank and the contamination is considered irrelevant.

(4) Reference material outside acceptance criteria - re-analysis yields similar results.

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Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#11313 SNC-LAVALIN INC.	Company Name		Quotation #	C21898	Bureau Veritas Job #	Bottle Order #:
Contact Name	Edna Wong	Contact Name	Edna Wong	P.O. #	694890		695069
Address	1300-3777 Kingsway Avenue BURNABY BC V5H 3Z7	Address		Project #	WHATCOM RD	Chain Of Custody Record	Project Manager
Phone	(604) 515-5151 Fax: (604) 515-5150	Phone	Fax:	Project Name		C#695069-18-01	Debbie Nordbruget
Email	edna.wong@snclavalin.com; envwestbclabdata@sncla	Email	edna.wong@snclavalin.com; envwestbclabdata@snclav	Site #			
				Sampled By	NL		

Regulatory Criteria:
- [ ] CSR
- [ ] CCME
- [ ] BC Water Quality
- [ ] Other _____

Special Instructions

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT:

(will be applied if Rush TAT is not specified): ☐

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

1 DAY ☐ 2 Day ☐ 3 Day ☐ Date Required: _____ ☐

Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Metals Field Filtered ? (Y / N)	# of Bottles	Comments
1		5523 - 38	23/05/29	29:29	Soil		1	
2		" -39		29:36				
3		" -40		21:45				
4		" -41		21:52				
5		" -42		22:03				
6		" -43		22:12				
7		" -44		22:22				
8		" -45		22:32				
9		" -46		22:40				
10		" -47		22:52				

HOLD: X

C338618_COC

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Nicole Wood	23/05/30	1530	Annie Dabao	2023/05/30	0800		☐	16, 16, 16	☑ Yes ☐ No

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White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

15, 14, 16
12, 15, 13

seal intact
no cooling media

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Chain Of Custody Record

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Contact Name	Edna Wong	Contact Name	Edna Wong	P.O. #	694890		695069
Address	1300-3777 Kingsway Avenue BURNABY BC V5H 3Z7	Address		Project #	WHATCOM RD	Chain Of Custody Record	Project Manager
Phone	(604) 515-5151 Fax: (604) 515-5150	Phone	Fax:	Project Name		C#695069-19-01	Debbie Nordbruget
Email	edna.wong@snclavalin.com; envwestbclabdata@sncla	Email	edna.wong@snclavalin.com; envwestbclabdata@snclav	Site #			
				Sampled By	NC		

Regulatory Criteria:
- ☐ CSR
- ☐ CCME
- ☐ BC Water Quality
- ☐ Other _____

Special Instructions

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1 DAY ☐ 2 Day ☐ 3 Day ☐ Date Required: _____ ☐
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Metals Field Filtered ? (Y / N)	HOLD	# of Bottles	Comments
1		SS23-48	23/05/29	23:55	Soil		X	1	
2		" " -49		23:59					
3		" " -50		23:06					
4		" " -51		23:19					
5		" " -52		23:29					
6		" " -53		23:33					
7		" " -54		23:48					
8		" " -55	↓	23:59					sampled@23:59
9		" " -56	23/05/30	00:29					
10		" " -57	↓	00:39	↓		↓	↓	

C338618_COC

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Nicole Wekki	23/05/30	5:20	Annie Bobso	2023/05/30	0800		☐	16, 16, 16	☑ Yes ☐ No

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White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

15, 14, 16
12, 13, 13

soil intact
no cooling media

Bureau Veritas
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Contact Name	Edna Wong	Contact Name	Edna Wong	P.O. #	694890		695069
Address	1300-3777 Kingsway Avenue BURNABY BC V5H 3Z7	Address		Project #	WHATCOM RD	Chain Of Custody Record	Project Manager
Phone	(604) 515-5151 Fax: (604) 515-5150	Phone	Fax:	Project Name		C#695069-17-01	Debbie Nordbruget
Email	edna.wong@snclavalin.com; envwestbclabdata@sncla	Email	edna.wong@snclavalin.com; envwestbclabdata@snclav	Site #			
				Sampled By	NL		

Regulatory Criteria: ☐ CSR ☐ CCME ☐ BC Water Quality ☐ Other _____

Special Instructions

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1 DAY ☐ 2 Day ☐ 3 Day ☐ Date Required: _____ ☐

Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Metals Field Filtered ? (Y / N)	HOLD	# of Bottles	Comments
1		SS23- 58	23/05/30	00:38	Soil		X		
2		" " -59		00:45					
3		" " -60		00:52					
4		" " -61		1:05					
5		" " -62		1:15					
6		" " -63		1:28					
7		" " -64		1:44					
8		" " -65		1:53					
9		" " -66		2:07					
10		" " -67		2:19					

C338618_COC

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Nicole Watkins	23/05/30	5:20	Amrit [illegible]	2023/05/30	0800		☐	16 16 16	☑ Yes ☐ No

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White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

15, 14, 16
12, 15, 13

seal intact
no cooling media

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Contact Name	Edna Wong	Contact Name	Edna Wong	P.O. #	694890		695069
Address	1300-3777 Kingsway Avenue BURNABY BC V5H 3Z7	Address		Project #	WHATCOM RD	Chain Of Custody Record	Project Manager
Phone	(604) 515-5151 Fax: (604) 515-5150	Phone	Fax:	Project Name		C#695069-16-01	Debbie Nordbruget
Email	edna.wong@snclavalin.com; envwestbclabdata@sncla	Email	edna.wong@snclavalin.com; envwestbclabdata@snclav	Site #			
				Sampled By	NC		

Regulatory Criteria:
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- ☐ CCME
- ☐ BC Water Quality
- ☐ Other _____

Special Instructions

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1 DAY ☐ 2 Day ☐ 3 Day ☐ Date Required: _____ ☐

Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Metals Field Filtered ? (Y / N)	HOLD	# of Bottles	Comments
1		SS23 - 68	23/05/30	2:33	Soil		X	1	
2		SS23 - 69		2:45					
3		" " - 70		2:56					
4		" " - 71		3:00					
5		" " - 72		3:08					
6		" " - 73		3:19					
7		" " - 74		3:33					
8		" " - 75		3:48					
9		" " - 76		4:00					
10		" " - 77		4:10	N				

C338618_COC

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Nicole Watkins	23/05/30	5:30	Annie Baban	2023/05/30	0800		☐	16, 16, 16	☑ Yes ☐ No

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White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

15, 14, 16
12, 15, 13

seal intact
no cooling media

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Contact Name	Edna Wong	Contact Name	Edna Wong	P.O. #	694890		695069
Address	1300-3777 Kingsway Avenue BURNABY BC V5H 3Z7	Address		Project #	WHATCOM RD	Chain Of Custody Record	Project Manager
Phone	(604) 515-5151 Fax: (604) 515-5150	Phone	Fax:	Project Name		C#695069-15-01	Debbie Nordbruget
Email	edna.wong@snclavalin.com; envwestbclabdata@sncla	Email	edna.wong@snclavalin.com; envwestbclabdata@snclav	Site #			
				Sampled By	NL		

Regulatory Criteria:
- ☐ CSR
- ☐ CCME
- ☐ BC Water Quality
- ☐ Other _____

Special Instructions

Metals Field Filtered ? (Y / N)

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

C338618_COC

HOLD

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Rush Confirmation Number: _____ *(call lab for #)*

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	# of Bottles	Comments
1		~~BH~~ 5523-78	23/05/30	4:20	SOIL	1	
2							
3							
4							
5							
6							
7							
8							
9							
10							

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Nicole Watt	23/05/30	5:20	Annie DOOO	2023/05/30	0800		☐	16, 16, 16	☐ Yes ☐ No

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White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

15, 14, 16
12, 15, 13

seal intact

SNC·LAVALIN

SNC-Lavalin Inc.
Suite 1300 - 3777 Kingsway Avenue
Burnaby, British Columbia, Canada V5H 3Z7
t. 604.515.5151
www.snclavalin.com