NexGen Energy Ltd.

Rook I Project

Environmental Impact Statement

Annex VII.3: Vegetation Chemistry Characterization Report

GOLDER MEMBER OF WSP

GOLDER
MEMBER OF WSP

VEGETATION CHEMISTRY BASELINE REPORT FOR THE ROOK I PROJECT

Prepared for:

NexGen Energy Ltd.

Prepared by:

Golder Associates Ltd.

March 2022

Executive Summary

The vegetation chemistry baseline report is a component of a comprehensive baseline program that documents the natural and socio-economic environments in the anticipated area of the Rook I Project (Project). The vegetation chemistry baseline program was undertaken to provide context from which effects on vegetation from the Project can be assessed in the Rook I Environmental Impact Statement (EIS).

The overall objective of the vegetation chemistry baseline program was to establish the existing element and radionuclide concentrations in lichen and blueberry (stems, leaves, and fruit) within the baseline study areas. Lichen and blueberry were chosen as ecological receptors as these species are important food sources for woodland caribou and local Indigenous communities, respectively. Furthermore, lichen are useful bioindicators of the deposition of airborne contaminants. Understanding existing vegetation chemistry is also important as Indigenous Peoples have expressed concerns about effects on cultural practices and vegetation from industrial facilities.

There are no existing publicly available vegetation chemistry data for the Project study areas, and there are no current guidelines for concentrations of elements or radionuclides for lichen or vascular plants (such as blueberry) to compare to the field data. In the absence of federal and provincial guidance, the vegetation chemistry baseline study incorporated assumptions around anticipated Project effects and is supported by existing scientific literature.

A field program was conducted in August 2018 and August 2019 to establish the existing concentrations of elements and radionuclides in selected plant species in the baseline study areas. During the field program, lichen and blueberry (stems, leaves, and fruit) were collected from three sampling sites within 1 km of the anticipated Project footprint (exposure area) and six sampling sites beyond 5 km from the anticipated Project footprint (reference area). Within each of the nine sampling sites, tissue samples were collected from three plot locations to account for variability within each sampling site. Vegetation samples were transported to Saskatoon, Saskatchewan, for laboratory analysis where moisture content, total extractable elements, and radionuclides were analyzed to determine baseline vegetation chemistry.

Results for vegetation chemistry were presented by calculating the mean concentration and relative standard deviation for each analyte (i.e., chemical substance being analyzed) among the three plot locations within each of the nine sampling sites. The relative standard deviation value was used as a measure of variability among plots within each of the nine sampling sites. Mean and relative standard deviation values were also calculated for the exposure areas and reference areas to identify potential differences between the exposure and reference areas at baseline.

Generally, a pattern of increased element concentrations was observed from blueberry fruit to blueberry leaves to blueberry stems to lichen. Comparison of the exposure and reference areas did not indicate any large differences in baseline values between the areas. Overall, differences observed at baseline sampling sites are likely related to natural variation in site conditions between the exposure and reference areas, annual variation in climate and microclimate, chemical composition of soil parent material, and differences in sampling tissues (e.g., variety of lichen species, age of blueberry stems). Observed concentrations of elements in lichen and blueberry tissues

appear consistent with published values for other remote sites indicating that deposition from anthropogenic emission sources within the study area is limited at baseline.

The baseline field study achieved the objective of characterizing existing vegetation chemistry element and radionuclide concentrations in lichen and blueberry for the Rook I Project. Element and radionuclide concentrations measured during the field study provide a representative baseline against which potential human health and ecological risks from the Project can be assessed.

If referencing this report, please use for the following citation:

Golder (Golder Associates Ltd.). 2022. Vegetation Chemistry Baseline Report for the Rook I Project. Prepared for NexGen Energy Ltd.

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TABLES

FIGURES

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Abbreviations and Units of Measure

Abbreviation	Definition
BNDN	Birch Narrows Dene Nation
BRDN	Buffalo River Dene Nation
CALA	Canadian Association for Laboratory Accreditation Inc.
CRDN	Clearwater River Dene Nation
DL	detection limit
EIS	Environmental Impact Statement
EXP	exposure
GPS	Global Positioning System
MN-S	Métis Nation – Saskatchewan
NexGen	NexGen Energy Ltd.
Project	Rook I Project
QA	quality assurance
QC	quality control
REF	reference
RSD	relative standard deviation
sp.	species
spp.	multiple species
SRC	Saskatchewan Research Council Environmental Analytical Laboratory
UTM	Universal Transverse Mercator
YNLRO	Ya'thi Néné Lands and Resources Office

Unit	Definition
%	percent
µg/g	micrograms per gram
g	gram
km	kilometre
m	metre

1.0 INTRODUCTION

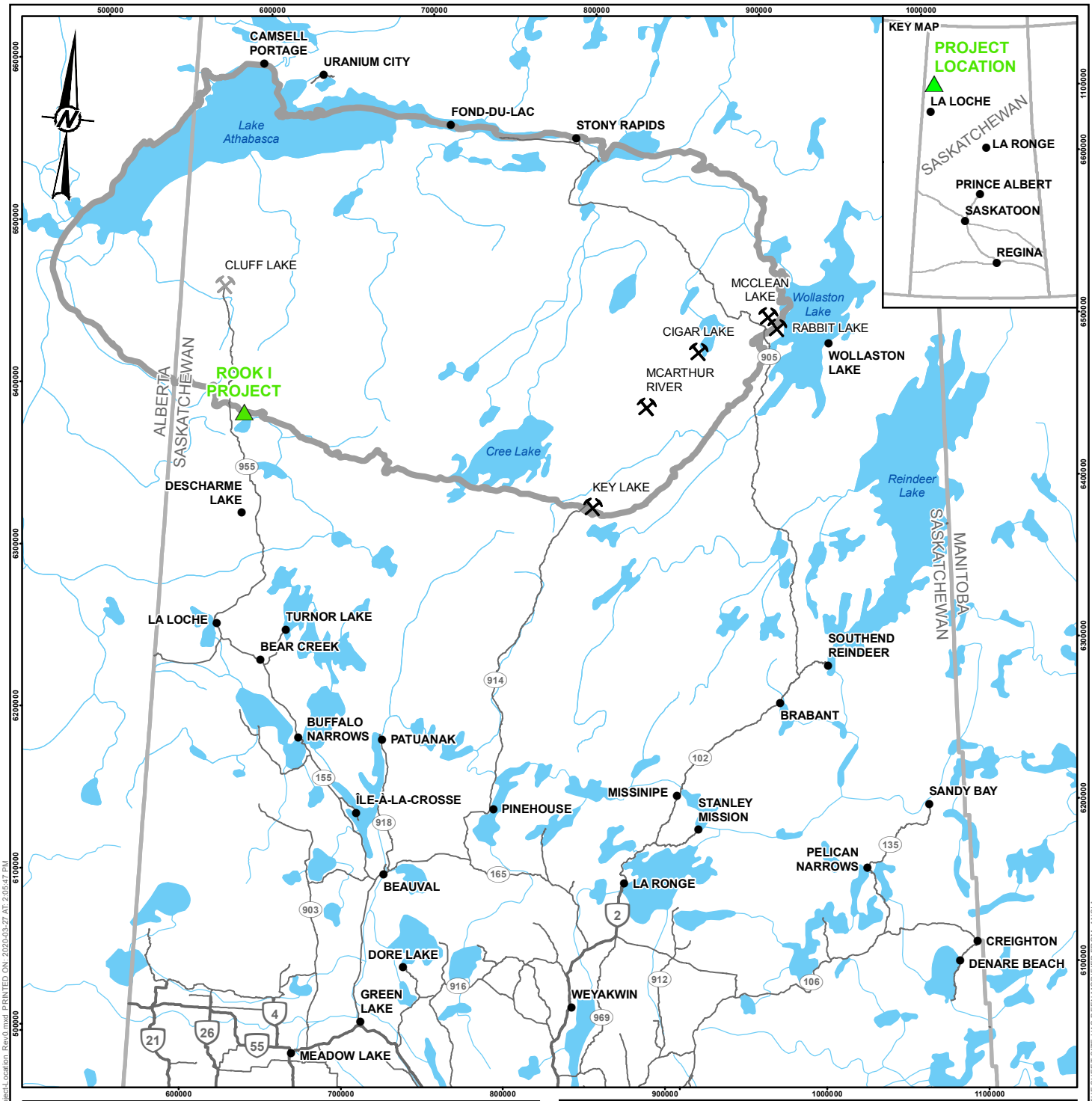
The Rook I Project (Project) is a proposed new uranium mining and milling operation that is 100% owned by NexGen Energy Ltd. (NexGen). The Project would be located in northwestern Saskatchewan, approximately 40 km east of the Saskatchewan-Alberta border, 130 km north of the town of La Loche, and 640 km northwest of the city of Saskatoon (Figure 1). The Project would reside within Treaty 8 territory and within the Métis Homeland. At a regional scale, the Project would be situated within the southern Athabasca Basin adjacent to Patterson Lake, and along the upper Clearwater River system (Figure 2). Access to the Project would be from an existing road off Highway 955. The Project would include underground and surface facilities to support the extraction and processing of uranium ore from the Arrow deposit, a land-based, basement-hosted, high-grade uranium deposit.

The vegetation chemistry baseline report is a component of a comprehensive baseline program that documents the natural and socio-economic environments in the anticipated area of the Project. The vegetation chemistry baseline program was undertaken to provide context from which Project environmental vegetation chemistry effects could be assessed in the Environmental Impact Statement (EIS).

Since exploration at the Project commenced in 2013, NexGen has engaged regularly and established relationships with local First Nation and Métis Groups (collectively referred to as Indigenous Groups) and northern communities, specifically those closest and with greatest access to the proposed Project. NexGen respects the rights of Indigenous Peoples and the unique relationship Indigenous Peoples have with the environment, and recognizes the importance of full and open discussion with interested or potentially affected Indigenous communities regarding the development, operation, and decommissioning of the proposed Project. Engagement activities to date, as well as future planned engagement activities, reflect the value NexGen places on meaningful engagement with Indigenous and northern communities who could be potentially affected by the proposed Project. Engagement mechanisms have included, but are not limited to: meetings with leadership, workshops and community information sessions, Project site tours, establishing Joint Working Groups to support the gathering and incorporation of Indigenous and Local Knowledge throughout the Environmental Assessment (process, and providing funding for Traditional Land Use (TLU) Studies[1] to understand how the proposed Project may interact with the Indigenous communities' traditional use of the anticipated area of the Project.

Feedback received during engagement activities was documented for contribution to the EIS for the Project; examples include identification of concerns, interests, potential adverse effects, mitigation, and design alternatives. Many baseline studies were initiated during exploration in advance of formal engagement on the Environmental Assessment for the Project; however, engagement during the execution of baseline studies helped inform the understanding of baseline conditions and confirmed components of the natural and socio-economic environments that required study. A summary of feedback related to the vegetation chemistry baseline program is presented in Appendix A of the Vegetation Baseline Road Map (Annex VII).

[1] Traditional Land Use (TLU) Studies include all land use studies developed by the Project's affected Indigenous Groups, including Traditional Land Use and Occupancy studies, Traditional Knowledge and Use studies, and Indigenous Rights and Knowledge studies, henceforth referred collectively as TLU Studies.



LEGEND

- POPULATED PLACE
- URANIUM MINING FACILITY (ACTIVE)
- URANIUM MINING FACILITY (DECOMMISSIONED)
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- WATERCOURSE
- WATERBODY
- ATHABASCA BASIN BOUNDARY
- PROJECT LOCATION

0 100 200

1:3,500,000 KILOMETRES

REFERENCE(S)

1. BASE DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

LOCATION OF THE ROOK I PROJECT, SASKATCHEWAN

CONSULTANT

GOLDER

YYYY-MM-DD	2020-03-27
DESIGNED	SS
PREPARED	NO/AK
REVIEWED	JMC
APPROVED	MM

PROJECT NO.	PHASE	REV.	FIGURE
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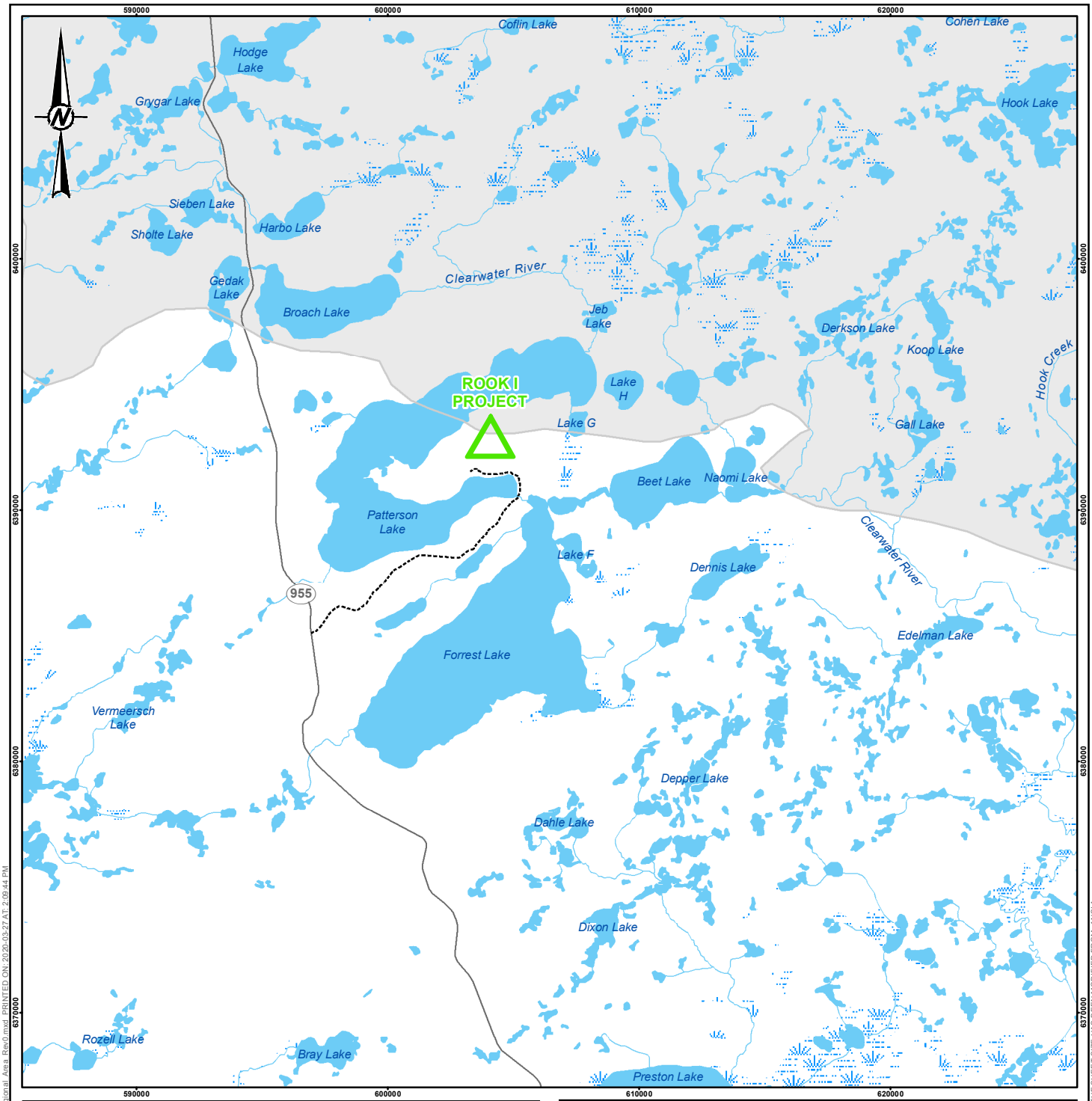

LEGEND

- SECONDARY HIGHWAY
- WATERCOURSE
- WATERBODY
- WETLAND
- ATHABASCA BASIN
- PROJECT LOCATION
- EXISTING ACCESS ROAD

0 5,000 10,000

1:225,000 METRES

REFERENCE(S)

1. BASE DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

REGIONAL AREA OF THE ROOK I PROJECT

CONSULTANT

GOLDER

YYYY-MM-DD	2020-03-27
DESIGNED	JMC
PREPARED	NO/AK
REVIEWED	JMC
APPROVED	MM

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2.0 STUDY OBJECTIVE

The overall objective of the vegetation chemistry baseline program was to establish the existing element and radionuclide concentrations in lichen and in blueberry stems, leaves, and fruit within the baseline study areas. This information supported the assessment of potential Project effects on vegetation, wildlife, and people by providing data for human health and ecological risk assessments.

The vegetation chemistry baseline program focused on lichen and blueberry due to the importance of these plants to caribou and to Indigenous Peoples. Lichen (i.e., *Cladonia* spp. and *Cladina* spp.) were chosen as an ecological receptor or indicator because these species are estimated to account for approximately 90% of the diet for caribou (Thomas 1998). Lichen can also bioaccumulate airborne contaminants because of the lack of roots, large surface area, long life span, and high ion exchange capacity (Naeth and Wilkinson 2009). These attributes allow lichen to provide precautionary exposure concentrations for assessment of risks to caribou in the EIS. Blueberry (i.e., *Vaccinium myrtilloides)* was selected to represent local and Indigenous use of plant resources. As noted in Appendix A of the Vegetation Baseline Road Map (Annex VII) and TLU Study reports completed by local Indigenous Groups in relation to the Project, blueberry was identified as a fruit consumed by Indigenous Peoples (TSD II: BNDN; TSD III: BRDN; TSD IV: MN-S; TSD V.1: CRDN; TSD VI: YNLRO). Studying existing vegetation chemistry conditions for lichen and blueberry was also appropriate as Indigenous Peoples have expressed concerns about food security and changes to cultural practices and wildlife from industrial activities and facilities (TSD II: BNDN; TSD III: BRDN; TSD IV: MN-S; TSD V.1: CRDN; TSD VI: YNLRO).

3.0 STUDY AREAS

The proposed Project would be located within the Firebag Hills Landscape Area, which is within the Mid-Boreal Upland Ecoregion of the Boreal Plain Ecozone of Saskatchewan (Acton et al. 1998). The Firebag Hills Landscape Area consists of mainly gently to strongly rolling morainic plains extending from the Clearwater River Valley located to the south of the Project and covering much of the area north along the Saskatchewan-Alberta border towards the Canadian Shield (Acton et al. 1998).

The following study areas were defined for the collection of the vegetation chemistry samples:

- exposure (EXP) area – within 1 km of the anticipated Project footprint; and
- reference (REF) area – beyond 5 km from the anticipated Project footprint.

The spatial extent of the exposure area was based on the potential indirect effects from the Project on vegetation (e.g., dust deposition; Figure 3). Effects from dust deposition on soil and vegetation are expected to be concentrated within 1 km of the Project footprint (Chen et al. 2017, Walker and Everett 1987). The spatial extent of the reference area was chosen to capture regionally representative vegetation chemistry data beyond the potential anticipated indirect effects of the Project. Data from the reference area may also be used for potential long-term vegetation chemistry monitoring.

4.0 METHODS

The following sub-sections describe the methods used for field data collection, data analysis, and quality assurance/quality control.

4.1 Review of Existing Information

There are no existing publicly available vegetation chemistry data in the exposure and reference areas for the Project. Although guidelines exist for soil chemistry (Soil Quality Guidelines for the Protection of Environmental and Human Heath [CCME 2014]) and the management of naturally occurring radioactive materials (Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials [Canadian NORM Working Group 2013]), there are no similar guidelines for vegetation. In the absence of federal and provincial guidance, the vegetation chemistry baseline study incorporated assumptions around anticipated Project effects and is supported by existing scientific literature. Resources include, but are not limited to:

- *Trace Elements in Berries Collected Near Upgraders and Open Pit Mines in the Athabasca Bituminous Sands Region (ABSR): Distinguishing Atmospheric Dust Deposition from Plant Uptake* (Stachiw et al. 2019).
- *A Geochemical Perspective on the Natural Abundance and Predominant Source of Trace Elements in Cranberries (Vaccinium oxycoccus) from Remote Bogs in the Boreal Region of Northern Alberta, Canada* (Shotyk et al. 2019).
- *Interactions of Lichens with Heavy Metals* (Backor and Loppi 2009).
- *Determination of Elemental Baseline Using Peltigeralean Lichens from Northeastern Canada (Québec): Initial Data Collection for Long Term Monitoring of the effect of Global Climate Change on Boreal and Subarctic Area in Canada* (Darnajoux et al. 2015).
- *An Analysis of the Element Content of Lichens from the Northwest Territories, Canada* (Puckett and Finegan 1980).
- *Background Levels of Some Major, Trace, and Rare Earth Elements in Indigenous Plant Species Growing in Norway and the Influence of Soil Acidification, Soil Parent Material, and Seasonal Variation on these Levels* (Gjengedal et al. 2015).

4.2 Study Approach

The vegetation chemistry field programs were completed from 2 August 2018 to 10 August 2018 and 6 August 2019 to 12 August 2019 by two field personnel per program. The programs included the collection of vegetation samples, and analysis of the samples for concentrations of elements and radionuclides.

4.3 Sample Locations

An initial desktop review of satellite imagery and available Ecological Landscape Classification data for the exposure and reference areas (ENV Forestry Branch 2016; SDLC 2009) was completed to identify suitable habitat most likely to support both blueberry and lichen species (e.g., BP02, Jack Pine Closed Canopy, Jack Pine Open Canopy, and Revegetating/Regenerating Burn) (Table 1; Figure 3).

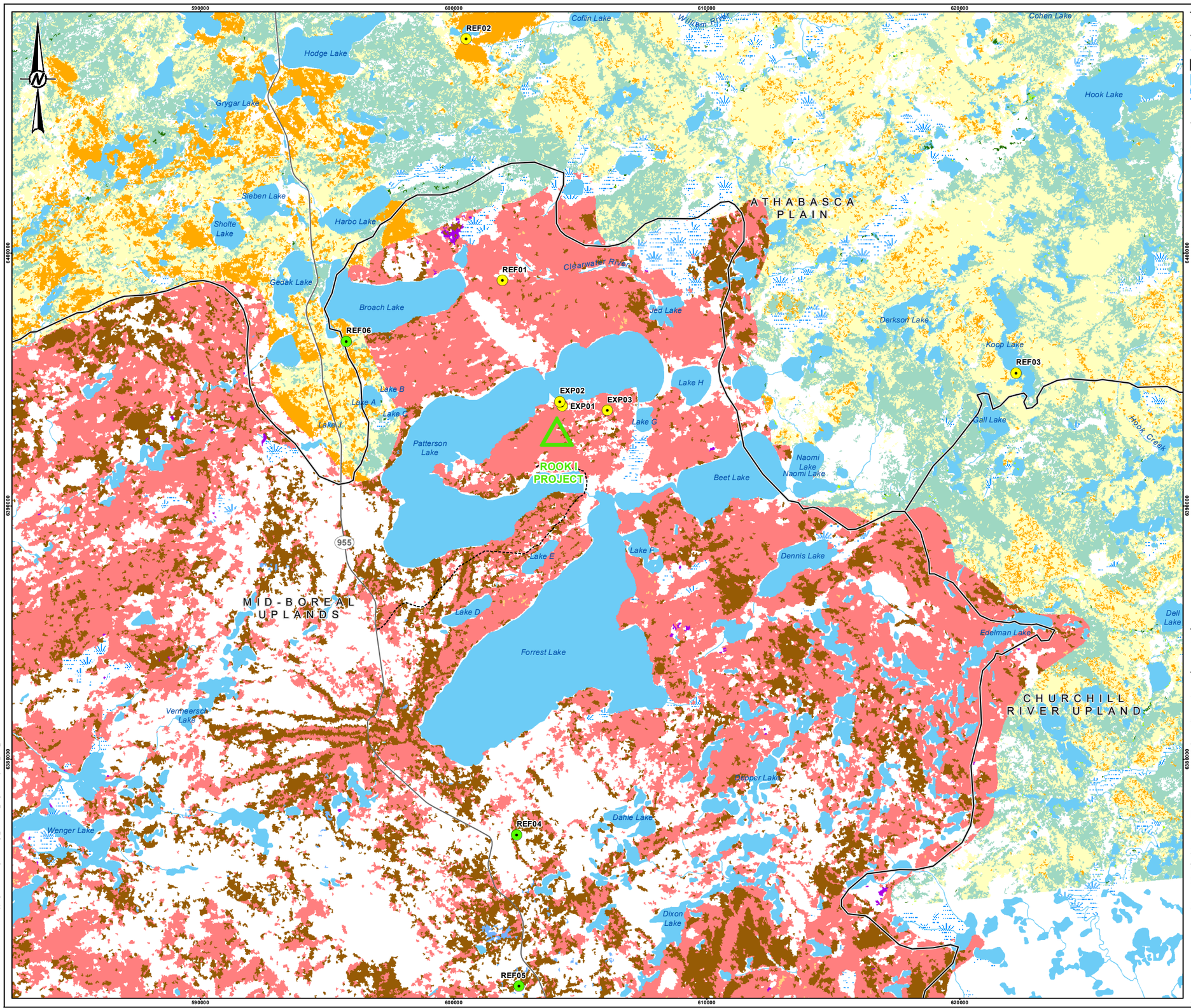
Table 1: Ecosite/Land Cover Classes with Potential to Support Target Sample Species

Ecosite/Land Cover	Description	Potential Sample Tissue
BP02[a]	Jack pine/lichen: Moderately fresh sand	Lichen/blueberry
BP03[a]	Jack pine/feathermoss: Moderately fresh loamy sand	Blueberry
BP04[a]	Jack pine/trembling aspen/feathermoss: Moderately fresh sand	Blueberry
BP12[a]	Jack pine/spruce/feathermoss: Fresh loamy sand	Blueberry
BP14[a]	Black spruce/Labrador tea/feathermoss: Very moist sandy clay loam	Blueberry
Jack Pine Closed Canopy[b]	Greater than 75% of jack pine by area; greater than 55% crown closure	Lichen/blueberry
Jack Pine Open Canopy[b]	Greater than 75% of jack pine by area; 10% to 55% crown closure	Lichen/blueberry
Spruce Closed Canopy[b]	Greater than 75% or greater black and white spruce; greater than 55% crown closure	Blueberry
Spruce Open Canopy[b]	Greater than 75% black and white spruce; 10% to 55% crown closure	Blueberry
Revegetating/Regenerating Burn[b]	An area showing evidence of natural or prescribed burning and where regeneration or revegetation is visible	Lichen/blueberry
Mixed Softwoods (Open and Closed Canopy)[b]	Jack pine/spruce, spruce/jack pine open and closed, an area of softwood combinations in which neither jack pine or spruce account for greater than 75% of species by area, and where crown closure is greater than 10%	Blueberry

Note: crown closure = the degree to which the forest canopy blocks sunlight or obscures the sky above the forest floor and is usually given as the percent of the total area which is occupied by the crowns of trees.
a) McLaughlan et al. 2010.
b) SDLC 2009.

Meteorological data collected from the Project site indicated that the dominant and subdominant wind directions were from the south-southeast and west, respectively. Proposed sampling sites were selected where suitable habitat types intersected either the dominant or subdominant wind directions. Final sampling sites were adjusted in the field where required, based on available plant material, access, and disturbance (i.e., recent fire burns). Three sampling sites (i.e., EXP01, EXP02, EXP03) within the exposure area and three sampling sites within the reference area (i.e., REF01, REF02, REF03) were selected in 2018 (Figure 3). In discussion with NexGen, it was determined that new reference sites would be sampled in 2019 due to access limitations with the initial 2018 reference sites (i.e., restricted to helicopter access only). Therefore, 2019 sampling was completed at three new reference sampling sites (i.e., REF04, REF05, REF06) (Figure 3). No access restrictions were identified for the exposure sampling sites identified in 2018, and therefore exposure sites were not resampled in 2019 (i.e., exposure sites were suitable for long-term monitoring, if required).

Within each sampling site, tissue samples were collected from three plot locations (i.e., A, B, C) to account for variability within each sampling site (i.e., to identify the potential for site-specific elevated concentrations of elements or radionuclides within vegetation). Plot location and proximity to each other were dependent upon available sample material and all three plot locations were within a 100 m radius of each other for each sampling site. Two exposure sites (i.e., EXP01, EXP02) and two reference sites (i.e., REF01, REF02) were located downwind along the south-southeast wind direction, and the one exposure site (i.e., EXP03) and one reference site (i.e., REF03) were located downwind along the west wind direction. Reference sampling sites in 2019 were selected due to proximity to access trails and suitability for long-term monitoring and were located downwind along the north wind direction (i.e., REF04, REF05) and downwind of the east-southeast wind direction (i.e., REF06).



LEGEND

- SECONDARY HIGHWAY
- WATERCOURSE
- ECOREGION
- WATERBODY
- WETLAND

PROJECT FEATURES

- EXISTING ACCESS ROAD
- PROJECT LOCATION
- 2018 VEGETATION CHEMISTRY SAMPLE SITE
- 2019 VEGETATION CHEMISTRY SAMPLE SITE

POTENTIAL TO SUPPORT LICHEN AND/OR BLUEBERRY[1]

ECOSITES

- BP02 - LICHEN AND BLUEBERRY
- BP03 - BLUEBERRY
- BP04 - BLUEBERRY
- BP12 - BLUEBERRY
- BP14 - BLUEBERRY

SASK DIGITAL LAND COVER

- 8: JACKPINE (CLOSED CANOPY) - LICHEN AND BLUEBERRY
- 9: JACKPINE (OPEN CANOPY) - LICHEN AND BLUEBERRY
- 10: SPRUCE (CLOSED CANOPY) - BLUEBERRY
- 11: SPRUCE (OPEN CANOPY) - BLUEBERRY
- 15: REVEGETATING/ REGENERATION BURN - LICHEN AND BLUEBERRY
- 27: MIXED SOFTWOODS (OPEN AND CLOSED) - BLUEBERRY

0 3,000 6,000

1:150,000 METRES

NOTE(S)

1. ECOSITES AND LAND COVER TYPES WITH LIMITED POTENTIAL TO SUPPORT LICHEN AND/OR BLUEBERRY WERE EXCLUDED FROM THE FIGURE.

REFERENCE(S)

ECOSITES (V2.0_RF_F) AND DIGITAL LAND COVER OBTAINED FROM GOVERNMENT OF SASKATCHEWAN.
ECOREGIONS OBTAINED FROM AGRICULTURE AND AGRI-FOOD CANADA (AAFC).
BASE DATA MAY BE OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 12 DATUM: NAD 83

CLIENT

NexGen Energy Ltd.

PROJECT

ROOK I PROJECT

TITLE

VEGETATION CHEMISTRY PLOT LOCATIONS AND LAND COVER/ECOSITE CLASSIFICATION

CONSULTANT

GOLDER

YYYY-MM-DD	2021-05-12
DESIGNED	AS
PREPARED	LMS/NO
REVIEWED	AS
APPROVED	JV

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4.3.1 Vegetation Chemistry Sample Collection

Twenty-seven plot locations were visited during the 2018 and 2019 vegetation chemistry field programs. Upon arriving at each plot location, Universal Transverse Mercator (UTM) coordinates were marked with a GPS device and tissue samples were collected for chemical analysis (Table 2). Several photographs were taken at each plot location to document the physical characteristics and habitat present. Photographs of collected samples were taken showing the corresponding sample identifier and sample condition. Representative photos of each of the 27 vegetation chemistry plot locations are presented in Appendix A Site Photographs.

Table 2: Vegetation Chemistry Plot Locations, 2018 and 2019

Year	Sampling Site	Plot Location	UTM Coordinate Location (Zone 12U NAD 83)	
			Easting	Northing
2018	EXP01	EXP01-A	604257	6394043
		EXP01-B	604236	6394033
		EXP01-C	604234	6394055
	EXP02	EXP02-A	604195	6394147
		EXP02-B	604201	6394134
		EXP02-C	604219	6394149
	EXP03	EXP03-A	606078	6393793
		EXP03-B	606017	6393781
		EXP03-C	606033	6393732
	REF01	REF01-A	601933	6398930
		REF01-B	601892	6398898
		REF01-C	602032	6398797
	REF02	REF02-A	600499	6408468
		REF02-B	600482	6408422
		REF02-C	600438	6408446
	REF03	REF03-A	622227	6395264
		REF03-B	622224	6395223
		REF03-C	622268	6395234
2019	REF04	REF04-A	602400	6377020
		REF04-B	602560	6376933
		REF04-C	602448	6377037
	REF05	REF05-A	602565	6371034
		REF05-B	602611	6371045
		REF05-C	602590	6371019
	REF06	REF06-A	595789	6396561
		REF06-B	595717	6396540
		REF06-C	595723	6396466

UTM = Universal Transverse Mercator; NAD = North American Datum; EXP = exposure site; REF = reference site.

Sterile sampling protocols were implemented so that samples were not contaminated by external sources. General notes regarding the sampling site and vegetation health and vigour were recorded. During the field programs, effort was made to pick berries that were considered edible (e.g., undamaged, ripe). Blueberry leaves were removed from stems by hand. Blueberry stems were collected by cutting the base of the aboveground growth with clean coated scissors (i.e., Teflon-coated [2018] or titanium-coated [2019]) and gently folding the stems. Lichen samples were cleaned as the samples were collected, by gently removing any obvious debris either by hand or trimming material with the Teflon- or titanium-coated scissors. Individual lichen species were not preferentially selected; rather, lichen collections included a variety of species available from each plot. These species included star-tipped reindeer lichen (*Cladina stellaris*), green reindeer lichen (*Cladina mitis*), gray reindeer lichen (*Cladina rangiferina*), mealy pixie-cup (*Cladonia chlorophaea*), bighorn cladonia (*Cladonia cornuta* ssp. *cornuta*), red-fruited pixie-cup (*Cladonia pleurota*), wooden soldiers (*Cladonia botrytis),* boreal pixie-cup (*Cladonia borealis*), split-peg soldiers (*Cladonia cariosa*), bronzed pixie lichen (*Cladonia gracilis* ssp. *turbinata*), greater sulphur-cup (*Cladonia sulphurina*), thorn lichen (*Cladonia uncialis*), and woolly foam lichen (*Stereocaulon tomentosum*).

Also included in the sample protocol was the use of nitrile gloves for all contact with sampled vegetation tissues. New gloves were used for each plot location and plant tissue type. Teflon- or titanium-coated scissors were used to snip the upper leafy portion from several plants within the same plot location to create a composite sample. Scissors were washed with decontamination soap and rinsed with distilled water between each plot location and tissue type. Where possible, 500 g of sample material was collected for each tissue type at each plot location and stored in clean zip-lock bags that were kept cool until they could be transported to the laboratory for analysis.

In 2018, with the exception of blueberry fruit for plots REF01-A and REF01-B, all four tissue types (i.e., lichen, and blueberry stems, leaves, and fruit) were collected from all 18 plot locations. Blueberry plants were observed to be abundant throughout plot locations REF01-A and REF01-B; however, due to a recent burn, plants were limited to the current year's growth and therefore did not produce flowers or fruit. Three tissue types (i.e., lichen, and blueberry stems and leaves) were collected from all nine plot locations in 2019. Blueberry plants were observed to be abundant at all nine plot locations; however, fruit production was poor at the time of sampling and fruit was not available in sufficient quantities for chemical analysis.

4.3.2 Vegetation Chemistry Analysis

Laboratory analyses were performed by the Saskatchewan Research Council Environmental Analytical Laboratory (SRC) in Saskatoon, Saskatchewan. Total extractable metals in vegetation were analyzed using inductively coupled plasma mass spectrometry. Radionuclides in vegetation were analyzed using Natural Uranium Tailings Program (NUTP)-3E Alpha and Beta Spectroscopy. The laboratory certificates of analyses are provided in Appendix B Laboratory Certificates of Analysis. Samples were analyzed for the following suite of parameters:

- moisture content;
- total elements (i.e., aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, cesium, chromium, cobalt, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, rubidium, selenium, silver, strontium, tellurium, thallium, tin, titanium, uranium, vanadium, zinc, and zirconium); and
- radionuclides (i.e., lead-210, polonium-210, radium-226, and thorium-230).

4.4 Quality Assurance and Quality Control

Quality assurance (QA) and quality control (QC) practices determine data integrity and are relevant to all aspects of a study, from sample collection to data analysis and reporting. Quality assurance encompasses management and technical practices designed to confirm that the data generated are of consistent high quality. Quality control is an aspect of QA and includes the procedures used to measure and evaluate data quality, and the corrective actions to be taken when data quality objectives are not met.

4.4.1 Quality Assurance

Quality assurance applicable to this study covers internal and external management. One field crew member was responsible for managing the sample shipping process for the field program to confirm that samples were properly labelled, documentation was completed, and samples were delivered to the laboratory. The other member of the field crew was designated as the laboratory liaison. The laboratory selected for the analysis of samples, SRC, is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA). Under CALA's accreditation program, performance evaluation assessments are conducted annually for laboratory procedures, methods, and internal quality control. The laboratory Quality Control Report is included in Appendix C Quality Control Report.

Internal QA included use of appropriately trained personnel for each task and senior review of work products at appropriate milestones, use of standardized data manipulation/summary tools, and filing of data and Project information according to standardized protocols.

4.4.2 Quality Control

The QC program consisted of the collection and analysis of field replicate samples and laboratory QC analysis. Laboratory QC analysis included a variety of techniques, such as the analysis of reference materials, control samples, and spike recovery measurements to verify the validity of the analytical results. If QC issues were identified, the samples were re-analyzed, or other corrective action was undertaken to demonstrate that the analytical results are within the expected measurement uncertainty.

5.0 RESULTS

Results for vegetation chemistry were obtained by calculating the mean concentration and relative standard deviation (RSD) for each analyte (i.e., chemical substance being analyzed) among the three plot locations within each of the nine sampling sites. Non-detect data were managed using a relatively simple approach following the United States Environmental Protection Agency's *Data Quality Assessment: Statistical Methods for Practitioners* (USEPA 2006). Prior to calculating the RSD, concentrations below the detection limit (DL) were replaced with the DL value in cases when at least one of the concentrations for a given parameter within a sampling site was detectable. Replacing non-detect data with the DL will bias high any measures of central tendency (i.e., mean, median) as the non-detect value is likely lower than the DL; however, replacing non-detect data with the DL instead of alternative approaches will result with a more conservative dataset. If all three plots resulted in a non-detect value, then a mean concentration and RSD were not calculated. The RSD was calculated using the following formula:

$$\text{RSD} = \frac{\text{Sample Standard Deviation}}{\text{Mean Concentration}} \times 100\%$$

The RSD value was used as a measure of variability among plots within each of the nine sampling sites. A higher value indicates a greater amount of variation observed among plots. For comparative purposes, a mean concentration and RSD value were also calculated for the exposure areas (2018) and reference areas (2018 and 2019) (where all three sampling sites were reported above detection limit) to identify any current differences between the exposure and reference areas.

Mean moisture content and the calculated RSD values are provided for each sample tissue type in the sections below. Values are used to provide data for the ecological risk assessment but provided limited descriptive analysis for the element concentrations observed during baseline. Therefore, no further discussion on moisture content is provided.

5.1 Lichen

The mean concentrations and RSDs for moisture, elements, and radionuclides for lichen are presented in Table 3. Complete analysis results are presented in Appendix D Vegetation Chemistry Laboratory Results (Table D-1).

Non-detect values in elements were observed in lichen from all nine sampling sites for antimony, tellurium, thallium, and tin. In detected values, the RSDs for sampling sites ranged from 0% to 150%.

Non-detect values in radionuclides for lichen were observed for thorium-230 in exposure and reference areas. Lead-210, polonium-210, and radium-226 were observed above non-detect values for all nine sampling sites except for two non-detect values for radium-226 (Appendix D). In detected values, the RSDs for sampling sites ranged from 8% to 99%.

The difference between the minimum and maximum concentrations for lichen were less than one order of magnitude for all elements and radionuclides except chromium and nickel indicating a consistent scale within the dataset.

Table 3: Element and Radionuclide Concentrations in Lichen Samples, 2018 and 2019

Year	2018																2019							
Sampling Site	EXP01		EXP02		EXP03		EXP Area Total		REF01		REF02		REF03		REF Area Total		REF04		REF05		REF06		REF Area Total	
Parameter	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%
% Moisture	10	57	40	9	49	12	33	55	8	8	48	26	24	46	27	72	27	30	66	3	41	26	45	44
Aluminum	313	27	233	17	593	41	380	55	533	108	373	9	460	29	456	67	290	7	253	5	270	17	271	7
Antimony	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Arsenic	0.08	18	0.06	9	0.15	43	0.10	53	0.18	111	0.11	16	0.12	22	0.14	78	0.07	20	0.05	0	0.05	11	0.06	19
Barium	12	22	12	34	15	10	13	22	12	32	17	27	12	30	14	33	8	33	8	13	7	21	7	11
Beryllium	0.01	0	n/c	n/c	0.02	35	n/c	n/c	0.01	43	0.01	43	0.01	43	0.01	38	0.01	0	n/c	n/c	0.01	0	n/c	n/c
Boron	1	0	1.3	43	1.3	43	1.2	36	1.7	69	n/c	n/c	1	0	n/c	n/c	1	0	n/c	n/c	n/c	n/c	n/c	n/c
Cadmium	0.05	11	0.04	13	0.06	9	0.05	19	0.08	99	0.06	24	0.05	12	0.06	68	0.05	11	0.03	0	0.05	12	0.04	28
Cesium	0.12	13	0.10	6	0.17	22	0.13	31	0.17	23	0.17	12	0.12	42	0.15	26	0.10	36	0.09	34	0.10	0	0.10	3
Chromium	2.4	83	1.2	13	52	132	18	229	1.9	91	9	126	16	76	9	116	1.2	12	0.9	11	1.1	18	1	16
Cobalt	0.10	30	0.09	29	0.62	109	0.27	159	0.10	82	0.11	37	0.22	51	0.15	63	0.08	8	0.07	21	0.07	25	0.07	5
Copper	1.1	12	1.1	20	1.5	29	1.2	27	1.5	68	1.6	10	1.1	11	1.4	40	1.0	12	0.9	4	0.9	14	0.9	7
Iron	217	16	170	12	587	76	324	92	363	109	293	14	313	29	323	64	160	11	187	39	160	11	169	9
Lead	0.40	38	0.26	21	0.87	46	0.51	69	0.80	129	1	27	0.51	26	0.79	75	0.22	26	0.19	23	0.23	23	0.21	10
Lithium	0.17	12	0.13	11	0.30	57	0.20	56	0.24	96	0.17	7	0.22	28	0.21	59	0.14	14	0.13	5	0.13	4	0.13	5
Manganese	183	5	202	40	169	40	185	30	63.7	49	162	13	134	15	120	41	133	10	97	5	102	18	111	18
Mercury	0.02	26	0.02	13	0.03	11	0.02	20	0.15	150	0.03	11	0.02	2	0.07	182	0.02	11	0.02	13	0.02	14	0.02	15
Molybdenum	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	0.10	0	0.10	0	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Nickel	1.2	70	0.72	18	21	132	8	224	1.1	85	3.7	112	6.5	71	3.8	104	0.70	15	0.51	7	0.60	21	0.60	16
Rubidium	4.7	7	4.3	10	5.4	23	4.8	18	5	37	4.4	15	3.9	16	4.4	25	5.6	12	5.9	6	4.9	3	5.5	9
Selenium	0.07	23	n/c	n/c	0.10	6	n/c	n/c	0.09	71	0.05	11	0.07	14	0.07	53	0.06	9	n/c	n/c	0.06	10	n/c	n/c
Silver	0.02	0	0.01	0	0.02	35	0.02	34	0.01	43	0.02	35	0.01	0	0.01	38	0.01	0	0.01	0	0.01	0	0.01	0
Strontium	3.6	29	2.7	24	6.1	36	4.1	48	5.2	10	3.7	26	4.5	24	4.5	23	3.5	4	3.7	20	2.6	28	3.3	18
Tellurium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Thallium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Tin	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Titanium	7.8	25	5.7	18	16	59	9.6	67	13	115	8.4	12	12	33	11	73	6.5	9	6.5	4	6.2	9	6.4	2
Uranium	0.14	14	0.08	18	0.04	58	0.09	51	0.03	108	0.04	87	0.02	35	0.03	90	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Vanadium	0.57	20	0.50	20	1.2	52	0.76	61	1.2	115	0.80	12	0.80	22	0.93	78	0.47	12	0.43	13	0.47	12	0.5	4
Zinc	16	6	12	5	19	24	15.7	23	16	60	16	26	17	20	16	34	17	6	10	8	15	7	14	25
Zirconium	0.26	30	0.17	15	0.58	77	0.34	87	0.34	112	0.24	17	0.55	57	0.38	75	0.16	10	0.14	7	0.16	13	0.15	6
Lead-210	0.27	17	0.25	18	0.37	9	0.30	22	0.30	57	0.32	23	0.27	8	0.30	32	0.27	16	0.24	24	0.33	18	0.28	16
Polonium-210	0.18	22	0.14	15	0.31	19	0.21	41	0.22	61	0.22	23	0.21	8	0.22	34	0.23	18	0.24	17	0.29	10	0.25	13
Radium-226	0.005	17	0.003	17	0.01	34	0.01	59	0.002	82	0.003	46	0.004	67	0.003	61	0.0006	40	0.0009	33	0.0005	12	0.0007	33
Thorium-230	0.002	35	0.001	17	n/c	n/c	n/c	n/c	0.0005	99	n/c	n/c	0.003	83	n/c	n/c	n/c	n/c	0.0007	40	0.0006	20	n/c	n/c

Note:
n/c = not calculated as concentrations were non-detect.
Element concentrations in µg/g.
Radionuclide concentrations in becquerels per gram.
RSD% = Relative Standard Deviation; EXP = exposure; REF = reference.

5.2 Blueberry Stems

The mean concentrations and RSDs for moisture, elements, and radionuclides for blueberry stems are presented in Table 4. Complete analysis results are presented in Appendix D (Table D-2).

Non-detect values in elements for blueberry stems were observed in blueberry stems from all nine sampling sites for antimony, arsenic, beryllium, molybdenum, silver, tellurium, and tin. In detected values, the RSDs for sampling sites ranged from 0% to 115%.

Thorium-230 was only detected at EXP01, EXP02, and REF06 sampling sites. Lead-210, polonium-210, and radium-226 were detected at all nine sampling sites. In detected values, the RSDs for sampling sites ranged from 5% to 160%.

The difference between the minimum and maximum concentrations for blueberry stems were less than one order of magnitude for all elements and radionuclides indicating a consistent scale within the dataset.

Table 4: Element and Radionuclide Concentrations in Blueberry Stem Samples, 2018 and 2019

Year	2018																2019							
Sampling Site	EXP01		EXP02		EXP03		EXP Area Total		REF01		REF02		REF03		REF Area Total		REF04		REF05		REF06		REF Area Total	
Parameter	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%
% Moisture	37	11	41	7	44	9	41	11	55	16	38	18	35	9	43	26	36	11	44	4	39	2	40	9
Aluminum	101	16	102	22	106	28	103	20	45	85	84	17	104	11	78	43	140	25	110	9	106	28	119	16
Antimony	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Arsenic	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Barium	61	26	78	15	71	10	70	18	77	18	77	31	69	6.7	74	19	79	5	70	10	62	12	71	12
Beryllium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Boron	7.0	0	8.3	6.9	8.3	7	7.9	10	11	22	7.3	16	7.0	0	8	26	8.3	7	6.3	9	7.7	15	7	14
Cadmium	0.02	0	0.02	0	0.03	35	0.02	36	0.04	42	0.03	46	0.02	25	0.03	41	0.02	25	0.01	43	0.02	0	0.02	27
Cesium	n/c	n/c	n/c	n/c	0.05	11	n/c	n/c	0.07	44	0.06	24	0.10	20	0.08	34	0.06	20	n/c	n/c	0.09	58	n/c	n/c
Chromium	0.77	27	0.60	29	0.63	9	0.67	24	n/c	n/c	0.53	11	n/c	n/c	n/c	n/c	0.77	30	0.53	11	0.53	11	0.61	22
Cobalt	0.05	29	0.08	20	0.04	0	0.06	34	0.02	65	0.03	43	0.02	25	0.02	41	0.05	35	0.07	8	0.04	16	0.05	35
Copper	5.1	9	5.4	15	5.3	8	5.3	10	5.8	26	5.0	7	5.1	3	5.3	16	4.7	14	5.6	2	5.2	29	5.2	9
Iron	59	18	63	27	61	25	61	21	33	75	49	28	54	8	45	38	81	32	69	4	57	28	69	17
Lead	0.08	20	0.07	25	0.07	14	0.07	18	0.03	115	0.05	45	0.05	11	0.04	53	0.08	30	0.06	9	0.05	45	0.06	28
Lithium	0.06	10	0.06	18	0.07	14	0.06	16	0.05	0	n/c	n/c	n/c	n/c	n/c	n/c	0.08	38	0.08	12	0.06	20	0.07	18
Manganese	1753	20	1920	24	1850	14	1841	18	1503	27	1303	14	1610	10	1472	19	1853	13	1243	16	1540	27	1546	20
Mercury	0.007	23	0.007	21	0.007	31	0.007	22	0.005	11	0.006	17	0.006	10	0.006	12	0.010	30	0.008	13	0.007	21	0.008	14
Molybdenum	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Nickel	1.2	27	1.0	15	0.75	20	1.0	27	0.81	42	0.77	29	0.70	25	0.76	30	0.87	13	0.83	12	0.87	24	0.86	2
Rubidium	5.3	18	4.9	4.7	4.6	7.7	4.9	13	9.2	15	4	20	4.5	17	5.9	44	6.2	48	6.4	6	6.8	54	6.5	4
Selenium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	0.05	11	n/c	n/c	n/c	n/c	n/c	n/c
Silver	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Strontium	7.7	24	10	113	4.8	20	7.7	84	9.2	9	11	25	10	10	10	17	7.6	35	9.3	16	6.4	21	7.7	19
Tellurium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Thallium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	0.07	43	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Tin	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Titanium	1.9	35	1.7	31	1.7	35	1.8	30	0.48	112	0.88	34	1.6	33	1.0	65	2.2	42	1.9	5	1.6	35	1.9	15
Uranium	0.05	0	0.04	31	0.01	43	0.03	52	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Vanadium	0.13	43	0.13	43	0.13	43	0.13	38	0.10	0	0.10	0	0.10	0	0.1	0	0.20	50	0.20	0	0.13	43	0.18	22
Zinc	32	34	42	9	43	4	39	20	43	12	47	36	45	18	45	22	33	11	20	23	34	14	29	27
Zirconium	0.07	31	0.06	0	0.05	11	0.06	22	n/c	n/c	n/c	n/c	0.06	20	n/c	n/c	0.08	18	0.05	0	0.05	11	0.06	27
Lead-210	0.07	22	0.08	26	0.09	34	0.08	29	0.04	154	0.07	16	0.07	16	0.06	57	0.13	15	0.11	10	0.08	52	0.11	26
Polonium-210	0.05	25	0.05	14	0.05	40	0.05	24	0.02	160	0.04	22	0.04	24	0.03	59	0.09	5	0.08	15	0.04	67	0.007	38
Radium-226	0.007	18	0.01	23	0.008	29	0.009	34	0.004	16	0.01	36	0.006	59	0.007	64	0.005	14	0.004	16	0.005	28	0.004	12
Thorium-230	0.001	26	0.0006	51	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	0.0005	0	n/c	n/c

Note:
n/c = not calculated as concentrations were non-detect.
Element concentrations in µg/g.
Radionuclide concentrations in becquerels per gram.
RSD% = Relative Standard Deviation; EXP = exposure; REF = reference.

5.3 Blueberry Leaves

The mean concentrations and RSDs for moisture, elements, and radionuclides for blueberry leaves are presented in Table 5. Complete analysis results are presented in Appendix D (Table D-3).

Non-detect values in elements were observed in blueberry leaves from all nine sampling sites for antimony, arsenic, beryllium, silver, tellurium, and vanadium. In detected values, the RSDs for sampling sites ranged from 0% to 76%.

Non-detect values in radionuclides for blueberry leaves were observed in all nine sampling sites for thorium-230, except EXP01 and REF05 sampling sites. In detected values, the RSDs for sampling sites ranged from 3% to 70%.

The difference between the minimum and maximum concentrations for blueberry leaves were less than one order of magnitude for all elements and radionuclides indicating the range of values appears to be consistent with results observed across all nine sampling sites.

Table 5: Element and Radionuclide Concentrations in Blueberry Leaf Samples, 2018 and 2019

Year	2018																2019							
Sampling Site	EXP01		EXP02		EXP03		EXP Area Total		REF01		REF02		REF03		REF Area Total		REF04		REF05		REF06		REF Area Total	
Parameter	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%
% Moisture	55	3	55	7	56	8	55	5	54	9	52	12	51	1	52	8	51	7	59	7	54	5	55	7
Aluminum	93	8	90	13	100	9	94	10	68	10	80	6.6	98	2	82	17	80	4	65	11	69	10	71	10
Antimony	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Arsenic	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Barium	45	27	63	14	63	10	57	22	55	46	74	28	76	7	68	28	57	7	57	7	54	8	56	3
Beryllium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Boron	32	15	39	17	31	20	34	19	25	24	24	26	23	12	24	19	18	19	9	12	16	10	14	31
Cadmium	n/c	n/c	n/c	n/c	0.01	0	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Cesium	0.08	30	0.06	20	0.08	33	0.07	29	0.15	72	0.11	63	0.16	6	0.14	49	0.08	9	0.07	17	0.15	35	0.10	47
Chromium	0.50	0	n/c	n/c	0.50	0	n/c	n/c	n/c	n/c	0.67	43	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Cobalt	0.04	0	0.04	13	0.03	22	0.04	24	0.01	43	0.02	50	0.02	50	0.02	47	0.03	22	0.04	16	0.03	22	0.03	19
Copper	3.4	5	3.6	15	3.2	10	3.4	11	3.6	36	3.3	17	3.5	10	3.5	22	3.7	12	4.1	2	3.9	24	3.9	5
Iron	54	7	50	11	54	15	53	11	43	12	44	15	46	4	44	10	36	12	40	8	35	6	37	6
Lead	0.05	12	0.03	33	0.03	17	0.04	27	0.02	35	0.03	58	0.02	0	0.02	49	0.01	0	0.01	0	n/c	n/c	n/c	n/c
Lithium	n/c	n/c	n/c	n/c	0.05	0	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Manganese	2770	17	3017	30	3697	24	3161	25	2363	30	2297	11	3170	6	2610	22	3243	12	1963	15	3003	28	2737	25
Mercury	0.007	8	0.008	7	0.008	0	0.008	7	n/c	n/c	0.006	9.1	0.007	8	n/c	n/c	0.006	10	0.007	9	0.006	9	0.006	8
Molybdenum	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	0.10	0	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Nickel	1.0	23	0.98	19	0.69	13	0.9	25	0.70	38	0.78	27	0.77	14	0.75	24	0.74	17	0.87	7	0.88	32	0.83	9
Rubidium	9.4	3	8.57	11	7	12	8.3	15	12	22	6.4	19	7.1	3	8.5	35	9.6	47	11.3	5	10.4	30	10.4	8
Selenium	0.06	36	n/c	n/c	0.05	11	n/c	n/c	n/c	n/c	0.05	0	0.05	11	n/c	n/c	0.06	29	n/c	n/c	n/c	n/c	n/c	n/c
Silver	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Strontium	6.7	32	5.07	76	5.2	15	5.7	42	5.6	43	9.1	19	11	20	8.7	36	5.9	28	7.3	14	4.9	32	6.0	20
Tellurium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Thallium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	0.06	29	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Tin	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	0.05	11	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Titanium	1.6	20	1.1	27	1.2	14	1.3	27	0.41	48	0.57	32	0.76	35	0.58	41	0.48	22	0.57	22	0.45	5	0.50	12
Uranium	0.10	53	0.03	0	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Vanadium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Zinc	9.8	2	11.3	13	15	25	12	26	11	9	14	8.4	14	4	13	12	11	15	8	12	12	5	10	17
Zirconium	0.06	9	0.05	0	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Lead-210	0.04	7	0.03	3	0.04	28	0.04	17	0.02	70	0.03	15	0.03	4	0.03	39	0.03	13	0.04	9	0.03	16	0.03	17
Polonium-210	0.01	17	0.02	13	0.02	63	0.02	37	0.006	53	0.02	31	0.01	19	0.01	48	0.01	9	0.01	7	0.01	9	0.01	14
Radium-226	0.006	25	0.01	16	0.007	15	0.007	21	0.004	21	0.006	44	0.006	7	0.005	31	0.003	23	0.002	4	0.003	44	0.002	33
Thorium-230	0.001	43	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	0.001	36	n/c	n/c	n/c	n/c

Note:
n/c = not calculated as concentrations were non-detect.
Element concentrations in µg/g.
Radionuclide concentrations in becquerels per gram.
RSD% = Relative Standard Deviation; EXP = exposure; REF = reference.

5.4 Blueberry Fruit

The mean concentrations and RSDs for moisture, elements, and radionuclides for blueberry fruit collected in 2018 are presented in Table 6. Complete analysis results are presented in Appendix D (Table D-4). Blueberry fruit was not collected in 2019 due to lack of available ripe fruit at the time of sampling.

Non-detect values in elements were observed in blueberry fruit from all six sampling sites for antimony, arsenic, beryllium, chromium, mercury, selenium, silver, tellurium, thallium, tin, uranium, and vanadium. In detected values, the RSDs for sampling sites ranged from 0% to 160%.

Non-detect values in radionuclides for blueberry fruit were observed in all six sampling sites for thorium-230. The RSDs for sampling sites ranged from 0% to 58% for lead-210, polonium-210, and radium-226. Due to recent fire disturbance, only one fruit tissue sample (REF01-C) could be collected from sampling site REF01. Therefore, actual single sample results for REF01 are presented in Table 6; mean concentration and RSD values were not calculated.

The difference between the minimum and maximum concentrations for blueberry fruit was less than one order of magnitude for all elements and radionuclides indicating the range of values appears to be consistent with results observed across all sampling sites.

Table 6: Element and Radionuclide Concentrations in Blueberry Fruit Samples, 2018

Year	2018														
Sampling Site	EXP01		EXP02		EXP03		EXP Area Total		REF01	REF02		REF03		REF Area Total	
Parameter	Mean	RSD%	Mean	RSD%	Mean	RSD%	Mean	RSD%	Sample Result[a]	Mean	RSD%	Mean	RSD%	Mean	RSD%
% Moisture	89	10	83	1	84	1	85	6	83	84	1	83	0	83	1
Aluminum	11	11	13	38	10	41	11	32	9.1	9.5	4	11	13	10	13
Antimony	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Arsenic	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Barium	17	10	20	8	18	16	18	13	21	20	5	19	11	20	7
Beryllium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Boron	11	42	11	5	10	26	11	25	7	9	40	7	14	8	31
Cadmium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	0.13	160	n/c	n/c
Cesium	0.07	29	0.06	17	0.08	59	0.07	41	0.24	0.13	87	0.23	9.2	0.19	46
Chromium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Cobalt	0.01	0	0.01	43	n/c	n/c	n/c	n/c	n/c	n/c	n/c	0.01	0	n/c	n/c
Copper	3.3	8	4.2	11	3.2	16	3.5	17	5.1	3	12	3.5	10	3.5	23
Iron	14	4	18	20	12	29	15	24	17	12	8	13	16	13	17
Lead	0.10	93	0.01	43	0.02	50	0.04	139	n/c	0.08	90	0.03	58	n/c	n/c
Lithium	0.06	36	0.07	28	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Manganese	639	28	626	19	767	15	677	21	500	419	11	580	14	500	19
Mercury	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Molybdenum	0.10	0	0.10	0	0.10	0	0.1	0	n/c	0.10	0	n/c	n/c	n/c	n/c
Nickel	0.57	19	0.81	23	0.44	17	0.61	32	0.7	0.56	30	0.54	17	0.57	22
Rubidium	18	6	20	16	16	15	18	15	26	15	20	17	10	17	26
Selenium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Silver	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Strontium	2.3	28	3	29	1.5	14	2.3	37	2.7	3.1	24	2.8	19	2.9	19
Tellurium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Thallium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Tin	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Titanium	0.14	11	0.16	57	0.21	69	0.17	53	n/c	0.07	23	0.15	28	n/c	n/c
Uranium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Vanadium	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Zinc	8.2	3.2	9.1	14	8.3	9	8.5	10	10	7.7	8	7.9	4	8.1	11
Zirconium	0.06	36	0.07	29	0.12	96	0.09	79	n/c	0.09	59	0.16	66	n/c	n/c
Lead-210	0.002	50	0.002	49	0.001	0	0.002	55	0.001	0.003	57	0.002	35	0.002	58
Polonium-210	0.002	36	0.002	29	0.0008	18	0.001	39	0.002	0.002	55	0.001	20	0.002	46
Radium-226	0.001	40	0.002	24	0.002	15	0.002	33	0.002	0.003	57	0.002	8	0.002	50
Thorium-230	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c

Note:
n/c = not calculated as concentrations were non-detect.
Element concentrations in µg/g.
Radionuclide concentrations in becquerels per gram.+
RSD% = Relative Standard Deviation; EXP = exposure; REF = reference.
a) Only one plot was collected from this location; therefore, a mean or RSD could not be calculated.

6.0 SUMMARY

The vegetation chemistry baseline study was undertaken to provide context from which effects on vegetation from the proposed Rook I Project (Project) can be assessed in the Environmental Impact Statement (EIS). Lichen and blueberry were chosen as ecological receptors for this study due to the importance of these plants to woodland caribou and local Indigenous communities. Understanding existing vegetation chemistry is also important for addressing concerns expressed by Indigenous Peoples regarding effects from industrial facilities on cultural practices and vegetation (TSD II: BNDN; TSD III: BRDN; TSD IV: MN-S; TSD V.1: CRDN; TSD VI: YNLRO).

The vegetation chemistry field programs were completed in August 2018 and August 2019. The programs included the collection of vegetation samples, and analysis of the samples for concentrations of elements and radionuclides. In total, lichen, blueberry stems, blueberry leaves, and blueberry fruit were collected from twenty-seven plot locations.

Feedback received during Joint Working Group meetings indicate that effects from industrial atmospheric emissions and deposition is a concern within the area of the Project with potential effects from Alberta oil sands developments raised by Métis Nation – Saskatchewan (MN-S) members. While atmospheric deposition of metals is anticipated to decrease rapidly beyond 45 km from emissions sources (Bari et al. 2014), the purpose of the baseline vegetation chemistry program was not to determine the level of existing effects, but to provide a baseline for element and radionuclide concentrations within lichen and blueberry plants within the study area. There are no current guidelines for concentrations of metals or radionuclides for lichen or vascular plants to compare to the field data.

Lichen were chosen as an ecological receptor or indicator due to their importance as a caribou forage. They are considered a sensitive receptor to environmental changes due to the tendency of these organisms to accumulate and tolerate metal concentrations that exceed physiological requirements (Backor and Loppi 2009; Carreras and Pignata 2002). However, the data suggest that these lichen attributes do not lead to a uniform uptake and/or storage of these elements among sampling sites and plot locations.

Generally, increased element concentrations were observed in lichen when compared to blueberry tissues. This may be attributable to the accumulation in lichen over a longer time frame compared to blueberry as well as the ability of lichen to accumulate and tolerate metal content in excess of physiological needs (Carreras and Pignata 2002). The greatest concentrations of lead-210, polonium-210, and thorium-230 were observed within lichen compared to blueberry stems, leaves, and fruit.

Blueberry was selected to represent Indigenous and local use of plant resources, as blueberry was identified as a fruit consumed by local Indigenous Peoples. Although berry collection was limited by site conditions (e.g., fire disturbance), data showed consistent results across sampling sites. The most common route of element uptake into plants is through the root systems (Stachiw et al. 2019), but uptake is also possible through foliar transfer (i.e., deposition on the surface of the plant).

Generally, a pattern of increased element and radionuclide concentrations was observed from blueberry fruit to blueberry leaves to blueberry stems. This pattern may be attributable to the accumulation in blueberry stems over a period of several years, rather than the seasonal growth of blueberry leaves and blueberry fruit. However, departures from this observed general pattern were observed, which are most likely associated with specific plant physiological requirements. Two exceptions include increased concentrations of boron in blueberry leaves compared to fruit and stems, and increased concentration of rubidium in blueberry fruit compared to leaves and stems. Boron is an essential element associated with meristematic tissues (i.e., undifferentiated tissue capable of

cell division important for plant growth and structure) in plant cell walls and has a close relationship with cell transpiration and accumulation in leaf tissue (Reid 2014). Rubidium does not have a known physiological function in plants; however, it does share an ionic charge and similar ionic radii to potassium (Shotyk et al. 2019). Therefore, rubidium uptake and accumulation in blueberry fruit is likely associated with the role of potassium in berry growth and ripening (Rogiers et al. 2017).

Comparison of the exposure and reference areas does not indicate any large differences in baseline values between the areas, which was expected. Generally, variation between exposure and reference areas was observed within the existing range of variation of the individual sampling sites. Differences observed at sampling sites are likely related to natural variation in site conditions between the exposure and reference areas, annual variation in climate and microclimate, chemical composition of soil parent material, and differences in sampling tissues (i.e., variety of lichen species, age of blueberry stems).

Overall, observed concentrations of elements in lichen and blueberry tissues are comparable to published values from background locations in other boreal ecosystems or remote locations (Puckett and Finegan 1980; Gjengedal et al. 2015; Darnajoux et al. 2015). These concentrations are consistent with the narrative that atmospheric deposition of anthropogenic emissions is limited within the study area at baseline.

Collected baseline vegetation chemistry data provides important observations of the natural variability of element and radionuclide concentrations within the exposure and reference areas. The objectives of the vegetation chemistry baseline program, to establish the existing element and radionuclide concentrations in lichen and in blueberry stems, leaves, and fruit within the baseline study areas, have been met. The results of the vegetation chemistry baseline program will serve to provide sufficient context to the Human Health Risk Assessment, Ecological Health Risk Assessment, and potential long-term effects monitoring of the Project.

CLOSING

Golder is pleased to submit this report to NexGen in support of the environmental assessment for the Rook I Project. For details on the limitations and use of information presented in this report, please refer to the Study Limitations section following this page. If you have any questions or require additional details related to this study, please contact the undersigned.

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AS/JV/pls

STUDY LIMITATIONS

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USEPA (United States Environmental Protection Agency). 2006. Data Quality Assessment: Statistical Methods for Practitioners. EPA QA/G-9S. EPA/240/B-06/003, February 2006. Office of Environmental Information, US Environmental Protection Agency, Washington, D.C.

Walker DA, Everett KR. 1987. Road Dust and its Environmental Impact on Alaskan Taiga and Tundra. Arctic and Alpine Research 19(1):479-489. DOI: 10.1080/00040851.1987.12002630

APPENDIX A

Site Photographs

Photo 1: Representative photo of plot EXP01-A, 4 August 2018

Photo 2: Representative photo of plot EXP01-B, 4 August 2018

Photo 3: Representative photo of plot EXP01-C, 4 August 2018

Photo 4: Representative photo of plot EXP02-A, 6 August 2018

Photo 5: Representative photo of plot EXP02-B, 4 August 2018

Photo 6: Representative photo of plot EXP02-C, 4 August 2018

Photo 7: Representative photo of plot EXP03-A, 7 August 2018

Photo 8: Representative photo of plot EXP03-B, 7 August 2018

Photo 9: Representative photo of plot REF01-A; August 5, 2018

Photo 10: Representative photo of plot REF01-B, 5 August 2018

Photo 11: Representative photo of plot REF01-C, 5 August 2018

Photo 12: Representative photo of plot REF02-A, 8 August 2018

Photo 13: Representative photo of plot REF02-B, 8 August 2018

Photo 14: Representative photo of plot REF02-C, 8 August 2018

Photo 15: Representative photo of plot REF03-A, 9 August 2018

Photo 16: Representative photo of plot REF03-B, 8 August 2018

Photo 17: Representative photo of plot REF03-C, 9 August 2018

Photo 18: Representative photo of plot REF04-A, 8 August 2019

Photo 19: Representative photo of plot REF04-B, 11 August 2019

Photo 20: Representative photo of plot REF04-C, 11 August 2019

Photo 21: Representative photo of plot REF05-A, 9 August 2019

Photo 22: Representative photo of plot REF05-B, 9 August 2019

Photo 23: Representative photo of plot REF05-C, 9 August 2019

Photo 24: Representative photo of plot REF06-A, 10 August 2019

Photo 25: Representative photo of plot REF06-B, 10 August 2019

Photo 26: Representative photo of plot REF06-C, 10 August 2019

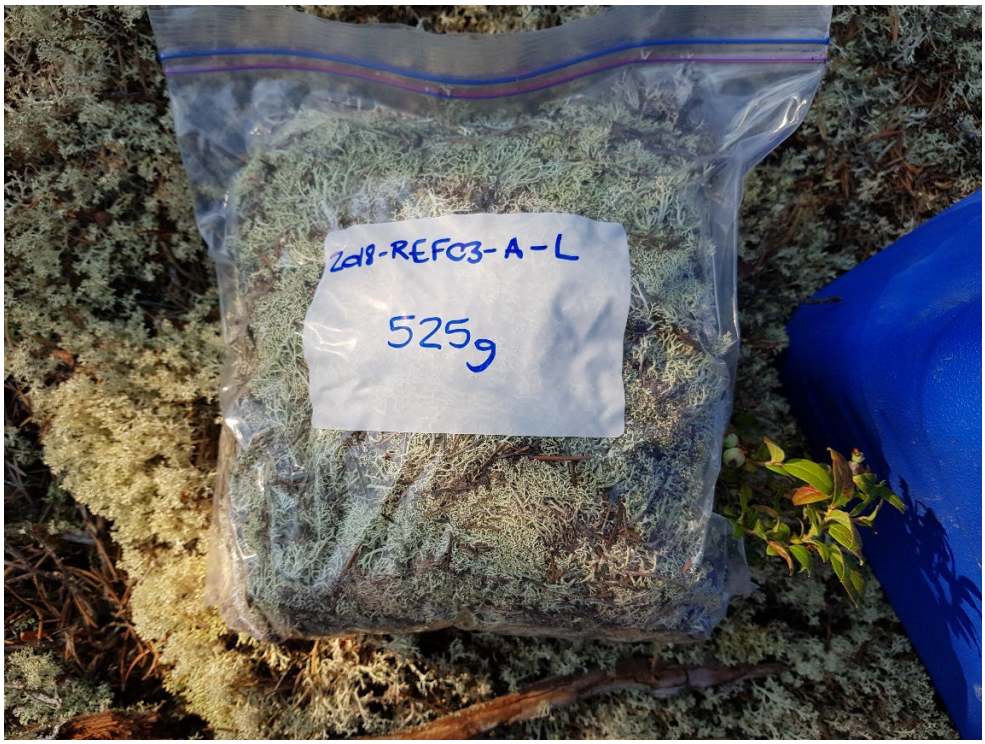

Photo 27: Representative lichen collection from plot REF03-A, 9 August 2018

Photo 28: Representative blueberry stem collection from plot EXP03-A, 7 August 2018

Photo 29: Representative blueberry leaf collection from plot EXP03-B, 7 August 2018

Photo 30: Representative blueberry fruit collection from plot REF03-A, 8 August 2018

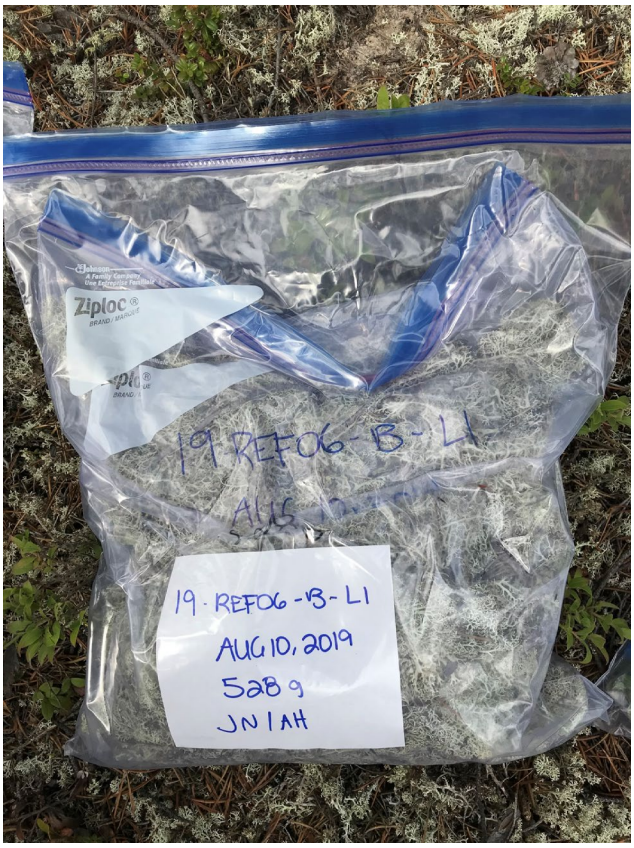

Photo 31: Representative lichen collection from plot REF06-B, 10 August 2019

Photo 32: Representative blueberry stem collection from plot REF05-C, 9 August 2019

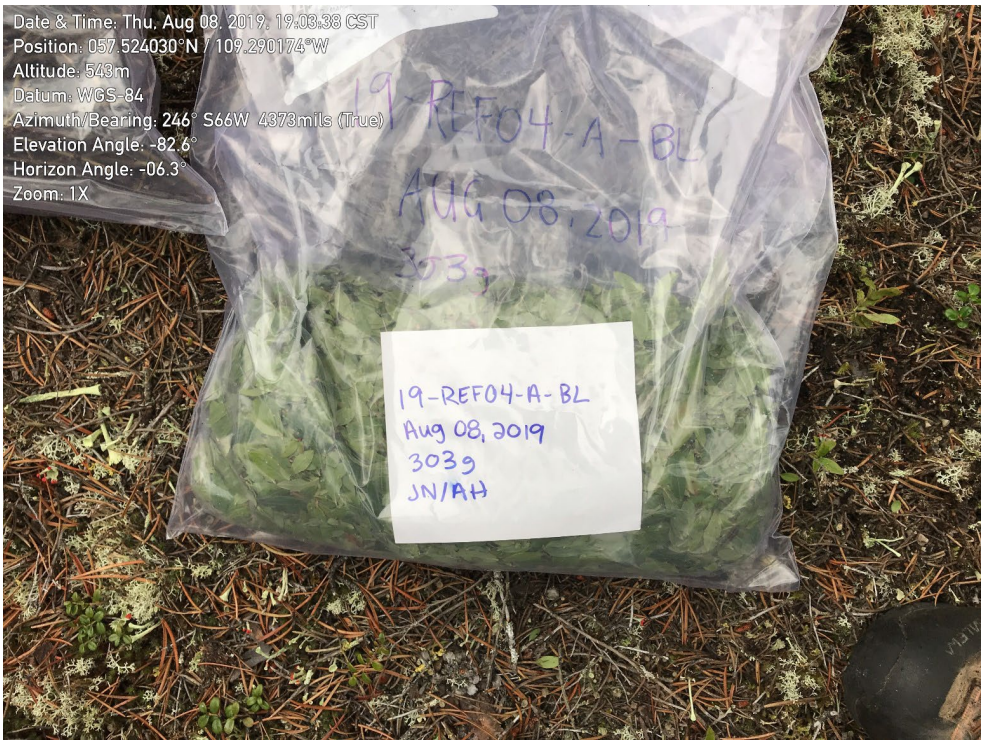

Photo 33: Representative blueberry leaf collection from plot REF04-A, 8 August 2019

APPENDIX B

Laboratory Certificates of Analysis

SASKATCHEWAN RESEARCH COUNCIL

Environmental Analytical Laboratories
143-111 Research Drive, Saskatoon, SK Canada S7N 3R2

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SRC Group # 2018-9960

Oct 30, 2018

Golder
1721 8th Street East
Saskatoon, SK S7H 0T4
Attn: Andrew Stewart

Date Samples Received: Aug-14-2018 Client P.O.: 1899581/2/2002

All results have been reviewed and approved by a Qualified Person in accordance with the Saskatchewan Environmental Code, Corrective Action Plan Chapter, for the purposes of certifying a laboratory analysis

Results from Lab Sections 1 and 2 have been authorized by Keith Gipman, Supervisor
Results from Lab Section 3 have been authorized by Pat Moser, Supervisor
Results from Lab Sections 4 and 5 have been authorized by Vicky Snook, Supervisor
Results from Lab Section 6 have been authorized by Marion McConnell, Supervisor

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* Test methods and data are validated by the laboratory's Quality Assurance Program.

* Routine methods follow recognized procedures from sources such as
    * Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF
    * Environment Canada
    * US EPA
    * CANMET

* The results reported relate only to the test samples as provided by the client.

* Samples will be kept for 30 days after the final report is sent. Please contact the lab if you have any special requirements.

* Additional information is available upon request.

This is a final report.

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Golder

1721 8th Street East
Saskatoon, SK S7H 0T4
Attn: Andrew Stewart

Date Samples Received: Aug-14-2018 Client P.O.: 1899581/2/2002

31819	**08/04/2018 EXP01-A-BB *VEGETATION***
31820	**08/04/2018 EXP01-A-BL *VEGETATION***
31821	**08/04/2018 EXP01-A-BS *VEGETATION***

Analyte	Units	31819	31820	31821
Lab Section 2 (ICP)				
Aluminum	ug/g	12±2	85±8	82±8
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	15±2	31±3	43±4
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	16±4	29±4	7±1
Cadmium	ug/g	<0.01	<0.01	0.02±0.02
Cesium	ug/g	0.09±0.07	0.09±0.07	<0.05
Chromium	ug/g	<0.5	<0.5	0.6±0.6
Cobalt	ug/g	<0.01	0.04±0.02	0.05±0.02
Copper	ug/g	3.1±0.5	3.3±0.5	4.6±0.7
Iron	ug/g	14±2	50±5	47±7
Lead	ug/g	0.05±0.02	0.05±0.02	0.06±0.02
Lithium	ug/g	0.09±0.07	<0.05	<0.05
Manganese	ug/g	840±80	3190±300	2150±200
Mercury	ug/g	<0.005	0.007±0.006	<0.005
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.45±0.2	0.85±0.2	0.81±0.2
Rubidium	ug/g	18±3	9.3±0.9	6.2±0.6
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	1.6±0.2	5.6±0.6	5.7±0.6
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	0.14±0.06	1.4±0.2	1.3±0.2
Uranium	ug/g	<0.01	0.06±0.02	0.05±0.02
Vanadium	ug/g	<0.1	<0.1	0.1±0.1
Zinc	ug/g	8.5±2	10±2	22±3
Zirconium	ug/g	<0.05	0.06±0.05	0.05±0.05

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31819 08/04/2018 EXP01-A-BB *VEGETATION*
31820 08/04/2018 EXP01-A-BL *VEGETATION*
31821 08/04/2018 EXP01-A-BS *VEGETATION*

Analyte	Units	31819	31820	31821
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.001±0.001	0.036±0.005	0.049±0.007
Polonium-210	Bq/g	0.0019±0.0007	0.017±0.002	0.034±0.003
Radium-226	Bq/g	0.0020±0.0005	0.0044±0.001	0.0071±0.001
Thorium-228	Bq/g	<0.0005	0.001±0.002	0.0036±0.003
Thorium-230	Bq/g	<0.0005	0.001±0.0008	0.0013±0.0008
Thorium-232	Bq/g	<0.0005	<0.0006	<0.0004

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Results are reported on a dry basis.

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31822 08/04/2018 EXP01-A-L *VEGETATION*
31823 08/03/2018 EXP01-B-BB *VEGETATION*
31824 08/04/2018 EXP01-B-BL *VEGETATION*

Analyte	Units	31822	31823	31824
Lab Section 2 (ICP)				
Aluminum	ug/g	280±30	10±2	100±10
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	0.08±0.06	<0.05	<0.05
Barium	ug/g	11±1	18±2	50±5
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	<1	10±2	29±4
Cadmium	ug/g	0.05±0.03	<0.01	<0.01
Cesium	ug/g	0.13±0.08	<0.05	<0.05
Chromium	ug/g	1.4±0.8	<0.5	<0.5
Cobalt	ug/g	0.08±0.02	0.01±0.01	0.04±0.02
Copper	ug/g	0.96±0.2	3.2±0.5	3.3±0.5
Iron	ug/g	220±20	14±2	54±5
Lead	ug/g	0.26±0.04	0.20±0.03	0.05±0.02
Lithium	ug/g	0.18±0.09	<0.05	<0.05
Manganese	ug/g	185±20	590±60	2260±200
Mercury	ug/g	0.016±0.009	<0.005	0.007±0.006
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.72±0.2	0.65±0.2	1.3±0.2
Rubidium	ug/g	4.9±0.7	17±2	9.2±0.9
Selenium	ug/g	0.07±0.06	<0.05	0.09±0.07
Silver	ug/g	0.02±0.01	<0.01	<0.01
Strontium	ug/g	2.7±0.4	2.8±0.4	9.2±0.9
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	6.9±0.7	0.13±0.06	1.5±0.2
Uranium	ug/g	0.16±0.04	<0.01	0.16±0.04
Vanadium	ug/g	0.5±0.2	<0.1	<0.1
Zinc	ug/g	17±2	8.1±2	9.9±2
Zirconium	ug/g	0.22±0.05	0.09±0.05	0.06±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.22±0.03	0.002±0.001	0.038±0.006
Polonium-210	Bq/g	0.18±0.03	0.0018±0.0006	0.015±0.002
Radium-226	Bq/g	0.0052±0.0008	0.0010±0.0006	0.0051±0.001
Thorium-228	Bq/g	0.001±0.002	<0.0005	0.002±0.002
Thorium-230	Bq/g	0.002±0.001	<0.0005	0.001±0.0008

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31822	**08/04/2018 EXP01-A-L *VEGETATION***
31823	**08/03/2018 EXP01-B-BB *VEGETATION***
31824	**08/04/2018 EXP01-B-BL *VEGETATION***

Analyte	Units	31822	31823	31824
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	0.0008±0.02	<0.0005	<0.0006

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Note for Sample # 31823
This sample was reanalyzed for Lead. Reanalysis confirms original results are within the expected measurement uncertainty.

Results are reported on a dry basis.

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SRC Group # 2018-9960

Oct 30, 2018

Golder

31825 08/04/2018 EXP01-B-BS *VEGETATION*
31826 08/03/2018 EXP01-B-L *VEGETATION*
31827 08/03/2018 EXP01-C-BB *VEGETATION*

Analyte	Units	31825	31826	31827
Lab Section 2 (ICP)				
Aluminum	ug/g	110±10	410±40	9.8±2
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	0.10±0.07	<0.05
Barium	ug/g	74±7	15±2	18±2
Beryllium	ug/g	<0.01	0.01±0.01	<0.01
Boron	ug/g	7±1	1±1	7±1
Cadmium	ug/g	0.02±0.02	0.06±0.03	<0.01
Cesium	ug/g	<0.05	0.10±0.07	0.07±0.06
Chromium	ug/g	0.7±0.6	4.7±1	<0.5
Cobalt	ug/g	0.07±0.02	0.13±0.03	0.01±0.01
Copper	ug/g	5.3±0.5	1.2±0.2	3.6±0.5
Iron	ug/g	65±6	250±20	15±2
Lead	ug/g	0.09±0.03	0.56±0.08	0.04±0.02
Lithium	ug/g	0.06±0.06	0.19±0.1	<0.05
Manganese	ug/g	1550±200	174±20	486±50
Mercury	ug/g	0.008±0.006	0.026±0.01	<0.005
Molybdenum	ug/g	<0.1	<0.1	0.1±0.1
Nickel	ug/g	1.3±0.2	2.1±0.3	0.61±0.2
Rubidium	ug/g	5.5±0.6	4.3±0.6	19±3
Selenium	ug/g	<0.05	0.08±0.06	<0.05
Silver	ug/g	<0.01	0.02±0.01	<0.01
Strontium	ug/g	9.4±0.9	4.7±0.7	2.6±0.4
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	1.8±0.3	10±1	0.16±0.07
Uranium	ug/g	0.05±0.02	0.12±0.03	<0.01
Vanadium	ug/g	0.1±0.1	0.7±0.2	<0.1
Zinc	ug/g	44±7	16±2	8.0±2
Zirconium	ug/g	0.06±0.05	0.35±0.05	<0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.074±0.01	0.31±0.05	0.003±0.001
Polonium-210	Bq/g	0.057±0.006	0.22±0.02	0.0009±0.0004
Radium-226	Bq/g	0.0053±0.0008	0.0039±0.001	0.0011±0.0007
Thorium-228	Bq/g	0.0056±0.004	0.002±0.002	<0.0005
Thorium-230	Bq/g	0.0008±0.0006	0.001±0.0008	<0.0005

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Oct 30, 2018

Golder

31825	**08/04/2018 EXP01-B-BS *VEGETATION***
31826	**08/03/2018 EXP01-B-L *VEGETATION***
31827	**08/03/2018 EXP01-C-BB *VEGETATION***

Analyte	Units	31825	31826	31827
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0004	<0.0007	<0.0005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Note for Sample # 31826
This sample was reanalyzed for Aluminum, Chromium and Nickel. Reanalysis confirms original results are within the expected measurement uncertainty.

Results are reported on a dry basis.

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SRC Group # 2018-9960

Oct 30, 2018

Golder

31828 08/03/2018 EXP01-C-BL *VEGETATION*
31829 08/03/2018 EXP01-C-BS *VEGETATION*
31830 08/03/2018 EXP01-C-L *VEGETATION*

Analyte	Units	31828	31829	31830
Lab Section 2 (ICP)				
Aluminum	ug/g	94±9	110±10	250±20
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	0.07±0.06
Barium	ug/g	53±5	66±7	10±1
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	37±6	7±1	<1
Cadmium	ug/g	<0.01	0.02±0.02	0.05±0.03
Cesium	ug/g	0.09±0.07	<0.05	0.12±0.08
Chromium	ug/g	0.5±0.5	1.0±0.7	1.1±0.7
Cobalt	ug/g	0.04±0.02	0.04±0.02	0.08±0.02
Copper	ug/g	3.6±0.5	5.5±0.6	1.0±0.2
Iron	ug/g	58±6	65±6	180±20
Lead	ug/g	0.04±0.02	0.08±0.03	0.38±0.06
Lithium	ug/g	<0.05	0.06±0.06	0.15±0.08
Manganese	ug/g	2860±300	1560±200	190±20
Mercury	ug/g	0.008±0.006	0.007±0.006	0.018±0.009
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.93±0.2	1.4±0.2	0.67±0.2
Rubidium	ug/g	9.8±2	4.3±0.6	4.9±0.7
Selenium	ug/g	<0.05	<0.05	0.05±0.05
Silver	ug/g	<0.01	<0.01	0.02±0.01
Strontium	ug/g	5.4±0.5	8.1±0.8	3.3±0.5
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	2.0±0.3	2.6±0.4	6.4±0.6
Uranium	ug/g	0.08±0.03	0.05±0.02	0.14±0.04
Vanadium	ug/g	<0.1	0.2±0.1	0.5±0.2
Zinc	ug/g	9.6±2	31±5	15±2
Zirconium	ug/g	0.07±0.05	0.09±0.05	0.21±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.033±0.005	0.074±0.01	0.29±0.04
Polonium-210	Bq/g	0.012±0.002	0.049±0.005	0.14±0.02
Radium-226	Bq/g	0.0071±0.001	0.0076±0.001	0.0055±0.001
Thorium-228	Bq/g	0.002±0.002	0.0041±0.003	0.002±0.002
Thorium-230	Bq/g	0.002±0.001	0.0009±0.0006	0.002±0.001

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Golder

31828 08/03/2018 EXP01-C-BL *VEGETATION*
31829 08/03/2018 EXP01-C-BS *VEGETATION*
31830 08/03/2018 EXP01-C-L *VEGETATION*

Analyte	Units	31828	31829	31830
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0006	<0.0003	<0.0008

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Results are reported on a dry basis.

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31831 08/04/2018 EXP02-A-BB *VEGETATION*
31832 08/06/2018 EXP02-A-BL *VEGETATION*
31833 08/06/2018 EXP02-A-BS *VEGETATION*

Analyte	Units	31831	31832	31833
Lab Section 2 (ICP)				
Aluminum	ug/g	9.8±2	77±8	77±8
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	20±2	53±5	72±7
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	11±3	38±6	8±1
Cadmium	ug/g	<0.01	<0.01	0.02±0.02
Cesium	ug/g	<0.05	<0.05	<0.05
Chromium	ug/g	<0.5	<0.5	<0.5
Cobalt	ug/g	0.01±0.01	0.05±0.02	0.08±0.02
Copper	ug/g	4.2±0.6	3.0±0.4	4.7±0.7
Iron	ug/g	14±2	45±7	45±7
Lead	ug/g	0.01±0.01	0.02±0.01	0.05±0.02
Lithium	ug/g	<0.05	<0.05	<0.05
Manganese	ug/g	680±70	2250±200	1420±100
Mercury	ug/g	<0.005	0.007±0.006	0.006±0.006
Molybdenum	ug/g	0.1±0.1	<0.1	<0.1
Nickel	ug/g	0.63±0.2	0.88±0.2	0.95±0.2
Rubidium	ug/g	16±2	7.9±0.8	4.8±0.7
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	2.3±0.3	2.9±0.4	4.2±0.6
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	0.08±0.05	0.92±0.2	1.1±0.2
Uranium	ug/g	<0.01	0.03±0.02	0.03±0.02
Vanadium	ug/g	<0.1	<0.1	<0.1
Zinc	ug/g	9.6±2	10±2	43±6
Zirconium	ug/g	0.07±0.05	<0.05	<0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.003±0.002	0.035±0.005	0.075±0.01
Polonium-210	Bq/g	0.0020±0.0009	0.015±0.002	0.047±0.005
Radium-226	Bq/g	0.0027±0.002	0.0063±0.0009	0.0097±0.001
Thorium-228	Bq/g	<0.0008	0.001±0.002	0.0047±0.003
Thorium-230	Bq/g	<0.0008	<0.0006	0.0004±0.0004

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31831	**08/04/2018 EXP02-A-BB *VEGETATION***
31832	**08/06/2018 EXP02-A-BL *VEGETATION***
31833	**08/06/2018 EXP02-A-BS *VEGETATION***

Analyte	Units	31831	31832	31833
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0008	<0.0006	<0.0004

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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31834 08/06/2018 EXP02-A-L *VEGETATION*
31835 08/04/2018 EXP02-B-BB *VEGETATION*
31836 08/06/2018 EXP02-B-BL *VEGETATION*

Analyte	Units	31834	31835	31836
Lab Section 2 (ICP)				
Aluminum	ug/g	270±30	11±2	100±10
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	0.07±0.06	<0.05	<0.05
Barium	ug/g	15±2	22±2	64±6
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	1±1	11±3	46±7
Cadmium	ug/g	0.05±0.03	<0.01	<0.01
Cesium	ug/g	0.10±0.07	0.07±0.06	<0.05
Chromium	ug/g	1.2±0.8	<0.5	<0.5
Cobalt	ug/g	0.11±0.03	0.02±0.01	0.04±0.02
Copper	ug/g	1.2±0.2	4.6±0.7	4.1±0.6
Iron	ug/g	190±20	21±3	56±6
Lead	ug/g	0.32±0.05	0.01±0.01	0.04±0.02
Lithium	ug/g	0.15±0.08	0.08±0.06	<0.05
Manganese	ug/g	163±20	710±70	4010±400
Mercury	ug/g	0.027±0.01	<0.005	0.008±0.006
Molybdenum	ug/g	<0.1	0.1±0.1	<0.1
Nickel	ug/g	0.75±0.2	1.0±0.2	0.87±0.2
Rubidium	ug/g	3.8±0.6	22±3	8.2±0.8
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	0.01±0.01	<0.01	<0.01
Strontium	ug/g	3.3±0.5	2.8±0.4	2.8±0.4
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	6.8±0.7	0.14±0.06	1.4±0.2
Uranium	ug/g	0.10±0.02	0.01±0.01	0.03±0.02
Vanadium	ug/g	0.6±0.2	<0.1	<0.1
Zinc	ug/g	12±2	10±2	13±2
Zirconium	ug/g	0.20±0.05	0.09±0.05	0.05±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.30±0.04	0.003±0.002	0.033±0.005
Polonium-210	Bq/g	0.12±0.02	0.0016±0.0008	0.019±0.003
Radium-226	Bq/g	0.0036±0.0009	0.0029±0.002	0.0078±0.002
Thorium-228	Bq/g	0.0010±0.002	<0.0008	0.003±0.002
Thorium-230	Bq/g	0.0009±0.0006	<0.0008	<0.0007

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31834 08/06/2018 EXP02-A-L *VEGETATION*
31835 08/04/2018 EXP02-B-BB *VEGETATION*
31836 08/06/2018 EXP02-B-BL *VEGETATION*

Analyte	Units	31834	31835	31836
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0003	<0.0008	<0.0007

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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31837 08/06/2018 EXP02-B-BS *VEGETATION*
31838 08/06/2018 EXP02-B-L *VEGETATION*
31839 08/06/2018 EXP02-C-BB *VEGETATION*

Analyte	Units	31837	31838	31839
Lab Section 2 (ICP)				
Aluminum	ug/g	110±10	240±20	19±3
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	0.06±0.06	<0.05
Barium	ug/g	70±7	14±1	19±2
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	8±1	2±1	12±3
Cadmium	ug/g	0.02±0.02	0.04±0.02	<0.01
Cesium	ug/g	<0.05	0.09±0.07	0.06±0.06
Chromium	ug/g	<0.5	1.3±0.8	<0.5
Cobalt	ug/g	0.06±0.02	0.10±0.02	<0.01
Copper	ug/g	6.3±0.6	1.3±0.2	3.7±0.6
Iron	ug/g	66±7	170±20	18±3
Lead	ug/g	0.08±0.03	0.23±0.03	0.02±0.01
Lithium	ug/g	0.07±0.06	0.13±0.08	0.09±0.07
Manganese	ug/g	2320±200	295±30	489±50
Mercury	ug/g	0.007±0.006	0.023±0.01	<0.005
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.91±0.2	0.83±0.2	0.80±0.2
Rubidium	ug/g	4.8±0.7	4.4±0.7	21±2
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	3.1±0.5	2.8±0.4	4.0±0.6
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	2.0±0.3	5.3±0.5	0.26±0.09
Uranium	ug/g	0.03±0.02	0.07±0.02	<0.01
Vanadium	ug/g	0.1±0.1	0.5±0.2	<0.1
Zinc	ug/g	38±6	12±2	7.6±2
Zirconium	ug/g	0.06±0.05	0.17±0.05	<0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.10±0.01	0.21±0.03	<0.001
Polonium-210	Bq/g	0.059±0.006	0.13±0.02	0.0011±0.0005
Radium-226	Bq/g	0.011±0.002	0.0037±0.0009	0.0018±0.001
Thorium-228	Bq/g	0.010±0.005	0.0009±0.002	<0.0005
Thorium-230	Bq/g	0.0010±0.0007	0.0009±0.0006	<0.0005

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31837 08/06/2018 EXP02-B-BS *VEGETATION*
31838 08/06/2018 EXP02-B-L *VEGETATION*
31839 08/06/2018 EXP02-C-BB *VEGETATION*

Analyte	Units	31837	31838	31839
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0004	<0.0004	<0.0005

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31840 08/06/2018 EXP02-C-BL *VEGETATION*
31841 08/06/2018 EXP02-C-BS *VEGETATION*
31842 08/06/2018 EXP02-C-L *VEGETATION*

Analyte	Units	31840	31841	31842
Lab Section 2 (ICP)				
Aluminum	ug/g	94±9	120±10	190±20
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	0.06±0.06
Barium	ug/g	71±7	91±9	7.4±0.7
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	33±5	9±1	1±1
Cadmium	ug/g	<0.01	0.02±0.02	0.04±0.02
Cesium	ug/g	0.07±0.06	<0.05	0.10±0.07
Chromium	ug/g	<0.5	0.8±0.6	1.0±0.7
Cobalt	ug/g	0.04±0.02	0.09±0.02	0.06±0.02
Copper	ug/g	3.7±0.6	5.2±0.5	0.87±0.2
Iron	ug/g	50±5	78±8	150±20
Lead	ug/g	0.03±0.02	0.08±0.03	0.22±0.03
Lithium	ug/g	<0.05	0.07±0.06	0.12±0.08
Manganese	ug/g	2790±300	2020±200	149±10
Mercury	ug/g	0.008±0.006	0.009±0.007	0.021±0.01
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	1.2±0.2	1.2±0.2	0.58±0.1
Rubidium	ug/g	9.6±1	5.2±0.5	4.6±0.7
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	9.5±1	24±2	2.0±0.3
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	0.88±0.2	2.0±0.3	4.9±0.7
Uranium	ug/g	0.03±0.02	0.05±0.02	0.08±0.03
Vanadium	ug/g	<0.1	0.2±0.1	0.4±0.2
Zinc	ug/g	11±2	45±7	13±2
Zirconium	ug/g	<0.05	0.07±0.05	0.15±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.033±0.005	0.060±0.009	0.25±0.04
Polonium-210	Bq/g	0.019±0.003	0.047±0.005	0.16±0.02
Radium-226	Bq/g	0.0088±0.001	0.015±0.002	0.0027±0.0004
Thorium-228	Bq/g	0.001±0.002	0.005±0.003	0.0008±0.002
Thorium-230	Bq/g	<0.0006	<0.0005	0.0012±0.0006

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31840 08/06/2018 EXP02-C-BL *VEGETATION*
31841 08/06/2018 EXP02-C-BS *VEGETATION*
31842 08/06/2018 EXP02-C-L *VEGETATION*

Analyte	Units	31840	31841	31842
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0006	<0.0005	0.0003±0.02

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Note for Sample # 31841
This sample was reanalyzed for Strontium. Reanalysis confirms original results are within the expected measurement uncertainty.

Results are reported on a dry basis.

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31843 08/07/2018 EXP03-A-BB *VEGETATION*
31844 08/07/2018 EXP03-A-BL *VEGETATION*
31845 08/07/2018 EXP03-A-BS *VEGETATION*

Analyte	Units	31843	31844	31845
Lab Section 2 (ICP)				
Aluminum	ug/g	7.3±2	97±10	88±9
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	16±2	70±7	70±7
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	11±3	32±5	8±1
Cadmium	ug/g	<0.01	0.01±0.01	0.04±0.02
Cesium	ug/g	0.06±0.06	0.08±0.06	0.05±0.05
Chromium	ug/g	<0.5	0.5±0.5	0.6±0.6
Cobalt	ug/g	<0.01	0.03±0.02	0.04±0.02
Copper	ug/g	3.6±0.5	3.6±0.5	5.1±0.5
Iron	ug/g	10±2	55±6	55±6
Lead	ug/g	0.02±0.01	0.04±0.02	0.07±0.02
Lithium	ug/g	<0.05	<0.05	0.06±0.06
Manganese	ug/g	750±80	3620±400	1770±200
Mercury	ug/g	<0.005	0.008±0.006	0.006±0.006
Molybdenum	ug/g	0.1±0.1	<0.1	<0.1
Nickel	ug/g	0.36±0.1	0.59±0.1	0.62±0.2
Rubidium	ug/g	17±2	7.9±0.8	4.9±0.7
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	1.3±0.2	4.7±0.7	3.8±0.6
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	0.33±0.1	1.0±0.2	1.7±0.2
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	<0.1	<0.1	0.1±0.1
Zinc	ug/g	7.5±2	18±3	45±7
Zirconium	ug/g	<0.05	<0.05	0.05±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.001±0.001	0.036±0.005	0.093±0.01
Polonium-210	Bq/g	0.0008±0.0004	0.014±0.002	0.037±0.004
Radium-226	Bq/g	0.0023±0.0006	0.0076±0.001	0.0095±0.001
Thorium-228	Bq/g	<0.0005	0.002±0.002	0.0066±0.004
Thorium-230	Bq/g	<0.0005	<0.0006	<0.0003

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31843 08/07/2018 EXP03-A-BB *VEGETATION*
31844 08/07/2018 EXP03-A-BL *VEGETATION*
31845 08/07/2018 EXP03-A-BS *VEGETATION*

Analyte	Units	31843	31844	31845
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0005	<0.0006	<0.0003

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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31846 08/07/2018 EXP03-A-L *VEGETATION*
31847 08/07/2018 EXP03-B-BB *VEGETATION*
31848 08/07/2018 EXP03-B-BL *VEGETATION*

Analyte	Units	31846	31847	31848
Lab Section 2 (ICP)				
Aluminum	ug/g	870±90	15±2	93±9
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	0.23±0.1	<0.05	<0.05
Barium	ug/g	16±2	21±2	58±6
Beryllium	ug/g	0.02±0.01	<0.01	<0.01
Boron	ug/g	2±1	12±3	36±5
Cadmium	ug/g	0.07±0.03	<0.01	<0.01
Cesium	ug/g	0.13±0.08	<0.05	0.05±0.05
Chromium	ug/g	130±80	<0.5	<0.5
Cobalt	ug/g	1.4±0.1	<0.01	0.03±0.02
Copper	ug/g	1.3±0.2	3.3±0.5	3.0±0.4
Iron	ug/g	1100±100	16±2	46±7
Lead	ug/g	1.3±0.1	0.01±0.01	0.03±0.02
Lithium	ug/g	0.49±0.1	<0.05	<0.05
Manganese	ug/g	109±10	660±70	2840±300
Mercury	ug/g	0.031±0.01	<0.005	0.008±0.006
Molybdenum	ug/g	0.1±0.1	<0.1	<0.1
Nickel	ug/g	54±5	0.46±0.2	0.77±0.2
Rubidium	ug/g	4.0±0.6	13±2	6.2±0.6
Selenium	ug/g	0.09±0.07	<0.05	<0.05
Silver	ug/g	0.02±0.01	<0.01	<0.01
Strontium	ug/g	8.6±0.9	1.6±0.2	4.8±0.7
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	26±3	0.24±0.09	1.3±0.2
Uranium	ug/g	0.07±0.02	<0.01	<0.01
Vanadium	ug/g	1.9±0.5	<0.1	<0.1
Zinc	ug/g	14±2	8.3±2	11±2
Zirconium	ug/g	1.1±0.2	0.26±0.05	<0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.33±0.05	<0.001	0.030±0.004
Polonium-210	Bq/g	0.35±0.04	0.0010±0.0004	0.0094±0.001
Radium-226	Bq/g	0.014±0.01	0.0021±0.0005	0.0066±0.001
Thorium-228	Bq/g	<0.007	0.0005±0.002	0.002±0.002
Thorium-230	Bq/g	<0.007	<0.0005	<0.0006

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31846 08/07/2018 EXP03-A-L *VEGETATION*
31847 08/07/2018 EXP03-B-BB *VEGETATION*
31848 08/07/2018 EXP03-B-BL *VEGETATION*

Analyte	Units	31846	31847	31848
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.007	<0.0005	<0.0006

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Note for Sample # 31846
This sample was reanalyzed for Lab Section 2 (ICP). Reanalysis confirms original results are within the expected measurement uncertainty.

Results are reported on a dry basis.

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31849 08/07/2018 EXP03-B-BS *VEGETATION*
31850 08/07/2018 EXP03-B-L *VEGETATION*
31851 08/07/2018 EXP03-C-BB *VEGETATION*

Analyte	Units	31849	31850	31851
Lab Section 2 (ICP)				
Aluminum	ug/g	89±9	490±50	8.4±2
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	0.12±0.08	<0.05
Barium	ug/g	78±8	15±2	16±2
Beryllium	ug/g	<0.01	0.02±0.01	<0.01
Boron	ug/g	9±1	1±1	7±1
Cadmium	ug/g	0.04±0.02	0.06±0.03	<0.01
Cesium	ug/g	<0.05	0.20±0.1	0.14±0.08
Chromium	ug/g	0.6±0.6	18±9	<0.5
Cobalt	ug/g	0.04±0.02	0.31±0.05	<0.01
Copper	ug/g	5.8±0.6	2.0±0.3	2.6±0.4
Iron	ug/g	50±5	380±40	10±2
Lead	ug/g	0.06±0.02	0.78±0.1	0.03±0.02
Lithium	ug/g	0.07±0.06	0.22±0.1	<0.05
Manganese	ug/g	1640±200	155±20	890±90
Mercury	ug/g	0.005±0.005	0.028±0.01	<0.005
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.71±0.2	7.1±0.7	0.51±0.1
Rubidium	ug/g	4.6±0.7	6.1±0.6	17±2
Selenium	ug/g	<0.05	0.10±0.07	<0.05
Silver	ug/g	<0.01	0.02±0.01	<0.01
Strontium	ug/g	5.7±0.6	5.0±0.5	1.7±0.2
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	1.1±0.2	11±1	<0.05
Uranium	ug/g	<0.01	0.04±0.02	<0.01
Vanadium	ug/g	0.1±0.1	1.0±0.2	<0.1
Zinc	ug/g	43±6	19±3	9.0±2
Zirconium	ug/g	<0.05	0.36±0.05	0.06±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.058±0.009	0.39±0.06	<0.001
Polonium-210	Bq/g	0.033±0.003	0.33±0.03	0.0007±0.0004
Radium-226	Bq/g	0.010±0.002	0.010±0.007	0.0017±0.001
Thorium-228	Bq/g	0.0072±0.004	<0.006	<0.0007
Thorium-230	Bq/g	<0.0004	<0.006	<0.0007

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31849 08/07/2018 EXP03-B-BS *VEGETATION*
31850 08/07/2018 EXP03-B-L *VEGETATION*
31851 08/07/2018 EXP03-C-BB *VEGETATION*

Analyte	Units	31849	31850	31851
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0004	<0.006	<0.0007

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Results are reported on a dry basis.

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31852 08/07/2018 EXP03-C-BL *VEGETATION*
31853 08/07/2018 EXP03-C-BS *VEGETATION*
31854 08/07/2018 EXP03-C-L *VEGETATION*

Analyte	Units	31852	31853	31854
Lab Section 2 (ICP)				
Aluminum	ug/g	110±10	140±10	420±40
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	0.11±0.07
Barium	ug/g	62±6	64±6	13±1
Beryllium	ug/g	<0.01	<0.01	0.01±0.01
Boron	ug/g	24±4	8±1	1±1
Cadmium	ug/g	<0.01	0.02±0.02	0.06±0.03
Cesium	ug/g	0.10±0.07	0.06±0.06	0.19±0.1
Chromium	ug/g	<0.5	0.7±0.6	7.1±2
Cobalt	ug/g	0.02±0.01	0.04±0.02	0.16±0.04
Copper	ug/g	3.1±0.5	5.1±0.5	1.2±0.2
Iron	ug/g	62±6	79±8	280±30
Lead	ug/g	0.03±0.02	0.08±0.03	0.52±0.08
Lithium	ug/g	0.05±0.05	0.08±0.06	0.18±0.09
Manganese	ug/g	4630±500	2140±200	242±20
Mercury	ug/g	0.008±0.006	0.009±0.007	0.025±0.01
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.71±0.2	0.91±0.2	3.3±0.5
Rubidium	ug/g	7.0±0.7	4.2±0.6	6.2±0.6
Selenium	ug/g	0.06±0.06	<0.05	0.10±0.07
Silver	ug/g	<0.01	<0.01	0.01±0.01
Strontium	ug/g	6.1±0.6	4.9±0.7	4.6±0.7
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	1.3±0.2	2.3±0.3	9.5±1
Uranium	ug/g	<0.01	0.02±0.01	0.02±0.01
Vanadium	ug/g	<0.1	0.2±0.1	0.7±0.2
Zinc	ug/g	17±2	42±6	23±3
Zirconium	ug/g	<0.05	0.06±0.05	0.29±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.051±0.008	0.12±0.01	0.39±0.06
Polonium-210	Bq/g	0.031±0.003	0.066±0.007	0.24±0.02
Radium-226	Bq/g	0.0056±0.001	0.0056±0.0008	0.007±0.005
Thorium-228	Bq/g	0.002±0.002	0.0043±0.003	<0.004
Thorium-230	Bq/g	<0.0006	<0.0003	<0.004

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31852	**08/07/2018 EXP03-C-BL *VEGETATION***
31853	**08/07/2018 EXP03-C-BS *VEGETATION***
31854	**08/07/2018 EXP03-C-L *VEGETATION***

Analyte	Units	31852	31853	31854
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0006	<0.0003	<0.004

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Results are reported on a dry basis.

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31855 08/05/2018 REF01-A-BL *VEGETATION*
31856 08/05/2018 REF01-A-BS *VEGETATION*
31857 08/05/2018 REF01-A-L *VEGETATION*

Analyte	Units	31855	31856	31857
Lab Section 2 (ICP)				
Aluminum	ug/g	73±7	25±4	1200±100
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	0.41±0.1
Barium	ug/g	39±4	67±7	16±2
Beryllium	ug/g	<0.01	<0.01	0.02±0.01
Boron	ug/g	26±4	12±3	3±1
Cadmium	ug/g	<0.01	0.04±0.02	0.17±0.04
Cesium	ug/g	0.08±0.06	<0.05	0.21±0.1
Chromium	ug/g	<0.5	<0.5	3.9±1
Cobalt	ug/g	0.01±0.01	0.02±0.01	0.20±0.03
Copper	ug/g	3.2±0.5	5.1±0.5	2.7±0.4
Iron	ug/g	40±6	19±3	820±80
Lead	ug/g	0.02±0.01	<0.01	2.0±0.2
Lithium	ug/g	<0.05	<0.05	0.50±0.1
Manganese	ug/g	2090±200	1180±100	51±5
Mercury	ug/g	<0.005	<0.005	0.40±0.1
Molybdenum	ug/g	0.1±0.1	<0.1	0.1±0.1
Nickel	ug/g	0.53±0.1	0.58±0.1	2.2±0.3
Rubidium	ug/g	11±2	9.9±1	5.7±0.6
Selenium	ug/g	<0.05	<0.05	0.17±0.09
Silver	ug/g	<0.01	<0.01	0.02±0.01
Strontium	ug/g	5.0±0.5	10±1	5.5±0.6
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	0.06±0.06
Titanium	ug/g	0.34±0.1	0.20±0.08	31±3
Uranium	ug/g	<0.01	<0.01	0.06±0.02
Vanadium	ug/g	<0.1	<0.1	2.8±0.4
Zinc	ug/g	11±2	41±6	27±4
Zirconium	ug/g	<0.05	<0.05	0.78±0.2
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.013±0.003	0.004±0.001	0.50±0.08
Polonium-210	Bq/g	0.0067±0.001	0.0014±0.0006	0.38±0.04
Radium-226	Bq/g	0.0035±0.0009	0.0036±0.0009	0.0037±0.0009
Thorium-228	Bq/g	0.002±0.002	0.001±0.002	0.004±0.003
Thorium-230	Bq/g	<0.0005	<0.0005	0.001±0.0008

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31855 08/05/2018 REF01-A-BL *VEGETATION*
31856 08/05/2018 REF01-A-BS *VEGETATION*
31857 08/05/2018 REF01-A-L *VEGETATION*

Analyte	Units	31855	31856	31857
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0005	<0.0005	0.001±0.02

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Note for Sample # 31857
This sample was reanalyzed for Lab Section 2 (ICP). Reanalysis confirms original results are within the expected measurement uncertainty.

Results are reported on a dry basis.

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31858 08/05/2018 REF01-B-BL *VEGETATION*
31859 08/05/2018 REF01-B-BS *VEGETATION*
31860 08/05/2018 REF01-B-L *VEGETATION*

Analyte	Units	31858	31859	31860
Lab Section 2 (ICP)				
Aluminum	ug/g	60±6	21±3	190±20
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	0.07±0.06
Barium	ug/g	42±4	72±7	12±1
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	19±5	12±3	<1
Cadmium	ug/g	<0.01	0.05±0.03	0.02±0.02
Cesium	ug/g	0.10±0.07	0.06±0.06	0.14±0.08
Chromium	ug/g	<0.5	<0.5	1.0±0.7
Cobalt	ug/g	0.01±0.01	0.01±0.01	0.04±0.02
Copper	ug/g	2.6±0.4	4.8±0.7	0.87±0.2
Iron	ug/g	40±6	18±3	150±20
Lead	ug/g	0.01±0.01	<0.01	0.23±0.03
Lithium	ug/g	<0.05	<0.05	0.11±0.07
Manganese	ug/g	1830±200	1370±100	41±4
Mercury	ug/g	<0.005	<0.005	0.014±0.008
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.56±0.1	0.65±0.2	0.47±0.2
Rubidium	ug/g	10±2	10±2	2.9±0.4
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	3.6±0.5	9.2±0.9	5.5±0.6
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	0.26±0.09	0.14±0.06	5.0±0.5
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	<0.1	<0.1	0.4±0.2
Zinc	ug/g	10±2	39±6	9.0±2
Zirconium	ug/g	<0.05	<0.05	0.13±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.007±0.002	0.004±0.001	0.18±0.03
Polonium-210	Bq/g	0.0029±0.0007	0.0015±0.0006	0.13±0.02
Radium-226	Bq/g	0.0034±0.0008	0.0036±0.0009	0.0010±0.0002
Thorium-228	Bq/g	0.0022±0.002	0.002±0.002	<0.0002
Thorium-230	Bq/g	<0.0004	<0.0005	<0.0002

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31858 08/05/2018 REF01-B-BL *VEGETATION*
31859 08/05/2018 REF01-B-BS *VEGETATION*
31860 08/05/2018 REF01-B-L *VEGETATION*

Analyte	Units	31858	31859	31860
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0004	<0.0005	<0.0002

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Results are reported on a dry basis.

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31861 08/05/2018 REF01-C-BB *VEGETATION*
31862 08/05/2018 REF01-C-BL *VEGETATION*
31863 08/05/2018 REF01-C-BS *VEGETATION*

Analyte	Units	31861	31862	31863
Lab Section 2 (ICP)				
Aluminum	ug/g	9.1±2	70±7	90±9
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	21±2	84±8	93±9
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	7±1	31±5	8±1
Cadmium	ug/g	<0.01	<0.01	0.02±0.02
Cesium	ug/g	0.24±0.1	0.28±0.1	0.11±0.07
Chromium	ug/g	<0.5	<0.5	<0.5
Cobalt	ug/g	<0.01	0.02±0.01	0.04±0.02
Copper	ug/g	5.1±0.5	5.1±0.5	7.5±0.8
Iron	ug/g	17±2	49±7	61±6
Lead	ug/g	<0.01	0.02±0.01	0.07±0.02
Lithium	ug/g	<0.05	<0.05	0.05±0.05
Manganese	ug/g	500±50	3170±300	1960±200
Mercury	ug/g	<0.005	0.006±0.006	0.006±0.006
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.70±0.2	1.0±0.2	1.2±0.2
Rubidium	ug/g	26±4	15±2	7.6±0.8
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	2.7±0.4	8.3±0.8	8.3±0.8
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	<0.05	0.64±0.2	1.1±0.2
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	<0.1	<0.1	0.1±0.1
Zinc	ug/g	10±2	12±2	49±7
Zirconium	ug/g	<0.05	<0.05	<0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.001±0.001	0.029±0.004	0.10±0.01
Polonium-210	Bq/g	0.0015±0.0006	0.0097±0.001	0.053±0.005
Radium-226	Bq/g	0.0018±0.001	0.0049±0.001	0.0047±0.0007
Thorium-228	Bq/g	<0.0005	0.0008±0.002	0.0024±0.002
Thorium-230	Bq/g	<0.0005	<0.0006	<0.0004

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31861	**08/05/2018 REF01-C-BB *VEGETATION***
31862	**08/05/2018 REF01-C-BL *VEGETATION***
31863	**08/05/2018 REF01-C-BS *VEGETATION***

Analyte	Units	31861	31862	31863
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0005	<0.0006	<0.0004

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Note for Sample # 31862
This sample was reanalyzed for Lead 210 and Thorium 228.
Reanalysis confirms original results are within the expected measurement uncertainty.

Note for Sample # 31863
This sample was reanalyzed for Aluminum, Iron, Titanium and Nickel.
Reanalysis confirms original results are within the expected measurement uncertainty.

Results are reported on a dry basis.

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31864 08/05/2018 REF01-C-L *VEGETATION*
31865 08/08/2018 REF02-A-BB *VEGETATION*
31866 08/08/2018 REF02-A-BL *VEGETATION*

Analyte	Units	31864	31865	31866
Lab Section 2 (ICP)				
Aluminum	ug/g	210±20	9.2±2	86±9
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	0.06±0.06	<0.05	<0.05
Barium	ug/g	8.3±0.8	19±2	98±10
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	1±1	6±1	17±4
Cadmium	ug/g	0.05±0.03	<0.01	<0.01
Cesium	ug/g	0.15±0.08	0.26±0.1	0.19±0.1
Chromium	ug/g	0.8±0.6	<0.5	1.0±0.7
Cobalt	ug/g	0.07±0.02	<0.01	0.03±0.02
Copper	ug/g	0.98±0.2	3.2±0.5	3.9±0.6
Iron	ug/g	120±10	12±2	51±5
Lead	ug/g	0.18±0.04	0.06±0.02	0.05±0.02
Lithium	ug/g	0.10±0.07	<0.05	<0.05
Manganese	ug/g	99±10	377±40	2350±200
Mercury	ug/g	0.025±0.01	<0.005	0.007±0.006
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.68±0.2	0.54±0.1	0.96±0.2
Rubidium	ug/g	6.3±0.6	13±2	5.4±0.5
Selenium	ug/g	0.06±0.06	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	4.6±0.7	4.0±0.6	11±1
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	0.06±0.06
Titanium	ug/g	4.0±0.6	0.07±0.05	0.78±0.2
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	0.4±0.2	<0.1	<0.1
Zinc	ug/g	12±2	8.0±2	15±2
Zirconium	ug/g	0.11±0.05	0.15±0.05	<0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.23±0.03	0.001±0.001	0.040±0.006
Polonium-210	Bq/g	0.16±0.02	0.0009±0.0004	0.024±0.002
Radium-226	Bq/g	0.0010±0.0002	0.0013±0.0008	0.0043±0.001
Thorium-228	Bq/g	0.0004±0.002	<0.0005	0.004±0.003
Thorium-230	Bq/g	<0.0002	<0.0005	<0.0009

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SRC Group # 2018-9960

Oct 30, 2018

Golder

31864	**08/05/2018 REF01-C-L *VEGETATION***
31865	**08/08/2018 REF02-A-BB *VEGETATION***
31866	**08/08/2018 REF02-A-BL *VEGETATION***

Analyte	Units	31864	31865	31866
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0002	<0.0005	<0.0009

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Results are reported on a dry basis.

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31867 08/08/2018 REF02-A-BS *VEGETATION*
31868 08/08/2018 REF02-A-L *VEGETATION*
31869 08/08/2018 REF02-B-BB *VEGETATION*

Analyte	Units	31867	31868	31869
Lab Section 2 (ICP)				
Aluminum	ug/g	99±10	410±40	9.5±2
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	0.13±0.08	<0.05
Barium	ug/g	104±10	20±2	20±2
Beryllium	ug/g	<0.01	0.02±0.01	<0.01
Boron	ug/g	6±1	<1	13±3
Cadmium	ug/g	0.05±0.03	0.08±0.03	<0.01
Cesium	ug/g	0.08±0.06	0.17±0.09	0.06±0.06
Chromium	ug/g	0.6±0.6	22±3	<0.5
Cobalt	ug/g	0.04±0.02	0.16±0.04	<0.01
Copper	ug/g	5.4±0.5	1.7±0.2	3.2±0.5
Iron	ug/g	63±6	340±30	11±2
Lead	ug/g	0.07±0.02	1.3±0.1	0.16±0.04
Lithium	ug/g	<0.05	0.18±0.09	<0.05
Manganese	ug/g	1300±100	139±10	414±40
Mercury	ug/g	0.006±0.006	0.030±0.01	<0.005
Molybdenum	ug/g	<0.1	<0.1	0.1±0.1
Nickel	ug/g	0.96±0.2	8.5±0.8	0.73±0.2
Rubidium	ug/g	3.2±0.5	3.6±0.5	18±3
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	0.02±0.01	<0.01
Strontium	ug/g	14±1	4.7±0.7	2.8±0.4
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	1.2±0.2	9.2±0.9	<0.05
Uranium	ug/g	<0.01	0.02±0.01	<0.01
Vanadium	ug/g	0.1±0.1	0.9±0.3	<0.1
Zinc	ug/g	66±7	15±2	8.1±2
Zirconium	ug/g	<0.05	0.29±0.05	0.07±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.084±0.01	0.27±0.04	0.004±0.001
Polonium-210	Bq/g	0.051±0.005	0.22±0.02	0.0020±0.0005
Radium-226	Bq/g	0.011±0.002	0.005±0.005	0.0023±0.0006
Thorium-228	Bq/g	0.011±0.005	<0.007	0.001±0.002
Thorium-230	Bq/g	<0.0004	<0.007	<0.0005

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31867	**08/08/2018 REF02-A-BS *VEGETATION***
31868	**08/08/2018 REF02-A-L *VEGETATION***
31869	**08/08/2018 REF02-B-BB *VEGETATION***

Analyte	Units	31867	31868	31869
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0004	<0.007	<0.0005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Note for Sample # 31869
This sample was reanalyzed for Lead. Reanalysis confirms original results are within the expected measurement uncertainty.

Results are reported on a dry basis.

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31870 08/08/2018 REF02-B-BL *VEGETATION*
31871 08/08/2018 REF02-B-BS *VEGETATION*
31872 08/08/2018 REF02-B-L *VEGETATION*

Analyte	Units	31870	31871	31872
Lab Section 2 (ICP)				
Aluminum	ug/g	78±8	70±7	370±40
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	0.10±0.07
Barium	ug/g	64±6	62±6	20±2
Beryllium	ug/g	<0.01	<0.01	0.01±0.01
Boron	ug/g	25±4	8±1	<1
Cadmium	ug/g	<0.01	0.03±0.02	0.05±0.03
Cesium	ug/g	<0.05	<0.05	0.15±0.08
Chromium	ug/g	<0.5	<0.5	3.4±1
Cobalt	ug/g	0.02±0.01	0.02±0.01	0.10±0.02
Copper	ug/g	3.0±0.4	4.9±0.7	1.6±0.2
Iron	ug/g	40±6	36±5	270±30
Lead	ug/g	0.02±0.01	0.03±0.02	1.1±0.1
Lithium	ug/g	<0.05	<0.05	0.16±0.09
Manganese	ug/g	2020±200	1120±100	166±20
Mercury	ug/g	0.006±0.006	<0.005	0.037±0.01
Molybdenum	ug/g	<0.1	<0.1	0.1±0.1
Nickel	ug/g	0.82±0.2	0.82±0.2	1.7±0.2
Rubidium	ug/g	6.1±0.6	4.0±0.6	4.8±0.7
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	0.02±0.01
Strontium	ug/g	8.5±0.8	10±1	3.5±0.5
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	0.46±0.1	0.62±0.2	8.7±0.9
Uranium	ug/g	<0.01	<0.01	0.02±0.01
Vanadium	ug/g	<0.1	<0.1	0.8±0.3
Zinc	ug/g	13±2	44±7	12±2
Zirconium	ug/g	<0.05	<0.05	0.23±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.034±0.005	0.061±0.009	0.41±0.06
Polonium-210	Bq/g	0.014±0.002	0.038±0.004	0.27±0.03
Radium-226	Bq/g	0.0040±0.001	0.0084±0.001	<0.002
Thorium-228	Bq/g	0.006±0.004	0.010±0.005	<0.005
Thorium-230	Bq/g	<0.0006	<0.0004	<0.005

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31870	**08/08/2018 REF02-B-BL *VEGETATION***
31871	**08/08/2018 REF02-B-BS *VEGETATION***
31872	**08/08/2018 REF02-B-L *VEGETATION***

Analyte	Units	31870	31871	31872
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0006	<0.0004	<0.005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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31873 08/08/2018 REF02-C-BB *VEGETATION*
31874 08/08/2018 REF02-C-BL *VEGETATION*
31875 08/08/2018 REF02-C-BS *VEGETATION*

Analyte	Units	31873	31874	31875
Lab Section 2 (ICP)				
Aluminum	ug/g	9.9±2	76±8	83±8
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	21±2	61±6	64±6
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	8±1	29±4	8±1
Cadmium	ug/g	<0.01	<0.01	0.02±0.02
Cesium	ug/g	0.07±0.06	0.10±0.07	0.06±0.06
Chromium	ug/g	<0.5	<0.5	<0.5
Cobalt	ug/g	<0.01	0.01±0.01	0.02±0.01
Copper	ug/g	2.6±0.4	2.9±0.4	4.7±0.7
Iron	ug/g	13±2	40±6	47±7
Lead	ug/g	0.02±0.01	0.02±0.01	0.04±0.02
Lithium	ug/g	<0.05	<0.05	<0.05
Manganese	ug/g	466±50	2520±200	1490±100
Mercury	ug/g	<0.005	0.006±0.006	0.007±0.006
Molybdenum	ug/g	0.1±0.1	<0.1	<0.1
Nickel	ug/g	0.40±0.2	0.55±0.1	0.52±0.1
Rubidium	ug/g	13±2	7.8±0.8	4.8±0.7
Selenium	ug/g	<0.05	0.05±0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	2.6±0.4	7.7±0.8	8.7±0.9
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	0.08±0.05	0.47±0.1	0.81±0.2
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	<0.1	<0.1	<0.1
Zinc	ug/g	7.0±2	13±2	32±5
Zirconium	ug/g	<0.05	<0.05	<0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.003±0.001	0.030±0.004	0.078±0.01
Polonium-210	Bq/g	0.0031±0.0008	0.015±0.002	0.034±0.003
Radium-226	Bq/g	0.0042±0.0006	0.0084±0.001	0.017±0.002
Thorium-228	Bq/g	0.0009±0.002	0.007±0.004	0.016±0.006
Thorium-230	Bq/g	<0.0005	<0.0005	<0.0004

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31873	**08/08/2018 REF02-C-BB *VEGETATION***
31874	**08/08/2018 REF02-C-BL *VEGETATION***
31875	**08/08/2018 REF02-C-BS *VEGETATION***

Analyte	Units	31873	31874	31875
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0005	<0.0005	<0.0004

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Results are reported on a dry basis.

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31876 08/08/2018 REF02-C-L *VEGETATION*
31877 08/09/2018 REF03-A-BB *VEGETATION*
31878 08/09/2018 REF03-A-BL *VEGETATION*

Analyte	Units	31876	31877	31878
Lab Section 2 (ICP)				
Aluminum	ug/g	340±30	10±2	98±10
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	0.10±0.07	<0.05	<0.05
Barium	ug/g	12±1	21±2	74±7
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	<1	7±1	22±3
Cadmium	ug/g	0.06±0.03	<0.01	<0.01
Cesium	ug/g	0.19±0.1	0.25±0.1	0.16±0.09
Chromium	ug/g	1.5±0.8	<0.5	<0.5
Cobalt	ug/g	0.08±0.02	<0.01	0.02±0.01
Copper	ug/g	1.4±0.2	3.9±0.6	3.5±0.5
Iron	ug/g	270±30	12±2	48±7
Lead	ug/g	0.74±0.1	0.05±0.02	0.02±0.01
Lithium	ug/g	0.16±0.09	<0.05	<0.05
Manganese	ug/g	180±20	600±60	3380±300
Mercury	ug/g	0.036±0.01	<0.005	0.007±0.006
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.93±0.2	0.45±0.2	0.65±0.2
Rubidium	ug/g	4.7±0.7	18±3	7.2±0.7
Selenium	ug/g	0.06±0.06	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	2.8±0.4	3.4±0.5	10±1
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	7.3±0.7	0.19±0.08	0.48±0.1
Uranium	ug/g	0.08±0.03	<0.01	<0.01
Vanadium	ug/g	0.7±0.2	<0.1	<0.1
Zinc	ug/g	20±3	7.6±2	13±2
Zirconium	ug/g	0.21±0.05	0.15±0.05	<0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.29±0.04	0.002±0.001	0.028±0.004
Polonium-210	Bq/g	0.17±0.02	0.0011±0.0005	0.011±0.002
Radium-226	Bq/g	0.003±0.002	0.0016±0.0009	0.0056±0.001
Thorium-228	Bq/g	0.002±0.002	<0.0005	0.003±0.002
Thorium-230	Bq/g	<0.001	<0.0005	<0.0006

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31876	**08/08/2018 REF02-C-L *VEGETATION***
31877	**08/09/2018 REF03-A-BB *VEGETATION***
31878	**08/09/2018 REF03-A-BL *VEGETATION***

Analyte	Units	31876	31877	31878
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.001	<0.0005	<0.0006

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Results are reported on a dry basis.

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31879 08/09/2018 REF03-A-BS *VEGETATION*
31880 08/09/2018 REF03-A-L *VEGETATION*
31881 08/09/2018 REF03-B-BB *VEGETATION*

Analyte	Units	31879	31880	31881
Lab Section 2 (ICP)				
Aluminum	ug/g	91±9	310±30	13±2
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	0.09±0.07	<0.05
Barium	ug/g	72±7	7.5±0.8	20±2
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	7±1	<1	8±1
Cadmium	ug/g	0.02±0.02	0.04±0.02	0.36±0.05
Cesium	ug/g	0.11±0.07	0.11±0.07	0.21±0.1
Chromium	ug/g	<0.5	3.7±1	<0.5
Cobalt	ug/g	0.02±0.01	0.10±0.02	0.01±0.01
Copper	ug/g	5.3±0.5	0.98±0.2	3.2±0.5
Iron	ug/g	59±6	220±20	15±2
Lead	ug/g	0.05±0.02	0.37±0.06	0.02±0.01
Lithium	ug/g	<0.05	0.15±0.08	<0.05
Manganese	ug/g	1780±200	131±10	650±60
Mercury	ug/g	0.006±0.006	0.024±0.01	<0.005
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.58±0.1	1.7±0.2	0.53±0.1
Rubidium	ug/g	5.3±0.5	3.8±0.6	18±3
Selenium	ug/g	<0.05	0.06±0.06	<0.05
Silver	ug/g	<0.01	0.01±0.01	<0.01
Strontium	ug/g	9.0±0.9	3.3±0.5	2.6±0.4
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	0.05±0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	1.0±0.2	7.4±0.7	0.14±0.06
Uranium	ug/g	<0.01	0.01±0.01	<0.01
Vanadium	ug/g	0.1±0.1	0.6±0.2	<0.1
Zinc	ug/g	44±7	15±2	8.3±2
Zirconium	ug/g	<0.05	0.19±0.05	0.27±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.056±0.008	0.25±0.04	0.002±0.001
Polonium-210	Bq/g	0.046±0.005	0.19±0.03	0.0016±0.0006
Radium-226	Bq/g	0.0018±0.001	0.005±0.004	0.0016±0.0009
Thorium-228	Bq/g	0.0084±0.004	<0.004	<0.0005
Thorium-230	Bq/g	<0.0004	0.005±0.004	<0.0005

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31879 08/09/2018 REF03-A-BS *VEGETATION*
31880 08/09/2018 REF03-A-L *VEGETATION*
31881 08/09/2018 REF03-B-BB *VEGETATION*

Analyte	Units	31879	31880	31881
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0004	<0.004	<0.0005

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Note for Sample # 31881
This sample was reanalyzed for Cadmium. Reanalysis confirms original results are within the expected measurement uncertainty.

Results are reported on a dry basis.

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SRC Group # 2018-9960

Oct 30, 2018

Golder

31882 08/09/2018 REF03-B-BL *VEGETATION*
31883 08/09/2018 REF03-B-BS *VEGETATION*
31884 08/09/2018 REF03-B-L *VEGETATION*

Analyte	Units	31882	31883	31884
Lab Section 2 (ICP)				
Aluminum	ug/g	100±10	110±10	500±50
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	0.13±0.08
Barium	ug/g	72±7	72±7	14±1
Beryllium	ug/g	<0.01	<0.01	0.01±0.01
Boron	ug/g	26±4	7±1	<1
Cadmium	ug/g	<0.01	0.03±0.02	0.05±0.03
Cesium	ug/g	0.15±0.08	0.08±0.06	0.08±0.06
Chromium	ug/g	<0.5	<0.5	16±9
Cobalt	ug/g	0.03±0.02	0.03±0.02	0.24±0.04
Copper	ug/g	3.1±0.5	5.0±0.5	1.2±0.2
Iron	ug/g	44±7	52±5	320±30
Lead	ug/g	0.02±0.01	0.06±0.02	0.64±0.1
Lithium	ug/g	<0.05	<0.05	0.23±0.1
Manganese	ug/g	2980±300	1470±100	116±10
Mercury	ug/g	0.007±0.006	0.006±0.006	0.024±0.01
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.79±0.2	0.90±0.2	6.9±0.7
Rubidium	ug/g	6.9±0.7	3.8±0.6	3.3±0.5
Selenium	ug/g	0.05±0.05	<0.05	0.07±0.06
Silver	ug/g	<0.01	<0.01	0.01±0.01
Strontium	ug/g	10±1	11±1	4.8±0.7
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	1.0±0.2	1.8±0.3	13±1
Uranium	ug/g	<0.01	<0.01	0.02±0.01
Vanadium	ug/g	<0.1	0.1±0.1	0.9±0.3
Zinc	ug/g	14±2	37±6	15±2
Zirconium	ug/g	<0.05	<0.05	0.67±0.2
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.029±0.004	0.063±0.009	0.28±0.04
Polonium-210	Bq/g	0.013±0.002	0.053±0.005	0.22±0.02
Radium-226	Bq/g	0.0058±0.001	0.0074±0.001	<0.0008
Thorium-228	Bq/g	0.003±0.002	0.0073±0.004	<0.002
Thorium-230	Bq/g	<0.0006	<0.0004	<0.002

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31882 08/09/2018 REF03-B-BL *VEGETATION*
31883 08/09/2018 REF03-B-BS *VEGETATION*
31884 08/09/2018 REF03-B-L *VEGETATION*

Analyte	Units	31882	31883	31884
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0006	<0.0004	<0.002

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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31885 08/09/2018 REF03-C-BB *VEGETATION*
31886 08/09/2018 REF03-C-BL *VEGETATION*
31887 08/09/2018 REF03-C-BS *VEGETATION*

Analyte	Units	31885	31886	31887
Lab Section 2 (ICP)				
Aluminum	ug/g	11±2	96±10	110±10
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	17±2	82±8	64±6
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	6±1	21±3	7±1
Cadmium	ug/g	<0.01	<0.01	0.02±0.02
Cesium	ug/g	0.22±0.1	0.17±0.09	0.12±0.08
Chromium	ug/g	<0.5	<0.5	<0.5
Cobalt	ug/g	<0.01	0.01±0.01	0.02±0.01
Copper	ug/g	3.4±0.5	3.8±0.6	5.0±0.5
Iron	ug/g	11±2	46±7	51±5
Lead	ug/g	0.02±0.01	0.02±0.01	0.05±0.02
Lithium	ug/g	<0.05	<0.05	<0.05
Manganese	ug/g	490±50	3150±300	1580±200
Mercury	ug/g	<0.005	0.008±0.006	0.005±0.005
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.63±0.2	0.87±0.2	0.61±0.2
Rubidium	ug/g	15±2	7.3±0.7	4.4±0.7
Selenium	ug/g	<0.05	0.06±0.06	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	2.4±0.4	14±1	10±1
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	0.08±0.06	0.10±0.07
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	0.11±0.06	0.80±0.2	2.0±0.3
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	<0.1	<0.1	0.1±0.1
Zinc	ug/g	7.9±2	14±2	53±5
Zirconium	ug/g	0.06±0.05	<0.05	0.07±0.05
Lab Section 4 (Radiochemistry)				
Lead-210	Bq/g	0.001±0.001	0.027±0.004	0.076±0.01
Polonium-210	Bq/g	0.0012±0.0005	0.016±0.002	0.032±0.003
Radium-226	Bq/g	0.0014±0.0008	0.0051±0.001	0.0076±0.001
Thorium-228	Bq/g	<0.0005	0.002±0.002	0.0062±0.004
Thorium-230	Bq/g	<0.0005	<0.0006	<0.0004

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31885	**08/09/2018 REF03-C-BB *VEGETATION***
31886	**08/09/2018 REF03-C-BL *VEGETATION***
31887	**08/09/2018 REF03-C-BS *VEGETATION***

Analyte	Units	31885	31886	31887
Lab Section 4 (Radiochemistry)				
Thorium-232	Bq/g	<0.0005	<0.0006	<0.0004

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Oct 30, 2018

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31888 08/09/2018 REF03-C-L *VEGETATION*

Analyte	Units	31888
Lab Section 2 (ICP)		
Aluminum	ug/g	570±60
Antimony	ug/g	<0.1
Arsenic	ug/g	0.14±0.08
Barium	ug/g	13±1
Beryllium	ug/g	0.02±0.01
Boron	ug/g	1±1
Cadmium	ug/g	0.05±0.03
Cesium	ug/g	0.18±0.09
Chromium	ug/g	28±10
Cobalt	ug/g	0.32±0.05
Copper	ug/g	1.2±0.2
Iron	ug/g	400±40
Lead	ug/g	0.53±0.08
Lithium	ug/g	0.27±0.1
Manganese	ug/g	156±20
Mercury	ug/g	0.025±0.01
Molybdenum	ug/g	<0.1
Nickel	ug/g	11±1
Rubidium	ug/g	4.5±0.7
Selenium	ug/g	0.08±0.06
Silver	ug/g	0.01±0.01
Strontium	ug/g	5.4±0.5
Tellurium	ug/g	<0.5
Thallium	ug/g	<0.05
Tin	ug/g	<0.05
Titanium	ug/g	15±2
Uranium	ug/g	0.02±0.01
Vanadium	ug/g	0.9±0.3
Zinc	ug/g	21±3
Zirconium	ug/g	0.78±0.2
Lab Section 4 (Radiochemistry)		
Lead-210	Bq/g	0.29±0.04
Polonium-210	Bq/g	0.22±0.02
Radium-226	Bq/g	0.0049±0.001
Thorium-228	Bq/g	0.006±0.004
Thorium-230	Bq/g	<0.0008

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SRC Group # 2018-9960

Oct 30, 2018

Golder

31888 08/09/2018 REF03-C-L *VEGETATION*

Analyte	Units	31888
Lab Section 4 (Radiochemistry)		
Thorium-232	Bq/g	0.002±0.02

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

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SRC Group # 2018-15107

Dec 04, 2018

Golder
1721 8th Street East
Saskatoon, SK S7H 0T4
Attn: Andrew Stewart

Date Samples Received: Dec-03-2018 Client P.O.: 1899581/2/2002

All results have been reviewed and approved by a Qualified Person in accordance with the Saskatchewan Environmental Code, Corrective Action Plan Chapter, for the purposes of certifying a laboratory analysis

Results from Lab Sections 1 and 2 have been authorized by Keith Gipman, Supervisor
Results from Lab Section 3 have been authorized by Pat Moser, Supervisor
Results from Lab Sections 4 and 5 have been authorized by Vicky Snook, Supervisor
Results from Lab Section 6 have been authorized by Marion McConnell, Supervisor

---

* Test methods and data are validated by the laboratory's Quality Assurance Program.

* Routine methods follow recognized procedures from sources such as
    * Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF
    * Environment Canada
    * US EPA
    * CANMET

* The results reported relate only to the test samples as provided by the client.

* Samples will be kept for 30 days after the final report is sent. Please contact the lab if you have any special requirements.

* Additional information is available upon request.

This is a final report.

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SRC Group # 2018-15107

Dec 04, 2018

Golder

1721 8th Street East
Saskatoon, SK S7H 0T4
Attn: Andrew Stewart

Date Samples Received: Dec-03-2018 Client P.O.: 1899581/2/2002

50587	**08/04/2018 EXP01-A-BB (PREV. SRC GR 18-9960-31819) *VEGETATION***
50588	**08/04/2018 EXP01-A-BL (PREV. SRC GR 18-9960-31820) *VEGETATION***
50589	**08/04/2018 EXP01-A-BS (PREV. SRC GR 18-9960-31821) *VEGETATION***

Analyte	Units	50587	50588	50589
Lab Section 6 (SPTP)				
Moisture	%	84.06	54.00	38.67

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50590	**08/04/2018 EXP01-A-L (PREV. SRC GR 18-9960-31822) *VEGETATION***
50591	**08/03/2018 EXP01-B-BB (PREV. SRC GR 18-9960-31823) *VEGETATION***
50592	**08/04/2018 EXP01-B-BL (PREV. SRC GR 18-9960-31824) *VEGETATION***

Analyte	Units	50590	50591	50592
Lab Section 6 (SPTP)				
Moisture	%	16.72	83.46	55.29

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50593	**08/04/2018 EXP01-B-BS (PREV. SRC GR 18-9960-31825) *VEGETATION***
50594	**08/03/2018 EXP01-B-L (PREV. SRC GR 18-9960-31826) *VEGETATION***
50595	**08/03/2018 EXP01-C-BB (PREV. SRC GR 18-9960-31827) *VEGETATION***

Analyte	Units	50593	50594	50595
Lab Section 6 (SPTP)				
Moisture	%	39.82	6.96	99.11

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50596	**08/03/2018 EXP01-C-BL (PREV. SRC GR 18-9960-31828) *VEGETATION***
50597	**08/03/2018 EXP01-C-BS (PREV. SRC GR 18-9960-31829) *VEGETATION***
50598	**08/03/2018 EXP01-C-L (PREV. SRC GR 18-9960-31830) *VEGETATION***

Analyte	Units	50596	50597	50598
Lab Section 6 (SPTP)				
Moisture	%	56.98	32.11	6.58

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50599	**08/04/2018 EXP02-A-BB (PREV. SRC GR 18-9960-31831) *VEGETATION***
50600	**08/06/2018 EXP02-A-BL (PREV. SRC GR 18-9960-31832) *VEGETATION***
50601	**08/06/2018 EXP02-A-BS (PREV. SRC GR 18-9960-31833) *VEGETATION***

Analyte	Units	50599	50600	50601
Lab Section 6 (SPTP)				
Moisture	%	83.11	53.16	38.81

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50602	**08/06/2018 EXP02-A-L (PREV. SRC GR 18-9960-31834) *VEGETATION***
50603	**08/04/2018 EXP02-B-BB (PREV. SRC GR 18-9960-31835) *VEGETATION***
50604	**08/06/2018 EXP02-B-BL (PREV. SRC GR 18-9960-31836) *VEGETATION***

Analyte	Units	50602	50603	50604
Lab Section 6 (SPTP)				
Moisture	%	36.87	82.39	59.94

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50605	**08/06/2018 EXP02-B-BS (PREV. SRC GR 18-9960-31837) *VEGETATION***
50606	**08/06/2018 EXP02-B-L (PREV. SRC GR 18-9960-31838) *VEGETATION***
50607	**08/06/2018 EXP02-C-BB (PREV. SRC GR 18-9960-31839) *VEGETATION***

Analyte	Units	50605	50606	50607
Lab Section 6 (SPTP)				
Moisture	%	44.35	43.65	83.13

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50608 08/06/2018 EXP02-C-BL (PREV. SRC GR 18-9960-31840) *VEGETATION*
50609 08/06/2018 EXP02-C-BS (PREV. SRC GR 18-9960-31841) *VEGETATION*
50610 08/06/2018 EXP02-C-L (PREV. SRC GR 18-9960-31842) *VEGETATION*

Analyte	Units	50608	50609	50610
Lab Section 6 (SPTP)				
Moisture	%	52.96	39.46	38.83

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50611	**08/07/2018 EXP03-A-BB (PREV. SRC GR 18-9960-31843) *VEGETATION***
50612	**08/07/2018 EXP03-A-BL (PREV. SRC GR 18-9960-31844) *VEGETATION***
50613	**08/07/2018 EXP03-A-BS (PREV. SRC GR 18-9960-31845) *VEGETATION***

Analyte	Units	50611	50612	50613
Lab Section 6 (SPTP)				
Moisture	%	83.54	56.17	45.62

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50614	**08/07/2018 EXP03-A-L (PREV. SRC GR 18-9960-31846) *VEGETATION***
50615	**08/07/2018 EXP03-B-BB (PREV. SRC GR 18-9960-31847) *VEGETATION***
50616	**08/07/2018 EXP03-B-BL (PREV. SRC GR 18-9960-31848) *VEGETATION***

Analyte	Units	50614	50615	50616
Lab Section 6 (SPTP)				
Moisture	%	48.89	83.13	51.01

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50617	**08/07/2018 EXP03-B-BS (PREV. SRC GR 18-9960-31849) *VEGETATION***
50618	**08/07/2018 EXP03-B-L (PREV. SRC GR 18-9960-31850) *VEGETATION***
50619	**08/07/2018 EXP03-C-BB (PREV. SRC GR 18-9960-31851) *VEGETATION***

Analyte	Units	50617	50618	50619
Lab Section 6 (SPTP)				
Moisture	%	39.50	43.45	84.13

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50620 08/07/2018 EXP03-C-BL (PREV. SRC GR 18-9960-31852) *VEGETATION*
50621 08/07/2018 EXP03-C-BS (PREV. SRC GR 18-9960-31853) *VEGETATION*
50622 08/07/2018 EXP03-C-L (PREV. SRC GR 18-9960-31854) *VEGETATION*

Analyte	Units	50620	50621	50622
Lab Section 6 (SPTP)				
Moisture	%	59.69	46.94	55.49

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50623	**08/05/2018 REF01-A-BL (PREV. SRC GR 18-9960-31855) *VEGETATION***
50624	**08/05/2018 REF01-A-BS (PREV. SRC GR 18-9960-31856) *VEGETATION***
50625	**08/05/2018 REF01-A-L (PREV. SRC GR 18-9960-31857) *VEGETATION***

Analyte	Units	50623	50624	50625
Lab Section 6 (SPTP)				
Moisture	%	57.00	59.94	8.89

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Golder

50626	**08/05/2018 REF01-B-BL (PREV. SRC GR 18-9960-31858) *VEGETATION***
50627	**08/05/2018 REF01-B-BS (PREV. SRC GR 18-9960-31859) *VEGETATION***
50628	**08/05/2018 REF01-B-L (PREV. SRC GR 18-9960-31860) *VEGETATION***

Analyte	Units	50626	50627	50628
Lab Section 6 (SPTP)				
Moisture	%	48.70	60.42	7.81

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SRC Group # 2018-15107

Dec 04, 2018

Golder

50629	**08/05/2018 REF01-C-BB (PREV. SRC GR 18-9960-31861) *VEGETATION***
50630	**08/05/2018 REF01-C-BL (PREV. SRC GR 18-9960-31862) *VEGETATION***
50631	**08/05/2018 REF01-C-BS (PREV. SRC GR 18-9960-31863) *VEGETATION***

Analyte	Units	50629	50630	50631
Lab Section 6 (SPTP)				
Moisture	%	82.68	57.21	44.68

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SRC Group # 2018-15107

Dec 04, 2018

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50632	**08/05/2018 REF01-C-L (PREV. SRC GR 18-9960-31864) *VEGETATION***
50633	**08/08/2018 REF02-A-BB (PREV. SRC GR 18-9960-31865) *VEGETATION***
50634	**08/08/2018 REF02-A-BL (PREV. SRC GR 18-9960-31866) *VEGETATION***

Analyte	Units	50632	50633	50634
Lab Section 6 (SPTP)				
Moisture	%	7.61	84.49	59.15

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50635 08/08/2018 REF02-A-BS (PREV. SRC GR 18-9960-31867) *VEGETATION*
50636 08/08/2018 REF02-A-L (PREV. SRC GR 18-9960-31868) *VEGETATION*
50637 08/08/2018 REF02-B-BB (PREV. SRC GR 18-9960-31869) *VEGETATION*

Analyte	Units	50635	50636	50637
Lab Section 6 (SPTP)				
Moisture	%	46.12	57.34	84.35

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50638	**08/08/2018 REF02-B-BL (PREV. SRC GR 18-9960-31870) *VEGETATION***
50639	**08/08/2018 REF02-B-BS (PREV. SRC GR 18-9960-31871) *VEGETATION***
50640	**08/08/2018 REF02-B-L (PREV. SRC GR 18-9960-31872) *VEGETATION***

Analyte	Units	50638	50639	50640
Lab Section 6 (SPTP)				
Moisture	%	48.43	33.39	53.14

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Dec 04, 2018

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50641	**08/08/2018 REF02-C-BB (PREV. SRC GR 18-9960-31873) *VEGETATION***
50642	**08/08/2018 REF02-C-BL (PREV. SRC GR 18-9960-31874) *VEGETATION***
50643	**08/08/2018 REF02-C-BS (PREV. SRC GR 18-9960-31875) *VEGETATION***

Analyte	Units	50641	50642	50643
Lab Section 6 (SPTP)				
Moisture	%	83.54	48.72	35.22

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50644	**08/08/2018 REF02-C-L (PREV. SRC GR 18-9960-31876) *VEGETATION***
50645	**08/09/2018 REF03-A-BB (PREV. SRC GR 18-9960-31877) *VEGETATION***
50646	**08/09/2018 REF03-A-BL (PREV. SRC GR 18-9960-31878) *VEGETATION***

Analyte	Units	50644	50645	50646
Lab Section 6 (SPTP)				
Moisture	%	34.17	83.24	51.53

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Dec 04, 2018

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50647	**08/09/2018 REF03-A-BS (PREV. SRC GR 18-9960-31879) *VEGETATION***
50648	**08/09/2018 REF03-A-L (PREV. SRC GR 18-9960-31880) *VEGETATION***
50649	**08/09/2018 REF03-B-BB (PREV. SRC GR 18-9960-31881) *VEGETATION***

Analyte	Units	50647	50648	50649
Lab Section 6 (SPTP)				
Moisture	%	37.11	33.94	83.16

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Dec 04, 2018

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50650	**08/09/2018 REF03-B-BL (PREV. SRC GR 18-9960-31882) *VEGETATION***
50651	**08/09/2018 REF03-B-BS (PREV. SRC GR 18-9960-31883) *VEGETATION***
50652	**08/09/2018 REF03-B-L (PREV. SRC GR 18-9960-31884) *VEGETATION***

Analyte	Units	50650	50651	50652
Lab Section 6 (SPTP)				
Moisture	%	50.23	31.07	25.93

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SRC Group # 2018-15107

Dec 04, 2018

Golder

50653	**08/09/2018 REF03-C-BB (PREV. SRC GR 18-9960-31885) *VEGETATION***
50654	**08/09/2018 REF03-C-BL (PREV. SRC GR 18-9960-31886) *VEGETATION***
50655	**08/09/2018 REF03-C-BS (PREV. SRC GR 18-9960-31887) *VEGETATION***

Analyte	Units	50653	50654	50655
Lab Section 6 (SPTP)				
Moisture	%	82.92	51.16	35.49

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SRC Group # 2018-15107

Dec 04, 2018

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50656 08/09/2018 REF03-C-L (PREV. SRC GR 18-9960-31888) *VEGETATION*

Analyte	Units	50656
Lab Section 6 (SPTP)		
Moisture	%	12.01

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SRC Group # 2019-11321

Oct 16, 2019

Golder
1721 8th Street East
Saskatoon, SK S7H 0T4
Attn: Kyle Hodgson

Date Samples Received: Aug-12-2019 Client P.O.:

All results have been reviewed and approved by a Qualified Person in accordance with the Saskatchewan Environmental Code, Corrective Action Plan Chapter, for the purposes of certifying a laboratory analysis

Results from Lab Section 2 authorized by Keith Gipman, Supervisor
Results from Lab Section 4 authorized by Vicky Snook, Supervisor
Results from Lab Section 6 authorized by Marion McConnell, Supervisor

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* Test methods and data are validated by the laboratory's Quality Assurance Program.

* Routine methods follow recognized procedures from sources such as
    * Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF
    * Environment Canada
    * US EPA
    * CANMET

* The results reported relate only to the test samples as provided by the client.

* Samples will be kept for 30 days after the final report is sent. Please contact the lab if you have any special requirements.

* Additional information is available upon request.

* Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

This is a final report.

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SRC Group # 2019-11321

Oct 16, 2019

Golder

1721 8th Street East
Saskatoon, SK S7H 0T4
Attn: Kyle Hodgson

Date Samples Received: Aug-12-2019 Client P.O.:

45070	**08/08/2019 19-REF04-A-LI *VEGETATION***
45071	**08/11/2019 19-REF04-B-LI *VEGETATION***
45072	**08/11/2019 19-REF04-C-LI *VEGETATION***

Analyte	Units	45070	45071	45072
Lab Section 2				
Aluminum	ug/g	310±30	270±30	290±30
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	0.06±0.06	<0.05	0.08±0.06
Barium	ug/g	7.0±0.7	11±1	6.0±0.6
Beryllium	ug/g	0.01±0.01	<0.01	<0.01
Boron	ug/g	1±1	<1	1±1
Cadmium	ug/g	0.05±0.03	0.06±0.03	0.05±0.03
Cesium	ug/g	0.10±0.07	0.13±0.08	0.06±0.06
Chromium	ug/g	1.1±0.7	1.2±0.8	1.4±0.8
Cobalt	ug/g	0.08±0.02	0.07±0.02	0.08±0.02
Copper	ug/g	1.0±0.2	0.86±0.2	1.1±0.2
Iron	ug/g	180±20	150±20	150±20
Lead	ug/g	0.20±0.03	0.29±0.04	0.18±0.04
Lithium	ug/g	0.16±0.09	0.12±0.08	0.14±0.08
Manganese	ug/g	147±10	132±10	120±10
Mercury	ug/g	0.025±0.01	0.021±0.01	0.026±0.01
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.65±0.2	0.62±0.2	0.82±0.2
Rubidium	ug/g	5.4±0.5	5.1±0.5	6.4±0.6
Selenium	ug/g	0.06±0.06	0.06±0.06	0.07±0.06
Silver	ug/g	<0.01	0.01±0.01	<0.01
Strontium	ug/g	3.5±0.5	3.4±0.5	3.7±0.6
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	7.0±0.7	5.8±0.6	6.6±0.7
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	0.5±0.2	0.4±0.2	0.5±0.2
Zinc	ug/g	16±2	18±3	17±2
Zirconium	ug/g	0.17±0.05	0.14±0.05	0.16±0.05

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45070	**08/08/2019**	**19-REF04-A-LI *VEGETATION***
45071	**08/11/2019**	**19-REF04-B-LI *VEGETATION***
45072	**08/11/2019**	**19-REF04-C-LI *VEGETATION***

Analyte	Units	45070	45071	45072
Lab Section 4				
Lead-210	Bq/g	0.27±0.04	0.32±0.05	0.23±0.03
Polonium-210	Bq/g	0.20±0.02	0.28±0.03	0.22±0.02
Radium-226	Bq/g	0.0009±0.0005	0.0006±0.0004	0.0004±0.0003
Thorium-230	Bq/g	<0.0003	<0.0003	<0.0003
Lab Section 6				
Moisture	%	25.13±2	36.16±4	20.23±2

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

Note for Sample # 45070
This sample was reanalyzed for Polonium-210 and Lead-210. Reanalysis confirms original results are within the expected measurement uncertainty.

The temperature of the cooler was 14.9 °C upon receipt.

Results are reported on a dry basis.

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45073 08/08/2019 19-REF04-A-BL *VEGETATION*
45074 08/11/2019 19-REF04-B-BL *VEGETATION*
45075 08/11/2019 19-REF04-C-BL *VEGETATION*

Analyte	Units	45073	45074	45075
Lab Section 2				
Aluminum	ug/g	81±8	76±8	82±8
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	53±5	57±6	61±6
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	14±4	20±3	20±3
Cadmium	ug/g	<0.01	<0.01	<0.01
Cesium	ug/g	0.08±0.06	<0.05	0.07±0.06
Chromium	ug/g	<0.5	<0.5	<0.5
Cobalt	ug/g	0.03±0.02	0.03±0.02	0.02±0.01
Copper	ug/g	3.5±0.5	3.4±0.5	4.2±0.6
Iron	ug/g	39±6	31±5	38±6
Lead	ug/g	0.01±0.01	<0.01	<0.01
Lithium	ug/g	<0.05	<0.05	<0.05
Manganese	ug/g	2930±300	3100±300	3700±400
Mercury	ug/g	0.006±0.006	0.005±0.005	0.006±0.006
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.79±0.2	0.84±0.2	0.60±0.2
Rubidium	ug/g	9.7±1	5.0±0.5	14±2
Selenium	ug/g	<0.05	0.08±0.06	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	7.1±0.7	6.7±0.7	4.0±0.6
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	0.60±0.2	0.42±0.1	0.42±0.1
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	<0.1	<0.1	<0.1
Zinc	ug/g	9.1±2	12±2	12±2
Zirconium	ug/g	<0.05	<0.05	<0.05
Lab Section 4				
Lead-210	Bq/g	0.028±0.004	0.034±0.005	0.027±0.004
Polonium-210	Bq/g	0.012±0.002	0.010±0.002	0.011±0.002
Radium-226	Bq/g	0.0020±0.001	0.0031±0.0008	0.0031±0.0008
Thorium-230	Bq/g	<0.0006	<0.0005	<0.0006

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45073	**08/08/2019**	**19-REF04-A-BL *VEGETATION***
45074	**08/11/2019**	**19-REF04-B-BL *VEGETATION***
45075	**08/11/2019**	**19-REF04-C-BL *VEGETATION***

Analyte	Units	45073	45074	45075
Lab Section 6				
Moisture	%	53.98±5	47.58±5	52.44±5

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 14.9 °C upon receipt.

Results are reported on a dry basis.

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45076	**08/08/2019**	**19-REF04-A-BS *VEGETATION***
45077	**08/11/2019**	**19-REF04-B-BS *VEGETATION***
45078	**08/11/2019**	**19-REF04-C-BS *VEGETATION***

Analyte	Units	45076	45077	45078
Lab Section 2				
Aluminum	ug/g	180±20	120±10	120±10
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	82±8	75±8	80±8
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	8±1	8±1	9±1
Cadmium	ug/g	0.02±0.02	0.02±0.02	0.03±0.02
Cesium	ug/g	0.07±0.06	<0.05	<0.05
Chromium	ug/g	0.9±0.7	<0.5	0.9±0.7
Cobalt	ug/g	0.07±0.02	0.04±0.02	0.04±0.02
Copper	ug/g	4.6±0.7	4.1±0.6	5.4±0.5
Iron	ug/g	110±10	60±6	72±7
Lead	ug/g	0.11±0.03	0.06±0.02	0.08±0.03
Lithium	ug/g	0.11±0.07	0.06±0.06	0.06±0.06
Manganese	ug/g	1620±200	1840±200	2100±200
Mercury	ug/g	0.013±0.008	0.008±0.006	0.008±0.006
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	1.0±0.2	0.81±0.2	0.79±0.2
Rubidium	ug/g	5.8±0.6	3.5±0.5	9.4±0.9
Selenium	ug/g	<0.05	0.06±0.06	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	7.9±0.8	10±1	4.8±0.7
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	3.2±0.5	1.4±0.2	2.0±0.3
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	0.3±0.2	0.1±0.1	0.2±0.1
Zinc	ug/g	30±4	32±5	37±6
Zirconium	ug/g	0.09±0.05	<0.05	0.07±0.05
Lab Section 4				
Lead-210	Bq/g	0.15±0.02	0.13±0.01	0.11±0.01
Polonium-210	Bq/g	0.089±0.009	0.084±0.008	0.093±0.009
Radium-226	Bq/g	0.0041±0.0006	0.0054±0.0008	0.0047±0.0007
Thorium-230	Bq/g	<0.0004	<0.0004	<0.0004

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45076	**08/08/2019**	**19-REF04-A-BS *VEGETATION***
45077	**08/11/2019**	**19-REF04-B-BS *VEGETATION***
45078	**08/11/2019**	**19-REF04-C-BS *VEGETATION***

Analyte	Units	45076	45077	45078
Lab Section 6				
Moisture	%	39.23±4	31.83±3	37.73±4

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 14.9 °C upon receipt.

Results are reported on a dry basis.

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SRC Group # 2019-11321

Oct 16, 2019

Golder

45079 08/09/2019 19-REF05-A-LI *VEGETATION*
45080 08/09/2019 19-REF05-B-LI *VEGETATION*
45081 08/09/2019 19-REF05-C-LI *VEGETATION*

Analyte	Units	45079	45080	45081
Lab Section 2				
Aluminum	ug/g	240±20	260±30	260±30
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	0.05±0.05	<0.05
Barium	ug/g	7.6±0.8	7.2±0.7	9.1±0.9
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	<1	<1	<1
Cadmium	ug/g	0.03±0.02	0.03±0.02	0.03±0.02
Cesium	ug/g	0.13±0.08	0.07±0.06	0.08±0.06
Chromium	ug/g	1.0±0.7	0.8±0.6	0.9±0.7
Cobalt	ug/g	0.07±0.02	0.09±0.02	0.06±0.02
Copper	ug/g	0.88±0.2	0.95±0.2	0.93±0.2
Iron	ug/g	140±10	270±30	150±20
Lead	ug/g	0.16±0.04	0.24±0.04	0.17±0.04
Lithium	ug/g	0.12±0.08	0.13±0.08	0.13±0.08
Manganese	ug/g	94±9	94±9	103±10
Mercury	ug/g	0.017±0.009	0.021±0.01	0.017±0.009
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.55±0.1	0.48±0.2	0.49±0.2
Rubidium	ug/g	6.3±0.6	5.7±0.6	5.6±0.6
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	0.01±0.01	<0.01
Strontium	ug/g	3.6±0.5	4.5±0.7	3.0±0.4
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	6.2±0.6	6.7±0.7	6.6±0.7
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	0.4±0.2	0.5±0.2	0.4±0.2
Zinc	ug/g	9.6±2	11±2	9.7±2
Zirconium	ug/g	0.14±0.05	0.13±0.05	0.15±0.05
Lab Section 4				
Lead-210	Bq/g	0.22±0.03	0.31±0.05	0.20±0.03
Polonium-210	Bq/g	0.19±0.03	0.26±0.03	0.26±0.03
Radium-226	Bq/g	0.0012±0.0008	0.0009±0.0006	0.0006±0.0004
Thorium-230	Bq/g	<0.0006	0.0009±0.0006	<0.0003

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SRC Group # 2019-11321

Oct 16, 2019

Golder

45079	**08/09/2019**	**19-REF05-A-LI *VEGETATION***
45080	**08/09/2019**	**19-REF05-B-LI *VEGETATION***
45081	**08/09/2019**	**19-REF05-C-LI *VEGETATION***

Analyte	Units	45079	45080	45081
Lab Section 6				
Moisture	%	66.99±7	67.73±7	64.12±6

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 14.9 °C upon receipt.

Results are reported on a dry basis.

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SRC Group # 2019-11321

Oct 16, 2019

Golder

45082 08/09/2019 19-REF05-A-BL *VEGETATION*
45083 08/09/2019 19-REF05-B-BL *VEGETATION*
45084 08/09/2019 19-REF05-C-BL *VEGETATION*

Analyte	Units	45082	45083	45084
Lab Section 2				
Aluminum	ug/g	73±7	64±6	59±6
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	61±6	53±5	58±6
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	10±2	10±2	8±1
Cadmium	ug/g	<0.01	<0.01	<0.01
Cesium	ug/g	0.08±0.06	0.06±0.06	0.06±0.06
Chromium	ug/g	<0.5	<0.5	<0.5
Cobalt	ug/g	0.03±0.02	0.04±0.02	0.04±0.02
Copper	ug/g	4.0±0.6	4.1±0.6	4.2±0.6
Iron	ug/g	41±6	42±6	36±5
Lead	ug/g	0.01±0.01	0.01±0.01	<0.01
Lithium	ug/g	<0.05	<0.05	<0.05
Manganese	ug/g	2300±200	1830±200	1760±200
Mercury	ug/g	0.006±0.006	0.007±0.006	0.007±0.006
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.90±0.2	0.80±0.2	0.90±0.2
Rubidium	ug/g	12±2	11±2	11±2
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	7.3±0.7	6.3±0.6	8.3±0.8
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	0.64±0.2	0.64±0.2	0.42±0.1
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	<0.1	<0.1	<0.1
Zinc	ug/g	9.5±2	7.5±2	8.1±2
Zirconium	ug/g	<0.05	<0.05	<0.05
Lab Section 4				
Lead-210	Bq/g	0.034±0.005	0.041±0.006	0.037±0.006
Polonium-210	Bq/g	0.015±0.002	0.014±0.002	0.013±0.002
Radium-226	Bq/g	0.0015±0.001	0.0016±0.001	0.0015±0.0009
Thorium-230	Bq/g	<0.0005	<0.0005	0.0009±0.0007

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45082	**08/09/2019**	**19-REF05-A-BL *VEGETATION***
45083	**08/09/2019**	**19-REF05-B-BL *VEGETATION***
45084	**08/09/2019**	**19-REF05-C-BL *VEGETATION***

Analyte	Units	45082	45083	45084
Lab Section 6				
Moisture	%	62.44±6	58.88±6	54.40±5

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45085 08/09/2019 19-REF05-A-BS *VEGETATION*
45086 08/09/2019 19-REF05-B-BS *VEGETATION*
45087 08/09/2019 19-REF05-C-BS *VEGETATION*

Analyte	Units	45085	45086	45087
Lab Section 2				
Aluminum	ug/g	100±10	120±10	110±10
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	73±7	62±6	76±8
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	7±1	6±1	6±1
Cadmium	ug/g	0.02±0.02	0.01±0.01	0.01±0.01
Cesium	ug/g	<0.05	<0.05	<0.05
Chromium	ug/g	<0.5	<0.5	0.6±0.6
Cobalt	ug/g	0.08±0.02	0.07±0.02	0.07±0.02
Copper	ug/g	5.7±0.6	5.6±0.6	5.5±0.6
Iron	ug/g	68±7	72±7	66±7
Lead	ug/g	0.06±0.02	0.07±0.02	0.06±0.02
Lithium	ug/g	0.07±0.06	0.08±0.06	0.09±0.07
Manganese	ug/g	1440±100	1240±100	1050±100
Mercury	ug/g	0.008±0.006	0.009±0.007	0.007±0.006
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.95±0.2	0.77±0.2	0.78±0.2
Rubidium	ug/g	6.5±0.6	6.0±0.6	6.7±0.7
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	8.6±0.9	8.2±0.8	11±1
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	1.8±0.3	1.9±0.3	2.0±0.3
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	0.2±0.1	0.2±0.1	0.2±0.1
Zinc	ug/g	25±4	19±3	16±2
Zirconium	ug/g	<0.05	0.05±0.05	0.05±0.05
Lab Section 4				
Lead-210	Bq/g	0.12±0.01	0.12±0.01	0.10±0.01
Polonium-210	Bq/g	0.071±0.007	0.093±0.009	0.075±0.008
Radium-226	Bq/g	0.0044±0.0007	0.0032±0.0008	0.0037±0.0009
Thorium-230	Bq/g	<0.0004	<0.0004	<0.0004

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45085	**08/09/2019**	**19-REF05-A-BS *VEGETATION***
45086	**08/09/2019**	**19-REF05-B-BS *VEGETATION***
45087	**08/09/2019**	**19-REF05-C-BS *VEGETATION***

Analyte	Units	45085	45086	45087
Lab Section 6				
Moisture	%	45.42±4	44.08±4	41.84±4

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Results are reported on a dry basis.

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45088	**08/10/2019 19-REF06-A-LI *VEGETATION***
45089	**08/10/2019 19-REF06-B-LI *VEGETATION***
45090	**08/10/2019 19-REF06-C-LI *VEGETATION***

Analyte	Units	45088	45089	45090
Lab Section 2				
Aluminum	ug/g	230±20	260±30	320±30
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	0.05±0.05	0.06±0.06
Barium	ug/g	5.6±0.6	5.8±0.6	8.1±0.8
Beryllium	ug/g	<0.01	<0.01	0.01±0.01
Boron	ug/g	<1	<1	<1
Cadmium	ug/g	0.04±0.02	0.05±0.03	0.05±0.03
Cesium	ug/g	0.10±0.07	0.10±0.07	0.10±0.07
Chromium	ug/g	0.9±0.7	1.3±0.8	1.2±0.8
Cobalt	ug/g	0.06±0.02	0.06±0.02	0.09±0.02
Copper	ug/g	0.76±0.2	0.84±0.2	1.0±0.2
Iron	ug/g	150±20	150±20	180±20
Lead	ug/g	0.21±0.03	0.19±0.05	0.29±0.04
Lithium	ug/g	0.13±0.08	0.13±0.08	0.14±0.08
Manganese	ug/g	84±8	121±10	100±10
Mercury	ug/g	0.016±0.009	0.020±0.01	0.021±0.01
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.46±0.2	0.64±0.2	0.70±0.2
Rubidium	ug/g	4.8±0.7	4.9±0.7	5.1±0.5
Selenium	ug/g	0.05±0.05	0.06±0.06	0.06±0.06
Silver	ug/g	0.01±0.01	<0.01	<0.01
Strontium	ug/g	2.0±0.3	2.4±0.4	3.4±0.5
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	5.9±0.6	5.9±0.6	6.9±0.7
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	0.4±0.2	0.5±0.2	0.5±0.2
Zinc	ug/g	14±2	16±2	15±2
Zirconium	ug/g	0.14±0.05	0.15±0.05	0.18±0.05
Lab Section 4				
Lead-210	Bq/g	0.36±0.05	0.26±0.04	0.37±0.06
Polonium-210	Bq/g	0.31±0.03	0.26±0.03	0.31±0.03
Radium-226	Bq/g	0.0005±0.0003	0.0004±0.0003	0.0005±0.0004
Thorium-230	Bq/g	<0.0003	<0.0002	0.0007±0.0005

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45088	**08/10/2019**	**19-REF06-A-LI *VEGETATION***
45089	**08/10/2019**	**19-REF06-B-LI *VEGETATION***
45090	**08/10/2019**	**19-REF06-C-LI *VEGETATION***

Analyte	Units	45088	45089	45090
Lab Section 6				
Moisture	%	54.04±5	34.56±3	35.68±4

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The temperature of the cooler was 14.9 °C upon receipt.

Results are reported on a dry basis.

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45091 08/10/2019 19-REF06-A-BL *VEGETATION*
45092 08/10/2019 19-REF06-B-BL *VEGETATION*
45093 08/10/2019 19-REF06-C-BL *VEGETATION*

Analyte	Units	45091	45092	45093
Lab Section 2				
Aluminum	ug/g	71±7	75±8	62±6
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	53±5	59±6	51±5
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	16±4	17±4	14±4
Cadmium	ug/g	<0.01	<0.01	<0.01
Cesium	ug/g	0.11±0.07	0.13±0.08	0.21±0.1
Chromium	ug/g	<0.5	<0.5	<0.5
Cobalt	ug/g	0.03±0.02	0.03±0.02	0.02±0.01
Copper	ug/g	3.3±0.5	3.5±0.5	5.0±0.5
Iron	ug/g	37±6	33±5	36±5
Lead	ug/g	<0.01	<0.01	<0.01
Lithium	ug/g	<0.05	<0.05	<0.05
Manganese	ug/g	3510±400	3460±300	2040±200
Mercury	ug/g	0.007±0.006	0.006±0.006	0.006±0.006
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.67±0.2	0.76±0.2	1.2±0.2
Rubidium	ug/g	8.3±0.8	8.8±0.9	14±2
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	4.2±0.6	3.8±0.6	6.7±0.7
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	0.47±0.1	0.44±0.1	0.43±0.1
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	<0.1	<0.1	<0.1
Zinc	ug/g	11±2	12±2	12±2
Zirconium	ug/g	<0.05	<0.05	<0.05
Lab Section 4				
Lead-210	Bq/g	0.022±0.003	0.030±0.004	0.029±0.004
Polonium-210	Bq/g	0.010±0.002	0.012±0.002	0.011±0.002
Radium-226	Bq/g	0.0034±0.0008	0.0043±0.001	0.0016±0.001
Thorium-230	Bq/g	<0.0005	<0.0006	<0.0005

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45091	**08/10/2019**	**19-REF06-A-BL *VEGETATION***
45092	**08/10/2019**	**19-REF06-B-BL *VEGETATION***
45093	**08/10/2019**	**19-REF06-C-BL *VEGETATION***

Analyte	Units	45091	45092	45093
Lab Section 6				
Moisture	%	56.50±6	51.55±5	53.69±5

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Results are reported on a dry basis.

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Golder

45094 08/10/2019 19-REF06-A-BS *VEGETATION*
45095 08/10/2019 19-REF06-B-BS *VEGETATION*
45096 08/10/2019 19-REF06-C-BS *VEGETATION*

Analyte	Units	45094	45095	45096
Lab Section 2				
Aluminum	ug/g	140±10	88±9	90±9
Antimony	ug/g	<0.1	<0.1	<0.1
Arsenic	ug/g	<0.05	<0.05	<0.05
Barium	ug/g	71±7	60±6	56±6
Beryllium	ug/g	<0.01	<0.01	<0.01
Boron	ug/g	9±1	7±1	7±1
Cadmium	ug/g	0.02±0.02	0.02±0.02	<0.01
Cesium	ug/g	0.06±0.06	0.06±0.06	0.15±0.08
Chromium	ug/g	0.6±0.6	<0.5	<0.5
Cobalt	ug/g	0.04±0.02	0.03±0.02	0.04±0.02
Copper	ug/g	4.6±0.7	4.1±0.6	6.9±0.7
Iron	ug/g	76±8	46±7	50±5
Lead	ug/g	0.07±0.02	0.03±0.02	0.04±0.02
Lithium	ug/g	0.07±0.06	<0.05	<0.05
Manganese	ug/g	2010±200	1420±100	1190±100
Mercury	ug/g	0.009±0.007	0.006±0.006	0.007±0.006
Molybdenum	ug/g	<0.1	<0.1	<0.1
Nickel	ug/g	0.83±0.2	0.69±0.2	1.1±0.2
Rubidium	ug/g	4.5±0.7	4.9±0.7	11±2
Selenium	ug/g	<0.05	<0.05	<0.05
Silver	ug/g	<0.01	<0.01	<0.01
Strontium	ug/g	5.6±0.6	5.6±0.6	7.9±0.8
Tellurium	ug/g	<0.5	<0.5	<0.5
Thallium	ug/g	<0.05	<0.05	<0.05
Tin	ug/g	<0.05	<0.05	<0.05
Titanium	ug/g	2.3±0.3	1.3±0.2	1.3±0.2
Uranium	ug/g	<0.01	<0.01	<0.01
Vanadium	ug/g	0.2±0.1	0.1±0.1	0.1±0.1
Zinc	ug/g	40±6	32±5	31±5
Zirconium	ug/g	0.06±0.05	<0.05	<0.05
Lab Section 4				
Lead-210	Bq/g	0.030±0.004	0.097±0.01	0.10±0.01
Polonium-210	Bq/g	0.0095±0.001	0.059±0.006	0.050±0.005
Radium-226	Bq/g	0.0045±0.0007	0.0060±0.0009	0.0034±0.0008
Thorium-230	Bq/g	0.0005±0.0004	<0.0005	<0.0004

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Oct 16, 2019

Golder

45094	**08/10/2019**	**19-REF06-A-BS *VEGETATION***
45095	**08/10/2019**	**19-REF06-B-BS *VEGETATION***
45096	**08/10/2019**	**19-REF06-C-BS *VEGETATION***

Analyte	Units	45094	45095	45096
Lab Section 6				
Moisture	%	40.31±4	38.53±4	39.30±4

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 14.9 °C upon receipt.

Results are reported on a dry basis.

APPENDIX C

Quality Control Report

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Oct 30, 2018

This report was generated for samples included in SRC Group # 2018-9960

Quality Control Report

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Reference Materials and Standards:

A reference material of known concentration is used whenever possible as either a control sample or control standard and analyzed with each batch of samples. These "QC" results are used to assess the performance of the method and must be within clearly defined limits; otherwise corrective action is required.

QC Analysis	Units	Target Value	Obtained Value	
Aluminum	ug/g	231	147	*(1)
Aluminum	ug/g	231	213	
Aluminum	ug/g	231	222	
Antimony	ug/g	0.0200	0.0150	
Antimony	ug/g	0.0200	0.0206	
Antimony	ug/g	0.0200	0.0224	
Arsenic	ug/g	0.170	0.128	
Arsenic	ug/g	0.170	0.159	
Arsenic	ug/g	0.170	0.178	
Barium	ug/g	115	80.4	
Barium	ug/g	115	112	
Barium	ug/g	115	111	
Boron	ug/g	26.3	21.3	
Boron	ug/g	26.3	26.3	
Boron	ug/g	26.3	25.0	
Cadmium	ug/g	0.0260	0.0194	
Cadmium	ug/g	0.0260	0.0282	
Cadmium	ug/g	0.0260	0.0264	
Chromium	ug/g	0.780	0.445	*(2)
Chromium	ug/g	0.780	0.688	
Chromium	ug/g	0.780	0.701	
Cobalt	ug/g	0.0960	0.134	*(3)
Cobalt	ug/g	0.0960	0.0820	
Cobalt	ug/g	0.0960	0.0707	
Copper	ug/g	3.70	2.29	*(4)
Copper	ug/g	3.70	3.31	
Copper	ug/g	3.70	6.02	*(5)
Iron	ug/g	196	130	
Iron	ug/g	196	194	
Iron	ug/g	196	189	
Lead	ug/g	0.810	0.561	
Lead	ug/g	0.810	0.781	

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QC Analysis	Units	Target Value	Obtained Value	
Lead	ug/g	0.810	0.847	
Lead-210	Bq/L	19.2	20.6	
Lead-210	Bq	0.397	0.367	
Lead-210	Bq/L	19.2	21.1	
Lead-210	Bq	7.70	7.94	
Lead-210	Bq/L	19.2	22.5	
Lead-210	Bq	0.385	0.213	*(6)
Lead-210	Bq/L	19.2	21.2	
Lead-210	Bq	1.92	1.68	
Lead-210	Bq/L	19.2	23.8	
Lead-210	Bq	7.70	8.49	
Lead-210	Bq/L	19.2	21.2	
Lead-210	Bq	0.385	0.401	
Lead-210	Bq/L	21.8	19.8	
Lead-210	Bq	0.385	0.362	
Manganese	ug/g	98.0	60.4	*(7)
Manganese	ug/g	98.0	89.9	
Manganese	ug/g	89.0	83.9	
Mercury	ug/g	0.0320	0.0225	
Mercury	ug/g	0.0320	0.0325	
Mercury	ug/g	0.0320	0.0292	
Molybdenum	ug/g	0.0470	0.0318	
Molybdenum	ug/g	0.0470	0.0439	
Molybdenum	ug/g	0.0470	0.0432	
Nickel	ug/g	0.600	0.440	
Nickel	ug/g	0.600	0.565	
Nickel	ug/g	0.600	0.603	
Polonium-210	Bq/L	21.0	19.6	
Polonium-210	Bq	0.397	0.365	
Polonium-210	Bq/L	21.0	19.7	
Polonium-210	Bq	0.077	0.080	
Polonium-210	Bq/L	21.0	20.8	
Polonium-210	Bq	0.385	0.339	
Polonium-210	Bq/L	21.0	17.3	
Polonium-210	Bq	0.077	0.086	
Polonium-210	Bq/L	21.0	16.6	
Polonium-210	Bq	0.385	0.389	
Radium-226	Bq/L	21.4	21.4	
Radium-226	Bq	0.427	0.456	
Radium-226	Bq/L	21.4	21.7	
Radium-226	Bq	0.427	0.444	
Radium-226	Bq/L	21.4	21.9	
Radium-226	Bq	2.13	2.26	
Radium-226	Bq/L	21.4	20.0	
Radium-226	Bq	2.13	2.15	

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QC Analysis	Units	Target Value	Obtained Value	
Radium-226	Bq/L	21.4	23.0	
Radium-226	Bq	0.427	0.508	
Selenium	ug/g	0.120	0.125	
Selenium	ug/g	0.120	0.153	
Selenium	ug/g	0.120	0.158	
Strontium	ug/g	53.0	36.0	
Strontium	ug/g	53.0	51.5	
Strontium	ug/g	53.0	50.5	
Thorium-230	Bq/L	20.5	20.8	
Thorium-230	Bq/L	20.5	20.8	
Thorium-230	Bq/L	20.5	20.8	
Thorium-232	Bq	0.203	0.179	
Thorium-232	Bq	0.203	0.186	
Thorium-232	Bq	0.203	0.201	
Uranium	ug/g	0.0120	0.00678	
Uranium	ug/g	0.0120	0.00954	
Uranium	ug/g	0.0120	0.0105	
Vanadium	ug/g	0.320	0.199	*(8)
Vanadium	ug/g	0.320	0.294	
Vanadium	ug/g	0.320	0.307	
Zinc	ug/g	18.0	11.5	*(9)
Zinc	ug/g	18.0	16.3	
Zinc	ug/g	18.0	23.3	

Duplicates:

Duplicates are used to assess problems with precision and help ensure that samples within a given batch were processed appropriately. The difference between duplicates must be within strict limits, otherwise corrective action is required. Please note, the duplicate(s) in this report are duplicates analyzed within a given batch of test samples and may not be from this specific group of samples.

Duplicate Analysis	Units	Sample ID	First Result	Second Result
Silver	ug/g	31823	<0.01	<0.01
Silver	ug/g	31830	0.02	0.02
Silver	ug/g	31840	<0.01	<0.01
Silver	ug/g	31851	<0.01	<0.01
Silver	ug/g	31858	<0.01	<0.01
Silver	ug/g	31868	0.02	0.02
Silver	ug/g	31877	<0.01	<0.01
Silver	ug/g	31884	0.01	0.01
Aluminum	ug/g	31823	10	11
Aluminum	ug/g	31830	250	230
Aluminum	ug/g	31840	94	100
Aluminum	ug/g	31851	8.4	9.4
Aluminum	ug/g	31858	60	59

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Duplicate Analysis	Units	Sample ID	First Result	Second Result
Aluminum	ug/g	31868	410	380
Aluminum	ug/g	31877	10	10
Aluminum	ug/g	31884	500	500
Arsenic	ug/g	31823	<0.05	<0.05
Arsenic	ug/g	31830	0.07	0.07
Arsenic	ug/g	31840	<0.05	<0.05
Arsenic	ug/g	31851	<0.05	<0.05
Arsenic	ug/g	31858	<0.05	<0.05
Arsenic	ug/g	31868	0.13	0.13
Arsenic	ug/g	31877	<0.05	<0.05
Arsenic	ug/g	31884	0.13	0.16
Boron	ug/g	31823	10	11
Boron	ug/g	31830	<1	<1
Boron	ug/g	31840	33	32
Boron	ug/g	31851	7	7
Boron	ug/g	31858	19	19
Boron	ug/g	31868	<1	<1
Boron	ug/g	31877	7	7
Boron	ug/g	31884	<1	<1
Barium	ug/g	31823	18	20
Barium	ug/g	31830	10	9.9
Barium	ug/g	31840	71	74
Barium	ug/g	31851	16	17
Barium	ug/g	31858	42	42
Barium	ug/g	31868	20	20
Barium	ug/g	31877	21	21
Barium	ug/g	31884	14	14
Beryllium	ug/g	31823	<0.01	<0.01
Beryllium	ug/g	31830	<0.01	<0.01
Beryllium	ug/g	31840	<0.01	<0.01
Beryllium	ug/g	31851	<0.01	<0.01
Beryllium	ug/g	31858	<0.01	<0.01
Beryllium	ug/g	31868	0.02	0.01
Beryllium	ug/g	31877	<0.01	<0.01
Beryllium	ug/g	31884	0.01	0.01
Cadmium	ug/g	31823	<0.01	<0.01
Cadmium	ug/g	31830	0.05	0.05
Cadmium	ug/g	31840	<0.01	<0.01
Cadmium	ug/g	31851	<0.01	<0.01
Cadmium	ug/g	31858	<0.01	<0.01
Cadmium	ug/g	31868	0.08	0.08
Cadmium	ug/g	31877	<0.01	<0.01
Cadmium	ug/g	31884	0.05	0.05
Cobalt	ug/g	31823	0.01	0.01
Cobalt	ug/g	31830	0.08	0.08
Cobalt	ug/g	31840	0.04	0.04

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Duplicate Analysis	Units	Sample ID	First Result	Second Result
Cobalt	ug/g	31851	<0.01	<0.01
Cobalt	ug/g	31858	0.01	<0.01
Cobalt	ug/g	31868	0.16	0.21
Cobalt	ug/g	31877	<0.01	<0.01
Cobalt	ug/g	31884	0.24	0.23
Chromium	ug/g	31823	<0.5	<0.5
Chromium	ug/g	31830	1.1	0.9
Chromium	ug/g	31840	<0.5	<0.5
Chromium	ug/g	31851	<0.5	<0.5
Chromium	ug/g	31858	<0.5	<0.5
Chromium	ug/g	31868	21	24
Chromium	ug/g	31877	<0.5	<0.5
Chromium	ug/g	31884	16	15
Cesium	ug/g	31823	<0.05	<0.05
Cesium	ug/g	31830	0.12	0.12
Cesium	ug/g	31840	0.07	0.07
Cesium	ug/g	31851	0.14	0.14
Cesium	ug/g	31858	0.10	0.10
Cesium	ug/g	31868	0.17	0.18
Cesium	ug/g	31877	0.25	0.25
Cesium	ug/g	31884	0.08	0.09
Copper	ug/g	31823	3.2	3.5
Copper	ug/g	31830	1.0	1.1
Copper	ug/g	31840	3.7	3.8
Copper	ug/g	31851	2.6	2.8
Copper	ug/g	31858	2.6	2.6
Copper	ug/g	31868	1.7	1.7
Copper	ug/g	31877	3.9	3.8
Copper	ug/g	31884	1.2	1.2
Iron	ug/g	31823	14	15
Iron	ug/g	31830	180	170
Iron	ug/g	31840	50	52
Iron	ug/g	31851	10	11
Iron	ug/g	31858	40	37
Iron	ug/g	31868	340	380
Iron	ug/g	31877	12	12
Iron	ug/g	31884	320	310
Mercury	ug/g	31823	<0.005	<0.005
Mercury	ug/g	31830	0.018	0.020
Mercury	ug/g	31840	0.008	0.008
Mercury	ug/g	31851	<0.005	<0.005
Mercury	ug/g	31858	<0.005	<0.005
Mercury	ug/g	31868	0.030	0.030
Mercury	ug/g	31877	<0.005	<0.005
Mercury	ug/g	31884	0.024	0.024
Lithium	ug/g	31823	<0.05	<0.05

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Lithium	ug/g	31830	0.15	0.13
Lithium	ug/g	31840	<0.05	<0.05
Lithium	ug/g	31851	<0.05	<0.05
Lithium	ug/g	31858	<0.05	<0.05
Lithium	ug/g	31868	0.18	0.16
Lithium	ug/g	31877	<0.05	<0.05
Lithium	ug/g	31884	0.23	0.21
Manganese	ug/g	31823	590	620
Manganese	ug/g	31830	190	178
Manganese	ug/g	31840	2790	2760
Manganese	ug/g	31851	890	920
Manganese	ug/g	31858	1830	1870
Manganese	ug/g	31868	139	139
Manganese	ug/g	31877	600	630
Manganese	ug/g	31884	116	115
Molybdenum	ug/g	31823	<0.1	<0.1
Molybdenum	ug/g	31830	<0.1	<0.1
Molybdenum	ug/g	31840	<0.1	<0.1
Molybdenum	ug/g	31851	<0.1	<0.1
Molybdenum	ug/g	31858	<0.1	<0.1
Molybdenum	ug/g	31868	<0.1	<0.1
Molybdenum	ug/g	31877	<0.1	<0.1
Molybdenum	ug/g	31884	<0.1	<0.1
Nickel	ug/g	31823	0.65	0.72
Nickel	ug/g	31830	0.67	0.61
Nickel	ug/g	31840	1.2	1.2
Nickel	ug/g	31851	0.51	0.54
Nickel	ug/g	31858	0.56	0.55
Nickel	ug/g	31868	8.5	9.5
Nickel	ug/g	31877	0.45	0.44
Nickel	ug/g	31884	6.9	6.1
Lead	ug/g	31823	0.20	0.21
Lead	ug/g	31830	0.38	0.39
Lead	ug/g	31840	0.03	0.03
Lead	ug/g	31851	0.03	0.04
Lead	ug/g	31858	0.01	0.02
Lead	ug/g	31868	1.3	1.2
Lead	ug/g	31877	0.05	0.05
Lead	ug/g	31884	0.64	0.60
Lead-210	Bq/g	31821	0.046	0.053
Lead-210	Bq/g	31826	0.29	0.32
Lead-210	Bq/g	31847	0.001	<0.001
Lead-210	Bq/g	31854	0.38	0.39
Lead-210	Bq/g	31858	0.008	0.007
Lead-210	Bq/g	31870	0.034	0.035
Lead-210	Bq/g	31883	0.061	0.066

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Duplicate Analysis	Units	Sample ID	First Result	Second Result
Lead-210	Bq/g	32002	0.02	0.01
Lead-210	Bq/g	40193	<0.02	<0.02
Polonium-210	Bq/g	31821	0.033	0.035
Polonium-210	Bq/g	31826	0.23	0.21
Polonium-210	Bq/g	31847	0.0006	0.0013
Polonium-210	Bq/g	31854	0.26	0.22
Polonium-210	Bq/g	31858	0.0032	0.0027
Polonium-210	Bq/g	31883	0.055	0.052
Polonium-210	Bq/g	33002	0.007	0.006
Polonium-210	Bq/g	40193	0.009	0.01
Radium-226	Bq/g	40044	0.000023	0.000022
Radium-226	Bq/g	31820	0.0051	0.0040
Radium-226	Bq/g	31832	0.0059	0.0066
Radium-226	Bq/g	31844	0.0077	0.0076
Radium-226	Bq/g	31855	0.0031	0.0039
Radium-226	Bq/g	31866	0.0046	0.0040
Radium-226	Bq/g	31876	0.002	0.003
Radium-226	Bq/g	31881	0.0015	0.0018
Radium-226	Bq/g	39798	0.08	0.05
Radium-226	Bq/g	34794	0.06	<0.05
Radium-226	Bq/g	39114	<0.005	<0.005
Rubidium	ug/g	31823	17	18
Rubidium	ug/g	31830	4.9	4.7
Rubidium	ug/g	31840	9.6	9.8
Rubidium	ug/g	31851	17	18
Rubidium	ug/g	31858	10	10
Rubidium	ug/g	31868	3.6	3.5
Rubidium	ug/g	31877	18	19
Rubidium	ug/g	31884	3.3	3.2
Antimony	ug/g	31823	<0.1	<0.1
Antimony	ug/g	31830	<0.1	<0.1
Antimony	ug/g	31840	<0.1	<0.1
Antimony	ug/g	31851	<0.1	<0.1
Antimony	ug/g	31858	<0.1	<0.1
Antimony	ug/g	31868	<0.1	<0.1
Antimony	ug/g	31877	<0.1	<0.1
Antimony	ug/g	31884	<0.1	<0.1
Selenium	ug/g	31823	<0.05	<0.05
Selenium	ug/g	31830	0.05	0.05
Selenium	ug/g	31840	<0.05	<0.05
Selenium	ug/g	31851	<0.05	<0.05
Selenium	ug/g	31858	<0.05	<0.05
Selenium	ug/g	31868	<0.05	0.05
Selenium	ug/g	31877	<0.05	<0.05
Selenium	ug/g	31884	0.07	0.08
Tin	ug/g	31823	<0.05	<0.05

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Tin	ug/g	31830	<0.05	<0.05
Tin	ug/g	31840	<0.05	<0.05
Tin	ug/g	31851	<0.05	<0.05
Tin	ug/g	31858	<0.05	<0.05
Tin	ug/g	31868	<0.05	<0.05
Tin	ug/g	31877	<0.05	<0.05
Tin	ug/g	31884	<0.05	<0.05
Strontium	ug/g	31823	2.8	3.0
Strontium	ug/g	31830	3.3	3.3
Strontium	ug/g	31840	9.5	9.9
Strontium	ug/g	31851	1.7	1.8
Strontium	ug/g	31858	3.6	3.7
Strontium	ug/g	31868	4.7	4.5
Strontium	ug/g	31877	3.4	3.4
Strontium	ug/g	31884	4.8	4.8
Tellurium	ug/g	31823	<0.5	<0.5
Tellurium	ug/g	31830	<0.5	<0.5
Tellurium	ug/g	31840	<0.5	<0.5
Tellurium	ug/g	31851	<0.5	<0.5
Tellurium	ug/g	31858	<0.5	<0.5
Tellurium	ug/g	31868	<0.5	<0.5
Tellurium	ug/g	31877	<0.5	<0.5
Tellurium	ug/g	31884	<0.5	<0.5
Thorium-228	Bq/g	31832	0.001	0.002
Thorium-228	Bq/g	31845	0.0066	0.0066
Thorium-228	Bq/g	31855	0.002	0.003
Thorium-228	Bq/g	31866	0.003	0.005
Thorium-228	Bq/g	31876	0.002	0.002
Thorium-228	Bq/g	31885	<0.0005	<0.0005
Thorium-228	Bq/g	31886	0.001	0.002
Thorium-230	Bq/g	40197	<0.01	<0.01
Titanium	ug/g	31823	0.13	0.13
Titanium	ug/g	31830	6.4	5.8
Titanium	ug/g	31840	0.88	1.1
Titanium	ug/g	31851	<0.05	0.06
Titanium	ug/g	31858	0.26	0.37
Titanium	ug/g	31868	9.2	9.4
Titanium	ug/g	31877	0.19	0.06
Titanium	ug/g	31884	13	13
Thallium	ug/g	31823	<0.05	<0.05
Thallium	ug/g	31830	<0.05	<0.05
Thallium	ug/g	31840	<0.05	<0.05
Thallium	ug/g	31851	<0.05	<0.05
Thallium	ug/g	31858	<0.05	<0.05
Thallium	ug/g	31868	<0.05	<0.05
Thallium	ug/g	31877	<0.05	<0.05

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Duplicate Analysis	Units	Sample ID	First Result	Second Result
Thallium	ug/g	31884	<0.05	<0.05
Uranium	ug/g	31823	<0.01	<0.01
Uranium	ug/g	31830	0.14	0.14
Uranium	ug/g	31840	0.03	0.03
Uranium	ug/g	31851	<0.01	0.01
Uranium	ug/g	31858	<0.01	<0.01
Uranium	ug/g	31868	0.02	0.02
Uranium	ug/g	31877	<0.01	<0.01
Uranium	ug/g	31884	0.02	0.02
Vanadium	ug/g	31823	<0.1	<0.1
Vanadium	ug/g	31830	0.5	0.5
Vanadium	ug/g	31840	<0.1	<0.1
Vanadium	ug/g	31851	<0.1	<0.1
Vanadium	ug/g	31858	<0.1	<0.1
Vanadium	ug/g	31868	0.9	0.9
Vanadium	ug/g	31877	<0.1	<0.1
Vanadium	ug/g	31884	0.9	0.9
Zinc	ug/g	31823	8.1	9.1
Zinc	ug/g	31830	15	14
Zinc	ug/g	31840	11	12
Zinc	ug/g	31851	9.0	9.6
Zinc	ug/g	31858	10	9.8
Zinc	ug/g	31868	15	15
Zinc	ug/g	31877	7.6	12
Zinc	ug/g	31884	15	15
Zirconium	ug/g	31823	0.09	0.09
Zirconium	ug/g	31830	0.21	0.18
Zirconium	ug/g	31840	<0.05	<0.05
Zirconium	ug/g	31851	0.06	0.06
Zirconium	ug/g	31858	<0.05	<0.05
Zirconium	ug/g	31868	0.29	0.27
Zirconium	ug/g	31877	0.15	0.13
Zirconium	ug/g	31884	0.67	0.55

Spikes and/or Surrogates:

Samples spiked with a known quantity of the analyte of interest or a surrogate which is a known quantity of a compound which behaves in a similar manner to the analyte of interest, are used to assess problems with the sample processing or sample matrix. The recovery must be within clearly defined limits when the quantity of spike is comparable to the sample concentration.

Spike Analysis	Percent Recovery
Radium-226	103

*(1) (2) (3) (4) (7) (8) (9) The Aluminum, Chromium, Cobalt, Copper, Manganese, Vanadium and Zinc results

Oct 30, 2018

This report was generated for samples included in SRC Group # 2018-9960

for the quality control sample were just beyond the specified limits. The data was reviewed and a number of samples in the batch were reanalyzed. Reanalysis confirmed original results within the expected measurement uncertainty. All other quality control measures in the batch were within limits.

*(5) (6) The Copper and Lead-210 results for the quality control sample were outside the specified limits. The data was reviewed and additional quality control measures in the same batch were within specified limits.

Overall, there were no other indications of problems with the analysis and the results were considered acceptable.

Roxane Ortmann - Quality Assurance Supervisor

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Sep 04, 2019

This report was generated for samples included in SRC Group # 2019-11322

Quality Control Report

Kyle Hodgson
Golder
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Reference Materials and Standards:

A reference material of known concentration is used whenever possible as either a control sample or control standard and analyzed with each batch of samples. These "QC" results are used to assess the performance of the method and must be within clearly defined limits; otherwise corrective action is required.

QC Analysis	Units	Target Value	Obtained Value
Aluminum	ug/g	23600	23400
Arsenic	ug/g	17.0	16.8
Barium	ug/g	99.0	102
Beryllium	ug/g	0.634	0.569
Bismuth	ug/g	1.89	1.88
Cadmium	ug/g	0.244	0.242
Calcium	mg/L	63.4	63.0
Calcium	ug/g	6400	6770
Chloride	mg/L	49.8	50.5
Chloride	mg/L	308	325
Chromium	ug/g	41.4	40.4
Cobalt	ug/g	13.7	12.7
Copper	ug/g	43.6	43.3
Iron	ug/g	37600	35200
Lead	ug/g	13.3	14.1
Lead-210	Bq/L	21.6	18.4
Lead-210	Bq	7.70	6.65
Magnesium	mg/L	16.5	16.4
Magnesium	ug/g	7400	7540
Manganese	ug/g	1230	1220
Mercury	ug/g	0.412	0.349
Mercury	ug/g	0.412	0.346
Molybdenum	ug/g	0.766	0.474
Nickel	ug/g	20.5	20.8
Phosphorus	ug/g	830	769
Polonium-210	Bq/L	18.8	19.9
Polonium-210	Bq	0.077	0.096
Potassium	mg/L	163	164
Potassium	ug/g	1700	1680
Radium-226	Bq/L	18.4	14.8
Radium-226	Bq	2.13	1.87
Radium-226	Bq/L	18.4	18.6

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QC Analysis	Units	Target Value	Obtained Value
Radium-226	Bq	0.043	0.037
Selenium	ug/g	0.420	0.393
Silver	ug/g	0.200	0.219
Sodium	mg/L	100	98.3
Sodium	ug/g	893	873
Strontium	ug/g	27.3	26.8
Sulfate	mg/L	150	147
Thorium-230	Bq/L	19.9	20.6
Thorium-232	Bq	0.203	0.189
Tin	ug/g	1.52	1.46
Titanium	ug/g	1990	2250
Uranium	ug/g	1.20	1.29
Vanadium	ug/g	71.2	69.2
Zinc	ug/g	74.8	80.4

Duplicates:

Duplicates are used to assess problems with precision and help ensure that samples within a given batch were processed appropriately. The difference between duplicates must be within strict limits, otherwise corrective action is required. Please note, the duplicate(s) in this report are duplicates analyzed within a given batch of test samples and may not be from this specific group of samples.

Duplicate Analysis	Units	Sample ID	First Result	Second Result
Silver	ug/g	45051	<0.1	<0.1
Silver	ug/g	45061	<0.1	<0.1
Aluminum	ug/g	45051	3650	3640
Aluminum	ug/g	45061	2580	2680
Arsenic	ug/g	45051	0.9	0.8
Arsenic	ug/g	45061	0.8	0.7
Boron	ug/g	45051	3	4
Boron	ug/g	45061	4	3
Barium	ug/g	45051	28	29
Barium	ug/g	45061	27	29
Beryllium	ug/g	45051	<0.1	<0.1
Beryllium	ug/g	45061	<0.1	<0.1
Bismuth	ug/g	45051	<0.2	<0.2
Bismuth	ug/g	45061	<0.2	<0.2
Calcium	ug/g	45051	330	370
Calcium	ug/g	45061	130	120
Calcium	mg/L	45068	10	9
Cadmium	ug/g	45051	<0.1	<0.1
Cadmium	ug/g	45061	<0.1	<0.1
Chloride	mg/L	45068	4	5
Chloride	mg/L	45847	<1	<1
Cobalt	ug/g	45051	0.5	1.3
Cobalt	ug/g	45061	0.3	0.3

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Duplicate Analysis	Units	Sample ID	First Result	Second Result
Chromium	ug/g	45051	4.2	4.2
Chromium	ug/g	45061	5.0	5.0
Cesium	ug/g	45051	0.1	0.1
Cesium	ug/g	45061	<0.1	<0.1
Copper	ug/g	45051	0.8	1.0
Copper	ug/g	45061	0.5	0.5
Iron	ug/g	45051	2870	2840
Iron	ug/g	45061	2940	2920
Mercury	ug/g	45051	<0.05	<0.05
Mercury	ug/g	45061	<0.05	<0.05
Potassium	ug/g	45051	630	650
Potassium	ug/g	45061	580	630
Potassium	mg/L	45068	7	7
Lithium	ug/g	45051	3.9	3.8
Lithium	ug/g	45061	1.8	1.8
Magnesium	ug/g	45051	360	360
Magnesium	ug/g	45061	130	130
Magnesium	mg/L	45068	2	2
Manganese	ug/g	45051	35	33
Manganese	ug/g	45061	40	43
Molybdenum	ug/g	45051	<0.1	0.7
Molybdenum	ug/g	45061	0.1	0.1
Moisture	%	45068	4.60	4.51
Sodium	ug/g	45051	100	110
Sodium	ug/g	45061	80	80
Sodium	mg/L	45068	3	3
Nickel	ug/g	45051	1.2	1.1
Nickel	ug/g	45061	0.7	0.6
Phosphorus	ug/g	45051	70	70
Phosphorus	ug/g	45061	70	70
Lead	ug/g	45051	2.4	2.4
Lead	ug/g	45061	1.6	1.6
Lead-210	Bq/g	45051	<0.04	<0.04
pH	pH units	45068	3.57	3.61
Polonium-210	Bq/g	45051	<0.01	<0.01
Radium-226	Bq/g	45057	0.02	0.02
Radium-226	Bq/g	45067	<0.01	0.02
Radium-226	Bq/g	45729	0.02	<0.01
Rubidium	ug/g	45051	2.6	2.6
Rubidium	ug/g	45061	2.4	2.6
Antimony	ug/g	45051	<0.2	<0.2
Antimony	ug/g	45061	<0.2	<0.2
Selenium	ug/g	45051	<0.1	<0.1
Selenium	ug/g	45061	<0.1	<0.1
Tin	ug/g	45051	0.2	0.2
Tin	ug/g	45061	0.1	0.1

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Duplicate Analysis	Units	Sample ID	First Result	Second Result
Sulfate	mg/L	45068	12	13
Specific conductivity	uS/cm	45068	176	174
Strontium	ug/g	45051	32	32
Strontium	ug/g	45061	17	18
Tellurium	ug/g	45051	<0.5	<0.5
Tellurium	ug/g	45061	<0.5	<0.5
Thorium-228	Bq/g	45051	<0.02	<0.02
Thorium-230	Bq/g	45051	<0.02	<0.02
Thorium-232	Bq/g	45051	<0.02	<0.02
Titanium	ug/g	45051	280	270
Titanium	ug/g	45061	280	270
Thallium	ug/g	45051	<0.2	<0.2
Thallium	ug/g	45061	<0.2	<0.2
Uranium	ug/g	45051	0.3	0.3
Uranium	ug/g	45061	0.3	0.3
Vanadium	ug/g	45051	8.3	8.2
Vanadium	ug/g	45061	5.2	5.1
Tungsten	ug/g	45051	<0.5	<0.5
Tungsten	ug/g	45061	<0.5	<0.5
Zinc	ug/g	45051	5.4	5.0
Zinc	ug/g	45061	2.5	3.8
Zirconium	ug/g	45051	18	18
Zirconium	ug/g	45061	16	16

Spikes and/or Surrogates:

Samples spiked with a known quantity of the analyte of interest or a surrogate which is a known quantity of a compound which behaves in a similar manner to the analyte of interest, are used to assess problems with the sample processing or sample matrix. The recovery must be within clearly defined limits when the quantity of spike is comparable to the sample concentration.

Spike Analysis	Percent Recovery
Calcium	106
Chloride	100
Magnesium	107
Potassium	105
Sodium	107
Sulfate	101

All quality control results were within the specified limits and considered acceptable.

Roxane Ortmann - Quality Assurance Supervisor

APPENDIX D

Vegetation Chemistry Laboratory Results

Table D-1: Metal and Radionuclide Concentrations in Lichen Samples; Complete Analysis Results

Sampling Site	EXP01	EXP01	EXP01	EXP02	EXP02	EXP02	EXP03	EXP03	EXP03	REF01	REF01	REF01	REF02	REF02	REF02	REF03	REF03	REF03	REF04	REF04	REF04	REF05	REF05	REF05	REF06	REF06	REF06
Plot Location	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
% Moisture	16.72	6.96	6.58	36.87	43.65	38.83	48.89	43.45	55.49	7.81	7.61	8.89	57.34	53.14	34.17	33.94	25.93	12.01	25.13	36.16	20.23	66.99	67.73	64.12	54.04	34.56	35.68
Aluminum	280	410	250	270	240	190	870	490	420	190	210	1200	410	370	340	310	500	570	310	270	290	240	260	260	230	260	320
Antimony	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	0.08	0.1	0.07	0.07	0.06	0.06	0.23	0.12	0.11	0.07	0.06	0.41	0.13	0.1	0.1	0.09	0.13	0.14	0.06	<0.05	0.08	<0.05	0.05	<0.05	<0.05	0.05	0.06
Barium	11	15	10	15	14	7.4	16	15	13	12	8.3	16	20	20	12	7.5	14	13	7	11	6	7.6	7.2	9.1	5.6	5.8	8.1
Beryllium	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	0.01	<0.01	<0.01	0.02	0.02	0.01	<0.01	<0.01	0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Boron	<1	1	<1	1	2	1	2	1	1	<1	1	3	<1	<1	<1	<1	<1	1	1	<1	1	<1	<1	<1	<1	<1	<1
Cadmium	0.05	0.06	0.05	0.05	0.04	0.04	0.07	0.06	0.06	0.02	0.05	0.17	0.08	0.05	0.06	0.04	0.05	0.05	0.05	0.06	0.05	0.03	0.03	0.03	0.04	0.05	0.05
Cesium	0.13	0.1	0.12	0.1	0.09	0.1	0.13	0.2	0.19	0.14	0.15	0.21	0.17	0.15	0.19	0.11	0.08	0.18	0.1	0.13	0.06	0.13	0.07	0.08	0.1	0.1	0.1
Chromium	1.4	4.7	1.1	1.2	1.3	1	130	18	7.1	1	0.8	3.9	22	3.4	1.5	3.7	16	28	1.1	1.2	1.4	1	0.8	0.9	0.9	1.3	1.2
Cobalt	0.08	0.13	0.08	0.11	0.1	0.06	1.4	0.31	0.16	0.04	0.07	0.2	0.16	0.1	0.08	0.1	0.24	0.32	0.08	0.07	0.08	0.07	0.09	0.06	0.06	0.06	0.09
Copper	0.96	1.2	1	1.2	1.3	0.87	1.3	2	1.2	0.87	0.98	2.7	1.7	1.6	1.4	0.98	1.2	1.2	1	0.86	1.1	0.88	0.95	0.93	0.76	0.84	1
Iron	220	250	180	190	170	150	1100	380	280	150	120	820	340	270	270	220	320	400	180	150	150	140	270	150	150	150	180
Lead	0.26	0.56	0.38	0.32	0.23	0.22	1.3	0.78	0.52	0.23	0.18	2	1.3	1.1	0.74	0.37	0.64	0.53	0.2	0.29	0.18	0.16	0.24	0.17	0.21	0.19	0.29
Lithium	0.18	0.19	0.15	0.15	0.13	0.12	0.49	0.22	0.18	0.11	0.1	0.5	0.18	0.16	0.16	0.15	0.23	0.27	0.16	0.12	0.14	0.12	0.13	0.13	0.13	0.13	0.14
Manganese	185	174	190	163	295	149	109	155	242	41	99	51	139	166	180	131	116	156	147	132	120	94	94	103	84	121	100
Mercury	0.016	0.026	0.018	0.027	0.023	0.021	0.031	0.028	0.025	0.014	0.025	0.4	0.03	0.037	0.036	0.024	0.024	0.025	0.025	0.021	0.026	0.017	0.021	0.017	0.016	0.02	0.021
Molybdenum	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	0.72	2.1	0.67	0.75	0.83	0.58	54	7.1	3.3	0.47	0.68	2.2	8.5	1.7	0.93	1.7	6.9	11	0.65	0.62	0.82	0.55	0.48	0.49	0.46	0.64	0.7
Rubidium	4.9	4.3	4.9	3.8	4.4	4.6	4	6.1	6.2	2.9	6.3	5.7	3.6	4.8	4.7	3.8	3.3	4.5	5.4	5.1	6.4	6.3	5.7	5.6	4.8	4.9	5.1
Selenium	0.07	0.08	0.05	<0.05	<0.05	<0.05	0.09	0.1	0.1	<0.05	0.06	0.17	<0.05	<0.05	0.06	0.06	0.07	0.08	0.06	0.06	0.07	<0.05	<0.05	<0.05	0.05	0.06	0.06
Silver	0.02	0.02	0.02	0.01	<0.01	<0.01	0.02	0.02	0.01	<0.01	<0.01	0.02	0.02	0.02	<0.01	0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01
Strontium	2.7	4.7	3.3	3.3	2.8	2	8.6	5	4.6	5.5	4.6	5.5	4.7	3.5	2.8	3.3	4.8	5.4	3.5	3.4	3.7	3.6	4.5	3	2	2.4	3.4
Tellurium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	6.9	10	6.4	6.8	5.3	4.9	26	11	9.5	5	4	31	9.2	8.7	7.3	7.4	13	15	7	5.8	6.6	6.2	6.7	6.6	5.9	5.9	6.9
Uranium	0.16	0.12	0.14	0.1	0.07	0.08	0.07	0.04	0.02	<0.01	<0.01	0.06	0.02	0.02	0.08	0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	0.5	0.7	0.5	0.6	0.5	0.4	1.9	1	0.7	0.4	0.4	2.8	0.9	0.8	0.7	0.6	0.9	0.9	0.5	0.4	0.5	0.4	0.5	0.4	0.4	0.5	0.5
Zinc	17	16	15	12	12	13	14	19	23	9	12	27	15	12	20	15	15	21	16	18	17	9.6	11	9.7	14	16	15
Zirconium	0.22	0.35	0.21	0.2	0.17	0.15	1.1	0.36	0.29	0.13	0.11	0.78	0.29	0.23	0.21	0.19	0.67	0.78	0.17	0.14	0.16	0.14	0.13	0.15	0.14	0.15	0.18
Lead-210	0.22	0.31	0.29	0.3	0.21	0.25	0.33	0.39	0.39	0.18	0.23	0.5	0.27	0.41	0.29	0.25	0.28	0.29	0.27	0.32	0.23	0.22	0.31	0.2	0.36	0.26	0.37
Polonium-210	0.18	0.22	0.14	0.12	0.13	0.16	0.35	0.33	0.24	0.13	0.16	0.38	0.22	0.27	0.17	0.19	0.22	0.22	0.2	0.28	0.22	0.19	0.26	0.26	0.31	0.26	0.31
Radium-226	0.0052	0.0039	0.0055	0.0036	0.0037	0.0027	0.014	0.01	0.007	0.001	0.001	0.0037	0.005	<0.002	0.003	0.005	<0.0008	0.0049	0.0009	0.0006	0.0004	0.0012	0.0009	0.0006	0.0005	0.0004	0.0005
Thorium-230	0.002	0.001	0.002	0.0009	0.0009	0.0012	<0.007	<0.006	<0.004	<0.0002	<0.0002	0.001	<0.007	<0.005	<0.001	0.005	<0.002	<0.0008	<0.0003	<0.0003	<0.0003	<0.0006	0.0009	<0.0005	<0.0005	<0.0005	0.0007

Table D-2: Metal and Radionuclide Concentrations in Blueberry Stem Samples; Complete Analysis Results

Sampling Site	EXP01	EXP01	EXP01	EXP02	EXP02	EXP02	EXP03	EXP03	EXP03	REF01	REF01	REF01	REF02	REF02	REF02	REF03	REF03	REF03	REF04	REF04	REF04	REF05	REF05	REF05	REF06	REF06	REF06
Plot Location	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**C**	**A**	**B**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
% Moisture	38.67	39.82	32.11	38.81	44.35	39.46	45.62	39.5	46.94	59.94	60.42	44.68	46.12	33.39	35.22	37.11	31.07	35.49	39.23	31.83	37.73	45.42	44.08	41.84	40.31	38.53	39.3
Aluminum	82	110	110	77	110	120	88	89	140	25	21	90	99	70	83	91	110	110	180	120	120	100	120	110	140	88	90
Antimony	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	43	74	66	72	70	91	70	78	64	67	72	93	104	62	64	72	72	64	82	75	80	73	62	76	71	60	56
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Boron	7	7	7	8	8	9	8	9	8	12	12	8	6	8	8	7	7	7	8	8	9	7	6	6	9	7	7
Cadmium	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.04	0.02	0.04	0.05	0.02	0.05	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.03	0.02	0.01	0.01	0.02	0.02	<0.01
Cesium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.06	<0.05	0.06	0.11	0.08	<0.05	0.06	0.11	0.08	0.12	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.06	0.15
Chromium	0.6	0.7	1	<0.5	<0.5	0.8	0.6	0.6	0.7	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	0.9	<0.5	<0.5	0.6	0.6	<0.5	<0.5
Cobalt	0.05	0.07	0.04	0.08	0.06	0.09	0.04	0.04	0.04	0.02	0.01	0.04	0.04	0.02	0.02	0.02	0.03	0.02	0.07	0.04	0.04	0.08	0.07	0.07	0.04	0.03	0.04
Copper	4.6	5.3	5.5	4.7	6.3	5.2	5.1	5.8	5.1	5.1	4.8	7.5	5.4	4.9	4.7	5.3	5	5	4.6	4.1	5.4	5.7	5.6	5.5	4.6	4.1	6.9
Iron	47	65	65	45	66	78	55	50	79	19	18	61	63	36	47	59	52	51	110	60	72	68	72	66	76	46	50
Lead	0.06	0.09	0.08	0.05	0.08	0.08	0.07	0.06	0.08	<0.01	<0.01	0.07	0.07	0.03	0.04	0.05	0.06	0.05	0.11	0.06	0.08	0.06	0.07	0.06	0.07	0.03	0.04
Lithium	<0.05	0.06	0.06	<0.05	0.07	0.07	0.06	0.07	0.08	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.06	0.06	0.07	0.08	0.09	0.07	<0.05	<0.05
Manganese	2150	1550	1560	1420	2320	2020	1770	1640	2140	1180	1370	1960	1300	1120	1490	1780	1470	1580	1620	1840	2100	1440	1240	1050	2010	1420	1190
Mercury	<0.005	0.008	0.007	0.006	0.007	0.009	0.006	0.005	0.009	<0.005	<0.005	0.006	0.006	<0.005	0.007	0.006	0.006	0.005	0.013	0.008	0.008	0.008	0.009	0.007	0.009	0.006	0.007
Molybdenum	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	0.81	1.3	1.4	0.95	0.91	1.2	0.62	0.71	0.91	0.58	0.65	1.2	0.96	0.82	0.52	0.58	0.9	0.61	1	0.81	0.79	0.95	0.77	0.78	0.83	0.69	1.1
Rubidium	6.2	5.5	4.3	4.8	4.8	5.2	4.9	4.6	4.2	9.9	10	7.6	3.2	4	4.8	5.3	3.8	4.4	5.8	3.5	9.4	6.5	6	6.7	4.5	4.9	11
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium	5.7	9.4	8.1	4.2	3.1	24	3.8	5.7	4.9	10	9.2	8.3	14	10	8.7	9	11	10	7.9	10	4.8	8.6	8.2	11	5.6	5.6	7.9
Tellurium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	1.3	1.8	2.6	1.1	2	2	1.7	1.1	2.3	0.2	0.14	1.1	1.2	0.62	0.81	1	1.8	2	3.2	1.4	2	1.8	1.9	2	2.3	1.3	1.3
Uranium	0.05	0.05	0.05	0.03	0.03	0.05	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	0.1	0.1	0.2	<0.1	0.1	0.2	0.1	0.1	0.2	<0.1	<0.1	0.1	0.1	<0.1	<0.1	0.1	0.1	0.1	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Zinc	22	44	31	43	38	45	45	43	42	41	39	49	66	44	32	44	37	53	30	32	37	25	19	16	40	32	31
Zirconium	0.05	0.06	0.09	<0.05	0.06	0.07	0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	0.09	<0.05	0.07	<0.05	0.05	0.05	0.06	<0.05	<0.05
Lead-210	0.049	0.074	0.074	0.075	0.1	0.06	0.093	0.058	0.12	0.004	0.004	0.1	0.084	0.061	0.078	0.056	0.063	0.076	0.15	0.13	0.11	0.12	0.12	0.1	0.03	0.097	0.1
Polonium-210	0.034	0.057	0.049	0.047	0.059	0.047	0.037	0.033	0.066	0.0014	0.0015	0.053	0.051	0.038	0.034	0.046	0.053	0.032	0.089	0.084	0.093	0.071	0.093	0.075	0.0095	0.059	0.05
Radium-226	0.0071	0.0053	0.0076	0.0097	0.011	0.015	0.0095	0.01	0.0056	0.0036	0.0036	0.0047	0.011	0.0084	0.017	0.0018	0.0074	0.0076	0.0041	0.0054	0.0047	0.0044	0.0032	0.0037	0.0045	0.006	0.0034
Thorium-230	0.0013	0.0008	0.0009	0.0004	0.001	<0.0005	<0.0003	<0.0004	<0.0003	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.0005	<0.0005	<0.0005

Table D-3: Metal and Radionuclide Concentrations in Blueberry Leave Samples; Complete Analysis Results

Sampling Site	EXP01	EXP01	EXP01	EXP02	EXP02	EXP02	EXP03	EXP03	EXP03	REF01	REF01	REF01	REF02	REF02	REF02	REF03	REF03	REF03	REF04	REF04	REF04	REF05	REF05	REF05	REF06	REF06	REF06
Plot Location	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**C**	**A**	**B**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
% Moisture	54	55.29	56.98	53.16	59.94	52.96	56.17	51.01	59.69	57	48.7	57.21	59.15	48.43	48.72	51.53	50.23	51.16	53.98	47.58	52.44	62.44	58.88	54.4	56.5	51.55	53.69
Aluminum	85	100	94	77	100	94	97	93	110	73	60	70	86	78	76	98	100	96	81	76	82	73	64	59	71	75	62
Antimony	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	31	50	53	53	64	71	70	58	62	39	42	84	98	64	61	74	72	82	53	57	61	61	53	58	53	59	51
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Boron	29	29	37	38	46	33	32	36	24	26	19	31	17	25	29	22	26	21	14	20	20	10	10	8	16	17	14
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cesium	0.09	<0.05	0.09	<0.05	<0.05	0.07	0.08	0.05	0.1	0.08	0.1	0.28	0.19	<0.05	0.1	0.16	0.15	0.17	0.08	<0.05	0.07	0.08	0.06	0.06	0.11	0.13	0.21
Chromium	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	0.04	0.04	0.04	0.05	0.04	0.04	0.03	0.03	0.02	0.01	0.01	0.02	0.03	0.02	0.01	0.02	0.03	0.01	0.03	0.03	0.02	0.03	0.04	0.04	0.03	0.03	0.02
Copper	3.3	3.3	3.6	3	4.1	3.7	3.6	3	3.1	3.2	2.6	5.1	3.9	3	2.9	3.5	3.1	3.8	3.5	3.4	4.2	4	4.1	4.2	3.3	3.5	5
Iron	50	54	58	45	56	50	55	46	62	40	40	49	51	40	40	48	44	46	39	31	38	41	42	36	37	33	36
Lead	0.05	0.05	0.04	0.02	0.04	0.03	0.04	0.03	0.03	0.02	0.01	0.02	0.05	0.02	0.02	0.02	0.02	0.02	0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01
Lithium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese	3190	2260	2860	2250	4010	2790	3620	2840	4630	2090	1830	3170	2350	2020	2520	3380	2980	3150	2930	3100	3700	2300	1830	1760	3510	3460	2040
Mercury	0.007	0.007	0.008	0.007	0.008	0.008	0.008	0.008	0.008	<0.005	<0.005	0.006	0.007	0.006	0.006	0.007	0.007	0.008	0.006	0.005	0.006	0.006	0.007	0.007	0.007	0.006	0.006
Molybdenum	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	0.85	1.3	0.93	0.88	0.87	1.2	0.59	0.77	0.71	0.53	0.56	1	0.96	0.82	0.55	0.65	0.79	0.87	0.79	0.84	0.6	0.9	0.8	0.9	0.67	0.76	1.2
Rubidium	9.3	9.2	9.8	7.9	8.2	9.6	7.9	6.2	7	11	10	15	5.4	6.1	7.8	7.2	6.9	7.3	9.7	5	14	12	11	11	8.3	8.8	14
Selenium	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05	0.06	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium	5.6	9.2	5.4	2.9	2.8	9.5	4.7	4.8	6.1	5	3.6	8.3	11	8.5	7.7	10	10	14	7.1	6.7	4	7.3	6.3	8.3	4.2	3.8	6.7
Tellurium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	1.4	1.5	2	0.92	1.4	0.88	1	1.3	1.3	0.34	0.26	0.64	0.78	0.46	0.47	0.48	1	0.8	0.6	0.42	0.42	0.64	0.64	0.42	0.47	0.44	0.43
Uranium	0.06	0.16	0.08	0.03	0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	10	9.9	9.6	10	13	11	18	11	17	11	10	12	15	13	13	13	14	14	9.1	12	12	9.5	7.5	8.1	11	12	12
Zirconium	0.06	0.06	0.07	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead-210	0.036	0.038	0.033	0.035	0.033	0.033	0.036	0.03	0.051	0.013	0.007	0.029	0.04	0.034	0.03	0.028	0.029	0.027	0.028	0.034	0.027	0.034	0.041	0.037	0.022	0.03	0.029
Polonium-210	0.017	0.015	0.012	0.015	0.019	0.019	0.014	0.0094	0.031	0.0067	0.0029	0.0097	0.024	0.014	0.015	0.011	0.013	0.016	0.012	0.01	0.011	0.015	0.014	0.013	0.01	0.012	0.011
Radium-226	0.0044	0.0051	0.0071	0.0063	0.0078	0.0088	0.0076	0.0066	0.0056	0.0035	0.0034	0.0049	0.0043	0.004	0.0084	0.0056	0.0058	0.0051	0.002	0.0031	0.0031	0.0015	0.0016	0.0015	0.0034	0.0043	0.0016
Thorium-230	0.001	0.001	0.002	<0.0006	<0.0007	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0004	<0.0006	<0.0009	<0.0006	<0.0005	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0006	<0.0005	<0.0005	0.0009	<0.0005	<0.0006	<0.0005

Table D-4: Metal and Radionuclide Concentrations in Blueberry Fruit Samples; Complete Analysis Results

Sampling Site	EXP01	EXP01	EXP01	EXP02	EXP02	EXP02	EXP03	EXP03	EXP03	REF01	REF02	REF02	REF02	REF03	REF03	REF03
Plot Location	A	B	C	A	B	C	A	B	C	C	A	B	C	A	B	C
% Moisture	84.06	83.46	99.11	83.11	82.39	83.13	83.54	83.13	84.13	82.68	84.49	84.35	83.54	83.24	83.16	82.92
Aluminum	12	10	9.8	9.8	11	19	7.3	15	8.4	9.1	9.2	9.5	9.9	10	13	<0.1
Antimony	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	17
Barium	15	18	18	20	22	19	16	21	16	21	19	20	21	21	20	<0.01
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	6
Boron	16	10	7	11	11	12	11	12	7	7	6	13	8	7	8	<0.01
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.36	0.22
Cesium	0.09	<0.05	0.07	<0.05	0.07	0.06	0.06	<0.05	0.14	0.24	0.26	0.06	0.07	0.25	0.21	<0.5
Chromium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01
Cobalt	<0.01	0.01	0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	3.4
Copper	3.1	3.2	3.6	4.2	4.6	3.7	3.6	3.3	2.6	5.1	3.2	3.2	2.6	3.9	3.2	11
Iron	14	14	15	14	21	18	10	16	10	17	12	11	13	12	15	0.02
Lead	0.05	0.2	0.04	0.01	0.01	0.02	0.02	0.01	0.03	<0.01	0.06	0.16	0.02	0.05	0.02	<0.05
Lithium	0.09	<0.05	<0.05	<0.05	0.08	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	490
Manganese	840	590	486	680	710	489	750	660	890	500	377	414	466	600	650	<0.005
Mercury	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.1
Molybdenum	<0.1	<0.1	0.1	0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	0.63
Nickel	0.45	0.65	0.61	0.63	1	0.8	0.36	0.46	0.51	0.7	0.54	0.73	0.4	0.45	0.53	15
Rubidium	18	17	19	16	22	21	17	13	17	26	13	18	13	18	18	<0.05
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2.4
Strontium	1.6	2.8	2.6	2.3	2.8	4	1.3	1.6	1.7	2.7	4	2.8	2.6	3.4	2.6	<0.5
Tellurium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05
Thallium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11
Titanium	0.14	0.13	0.16	0.08	0.14	0.26	0.33	0.24	<0.05	<0.05	0.07	<0.05	0.08	0.19	0.14	<0.01
Uranium	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1
Vanadium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.9
Zinc	8.5	8.1	8	9.6	10	7.6	7.5	8.3	9	10	8	8.1	7	7.6	8.3	0.06
Zirconium	<0.05	0.09	<0.05	0.07	0.09	<0.05	<0.05	0.26	0.06	<0.05	0.15	0.07	<0.05	0.15	0.27	
Lead-210	0.001	0.002	0.003	0.003	0.003	<0.001	0.001	<0.001	<0.001	0.001	0.001	0.004	0.003	0.002	0.002	0.0012
Polonium-210	0.0019	0.0018	0.0009	0.002	0.0016	0.0011	0.0008	0.001	0.0007	0.0015	0.0009	0.002	0.0031	0.0011	0.0016	0.0014
Radium-226	0.002	0.001	0.0011	0.0027	0.0029	0.0018	0.0023	0.0021	0.0017	0.0018	0.0013	0.0023	0.0042	0.0016	0.0016	<0.0005
Thorium-230	<0.0005	<0.0005	<0.0005	<0.0008	<0.0008	<0.0005	<0.0005	<0.0005	<0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005