



FIRST NATION HEALTH AUTHORITY

ATTN: [REDACTED]

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Vancouver BC V6E 4S5

Date Received: 19-AUG-14

Report Date: 02-SEP-14 14:22 (MT)

Version: DRAFT

Client Phone: [REDACTED]

Certificate of Analysis

Lab Work Order #: **L1504356**
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: PG002
Legal Site Desc:

DRAFT

[REDACTED]
Senior Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1504356-1 FISH 31-JUL-14 1 SOCKEYE- SKYLINE RD(FS) (MUSCLE+SKIN)	L1504356-2 FISH 31-JUL-14 2 SOCKEYE- SKYLINE RD(FS) (MUSCLE+SKIN)	L1504356-3 FISH 31-JUL-14 3 SOCKEYE- SKYLINE RD(FS) (MUSCLE+SKIN)	L1504356-4 FISH 31-JUL-14 4 SOCKEYE- SKYLINE RD(FS) (MUSCLE+SKIN)	L1504356-5 FISH 31-JUL-14 5 SOCKEYE- SKYLINE RD(FS) (MUSCLE+SKIN)
Grouping	Analyte					
TISSUE						
Metals	Aluminum (Al)-Total (mg/kg wwt)	<0.40	<0.40	<0.40	<0.40	0.51
	Antimony (Sb)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Arsenic (As)-Total (mg/kg wwt)	0.397	0.651	0.384	0.425	0.285
	Barium (Ba)-Total (mg/kg wwt)	0.114	0.107	0.085	0.135	0.104
	Beryllium (Be)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Bismuth (Bi)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Boron (B)-Total (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Cadmium (Cd)-Total (mg/kg wwt)	0.0136	0.0080	0.0047	0.0059	0.0047
	Calcium (Ca)-Total (mg/kg wwt)	506	683	377	622	434
	Cesium (Cs)-Total (mg/kg wwt)	0.0231	0.0188	0.0207	0.0182	0.0204
	Chromium (Cr)-Total (mg/kg wwt)	0.034	<0.010	<0.010	<0.010	0.017
	Cobalt (Co)-Total (mg/kg wwt)	0.0080	0.0079	0.0049	0.0050	0.0060
	Copper (Cu)-Total (mg/kg wwt)	1.19	1.20	0.703	0.635	0.873
	Iron (Fe)-Total (mg/kg wwt)	7.50	8.27	5.63	5.53	7.04
	Lead (Pb)-Total (mg/kg wwt)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
	Lithium (Li)-Total (mg/kg wwt)	<0.10	<0.10	<0.10	<0.10	<0.10
	Magnesium (Mg)-Total (mg/kg wwt)	292	257	258	272	289
	Manganese (Mn)-Total (mg/kg wwt)	0.161	0.193	0.140	0.191	0.167
	Mercury (Hg)-Total (mg/kg wwt)	0.0488	0.0328	0.113	0.0318	0.0432
	Molybdenum (Mo)-Total (mg/kg wwt)	0.0082	0.0069	0.0075	0.0052	0.0074
	Nickel (Ni)-Total (mg/kg wwt)	<0.040	<0.040	<0.040	<0.040	<0.040
	Phosphorus (P)-Total (mg/kg wwt)	2650	2560	2350	2520	2570
	Potassium (K)-Total (mg/kg wwt)	3660	3130	3200	3040	3370
	Rubidium (Rb)-Total (mg/kg wwt)	1.02	0.740	0.817	0.707	0.790
	Selenium (Se)-Total (mg/kg wwt)	0.310	0.314	0.302	0.315	0.321
	Sodium (Na)-Total (mg/kg wwt)	605	431	524	411	487
	Strontium (Sr)-Total (mg/kg wwt)	2.35	3.47	1.77	3.25	2.09
	Tellurium (Te)-Total (mg/kg wwt)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
	Thallium (Tl)-Total (mg/kg wwt)	0.00120	0.00087	0.00084	0.00087	0.00080
	Tin (Sn)-Total (mg/kg wwt)	0.024	<0.020	<0.020	0.023	0.032
	Uranium (U)-Total (mg/kg wwt)	0.00316	0.00167	0.00315	0.00484	0.00321
	Vanadium (V)-Total (mg/kg wwt)	<0.020	<0.020	<0.020	<0.020	0.139
	Zinc (Zn)-Total (mg/kg wwt)	10.6	10.1	5.23	6.21	5.28
	Zirconium (Zr)-Total (mg/kg wwt)	<0.040	<0.040	<0.040	<0.040	<0.040

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1504356-6	L1504356-7		
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
TISSUE						
Metals	Aluminum (Al)-Total (mg/kg wwt)		<0.40	<0.40		
	Antimony (Sb)-Total (mg/kg wwt)		<0.0020	<0.0020		
	Arsenic (As)-Total (mg/kg wwt)		0.535	0.576		
	Barium (Ba)-Total (mg/kg wwt)		0.081	0.167		
	Beryllium (Be)-Total (mg/kg wwt)		<0.0020	<0.0020		
	Bismuth (Bi)-Total (mg/kg wwt)		<0.0020	<0.0020		
	Boron (B)-Total (mg/kg wwt)		<0.20	<0.20		
	Cadmium (Cd)-Total (mg/kg wwt)		0.0074	0.0078		
	Calcium (Ca)-Total (mg/kg wwt)		605	653		
	Cesium (Cs)-Total (mg/kg wwt)		0.0187	0.0176		
	Chromium (Cr)-Total (mg/kg wwt)		<0.010	<0.010		
	Cobalt (Co)-Total (mg/kg wwt)		0.0057	0.0081		
	Copper (Cu)-Total (mg/kg wwt)		0.904	1.24		
	Iron (Fe)-Total (mg/kg wwt)		7.42	8.90		
	Lead (Pb)-Total (mg/kg wwt)		<0.0040	<0.0040		
	Lithium (Li)-Total (mg/kg wwt)		<0.10	<0.10		
	Magnesium (Mg)-Total (mg/kg wwt)		273	274		
	Manganese (Mn)-Total (mg/kg wwt)		0.178	0.240		
	Mercury (Hg)-Total (mg/kg wwt)		0.0328	0.0343		
	Molybdenum (Mo)-Total (mg/kg wwt)		0.0069	0.0077		
	Nickel (Ni)-Total (mg/kg wwt)		<0.040	<0.040		
	Phosphorus (P)-Total (mg/kg wwt)		2670	2660		
	Potassium (K)-Total (mg/kg wwt)		3370	2940		
	Rubidium (Rb)-Total (mg/kg wwt)		0.809	0.713		
	Selenium (Se)-Total (mg/kg wwt)		0.315	0.341		
	Sodium (Na)-Total (mg/kg wwt)		440	412		
	Strontium (Sr)-Total (mg/kg wwt)		3.06	3.40		
	Tellurium (Te)-Total (mg/kg wwt)		<0.0040	<0.0040		
	Thallium (Tl)-Total (mg/kg wwt)		0.00083	0.00106		
	Tin (Sn)-Total (mg/kg wwt)		<0.020	<0.020		
	Uranium (U)-Total (mg/kg wwt)		0.00143	0.00638		
	Vanadium (V)-Total (mg/kg wwt)		0.020	<0.020		
	Zinc (Zn)-Total (mg/kg wwt)		10.8	7.29		
	Zirconium (Zr)-Total (mg/kg wwt)		<0.040	<0.040		

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Barium (Ba)-Total	DUP-H	L1504356-1, -2, -3, -4, -5, -6, -7
Duplicate	Copper (Cu)-Total	DUP-H	L1504356-1, -2, -3, -4, -5, -6, -7
Duplicate	Iron (Fe)-Total	DUP-H	L1504356-1, -2, -3, -4, -5, -6, -7
Duplicate	Manganese (Mn)-Total	DUP-H	L1504356-1, -2, -3, -4, -5, -6, -7
Duplicate	Strontium (Sr)-Total	DUP-H	L1504356-1, -2, -3, -4, -5, -6, -7

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
HG-WET-CVAFS-VA	Tissue	Mercury in Tissue by CVAFS (WET)	EPA 200.3, EPA 245.7

This method is adapted from US EPA Method 200.3 "Sample Procedures for Spectrochemical Determination of Total Recoverable Elements in Biological Tissues" (1996). Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide. Analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry, adapted from US EPA Method 245.7. This digestion procedure was implemented on October 5, 2009.

MET-WET-CCMS-VA	Tissue	Metals in Tissue by CRC ICPMS (WET)	EPA 200.3/6020A
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This method is adapted from US EPA Method 200.3 "Sample Procedures for Spectrochemical Determination of Total Recoverable Elements in Biological Tissues" (1996). Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.

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

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

PG002

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

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

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.