FIRST NATION HEALTH AUTHORITY
ATTN: [redacted]
[redacted]
Vancouver BC V6E 4S5

Date Received: 22-AUG-14
Report Date: 24-SEP-14 11:54 (MT)
Version: FINAL

Client Phone: [redacted]

Certificate of Analysis

Lab Work Order #: **L1506474**

Project P.O. #:	Lillooet Fish
Job Reference:	FNHA FISH SAMPLING PROJECT
C of C Numbers:	KA002
Legal Site Desc:	GATESCREEK

Comments: Samples were subleted to ALS Kelso for Arsenic Speciation, please see the attached report for details.

[redacted]
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1506474-1	L1506474-2	L1506474-3	L1506474-4	L1506474-5
	Description	Sockeye	Sockeye	Sockeye	Sockeye	Sockeye
	Sampled Date	21-AUG-14	21-AUG-14	20-AUG-14	31-AUG-13	06-AUG-14
	Sampled Time	17:00	17:00	17:00	17:00	17:00
	Client ID	1	2	3	4	5
Grouping	**Analyte**					
TISSUE						
Metals	Aluminum (Al)-Total (mg/kg wwt)	<0.40	0.51	<0.40	3.03	0.83
	Antimony (Sb)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Arsenic (As)-Total (mg/kg wwt)	0.374	0.249	0.529	0.349	0.429
	Barium (Ba)-Total (mg/kg wwt)	0.018	0.011	0.024	0.047	0.034
	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)	0.0060	0.0045	0.0075	0.0048	0.0065
	Calcium (Ca)-Total (mg/kg wwt)	538	405	601	510	465
	Cesium (Cs)-Total (mg/kg wwt)	0.0240	0.0211	0.0271	0.0177	0.0184
	Chromium (Cr)-Total (mg/kg wwt)	0.383	0.175	0.569	0.018	0.021
	Cobalt (Co)-Total (mg/kg wwt)	0.0139	0.0098	0.0132	0.0053	0.0077
	Copper (Cu)-Total (mg/kg wwt)	0.796	0.616	0.819	0.590	1.23
	Iron (Fe)-Total (mg/kg wwt)	8.48	5.21	8.06	6.92	6.95
	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)	259	265	281	256	267
	Manganese (Mn)-Total (mg/kg wwt)	0.145	0.094	0.160	0.201	0.132
	Mercury (Hg)-Total (mg/kg wwt)	0.0395	0.0535	0.0386	0.0373	0.0411
	Molybdenum (Mo)-Total (mg/kg wwt)	0.0481	0.0232	0.0712	<0.0040	0.0067
	Nickel (Ni)-Total (mg/kg wwt)	0.238	0.133	0.368	<0.040	<0.040
	Phosphorus (P)-Total (mg/kg wwt)	2680	2710	2980	2630	2760
	Potassium (K)-Total (mg/kg wwt)	3700	3860	3970	3560	3850
	Rubidium (Rb)-Total (mg/kg wwt)	0.872	0.992	0.943	0.824	0.906
	Selenium (Se)-Total (mg/kg wwt)	0.289	0.311	0.291	0.256	0.281
	Sodium (Na)-Total (mg/kg wwt)	541	583	483	322	491
	Strontium (Sr)-Total (mg/kg wwt)	2.32	1.65	2.75	2.75	2.20
	Tellurium (Te)-Total (mg/kg wwt)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
	Thallium (Tl)-Total (mg/kg wwt)	0.00096	0.00077	0.00098	0.00046	0.00144
	Tin (Sn)-Total (mg/kg wwt)	<0.020	<0.020	0.020	<0.020	<0.020
	Uranium (U)-Total (mg/kg wwt)	<0.00040	<0.00040	0.00053	0.00087	<0.00040
	Vanadium (V)-Total (mg/kg wwt)	<0.020	<0.020	<0.020	0.136	<0.020
	Zinc (Zn)-Total (mg/kg wwt)	6.83	5.76	8.24	4.50	7.67
	Zirconium (Zr)-Total (mg/kg wwt)	<0.040	<0.040	<0.040	<0.040	<0.040

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L1506474-6 Description: Sockeye Sampled Date: 20-AUG-14 Sampled Time: 17:00 Client ID: 6	L1506474-7 Sockeye 20-AUG-14 17:00 7	L1506474-8 Sockeye 20-AUG-14 17:00 8	L1506474-9 Sockeye 18-AUG-14 17:00 9	L1506474-10 Sockeye 18-AUG-14 17:00 10
TISSUE						
Metals	Aluminum (Al)-Total (mg/kg wwt)	1.80	<0.40	<0.40	<0.40	<0.40
	Antimony (Sb)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Arsenic (As)-Total (mg/kg wwt)	0.304	0.361	0.477	0.570	0.319
	Barium (Ba)-Total (mg/kg wwt)	0.018	0.019	0.015	0.023	0.015
	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)	0.0045	0.0044	0.0050	0.0103	0.0058
	Calcium (Ca)-Total (mg/kg wwt)	400	506	344	788	375
	Cesium (Cs)-Total (mg/kg wwt)	0.0217	0.0214	0.0234	0.0214	0.0201
	Chromium (Cr)-Total (mg/kg wwt)	2.45	0.026	0.012	0.075	0.048
	Cobalt (Co)-Total (mg/kg wwt)	0.0433	0.0067	0.0046	0.0099	0.0055
	Copper (Cu)-Total (mg/kg wwt)	1.09	0.672	0.890	0.976	0.671
	Iron (Fe)-Total (mg/kg wwt)	16.0	4.65	5.12	6.71	4.88
	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)	288	252	281	327	253
	Manganese (Mn)-Total (mg/kg wwt)	0.337	0.140	0.113	0.205	0.136
	Mercury (Hg)-Total (mg/kg wwt)	0.0700	0.0468	0.0534	0.0560	0.0295
	Molybdenum (Mo)-Total (mg/kg wwt)	0.310	0.0067	0.0060	0.0146	0.0087
	Nickel (Ni)-Total (mg/kg wwt)	1.58	<0.040	<0.040	0.059	<0.040
	Phosphorus (P)-Total (mg/kg wwt)	2920	2680	2840	3490	2530
	Potassium (K)-Total (mg/kg wwt)	4120	3690	3940	4540	3490
	Rubidium (Rb)-Total (mg/kg wwt)	0.923	0.903	0.984	1.13	0.847
	Selenium (Se)-Total (mg/kg wwt)	0.363	0.283	0.301	0.304	0.241
	Sodium (Na)-Total (mg/kg wwt)	495	432	432	626	476
	Strontium (Sr)-Total (mg/kg wwt)	2.06	2.31	1.57	3.49	1.69
	Tellurium (Te)-Total (mg/kg wwt)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
	Thallium (Tl)-Total (mg/kg wwt)	0.00096	0.00108	0.00134	0.00087	0.00076
	Tin (Sn)-Total (mg/kg wwt)	0.023	<0.020	<0.020	0.024	<0.020
	Uranium (U)-Total (mg/kg wwt)	<0.00040	<0.00040	<0.00040	0.00056	<0.00040
	Vanadium (V)-Total (mg/kg wwt)	0.944	<0.020	<0.020	<0.020	<0.020
	Zinc (Zn)-Total (mg/kg wwt)	6.99	5.55	5.48	8.07	4.99
	Zirconium (Zr)-Total (mg/kg wwt)	<0.040	<0.040	<0.040	<0.040	<0.040

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1506474-11	L1506474-12	L1506474-13		
	Description	Sockeye	Sockeye	Sockeye		
	Sampled Date	20-AUG-14	20-AUG-14	20-AUG-14		
	Sampled Time	17:00	17:00	17:00		
	Client ID	11	12	13		
Grouping	**Analyte**					
TISSUE						
Metals	Aluminum (Al)-Total (mg/kg wwt)	<0.40	<0.40	<0.40		
	Antimony (Sb)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020		
	Arsenic (As)-Total (mg/kg wwt)	0.402	0.540	0.258		
	Barium (Ba)-Total (mg/kg wwt)	0.025	0.014	0.018		
	Beryllium (Be)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020		
	Bismuth (Bi)-Total (mg/kg wwt)	<0.0020	<0.0020	<0.0020		
	Boron (B)-Total (mg/kg wwt)	<0.20	<0.20	<0.20		
	Cadmium (Cd)-Total (mg/kg wwt)	0.0052	0.0079	0.0045		
	Calcium (Ca)-Total (mg/kg wwt)	499	346	368		
	Cesium (Cs)-Total (mg/kg wwt)	0.0215	0.0204	0.0231		
	Chromium (Cr)-Total (mg/kg wwt)	0.044	0.015	0.099		
	Cobalt (Co)-Total (mg/kg wwt)	0.0049	0.0087	0.0052		
	Copper (Cu)-Total (mg/kg wwt)	0.655	0.922	0.679		
	Iron (Fe)-Total (mg/kg wwt)	4.63	5.67	5.10		
	Lead (Pb)-Total (mg/kg wwt)	<0.0040	<0.0040	<0.0040		
	Lithium (Li)-Total (mg/kg wwt)	<0.10	<0.10	<0.10		
	Magnesium (Mg)-Total (mg/kg wwt)	301	264	300		
	Manganese (Mn)-Total (mg/kg wwt)	0.140	0.110	0.115		
	Mercury (Hg)-Total (mg/kg wwt)	0.0368	0.0623	0.0473		
	Molybdenum (Mo)-Total (mg/kg wwt)	0.0067	0.0059	0.0079		
	Nickel (Ni)-Total (mg/kg wwt)	0.046	<0.040	0.069		
	Phosphorus (P)-Total (mg/kg wwt)	3120	2750	2910		
	Potassium (K)-Total (mg/kg wwt)	4110	3810	4130		
	Rubidium (Rb)-Total (mg/kg wwt)	0.975	0.911	0.990		
	Selenium (Se)-Total (mg/kg wwt)	0.301	0.300	0.298		
	Sodium (Na)-Total (mg/kg wwt)	456	485	494		
	Strontium (Sr)-Total (mg/kg wwt)	2.15	1.60	1.59		
	Tellurium (Te)-Total (mg/kg wwt)	<0.0040	<0.0040	<0.0040		
	Thallium (Tl)-Total (mg/kg wwt)	0.00085	0.00119	0.00083		
	Tin (Sn)-Total (mg/kg wwt)	<0.020	<0.020	0.029		
	Uranium (U)-Total (mg/kg wwt)	0.00052	<0.00040	<0.00040		
	Vanadium (V)-Total (mg/kg wwt)	<0.020	<0.020	<0.020		
	Zinc (Zn)-Total (mg/kg wwt)	5.00	7.21	4.98		
	Zirconium (Zr)-Total (mg/kg wwt)	<0.040	<0.040	<0.040		

Reference Information

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

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:

KA002

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.

ALS Environmental
ALS Group USA, Corp.
1317 South 13th Avenue
Kelso, WA 98626
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September 23, 2014

Analytical Report for Service Request No: K1409558

[redacted]
ALS Environmental - Canada
8081 Lougheed Hwy
Suite 100
Burnaby, BC V5A 1W9

CANADA

RE: L1506474

Dear [redacted]

Enclosed are the results of the samples submitted to our laboratory on September 06, 2014. For your reference, these analyses have been assigned our service request number K1409558.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is [redacted] You may also contact me via Email at [redacted]

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

[redacted]
Project Manager

CL/aj

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
ISO 17025	http://www.pjlabs.com/	L14-50
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

ALS Environmental

L1506474

VANCOUVER

K1409550

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - KELSO, WASHINGTON, USA

1317 S. 13TH AVE
KELSO,WA 98626

NOTES: Please reference on final report and invoice: PO# *L1506474*
ALS requires QC data to be provided with your final results.

Rush Arsenic Spc

Please see enclosed 13 sample(s) in 13 Container(s)

SAMPLE NUMBER	CLIENT ID	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L1506474-1	1	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P
L1506474-2	2	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P
L1506474-3	3	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P
L1506474-4	4	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P
L1506474-5	9	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P
L1506474-6	6	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P
L1506474-7	7	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P
L1506474-8	8	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P
L1506474-9	9	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P
L1506474-10	10	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P

ALS Environmental

L1506474

VANCOUVER

K1409558

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - KELSO, WASHINGTON, USA

1317 S. 13TH AVE
KELSO,WA 98626

SAMPLE NUMBER	CLIENT ID	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L1506474-11	11	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P
L1506474-12	12	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P
L1506474-13	13	Special Request - Kelso (SPECIAL REQUEST-KL 14)	8/21/2014 / 9/15/2014	P

Subcontract Info Contact: [redacted]

Analysis and reporting info contact: [redacted]

8081 LOUGHEED HWY
SUITE 100
BURNABY,BC V5A 1W9

Phone: [redacted]

Please email confirmation of receipt to: [redacted]

Shipped By: _____ Date Shipped: _____

Received By: _____ 9/4/14 0930 Date Received: _____

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

PC CL

Cooler Receipt and Preservation Form

Client / Project: ALS Service Request K14 9558

Received: 9/6/14 Opened: 9/6/14 By: AL Unloaded: 9/6/14 By: A

1. Samples were received via? *Mail* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y (N) If yes, how many and where? _____

If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number	NA	Filed
-45.0	-44.9	—	—	+0.1	345		531917603498		

4. Packing material: *Inserts* *Baggies* (*Bubble Wrap*) *Gel Packs* *Wet Ice* (*Dry Ice*) *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y (N)
6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA (Y) N
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: COC'S NOT SIGNED BY CLIENT.

Page ____ *of* ____

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal Tissue	**Date Received:**	09/6/14
Analysis Method:	Freeze Dry	**Units:**	Percent
Prep Method:	None	**Basis:**	Wet

Total Solids

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
L1506474-1	K1409558-001	**26.5**	-	1	09/09/14 13:40	
L1506474-2	K1409558-002	**25.5**	-	1	09/09/14 13:40	
L1506474-3	K1409558-003	**28.8**	-	1	09/09/14 13:40	
L1506474-4	K1409558-004	**29.5**	-	1	09/09/14 13:40	
L1506474-5	K1409558-005	**26.6**	-	1	09/09/14 13:40	
L1506474-6	K1409558-006	**28.4**	-	1	09/09/14 13:40	
L1506474-7	K1409558-007	**31.6**	-	1	09/09/14 13:40	
L1506474-8	K1409558-008	**34.1**	-	1	09/09/14 13:40	
L1506474-9	K1409558-009	**28.7**	-	1	09/09/14 13:40	
L1506474-10	K1409558-010	**30.7**	-	1	09/09/14 13:40	
L1506474-11	K1409558-011	**29.9**	-	1	09/09/14 13:40	
L1506474-12	K1409558-012	**28.2**	-	1	09/09/14 13:40	
L1506474-13	K1409558-013	**28.1**	-	1	09/09/14 13:40	

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dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project	L1506474	**Date Collected:**	NA
Sample Matrix:	Animal Tissue	**Date Received:**	NA
		Date Analyzed:	09/09/14

Replicate Sample Summary
Inorganic Parameters

Sample Name:	Batch QC	**Units:**	Percent
Lab Code:	K1409561-006	**Basis:**	Wet

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1409561-006DUP Result	Average	RPD	RPD Limit
Total Solids	Freeze Dry	-	46.3	45.2	45.8	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-1	Units:	ug/g
Lab Code:	K1409558-001	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-2	Units:	ug/g
Lab Code:	K1409558-002	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.02	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-3	Units:	ug/g
Lab Code:	K1409558-003	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-4	Units:	ug/g
Lab Code:	K1409558-004	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-5	Units:	ug/g
Lab Code:	K1409558-005	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-6	Units:	ug/g
Lab Code:	K1409558-006	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-7	Units:	ug/g
Lab Code:	K1409558-007	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-8	Units:	ug/g
Lab Code:	K1409558-008	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-9	Units:	ug/g
Lab Code:	K1409558-009	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-10	Units:	ug/g
Lab Code:	K1409558-010	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-11	Units:	ug/g
Lab Code:	K1409558-011	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-12	Units:	ug/g
Lab Code:	K1409558-012	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	L1506474-13	Units:	ug/g
Lab Code:	K1409558-013	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.01	1	09/21/14	09/22/14	ND	
Arsenic (V)	1632A	1632A	0.03	1	NA	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.03	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	Method Blank 1	Units:	ug/g
Lab Code:	K1409558-MB1	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.04	1	09/21/14	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	Method Blank 2	Units:	ug/g
Lab Code:	K1409558-MB2	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.04	1	09/21/14	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	09/17/14	09/18/14	ND	

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14

Total Metals

Sample Name:	Method Blank 3	Units:	ug/g
Lab Code:	K1409558-MB3	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.04	1	09/21/14	09/22/14	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	09/17/14	09/18/14	ND	

ALS Group USA, Corp.
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QA/QC Report

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	08/21/14
Sample Matrix:	Animal tissue	**Date Received:**	09/06/14
		Date Extracted:	09/17,09/21/14
		Date Analyzed:	09/18,09/22/14

Matrix Spike/Duplicate Matrix Spike Summary
Total Metals

Sample Name:	L1506474-1	Units:	ug/g
Lab Code:	K1409558-001MS, K1409558-001MSD	Basis:	Wet
Test Notes:			

				Spike Level		Sample	Spike Result		Percent Recovery				
Analyte	**Prep Method**	**Analysis Method**	**MRL**	MS	DMS	**Result**	MS	DMS	MS	DMS	Method Acceptance Limits	**Relative Percent Difference**	**Result Notes**
Arsenic (III)	1632A	1632A	0.04	0.50	0.49	ND	0.49	0.50	98	102	30-170	2	
Inorganic Arsenic	1632A	1632A	0.1	0.70	0.75	ND	0.59	0.65	84	87	50-150	10	

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dba ALS Environmental
QA/QC Report

Client:	ALS Environmental - Canada	**Service Request:**	K1409558
Project:	L1506474	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	09/17,09/21/14
		Date Analyzed:	09/18,09/22/14

Ongoing Precision and Recovery (OPR) Sample Summary
Total Metals

Sample Name: Ongoing Precision and Recovery

Units: ug/g
Basis: NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Arsenic (III)	Method	1632A	2.000	1.506	75	30-170	
Inorganic Arsenic	Method	1632A	0.200	0.177	88	50-150	