



ARS Aleut Analytical, LLC
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8/6/2015

Kenai Watershed Forum
44129 Sterling Highway
Soldotna, AK 99669
Attn: Branden Bornemann

Work Order #: A1507370
Date: 8/6/2015
Work ID: KWF Baseline Monitoring 2015
Date Received: 7/21/2015
Proj #: none

Sample Identification

Lab Sample Number	Client Description	Lab Sample Number	Client Description
A1507370-01	RM 79.5-Juneau Creek		

Enclosed are the analytical results for the submitted sample(s). Please review the CASE NARRATIVE for a discussion of any data and/or quality control issues. Listings of data qualifiers, analytical codes, key dates, and QC relationships are provided at the end of the report.

Sincerely,

A handwritten signature in blue ink that reads 'Carissa Cumine'.

Carissa Cumine
Project Manager

"The Science of Analysis, The Art of Service"

Case Narrative

ARS Aleut Analytical
Work Order: A1507370

Samples were prepared and analyzed according to EPA or equivalent methods outlined in the following references:

Methods for the Determination of Metals in Environmental Samples, EPA/600/R-94/111, May 1994.

Standard Methods for the Examination of Water and Wastewater, 21st Edition, 2005.

SAMPLE RECEIPT:

One (1) sample was received on 7/21/2015 6:05:00 PM at a temperature of 3.2°C at AAA - Anchorage. The samples were received in good condition and in order per chain of custody.

REVIEW FOR COMPLIANCE WITH ARS Aleut Analytical QA PLAN

A summary of our review is shown below.

All analytical results contained in this report have been reviewed under AAA's internal quality assurance and quality control program. Any deviations in quality control parameters for specific analyses are noted in the following text. A complete quality assurance report, including laboratory control, matrix spike, and sample duplicate recoveries, is kept on file in our office and is available upon request.

All method specifications were met for the following tests, unless otherwise noted:

Test Method: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Nitrate+Nitrite pres - Aqueous

Test Method: SM4500-PE - Total Phos HACH 8190 - Aqueous
MS/MSD and DUP OUTLIERS:

The target was recovered outside the acceptance limits in the batch MS/MSD associated with this analysis. However, the sample spiked is not associated with this project.

The following was a subcontracted tests and has been represented to us as meeting criteria:

Test Method: 200.8 - Metals by ICP/MS - 200.8 Metals - Aqueous

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

Report Section: Client Sample Report

Client Sample Name: RM 79.5-Juneau Creek

Matrix: Aqueous

Collection Date: 7/21/2015 9:30:00AM

The following test was conducted by: ARS Aleut Analytical,LLC

Lab Sample Number: A1507370-01A

Analysis Date: 7/24/2015 8:30:00AM

Prep Date: 7/24/2015

Instrument: Thermospectr

Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: A150724012

Report Basis: As Received

Analyst Initials: RT

Sample prep wt./vol: 25.00 ml

Prep Extract Vol: 25.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
Nitrate-Nitrite as Nitrogen		ND		mg/L	0.10	0.015	1

The following test was conducted by: SGS Environmental Services Inc.

Lab Sample Number: A1507370-01B

Analysis Date: 7/27/2015 3:24:00PM

Prep Date: 7/23/2015

Instrument:

Analytical Method ID: 200.8 - Metals by ICP/MS - 200.8 Metals

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: R1507291553-4

Report Basis: As Received

Analyst Initials: EAB

Sample prep wt./vol:

Prep Extract Vol: ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
Calcium	7440-70-2	14,000		ug/L	500	150	1
Iron	7439-89-6	ND		ug/L	250	78	
Magnesium	7439-96-4	1,200		ug/L	50	15	

The following test was conducted by: ARS Aleut Analytical,LLC

Lab Sample Number: A1507370-01C

Analysis Date: 7/27/2015 11:35:00AM

Prep Date: 7/27/2015

Instrument: Spectrophoto

Analytical Method ID: SM4500-PE - Total Phos HACH 8190

File Name:

Prep Method ID: 4500-PB

Dilution Factor: 1

Prep Batch Number: F150728002

Report Basis: As Received

Analyst Initials: MOC

Sample prep wt./vol: 5.00 ml

Prep Extract Vol: 5.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
Phosphorous, Total		ND		mg/L	0.10	0.025	1

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

Report Section: Method Blank Report

Client Sample Name: MB

Matrix: Aqueous

Collection Date: 7/24/2015 8:30:00AM

The following test was conducted by: ARS Aleut Analytical, LLC

Lab Sample Number: A150724012-MB

Analysis Date: 7/24/2015 8:30:00AM

Prep Date: 7/24/2015

Instrument: Thermospectr

Analytical Method ID: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: A150724012

Report Basis: As Received

Analyst Initials: RT

Sample prep wt./vol: 25.00 ml

Prep Extract Vol: 25.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
Nitrate-Nitrite as Nitrogen		ND		mg/L	0.10	0.015	1

The following test was conducted by: SGS Environmental Services Inc.

Lab Sample Number: 1278674

Analysis Date: 7/27/2015 2:53:00PM

Prep Date: 7/23/2015

Instrument:

Analytical Method ID: 200.8 - Metals by ICP/MS - 200.8 Metals

File Name:

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: R1507291553-4

Report Basis: As Received

Analyst Initials: EAB

Sample prep wt./vol:

Prep Extract Vol: ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
Calcium	7440-70-2	ND		ug/L	500	150	1
Iron	7439-89-6	ND		ug/L	250	78	
Magnesium	7439-96-4	ND		ug/L	50	15	

The following test was conducted by: ARS Aleut Analytical, LLC

Lab Sample Number: F150728002-MB

Analysis Date: 7/27/2015 11:35:00AM

Prep Date: 7/27/2015

Instrument: Spectrophoto

Analytical Method ID: SM4500-PE - Total Phos HACH 8190

File Name:

Prep Method ID: 4500-PB

Dilution Factor: 1

Prep Batch Number: F150728002

Report Basis: As Received

Analyst Initials: MOC

Sample prep wt./vol: 5.00 ml

Prep Extract Vol: 5.00 ml

Analyte	CASNo	Result	Flags	Units	PQL	MDL	run #:
Phosphorous, Total		ND		mg/L	0.10	0.025	1

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Project Number:

QUALITY CONTROL REPORT

Prep Batch: A150724012

LCS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - MB: A150724012-MB

Prep Date: 7/24/2015

MB Anal. Date: 7/24/2015 8:30:00AM

Units: mg/L

LCS Anal. Date: 7/24/2015 8:30:00AM

Matrix: Aqueous

<u>Analyte Name</u>	<u>SampResult</u>	<u>LCSRes.</u>	<u>SPLev</u>	<u>Recov.</u>	<u>Recov Lim</u>	<u>RPDLim</u>	<u>Flag</u>
Nitrate-Nitrite as Nitrogen	ND	0.448	0.406	110	90 - 110		

FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

Note 2: If the sample concentration is greater than 4 times the spike level, a recovery is not meaningful, and the result should be used as a replicate. In such cases the spike is not as high as expected random measurement variability of the sample result itself.

Note 3: For sample duplicates, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample and duplicate results are not five times the PQL or greater, then the RPD is not expected to fall within the window shown and the comparison should be made on the basis of the absolute difference. Analytica uses the criterion that the absolute difference should be less than the PQL for water or less than 2XPQL for other matrices.

Note 4: For serial dilutions, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample result is not 50 times the MDL or greater, then the fact that the RPD does not meet the 10% criterion has little significance. Otherwise it indicates that a matrix bias may exist at the analytical step.

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

Tests Run at: SGS Environmental Services Inc.

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Project Number:

Prep Batch: R1507291553-4

QUALITY CONTROL REPORT

LCS REPORT

Analysis: 200.8 - Metals by ICP/MS - 200.8 Metals

MB: 1278674

Prep Date: 7/23/2015

MB Anal. Date: 7/27/2015 2:53:00PM

Units: ug/L

LCS Anal. Date: 7/27/2015 2:56:00PM

Matrix:

<u>Analyte Name</u>	<u>SampResult</u>	<u>LCSRes.</u>	<u>SPLev</u>	<u>Recov.</u>	<u>Recov Lim</u>	<u>RPDLim</u>	<u>Flag</u>
Calcium	ND	10,300	10,000	103	85 - 115		
Iron	ND	5,220	5,000	104	85 - 115		
Magnesium	ND	10,200	10,000	102	85 - 115		

FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

Note 2: If the sample concentration is greater than 4 times the spike level, a recovery is not meaningful, and the result should be used as a replicate. In such cases the spike is not as high as expected random measurement variability of the sample result itself.

Note 3: For sample duplicates, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample and duplicate results are not five times the PQL or greater, then the RPD is not expected to fall within the window shown and the comparison should be made on the basis of the absolute difference. Analytica uses the criterion that the absolute difference should be less than the PQL for water or less than 2XPQL for other matrices.

Note 4: For serial dilutions, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample result is not 50 times the MDL or greater, then the fact that the RPD does not meet the 10% criterion has little significance. Otherwise it indicates that a matrix bias may exist at the analytical step.

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

Tests Run at:

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Project Number:

Prep Batch: F150728002

QUALITY CONTROL REPORT

LCS REPORT

Analysis: SM4500-PE - Total Phos HACH 8190

MB: F150728002-MB

Prep Date: 7/27/2015

MB Anal. Date: 7/27/2015 11:35:00AM

Units: mg/L

LCS Anal. Date: 7/27/2015 11:35:00AM

Matrix: Aqueous

<u>Analyte Name</u>	<u>SampResult</u>	<u>LCSRes.</u>	<u>SPLev</u>	<u>Recov.</u>	<u>Recov Lim</u>	<u>RPDLim</u>	<u>Flag</u>
Phosphorous, Total	ND	0.349	0.333	105	90 - 110		

FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

Note 2: If the sample concentration is greater than 4 times the spike level, a recovery is not meaningful, and the result should be used as a replicate. In such cases the spike is not as high as expected random measurement variability of the sample result itself.

Note 3: For sample duplicates, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample and duplicate results are not five times the PQL or greater, then the RPD is not expected to fall within the window shown and the comparison should be made on the basis of the absolute difference. Analytica uses the criterion that the absolute difference should be less than the PQL for water or less than 2XPQL for other matrices.

Note 4: For serial dilutions, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample result is not 50 times the MDL or greater, then the fact that the RPD does not meet the 10% criterion has little significance. Otherwise it indicates that a matrix bias may exist at the analytical step.

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID:	172,480	Lab Project Number:	A1507370
Prep Date: 7/24/2015			
Lab Method Blank Id:	A150724012-MB		
Prep Batch ID:	A150724012		
Method:	SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method -		
This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:			
<u>SampleNum</u>	<u>ClientSampleName</u>	<u>DataFile</u>	<u>AnalysisDate</u>
A1507366-04A	Batch QC		7/24/2015 8:30:00AM
A1507370-01A	RM 79.5-Juneau Creek		7/24/2015 8:30:00AM
A150724012-LCS	LCS		7/24/2015 8:30:00AM
A1507366-04A-DUP	DUP		7/24/2015 8:30:00AM
A1507366-04A-MS	MS		7/24/2015 8:30:00AM
Prep Date: 7/27/2015			
Lab Method Blank Id:	F150728002-MB		
Prep Batch ID:	F150728002		
Method:	SM4500-PE - Total Phos HACH 8190		
This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:			
<u>SampleNum</u>	<u>ClientSampleName</u>	<u>DataFile</u>	<u>AnalysisDate</u>
A1507369-03C	Batch QC		7/27/2015 11:35:00AM
A1507370-01C	RM 79.5-Juneau Creek		7/27/2015 11:35:00AM
F150728002-LCS	LCS		7/27/2015 11:35:00AM
A1507369-03C-DUP	DUP		7/27/2015 11:35:00AM
A1507369-03C-MS	MS		7/27/2015 11:35:00AM
A1507369-03C-MSD	MSD		7/27/2015 11:35:00AM
Prep Date: 7/23/2015			
Lab Method Blank Id:	1278674		
Prep Batch ID:	R1507291553-4		
Method:	200.8 - Metals by ICP/MS - 200.8 Metals		
This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:			
<u>SampleNum</u>	<u>ClientSampleName</u>	<u>DataFile</u>	<u>AnalysisDate</u>
A1507370-01B	RM 79.5-Juneau Creek		7/27/2015 3:24:00PM
1278675	LCS for HBN 1714415 [MXX/28911		7/27/2015 2:56:00PM
1278676	1278792 MS FOR [MXX28911]		7/27/2015 3:01:00PM
1278677	1278793 MS FOR [MXX28911]		7/27/2015 3:31:00PM

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

DATA FLAGS AND DEFINITIONS

The PQL is the Method Quantitation Limit as defined by USACE.

Reporting Limit: Limit below which results are shown as "ND". This may be the PQL, MDL, or a value between. See the report conventions below.

Result Field:

ND = Not Detected at or above the Reporting Limit

NA = Analyte not applicable (see Case Narrative for discussion)

Qualifier Fields:

LOW = Recovery is below Lower Control Limit

HIGH = Recovery, RPD, or other parameter is above Upper Control Limit

E = Reported concentration is above the instrument calibration upper range

Organic Analysis Flags:

B = Analyte was detected in the laboratory method blank

J = Analyte was detected above MDL or Reporting Limit but below the Quant Limit (PQL)

Inorganic Analysis Flags:

J = Analyte was detected above the Reporting Limit but below the Quant Limit (PQL)

W = Post digestion spike did not meet criteria

S = Reported value determined by the Method of Standard Additions (MSA)

Several ways of defining the limit of detection and quantitation are prevalent in the laboratory industry and may appear in Analytica reports. These include the following:

MRL = "minimum reporting level", from the EPA Safe Drinking Water program (SDW)

PQL = "practical quantitation limit", from SW-846

EQL = "estimated quantitation limit", from SW-846

LOQ = "limit of quantitation", from a number of authoritative sources

In Analytica's work, all of these terms have the same meaning, equivalent to the EPA definition of the MRL. This reporting level is supported by a satisfactory calibration data point which is at that level or lower, and also is supported by a method detection limit (MDL) determined by the procedure in 40CFR. The MDL is lower than the MRL and represents an estimate of the level where positive detections have a 99% probability of being real, but where quantitation accuracy is unknown.

The MRL as defined by Analytica is the lowest demonstrated point of known quantitation accuracy.

The MRL should not be confused with the MCL, which is the EPA-defined "maximum contaminant level" allowed for certain regulated targets under specific regulations, such as the National Primary Drinking Water Regulations. Normally, the MRL is set at a level which is much lower than the MCL in order to ensure that levels are well below those limits. Not all target analytes have MCL levels established.

Other Flags may be applied. See Case Narrative for Description

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1507370

Project: KWF Baseline Monitoring 2015

Client: Kenai Watershed Forum

Client Project Number: none

REPORTING CONVENTIONS FOR THIS REPORT

A1507370

<u>TestPkgName</u>	<u>Basis</u>	<u># Sig Figs</u>	<u>Reporting Limit</u>
200.8 (Aqueous) - 200.8 Metals	As Received	2	Report to PQL
4500-NO3E (Aqueous) - Nitrate+Nitrite pres	As Received	3	Report to PQL
4500-PE/4500-PB (Aqueous) - Total Phos HACH 8190	As Received	2	Report to PQL

