



ARS Aleut Analytical, LLC
4307 Arctic Boulevard
Anchorage, AK 99503
Phone: 907-258-2155
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5/16/2016

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

Work Order #: A1604407
Date: 5/16/2016
Work ID: KWF Baseline Monitoring 2016
Date Received: 4/26/2016
Proj #: 2016

Sample Identification

Lab Sample Number	Client Description	Lab Sample Number	Client Description
A1604407-01	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: A1604407

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, 22nd Edition, 2012.

SAMPLE RECEIPT:

One (1) sample was received on 4/26/2016 11:37:00 AM at a temperature of 6.9°C (from site) at AAA - Anchorage. The sample was received in good condition and in order per chain of custody.

REVIEW FOR COMPLIANCE WITH AAA 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

The following were subcontracted tests and have been represented to us as meeting criteria:

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

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1604407

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Report Section: Client Sample Report

Client Sample Name: **RM 79.5 Juneau Creek**

Matrix: Aqueous

Collection Date: 4/26/2016 10:02:00AM

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

Lab Sample Number: A1604407-01A

Analysis Date: 5/11/2016 2:45:00PM

Prep Date: 5/11/2016

Instrument: Thermospectr

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

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: A160511015

Report Basis: As Received

Analyst Initials: JR

Sample prep wt./vol: 25.00 ml

Prep Extract Vol: 25.00 ml

<u>Analyte</u>	<u>CASNo</u>	<u>Result</u>	<u>Flags</u>	<u>Units</u>	<u>PQL</u>	<u>MDL</u>	<u>run #:</u>
Nitrate-Nitrite as Nitrogen		0.344		mg/L	0.10	0.015	1

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

Lab Sample Number: A1604407-01B

Analysis Date: 5/3/2016 1:57:00PM

Prep Date: 5/2/2016

Instrument:

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

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: R1605051902-36

Report Basis: As Received

Analyst Initials: VDL

Sample prep wt./vol:

Prep Extract Vol: ml

<u>Analyte</u>	<u>CASNo</u>	<u>Result</u>	<u>Flags</u>	<u>Units</u>	<u>PQL</u>	<u>MDL</u>	<u>run #:</u>
Calcium	7440-70-2	14,000		ug/L	500	150	1
Iron	7439-89-6	<250		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: A1604407-01C

Analysis Date: 5/2/2016 11:50:00PM

Prep Date: 5/2/2016

Instrument: Spectrophoto

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

Prep Method ID: 4500-PB

Dilution Factor: 20

Prep Batch Number: F160504004

Report Basis: As Received

Analyst Initials: MOC

Sample prep wt./vol: 5.00 ml

Prep Extract Vol: 5.00 ml

<u>Analyte</u>	<u>CASNo</u>	<u>Result</u>	<u>Flags</u>	<u>Units</u>	<u>PQL</u>	<u>MDL</u>	<u>run #:</u>
Phosphorous, Total		3.7		mg/L	2.0	0.50	1

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1604407

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Report Section: Method Blank Report

Client Sample Name: MB

Matrix: Aqueous

Collection Date: 5/11/2016 2:45:00PM

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

Lab Sample Number: A160511015-MB

Analysis Date: 5/11/2016 2:45:00PM

Prep Date: 5/11/2016

Instrument: Thermospectr

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

Prep Method ID:

Dilution Factor: 1

Prep Batch Number: A160511015

Report Basis: As Received

Analyst Initials: JR

Sample prep wt./vol: 25.00 ml

Prep Extract Vol: 25.00 ml

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

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

Lab Sample Number: F160504004-MB

Analysis Date: 5/2/2016 11:50:00PM

Prep Date: 5/2/2016

Instrument: Spectrophoto

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

Prep Method ID: 4500-PB

Dilution Factor: 1

Prep Batch Number: F160504004

Report Basis: As Received

Analyst Initials: MOC

Sample prep wt./vol: 5.00 ml

Prep Extract Vol: 5.00 ml

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

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1604407

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1604407

Project: KWF Baseline Monitoring 2016

Project Number:

Prep Batch: A160511015

QUALITY CONTROL REPORT

SAMPLE DUPLICATE REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Base Sample: A1604400-02A
Prep Date: 5/11/2016

Samp. Anal. Date: 5/11/2016 2:45:00PM

Units: mg/L

DUP Anal. Date: 5/11/2016 2:45:00PM

Matrix: Aqueous

<u>Analyte Name</u>	<u>SampResult</u>	<u>DUPRes.</u>	<u>RPD</u>	<u>RPDLim</u>	<u>Flag</u>
Nitrate-Nitrite as Nitrogen	0.196	0.199	1.5	20	

LCS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - MB: A160511015-MB

Prep Date: 5/11/2016

MB Anal. Date: 5/11/2016 2:45:00PM

Units: mg/L

LCS Anal. Date: 5/11/2016 2:45:00PM

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	0.525	0.527	99.6	90 - 110		

MS REPORT

Analysis: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Parent: A1604400-02A

Prep Date: 5/11/2016

Samp. Anal. Date: 5/11/2016 2:45:00PM

Units: mg/L

MS Anal. Date: 5/11/2016 2:45:00PM

Matrix: Aqueous

<u>Analyte Name</u>	<u>SampResult</u>	<u>MSRes.</u>	<u>SPLev</u>	<u>Recov.</u>	<u>Recov Lim</u>	<u>Flag</u>
Nitrate-Nitrite as Nitrogen	0.196	0.483	0.275	105	80 - 120	

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1604407

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

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): A1604407

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

Tests Run at: Analytica Environmental Laboratories - Anchorage, Alaska

Workorder (SDG): A1604407

Project: KWF Baseline Monitoring 2016

Project Number:

Prep Batch: F160504004

QUALITY CONTROL REPORT

SAMPLE DUPLICATE REPORT

Analysis: SM4500-PE - Total Phos HACH 8190

Base Sample: A1604406-03D

Prep Date: 5/2/2016

Samp. Anal. Date: 5/2/2016 11:50:00PM

Units: mg/L

DUP Anal. Date: 5/2/2016 11:50:00PM

Matrix: Aqueous

<u>Analyte Name</u>	<u>SampResult</u>	<u>DUPRes.</u>	<u>RPD</u>	<u>RPDLim</u>	<u>Flag</u>
Phosphorous, Total	0.153	0.157	2.6	0	OUT

LCS REPORT

Analysis: SM4500-PE - Total Phos HACH 8190

MB: F160504004-MB

Prep Date: 5/2/2016

MB Anal. Date: 5/2/2016 11:50:00PM

Units: mg/L

LCS Anal. Date: 5/2/2016 11:50:00PM

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		

MS/MSD REPORT

Analysis: SM4500-PE - Total Phos HACH 8190

Parent: A1604406-03D

Prep Date: 5/2/2016

Samp. Anal. Date: 5/2/2016 11:50:00PM

Units: mg/L

MS Anal. Date: 5/2/2016 11:50:00PM MSD Anal. Date: 5/2/2016 11:50:00PM Matrix: Aqueous

<u>Analyte Name</u>	<u>SampResult</u>	<u>MSRes.</u>	<u>MSDRes</u>	<u>SPLev</u>	<u>SPDL Lev</u>	<u>Recov.</u>	<u>MSD Rec.</u>	<u>RPD</u>	<u>Recov Lim</u>	<u>RPDLim</u>	<u>Flag</u>
Phosphorous, Total	0.153	0.215	0.280	0.0646	0.129	101	101	26.3	80 - 120	20	

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1604407

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

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): A1604407

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID: 178,783 Lab Project Number: A1604407

Prep Date: 5/2/2016

Lab Method Blank Id: F160504004-MB

Prep Batch ID: F160504004

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>
A1604406-03D	Batch QC		5/2/2016 11:50:00PM
A1604407-01C	RM 79.5 Juneau Creek		5/2/2016 11:50:00PM
F160504004-LCS	LCS		5/2/2016 11:50:00PM
A1604406-03D-DUP	DUP		5/2/2016 11:50:00PM
A1604406-03D-MS	MS		5/2/2016 11:50:00PM
A1604406-03D-MSD	MSD		5/2/2016 11:50:00PM

Prep Date: 5/11/2016

Lab Method Blank Id: A160511015-MB

Prep Batch ID: A160511015

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>
A1604400-02A	Batch QC		5/11/2016 2:45:00PM
A1604407-01A	RM 79.5 Juneau Creek		5/11/2016 2:45:00PM
A160511015-LCS	LCS		5/11/2016 2:45:00PM
A1604400-02A-DUP	DUP		5/11/2016 2:45:00PM
A1604400-02A-MS	MS		5/11/2016 2:45:00PM

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1604407

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

DATA FLAGS AND DEFINITIONS

The PQL is the Method Quantitation Limit.

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

Result Field:

< = Not Detected at or above the Reporting Limit shown

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 ARS 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. When results are provided from a subcontract laboratory, ARS reflects their data flags.

Detailed Analytical Report

ARS Aleut Analytical

Workorder (SDG): A1604407

Project: KWF Baseline Monitoring 2016

Client: Kenai Watershed Forum

Client Project Number: 2016

REPORTING CONVENTIONS FOR THIS REPORT

A1604407

<u>TestPkgName</u>	<u>Basis</u>	<u># Sig Figs</u>	<u>Reporting Limit</u>
200.8 (Aqueous) - Total	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



Anchorage Laboratory
4307 Arctic Blvd
Anchorage, AK 99503
907 258 2155
907 258 6634 fax

Mat-Su Service Center
701 East Parks Highway #203
Wasilla, AK 99654
907 373 5440

Fairbanks Laboratory
475 Hall Street
Fairbanks, AK 99701
907 456 3116
907 456 3125 fax

ARS Corporate Office
2609 North River Road
Port Allen, LA 70767
225 381 2991

AAA Chain of Custody

Page ____ of ____

Client Name & Address:

Kenai Watershed Forum
44129 Sterling Hwy
Soldotna, AK 99669

Contact Person: Branden Bornemann

Phone No: (907) 260-5449

Fax No: (907) 260-5412

E-mail: branden@kenaiwatershed.org

Special Instructions/Comments:

* Received on frozen ice within 2 hrs SA 4/26/16

TEAM ID: KWF
Project Name: KWF Baseline Monitoring - April 2016

Turnaround Time for Results (TAT)

Standard Expedited (< 10 days, prior authorization required)
(Please specify due date below, add'l charges may apply)

Results Due Date:

Section To be Completed by AAA
Quote ID No: A16030019 LGN: A1664407

Invoice to Name & Address:

P.O. or Contract

Lab Bottle Order No:

Client Sample Identification / Location

RM 79.5 Juneau Creek

Date Sampled
Time Sampled

4/26 10:02

Matrix
(S-DW-WW-Other)

Aqu

No. of Containers

3

Nitrate SM4500-NO3E

X

Lot #: A105A62
Pres: H2SO4

200.8 Metals by ICP-Total
TR

X

Lot #: 451298
Pres: HNO3

200.8 Dissolved Metals

X

Lot #: HNO3
Pres: HNO3

Total Phos SM4500

X

Lot #: 4405A102
Pres: H2SO4

Lot #: Pres:

Lot #: Pres:

Lot #: Pres:

Lot #: Pres:

Field Preserved

Field Filtered

MS/MSD ?

Collected/Relinquished by:

Date Time

Received by:

Date Time

Relinquished by:

Date Time

Received by:

Date Time

Relinquished by:

Date Time

Received by:

Date Time

Name of Sampler: (printed)

Brandon A. Selkirk

Chain-of-Custody Seal?

ANC WAS FBKS

Initiated By:

6.9*

Temp/Loc:

150187221

Thermo ID#:

150187221

Shipping Via:

Cent

To be Completed by AAA

Requested Analysis/Method