ALPINE SATELLITE DEVELOPMENT PLAN
2012 WATER QUALITY MONITORING REPORT

Prepared for:

ConocoPhillips Alaska

Prepared by:

Baker

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November 2012
129052-MBJ-RPT-001 FINAL

Contents

Figures

Tables

Photos

Appendices

Acronyms and Abbreviations

µS/cm	Microsiemens per centimeter
^{0}C	Degrees Celsius
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ASDP	Alpine Satellite Development Plan
Baker	Michael Baker Jr., Inc.
CPAI	ConocoPhillips Alaska, Inc.
DO	Dissolved oxygen
DRO	Diesel range organics
EPA	U.S. Environmental Protection Agency
FID	Flame ionization detector
GC	Gas chromatography
ICP	Inductively coupled plasma
LCMF	UMIAQ, LLC
LOQ	Limit of quantitation
mg/L	Milligrams per liter
MS	Mass spectrometer
NTU	Nephelometric turbidity units
ppt	Parts per thousand
PSS	Practical Salinity Scale
RCRA	Resource Conservation and Recovery Act
RRO	Residual range organics
SGS	SGS North America, Inc.
USGS	U.S. Geological Survey

1.0 INTRODUCTION

The Alpine Satellite Development Plan (ASDP) 2012 Water Quality Monitoring Report presents the results of the field sampling conducted in August 2012 for ConocoPhillips Alaska, Inc. (CPAI). Annual monitoring of lakes M9313, L9323, and L9324 is required by North Slope Borough Ordinance Serial No. 75-6-46, Stipulation IV.2.4.3(h) (NSB 2004). At the request of CPAI, these three lakes have been monitored annually by Michael Baker Jr. Inc. (Baker) since 2007. An overview of the three study lakes relative to Alpine facilities is presented in Figure 1.1.

During the winter of 1998/1999, CPAI initiated construction of the Alpine Facility, CD1 and CD2, in the Colville River Delta. Alpine operations expanded with the implementation of the ASDP during the 2004/2005 winter season. Construction included placement of gravel facilities for two new satellite drill sites, CD3 and CD4. The CD3 pad development included an airstrip and pad/airstrip access road, apron, and taxiway. The CD4 pad development included an access road running parallel to the existing Alpine Sales Pipeline, connecting to the CD2 access road. Lake M9313 is near CD3, and lakes L9323 and L9324 are located north and south of CD4, respectively.

The 2012 water quality monitoring program included in-situ field sampling of the lakes for temperature, dissolved oxygen (DO), salinity, conductivity/specific conductance, and turbidity. Additional water samples were collected at the lakes for laboratory analysis of dissolved hydrocarbons: diesel range organics (DRO), residual range organics (RRO) and Resource Conservation and Recovery Act (RCRA) metals. The laboratory analyses for the lakes were chosen to identify and monitor the persistence of trace concentrations originally observed in 2007.

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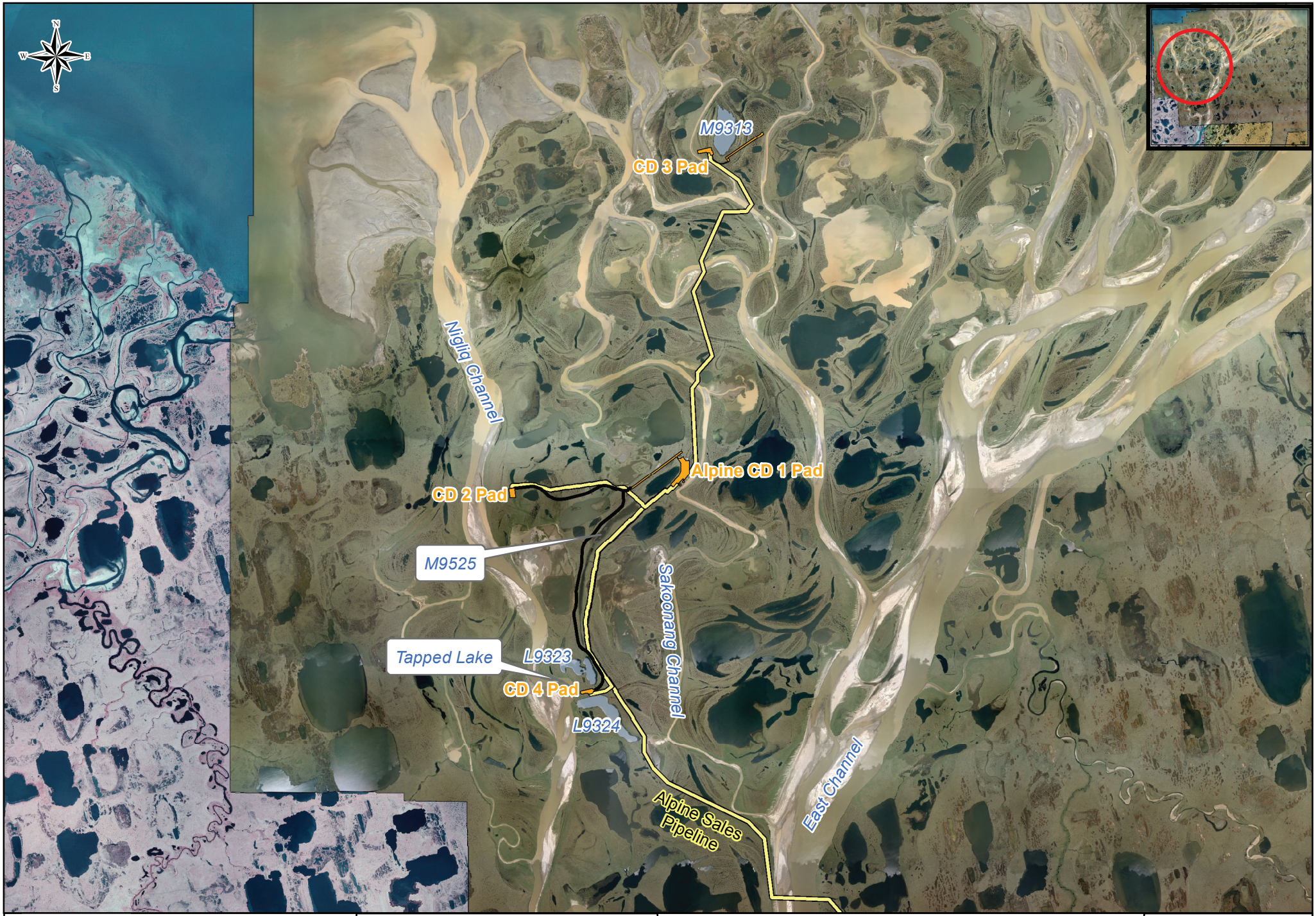

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Legend

Roads
Pipelines
Sample Lakes
Facilities

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2012 OVERVIEW
ASDP WATER QUALITY MONITORING AREA

FIGURE: 1.1

(SHEET 1 of 1)

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2.0 METHODS

On August 9 and 11, 2012, Baker conducted field investigations at lakes M9313, L9323, and L9324. Bristow Helicopters provided access to Lake M9313, and an Alpine Environmental pickup truck was used to access Lake L9323 and Lake L9324.

In-situ water quality data measurements and laboratory sample collection were performed by a two-person Baker team; each in an inflatable kayak, with an attached support raft for transporting the sampling equipment (Photo 2.1). In-situ water quality instruments were provided by TTT Environmental. Laboratory analyses and sample collection bottles were provided by SGS North America, Inc. (SGS).

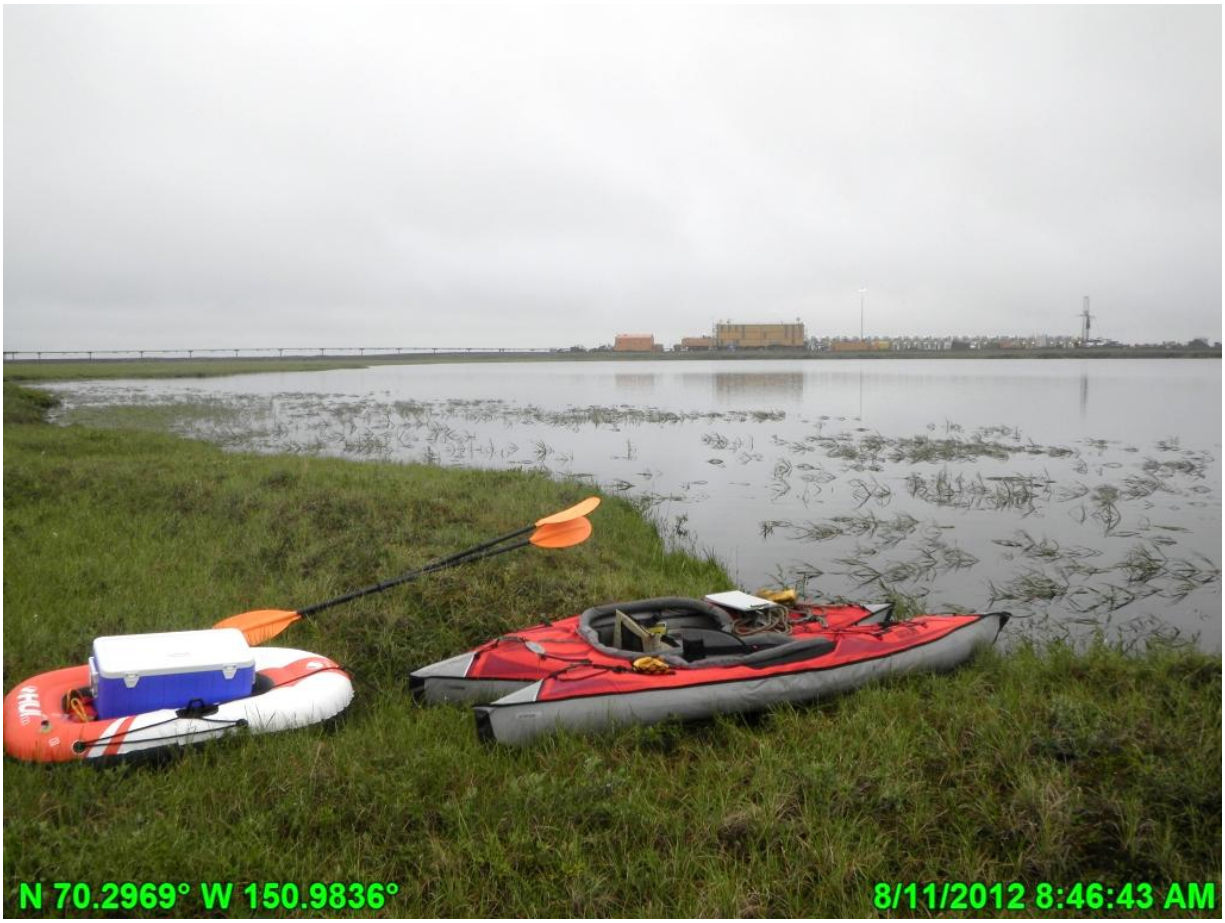


Photo 2.1: Inflatable Kayaks and Support Equipment, Lake L9323; August 11, 2012

Prior to sampling, aerial reconnaissance was conducted to identify possible inflow and outflow sources, and to determine if each lake was hydraulically connected to other nearby surface water sources. It was also confirmed that each lake was well-mixed and lacked definable stratums prior to analytic sample collection.

Field sampling methods were based on U.S. Geological Survey (USGS 2006), Ward and Harr (1990), and U.S. Army Corps of Engineers methods (USACE 1987).

Safety precautions were followed, as outlined in the North Slope Water Resources 2012 Health, Safety and Environmental Safety Plan (Baker 2012a) and the 2012 ASDP Water Quality Monitoring Job Safety Analysis (Baker 2012b). Baker employees worked in groups of two, and an UMIAQ, LLC (LCMF) employee served as a bear guard during sampling of Lake M9313 because of its remote location in relation to Alpine facilities and proximity to the coast. Personnel were equipped with U.S. Coast Guard approved personal flotation devices (float-coats).

2.1 Sample Location Selection

Previous in-situ monitoring of North Slope lakes indicates hydraulically isolated lakes are well-mixed during open water conditions. The likelihood of homogeneous conditions, which are verified at each lake with in-situ measurements, supports the use of single point sampling. For this project, it is assumed that data collected at specific stations are representative of conditions throughout the well-mixed water body and thus, water samples collected at a single location are representative of the lake.

Lake sample location selection was based on maximum lake depth and relative proximity to gravel facilities. Lake bathymetry was used to identify the deepest part of the water body, and a single representative sampling location was selected. The location of the deepest part of each lake was confirmed in 2010 using a hand-held sonar depth finder (Baker 2010).

Sample locations were identified and confirmed using a handheld global positioning system Garmin Rino 520HCx referenced to the North American [horizontal] Datum of 1983. Samples were collected at locations confirmed by the 2010 field investigation to be the deepest part of lakes M9313, L9323, and L9324 (Baker 2010). The sample location for Lake M9313 is shown in Figure 2.1. Figure 2.2 shows the sample locations for lakes L9323 and L9324.

2.2 In-Situ Water Quality Parameters

In-situ water quality was measured at 2-foot intervals throughout the water column. A list of parameters collected is presented in Table 2.1.

Table 2.1: In-Situ Water Quality Parameters

Parameter	Units	Notes
Temperature	°C	degrees Celsius
Dissolved Oxygen	mg/L	milligrams per liter
Salinity	ppt	parts per thousand
Conductivity	µS/cm	microsiemens per centimeter
Specific Conductance	µS/cm	microsiemens per centimeter
Turbidity	NTU	Nephelometric Turbidity Units

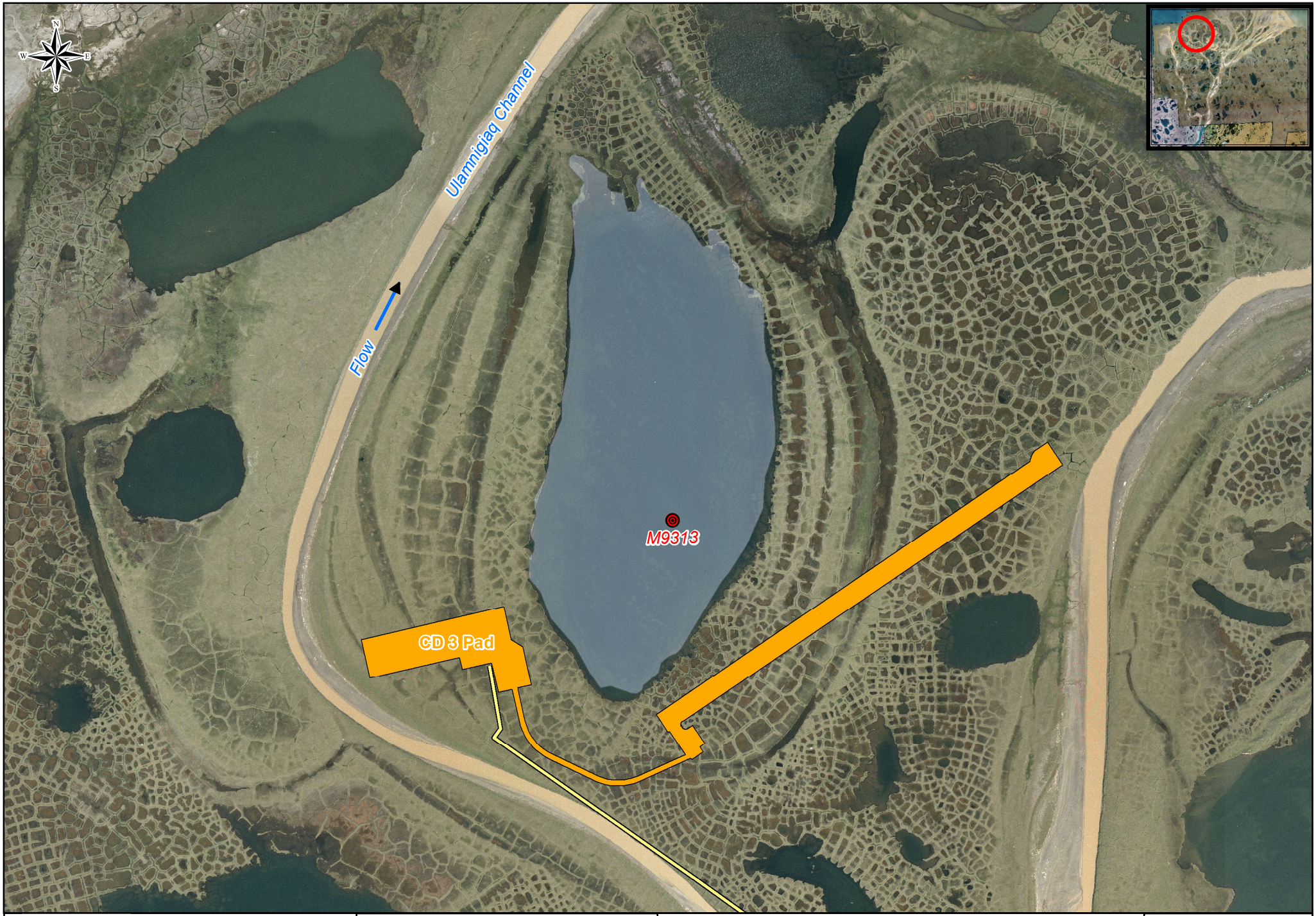
Conductivity is a measurement of the water's ability to carry an electrical current. Dissolved salts (ions) are conductors of electrical current, and conductivity is proportional to the ion concentration (salinity) in an aqueous solution. The salinity is calculated using the in-situ conductivity, temperature and pressure measurements, and the conversions defined by the Practical Salinity Scale (PSS) of 1978

(YSI 2007). The PSS is derived for standard seawater with a known ion composition; therefore, using the PSS for freshwater with unknown ion composition only provides an estimate of the salinity.

Specific conductance and total dissolved solids (TDS) are metrics commonly used to report the concentration of salts in freshwater. Conductivity measurements are temperature dependent. Specific conductance is calculated from in-situ conductivity and temperature using a site specific temperature correction coefficient.

The correction coefficient is determined for a site by relating the conductivity of a sample at the in-situ temperature and the conductivity of the same sample at 25 degrees Celsius (^{o} C). Baker completed this analysis for the Colville River in 2005 resulting in a correction coefficient of 0.0196 (Baker 2006). The recharge of lakes from the Colville River flood waters during spring breakup justifies using the same correction coefficient for the lake measurements.

TDS is a measurement of the concentration of total dissolved material in the water. Because it includes organic and inorganic matter it typically overestimates the concentration of salts. To accurately determine the TDS, a sample must be filtered and evaporated and the mass of the dry residue measured. A linear relationship between TDS and specific conductance has been empirically determined for natural freshwater so that TDS can be approximated from in-situ conductivity measurements. Like specific conductance, generally, there is a direct correlation between salinity and TDS.



ConocoPhillips Alaska

Feet
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Project:	129052
File:	Figure 2.1
Scale:	1 in = 1000 feet

Legend

- Water Quality Sampling Point
- Sample Lake
- Pipelines
- Facilities

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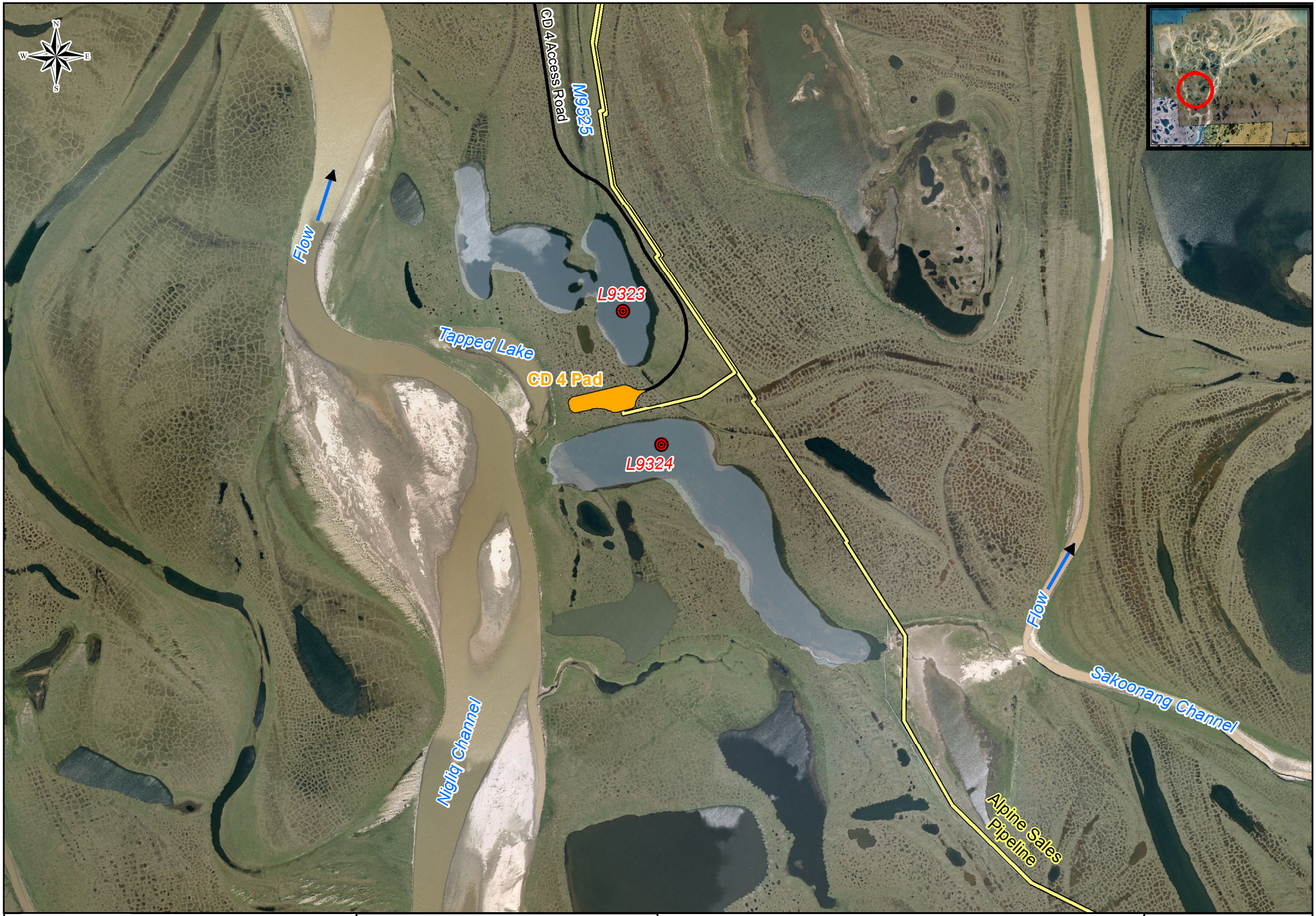
LAKE M9313 ASDP WATER QUALITY SAMPLING LOCATIONS

FIGURE: 2.1

(SHEET 1 of 1)



ConocoPhillips Alaska

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Legend

- Water Quality Sampling Point
- Roads
- Pipelines
- Sample Lakes
- Facilities

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LAKE L9323 & L9324
ASDP WATER QUALITY SAMPLING LOCATIONS

FIGURE: 2.2

(SHEET 1 of 1)

2.2.1 Instrument Calibration

A YSI 650 MDS handheld unit with YSI 6920V2 Sonde sensor was calibrated by TTT Environmental according to the manufacturer's specifications. Prior to sampling, a calibration check of the DO sensor was performed using tap water as directed by the manufacturer. An optical DO sensor was used for the DO sampling. Prior to each field sampling event, the meter was thoroughly rinsed with lake water.

2.3 Laboratory Sample Collection and Analysis

2.3.1 Sample Collection

In-situ sampling was performed to confirm well-mixed water quality constituents within the water column at each sample location prior to laboratory sample collection. Neither oxycline (notable change in oxygen concentration with depth) nor thermocline (notable change in temperature values with depth) was apparent at any of the sampling sites (see Table 3.1). Therefore, a representative single point sample at mid-depth was collected at each location. In the event of lake stratification, multiple samples would have been collected throughout the water column and combined for laboratory analysis. Samples were collected from lakes using a 1.6" x 36" disposable polyethylene bailer (1000 milliliter capacity). Nitrile gloves were worn during sample collection and changed between samples. Bailers were discarded after use. A duplicate sample was collected from one lake.

Sample bottles provided by SGS were stored in the provided cooler before, during, and after sample collection to maintain adequate storage temperatures and ensure chain of custody procedures were followed. Field samples were transported to SGS within 93 hours of initial sample collection. The procedures for transport and transfer are described in the SGS analysis report in Appendix A.

2.3.2 Laboratory Analysis

Table 2.2 shows the laboratory analyses performed for each water sample.

Table 2.2: Laboratory Sampling

Lake Name	Laboratory Analyses
M9313 L9323 L9324	Diesel Range Organics (DRO) Residual Range Organics (RRO) Resource Conservation and Recovery Act Metals (RCRA Metals)

2.3.2.1 Diesel Range Organics (AK 102)

The AK 102 method for DRO, developed by the Alaska Department of Environmental Conservation (ADEC), is based on a solvent extraction, gas chromatography (GC) procedure for the detection of semi-volatile petroleum products such as diesels. Other nonpetroleum compounds of similar characteristics may be detected with this method. Samples spiked with a surrogate (o-Terphenyl) are extracted with methylene chloride. The GC is temperature programmed to facilitate separation of organic compounds detected by a flame ionization detector (FID). Quantification is based on FID response compared to a diesel calibration standard.

2.3.2.2 Residual Range Organics (AK 103)

The AK 103 method for RRO, developed by ADEC, was originally designed to measure lubricating or motor oils and other heavy petroleum products in soils. The *Underground Storage Tanks Procedures* (ADEC 2009) identifies the method as adequate for determining such compounds in solution. The method is an extension of ADEC AK102, employing solvent extractions and GC to identify heavier RRO. Quantification is based on FID response compared to a residuals calibration standard.

2.3.2.3 RCRA Metals (SW6020)

The RCRA metals laboratory analysis method SW6020, developed by the U.S. Environmental Protection Agency (EPA) Office of Solid Waste, employs inductively coupled plasma (ICP) -mass spectrometry to determine trace elements, including metals in solution (EPA 2006). Elements tested include arsenic, barium, cadmium, chromium, lead, selenium, and silver. This method measures ions produced by a radio frequency ICP. High temperatures are used to produce ions, which are then entrained in a plasma gas and extracted. The ions are separated on the basis of their mass-to-charge ratio with a mass spectrometer.

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3.0 RESULTS

In-situ measurements were collected throughout the water column at the deepest part of each lake. Based on the relative homogeneity of results in all locations, the study lakes were determined to be well-mixed at the time of sampling. Samples for laboratory analysis were collected from the middle of the water column. The in-situ measurements from lakes M9313, L9323 and L9324 are presented in Table 3.1.

3.1 FIELD CONDITIONS AUGUST 9 AND 11, 2012

During the field sampling event, the temperature ranged from 40°F to 50°F. The weather was cloudy and breezy on August 9 during sampling at Lake M9313, and cloudy and calm on August 11 during sampling at lakes L9323 and L9324.

3.1.1 LAKE M9313

Lake M9313, located near CD3, is large with low grassy banks (Photo 3.1). At the time of sampling, Lake M9313 was connected to some areas of water ponded in adjacent polygons, but flow was not observable between water bodies. No odor or film was observed while accessing the lake.

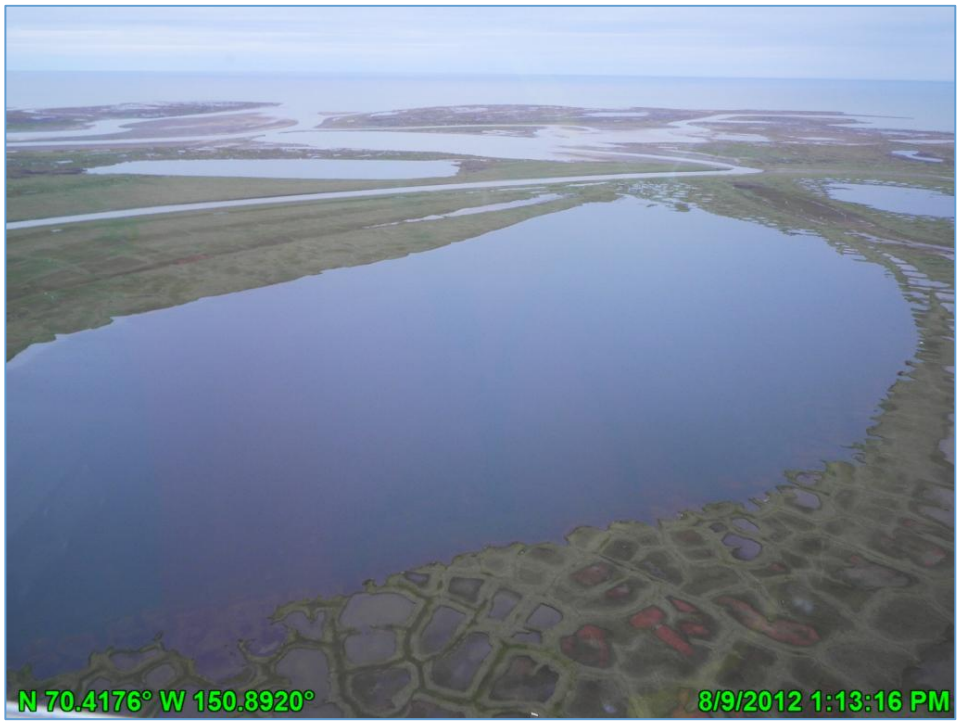

Photo 3.1 Lake M9313, Looking North, August 9, 2012

3.1.2 LAKE L9323

Located near CD4, Lake L9323 is moderately sized with grassy banks and some reeds on the periphery (Photo 3.2). Lake L9323 recharged primarily through local melt. There was limited connectivity to the Sakoonang Channel via the CD4 culverts. Lake L9323 was hydraulically connected to Lake M9525 to the north via CD4 road culverts. No hydraulic connectivity between Lake L9323 and any other body of water was observed at the time of sampling (Photo 3.3). No odor or film was observed while accessing the lake.

Photo 3.2 Lake L9323, Looking Northwest August 11, 2012

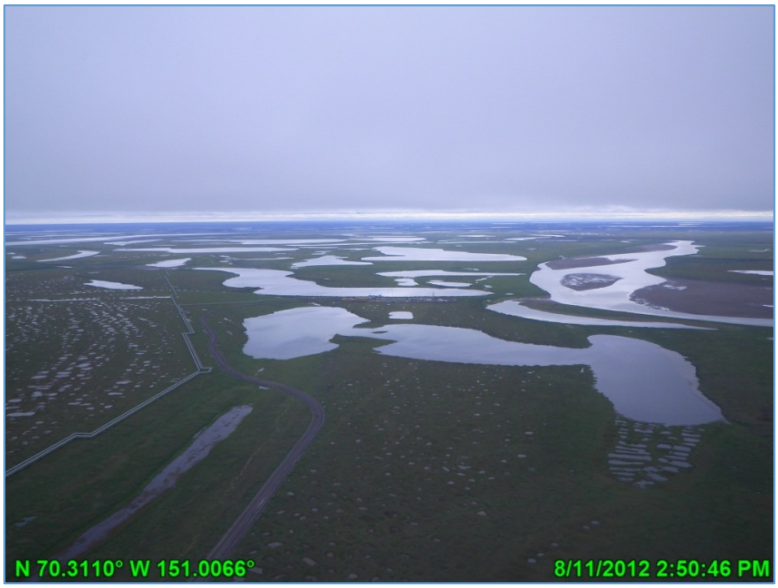

Photo 3.3 Lake L9323, Looking South, August 11, 2012

3.1.3 LAKE L9324

Located near CD4, Lake L9324 is moderately sized with grassy banks and willows (Photo 3.4). Some large bluffs surround the lake. Lake L9324 recharged primarily from Sakoonang Channel flow, and was connected to the Nigliq Channel via Tapped Lake to the west during spring breakup. At the time of sampling, lake L9324 appeared to be draining to the southeast (Photo 3.5). No odor or film was observed while accessing the lake.

Photo 3.4 Lake L9324 Looking Southeast, August 11, 2012

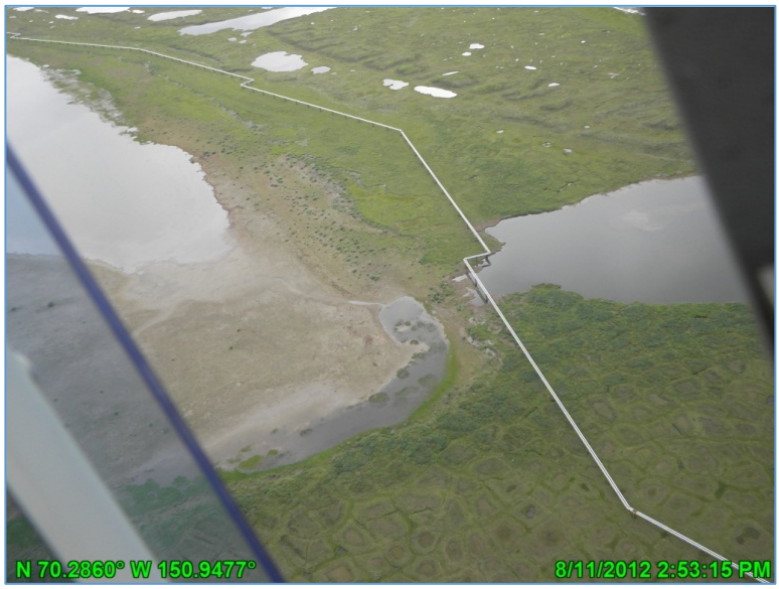

Photo 3.5 Lake L9324 Outlet to the Southeast, Looking South, August 11, 2012

3.2 IN-SITU RESULTS

The in-situ water quality results from the August 9 and 11, 2012 sampling event are tabulated in Table 3.1.

Table 3.1: In-Situ Water Quality Results

CPAI 2012 Lake Monitoring Program
In-Situ Water Quality
Sample Date: August 9 and 11, 2012

Lake Location Time	Total Depth (ft)	Turibidity (NTU)	Depth (ft)	Temp (°C)	Conductivity (µS/cm)	Specific Conductance (µS/cm)	DO (mg/L)	DO (Percent Saturation)	Salinity (ppt)	pH
M9313 N70°25'18.9" W150°53'58.2" 8/9/2012 11:30 a.m.	20	0.0	Surface	-	-	-	-	-	-	-
			1.0	11.4	531	723	10.92	100.2	0.35	7.94
			3.0	11.4	531	723	10.90	100.2	0.35	7.93
			5.0	11.4	531	723	10.90	100.0	0.35	7.93
			7.0	11.4	531	723	10.89	100.0	0.35	7.93
			9.0	11.4	531	723	10.90	100.1	0.35	7.92
			11.0	11.4	531	723	10.89	99.9	0.35	7.91
			13.0	11.4	531	723	10.89	100.0	0.35	7.90
			15.0	11.4	531	723	10.86	99.7	0.35	7.89
			17.0	11.4	531	723	10.85	99.6	0.35	7.87
			19.0	11.4	531	723	10.84	99.6	0.35	7.81
			20.0							
L9323 N70°17'45.9" W150°59'17.9" 8/11/2012 9:00 a.m.	15	0.1	Surface	-	-	-	-	-	-	
			2.0	11.0	67	92	11.90	107.8	0.04	7.60
			4.0	11.0	67	92	12.02	109.1	0.04	7.59
			6.0	11.0	67	92	12.01	108.9	0.04	7.57
			8.0	11.0	67	92	12.03	109.0	0.04	7.55
			10.0	11.0	67	92	12.02	108.8	0.04	7.53
			12.0	10.9	67	92	12.02	108.9	0.04	7.51
			14.0	10.9	67	93	11.94	108.2	0.04	7.48
			15.0	-	-	-	-	-	-	-
L9324 N70°17'24.7" W150°58'58.6" 8/11/2012 10:30 a.m.	10.0	1.0	Surface	-	-	-	-	-	-	-
			1.0	10.5	47	66	11.33	101.7	0.03	7.75
			3.0	10.5	47	66	11.31	101.5	0.03	7.74
			5.0	10.6	47	66	11.30	101.3	0.03	7.73
			7.0	10.5	47	66	11.26	101.0	0.03	7.72
			9.0	10.5	47	66	11.22	100.7	0.03	7.70
			10.0	-	-	-	-	-	-	-

Notes:
(1) Sample depth is measured from the water surface.
(2) Turbidity, temperature, conductivity, dissolved oxygen, and salinity were measured using a YSI 6920V2-M meter.
(3) Turbidity is presented as an average of the sampled values in the water column.
(4) Specific conductance (referenced to 25°C) was obtained using a conversion coefficient of 0.0196 based on empirical data.

3.2.1 Specific Conductance

Specific conductance varied little within the water column, but was notably different between lakes. The average specific conductance in Lake M9313 was 723 microsiemens per centimeter (µS/cm). Measured values exceeding 500 µS/cm are indicative of saline environments (ADF&G, 2008) which are usually noted in lakes near the coast. Average specific conductance was 92 µS/cm in Lake L9323 and 66 µS/cm in Lake L9324.

3.2.2 Dissolved Oxygen and Water Temperature

Concentrations of DO varied between lakes. In 2012, the average DO was measured at 10.88 milligrams per liter (mg/L) in Lake M9313, 11.99 mg/L in Lake L9323, and 11.28 mg/L in Lake L9324. Average DO values observed were higher than the 2011 values.

A 100% saturation level is based on standard temperature and pressure conditions. The percent-saturation at Lake M9313 was 99.9%, Lake L9323 was 108.7%, and Lake L9324 was 101.2%. DO saturation values greater than 100% are influenced by temperature, time of day, and the photosynthetic activity of vegetation in the water body.

Oxyclines or thermoclines were not apparent at any of the sampling sites (see Table 3.1). Generally, there was a slight decrease of oxygen saturation corresponding with depth and temperature in all lakes. The maximum difference of 1.0% was measured between the surface and the bottom of the lakes. Temperatures in all three lakes ranged from 10.5 °C in Lake L9324 to 11.4°C in Lake M9313. The coolest temperatures were found at the bottom of the lakes.

3.2.3 Salinity

Salinity remained consistent with depth. The greatest concentration was measured in Lake M9313 at 0.35 parts per thousand (ppt) likely because of its coastal proximity. Lakes L9323 and L9324 had concentrations of 0.04 ppt and 0.04 ppt, respectively.

3.2.4 Turbidity

Average turbidity ranged from 0.0 nephelometric turbidity units (NTU) at Lake M9313 to 1.0 NTU at Lake L9324. Average turbidity at Lake L9323 was 0.1 NTU.

3.3 LABORATORY RESULTS

Analytical results show the targeted compounds and metals were not detected above the laboratory detection limit in lakes M9313, L9323, and L9324 except for barium. Barium was detected in all lakes at concentrations below the ADEC cleanup level of 2.0 mg/L. The greatest measured concentration of barium was 0.234 mg/L in Lake M9313. Barium is not uncommon in arctic waters at concentrations similar to those measured at the three lakes (Guay and Falkner 1998). Analytical results are shown in Table 3.2. The laboratory report is presented in Appendix A.

Analytical results show 0.686 mg/L of RRO was detected in the sample collected from Lake M9313. According to SGS, the chromatograph shows no identifiable peaks that would be indicative of a manmade product, and no diesel or other petroleum products were found. Therefore, the results likely have a biogenic origin. The results are below the ADEC cleanup level of 1.1 mg/L. RRO was not detected above the laboratory detection limit in samples collected from lakes L9323 and L9324. DRO was not detected in any of the samples.

Table 3.2: Laboratory Analytical Results

Parameter	ADEC Cleanup Level [1] (mg/L)	M9313[2] (mg/L)	L9323 (mg/L)	L9324 (mg/L)	L9324[3] (mg/L)
Mercury	0.002	ND	ND	ND	ND
Arsenic	0.010	ND	ND	ND	ND
Barium	2.0	0.234	0.046	0.046	0.046
Cadmium	0.005	ND	ND	ND	ND
Chromium	0.10	ND	ND	ND	ND
Lead	0.015	ND	ND	ND	ND
Selenium	0.05	ND	ND	ND	ND
Silver	0.10	ND	ND	ND	ND
DRO	1.5	ND	ND	ND	ND
RRO	1.1	0.686	ND	ND	ND

Notes:
1 - ADEC Water Quality Standards 18 AAC 75.345 Table C Groundwater Cleanup Levels (2009).
2 – Lab Sample Remarks: AK 103 - Unknown hydrocarbon with several peaks present.
3 - Duplicate sample.

-- Not tested
DRO - Diesel Range Organics
RRO – Residual Range Organics
mg/L – milligrams per liter
ND – Analyte not detected above the laboratory detection limit
RRO – Residual Range Organics
Source: SGS Laboratory Analysis Report 1123658 (0)

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Appendix A LABORATORY ANALYTICAL RESULTS

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Laboratory Analysis Report

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Anchorage, AK 99503

Work Order:	1123658
	ASDP WQ
Client:	Michael Baker Jr., Inc.
Report Date:	August 29, 2012

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO 17025 (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.
The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 2xDL)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content.
All DRO/RRO analyses are integrated per SOP.

SGS Ref.#	1123658001		
Client Name	Michael Baker Jr., Inc.	**Printed Date/Time**	08/29/2012 8:51
Project Name/#	ASDP WQ	**Collected Date/Time**	08/09/2012 12:30
Client Sample ID	M9313-A-B	**Received Date/Time**	08/13/2012 9:08
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

AK103 - Unknown hydrocarbon with several peaks is present.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals by ICP/MS									
Arsenic	ND	5.00	ug/L	SW6020	B		08/21/12	08/22/12	NRB
Barium	234	3.00	ug/L	SW6020	B		08/21/12	08/22/12	NRB
Cadmium	ND	2.00	ug/L	SW6020	B		08/21/12	08/22/12	NRB
Chromium	ND	4.00	ug/L	SW6020	B		08/21/12	08/22/12	NRB
Lead	ND	1.00	ug/L	SW6020	B		08/21/12	08/22/12	NRB
Mercury	ND	0.200	ug/L	SW6020	B		08/21/12	08/22/12	NRB
Selenium	ND	5.00	ug/L	SW6020	B		08/21/12	08/22/12	NRB
Silver	ND	2.00	ug/L	SW6020	B		08/21/12	08/22/12	NRB
Semivolatile Organic Fuels Department									
Diesel Range Organics	ND	0.600	mg/L	AK102	A		08/21/12	08/22/12	MEM
Residual Range Organics	0.686	0.500	mg/L	AK103	A		08/21/12	08/22/12	MEM
Surrogates									
5a Androstane <surr>	86.8		%	AK102	A	50-150	08/21/12	08/22/12	MEM
n-Triacontane-d62 <surr>	88.1		%	AK103	A	50-150	08/21/12	08/22/12	MEM

SGS Ref.#	1123658002		
Client Name	Michael Baker Jr., Inc.	**Printed Date/Time**	08/29/2012 8:51
Project Name/#	ASDP WQ	**Collected Date/Time**	08/11/2012 9:00
Client Sample ID	L9323-A-B	**Received Date/Time**	08/13/2012 9:08
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals by ICP/MS									
Arsenic	ND	5.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Barium	45.9	3.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Cadmium	ND	2.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Chromium	ND	4.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Lead	ND	1.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Mercury	ND	0.200	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Selenium	ND	5.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Silver	ND	2.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Semivolatile Organic Fuels Department									
Diesel Range Organics	ND	0.600	mg/L	AK102	A		08/23/12	08/24/12	MEM
Residual Range Organics	ND	0.500	mg/L	AK103	A		08/23/12	08/24/12	MEM
Surrogates									
5a Androstane <surr>	96.3		%	AK102	A	50-150	08/23/12	08/24/12	MEM
n-Triacontane-d62 <surr>	102		%	AK103	A	50-150	08/23/12	08/24/12	MEM

SGS Ref.#	1123658003		
Client Name	Michael Baker Jr., Inc.	**Printed Date/Time**	08/29/2012 8:51
Project Name/#	ASDP WQ	**Collected Date/Time**	08/11/2012 10:30
Client Sample ID	L9324-A-B	**Received Date/Time**	08/13/2012 9:08
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals by ICP/MS									
Arsenic	ND	5.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Barium	46.5	3.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Cadmium	ND	2.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Chromium	ND	4.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Lead	ND	1.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Mercury	ND	0.200	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Selenium	ND	5.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Silver	ND	2.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Semivolatile Organic Fuels Department									
Diesel Range Organics	ND	0.600	mg/L	AK102	A		08/23/12	08/24/12	MEM
Residual Range Organics	ND	0.500	mg/L	AK103	A		08/23/12	08/24/12	MEM
Surrogates									
5a Androstane <surr>	96.3		%	AK102	A	50-150	08/23/12	08/24/12	MEM
n-Triacontane-d62 <surr>	101		%	AK103	A	50-150	08/23/12	08/24/12	MEM

SGS Ref.#	1123658004		
Client Name	Michael Baker Jr., Inc.	**Printed Date/Time**	08/29/2012 8:51
Project Name/#	ASDP WQ	**Collected Date/Time**	08/11/2012 10:35
Client Sample ID	L9324-Z-Y	**Received Date/Time**	08/13/2012 9:08
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals by ICP/MS									
Arsenic	ND	5.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Barium	46.1	3.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Cadmium	ND	2.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Chromium	ND	4.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Lead	ND	1.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Mercury	ND	0.200	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Selenium	ND	5.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Silver	ND	2.00	ug/L	SW6020	B		08/14/12	08/15/12	NRB
Semivolatile Organic Fuels Department									
Diesel Range Organics	ND	0.600	mg/L	AK102	A		08/23/12	08/24/12	MEM
Residual Range Organics	ND	0.500	mg/L	AK103	A		08/23/12	08/24/12	MEM
Surrogates									
5a Androstane <surr>	95		%	AK102	A	50-150	08/23/12	08/24/12	MEM
n-Triacontane-d62 <surr>	100		%	AK103	A	50-150	08/23/12	08/24/12	MEM

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1123658

SGS Reference #:

page _____ of _____

(1)

CLIENT: MICHAEL BAKER JR

CONTACT: ~~STEVEN CLARK~~ ~~KAREN BROWN~~ PHONE NO: 907-440-4919

PROJECT NAME: ASDP WQ

PROJECT/ PWSID/ PERMIT#: 128228

REPORTS TO: KAREN BROWN

EMAIL: SMCLARK@MBAKERCORP.COM

INVOICE TO:

QUOTE #:

P.O. #: 128228

(2)

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/ MATRIX CODE	# CONTAINERS	SAMPLE TYPE C= COMP G= GRAB MI= Multi Incremental Samples	Preservatives Used	HCl	HNO3	HCl							
							Analysis Required (3)	RRO	RCRA	DRO							REMARKS/ LOC ID
(1) A	M9313-A	8-9	12:30		1			X		X							
(1) B	M9313-B	8-9	12:30		1				X								
(2) A	~~AA~~ L9323-A	8-11	0900		1			X		X							
(2) B	L9323-B	8-11	0900		1				X								
(3) A	L9324-A	8-11	1030		1			X		X							
(3) B	*L9324-B	8-11	1030		1				X								
(4) A	L9324-Z	8-11	1035		1			X		X							
(4) B	L9324-Y	8-11	1035		1				X								

(5)

	Date	Time	
Collected/Relinquished By:(1) STEVEN CLARK	8-R	0730	Received By:
Relinquished By: (2)	8-13	0908	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	8/13/12	0908	Received For Laboratory By:

(4)

DOD Project? YES NO

Cooler ID _____

Data Deliverable Requirements:

Requested Turnaround Time and-or Special Instructions:

BOTTLES FOR DISPOSAL

Temperature Blank °C: 6.3 #13

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

(See attached Sample Receipt Form)

❑ 200 W. Potter Drive **Anchorage, AK 99518** Tel: (907) 562-2343 Fax: (907) 561-5301
❑ 5500 Business Drive **Wilmington, NC 28405** Tel: (910) 350-1903 Fax: (910) 350-1557

White - Retained by Lab
Pink - Retained by Client

SGS

1123658

SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable.	Yes No (N/A)	
COC accompanied samples?	(Yes) No N/A	
Temperature blank compliant* (i.e., 0-6°C after correction factor)?	Yes (No) N/A	Client ok w/ temp
** Note: Exemption permitted for chilled samples collected less than 8 hours ago.*		
Cooler ID: 1 @ 6-3 w/ Therm.ID: 13		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Note: If non-compliant, use form FS-0029 to document affected samples/analyses.		
If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled."		
If temperature(s) <0°C, were all sample containers ice free?	Yes No (N/A)	
Delivery method (specify all that apply): (Client)	Note ABN/ tracking #	
USPS Alert Courier Road Runner AK Air		
Lynden Carlile ERA PenAir	See Attached	
FedEx UPS NAC Other:	or (N/A)	
→ *For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?*	Yes No (N/A)	
→ For samples received with payment, note amount ($) and cash / check / CC **(circle one)** or note:		(N/A)
→ For samples **received in FBKS**, ANCH staff will verify all criteria are reviewed.	SRF Initiated by: SC	N/A
Were samples received within hold time?	(Yes) No N/A	
Note: Refer to form F-083 "Sample Guide" for hold time information.		
Do samples **match COC*** (i.e., sample IDs, dates/times collected)?	(Yes) No N/A	
** Note: Exemption permitted if times differ <1hr; in which case, use times on COC.*		
Were analyses requested unambiguous?	(Yes) No N/A	
Were samples in **good condition** (no leaks/cracks/~~breakage~~)?	(Yes) No N/A	
Packing material used (specify all that apply): ~~Bubble Wrap~~		
Separate plastic bags Vermiculite Other:		
Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)?	Yes No (N/A)	
Were all soil VOAs **field extracted** with MeOH+BFB?	Yes No (N/A)	
Were **proper containers** (type/mass/volume/preservative*) used?	(Yes) No N/A	
** Note: Exemption permitted for waters to be analyzed for metals.*		
Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	Yes No (N/A)	
For **special handling** (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	Yes No (N/A)	
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant?**	(Yes) No N/A	
If pH was adjusted, were bottles flagged (i.e., stickers)?	Yes No (N/A)	
For **RUSH/SHORT Hold Time** or **site-specific QC** (e.g., BMS/BMSD/BDUP) samples, were the COC & bottles flagged (e.g., stickers) accordingly? For RUSH/SHORT HT, was email sent?	Yes No (N/A)	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	Yes No (N/A)	SRF Completed by: SC
		PM = N/A
Was **PEER REVIEW** of ***sample numbering/labeling completed?***	Yes No N/A	Peer Reviewed by: N/A

Additional notes (if applicable):

Note to Client: *Any "no" circled above indicates non-compliance with standard procedures and may impact data quality.*

SGS North America Inc.
200 W. Potter Dr., Anchorage, AK 99518 (ph) 907-562-2342, (fax) 907-561-5301
3180 Peger Rd., Fairbanks, AK 99701 (ph) 907-474-8656, (fax) 907-474-9685

Sample Kit Request

☐ Client pickup Date: 8/7/2012 Time: 8 AM
☐ Deliver to client:
☐ Shipment Method:
Airline Carrier:
Airbill Number:
Date to ship by:
Notes:
Kit request taken by: crb Date: 8/1/2012
Kit prepared by: VMS Date: 8/16/12
Kit checked by: SC Date: 8/16/12
Kit shipped by: Date:
Estimated date for samples returning to the lab:

Client Name: MLF
Ordered By: Steven Clark e-mail:
Phone/Fax:
Project Name:
Quote #:
Delivery:

1123658

PM Reminders:
☐ Track all Lot# ☐ SOW/SAP/QAPP ☐ Profile Build/Project Notice ☐ Total # Bottles includes bottles for % Solids ☐ Regulatory/Special Requirements ☐ DQOs ☐ Problem Matrix

Notes:

No. Samples	Matrix	Analysis	Container Size & Type		Pres.	Bottle Lot #	Pres. Lot #	Hold Time	# QC Bottles	Total Bottles
4	water	RCRA Metals	1X250	HDPE	HNO3			6 months		4
8	water	dro/rro and silica gel	2 x 1L	amber	HCl			14 days		16
	~~water~~									

☑ Pack for Shipping via air carrier
☑ 125mL Temperature Blank
☐ 500mL Temperature Blank
☐ Soil VOA Trip Blank - Lot#:
☐ Water VOA Trip Blank - Lot#:
☐ 524 VOA Trip Blank - Lot#:
☐ Low Level Mercury - Lot#:
☑ SGS COCs
☑ Custody Seals
☑ Labels
☑ Coolers
☑ Gel Ice (*circle one:* in each cooler OR in a separate cooler)
☐ Pack similar bottles together OR custom packing *(circle one)*
☑ Bubble Wrap
☐ Send Instructions

Other Notes/Reminders for Kit Prep:

Attention Client/Sampler: ***Please remember the following sampling guidelines -***

1. Do not rinse container before filling and be aware of any acid preservative in container.
2. Fill container to top, but do not overfill (except volatiles which should be headspace free).
3. Label the container with your sample/site ID, as well as the date & time of collection.
4. Fill in the Chain of Custody.
5. Add frozen gel packs or ice to your cooler & pack to prevent breakage.

Note: Charges may be invoiced for bottles which are unused or improperly used.

If you have any questions concerning this sample kit, please contact your Project Manager for assistance. *Thank you.*

Returned Bottles Inventory

Name of individual returning bottles: Steven Clark

Date Received: 8/13/12

Client Name: Michael Baker JR

Received by: Annette Woodard

Project Name: ASDP WQ

SGS PM:

Preservative:	unpres.	H2SO4	HCl	HNO3	NaOH	other	vials of MeOH
HDPE/Nalgene:							
1-L							
500-ml							
250-ml							
125-ml							
other							
Amber Glass:							
1-L BR			12				
500-ml BR							
250-ml BR							
125-ml BR							
8-oz SS							
4-oz SS							
4-oz w/ septa							
40-ml VOA vial							
other							
Subtotal:			12				

~~~ The bottom of this form should be completed by the Project Manager, who will determine how apply charges. ~~~

Note: Returned bottles (regardless of size/pres.) are billed back at $4/bottle ***unless otherwise quoted.***
These prices are only for bottles returned to the lab for disposal.
Unused/unreturned bottles are billed separately. Please see Accounting for current price list.

Amount to Invoice Client: $ 48.00

WO#: 1123658