




ALPINE SATELLITE DEVELOPMENT PLAN (ASDP) WATER QUALITY MONITORING 2017

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ACRONYMS & ABBREVIATIONS

°C	Degrees Celsius
ADEC	Alaska Department of Environmental Conservation
ASDP	Alpine Satellite Development Plan
CPAI	ConocoPhillips Alaska, Inc.
DO	Dissolved oxygen
DRO	Diesel range organics
FID	Flame ionization detector
GC	Gas chromatography
ICP	Inductively coupled plasma
MS	Mass spectrometry
µS/cm	Microsiemens per centimeter
mS/cm	MilliSiemens per centimeter
mg/L	Milligrams per liter
Michael Baker	Michael Baker International
NTU	Nephelometric Turbidity Units
pH	Potential of hydrogen
ppt	Parts per thousand
PSS	Practical Salinity Scale
RCRA	Resource Conservation and Recovery Act
RRO	Residual range organics
SG	Silica gel
SGS	SGS North America, Inc.
SU	Standard units



1. INTRODUCTION

The 2017 Alpine Satellite Development Plan (ASDP) Water Quality Monitoring Report presents the results of lake monitoring conducted in August 2017 and September 2017 for ConocoPhillips Alaska, Inc. (CPAI). Annual monitoring of three lakes, lakes L9323, L9324, and M9313, is required by North Slope Borough Ordinance Serial No. 75-6-46, Stipulation IV.2.4.3(h) (NSB 2004). Lakes L9323, L9324, and M9313 have been monitored annually 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 satellite drill sites, CD3 and CD4. The CD3 development included an airstrip and pad/airstrip access road, apron, and taxiway adjacent to the south side of Lake M9313. The CD4 development included a gravel pad, access road connected to the CD2 access road, and pipeline parallel to the access road connecting to the existing Alpine Pipeline. The CD4 pad is located between Lake L9323 to the north and Lake L9324 to the south. Alpine operations expanded again with the construction of CD5, which included a gravel pad, access road connected to the CD4 access road, and pipeline parallel to the access road connecting to the existing Alpine Pipeline.

Michael Baker International (Michael Baker) field team members conducted in-situ field sampling of the three lakes for turbidity, temperature, conductivity/specific conductance, dissolved oxygen (DO), salinity, and pH. Water samples were collected at each lake for laboratory analyses of dissolved hydrocarbons: diesel range organics (DRO), residual range organics (RRO), and Resource Conservation and Recovery Act (RCRA) metals.



Date: 09/29/2017	Project: 161682
Drawn: BTG	File: Figure 1.1
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Legend	
Sample Lake	Pipeline
Facility	Road



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2017 ASDP
Water Quality
Overview Map

FIGURE 1.1
(SHEET 1 of 1)



2. METHODS

Field investigations were conducted at lakes L9323, L9324, and M9313 on August 23, 2017 and at Lake M9313 again on September 11, 2017. Soloy Helicopters, LLC provided helicopter access to Lake M9313. An Alpine Environmental pickup truck was used to access lakes L9323 and L9324.

In-situ water quality data measurements and laboratory sample collections were performed at all three lakes by a two-person team on August 23, 2017. Laboratory sample collections were performed again at Lake M9313 by a two-person team on September 11, 2017. The team used inflatable kayaks with an attached support raft for transporting the sampling equipment (Photo 2.1 and Photo 2.2). In-situ water quality instruments were provided by TTT Environmental. Laboratory analyses and sample collection bottles were provided by SGS North America, Inc. (SGS). Prior to sampling, aerial reconnaissance was conducted to identify possible inflow and outflow sources, and to determine if lakes were 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 (USACE 1987) methods.

Safety precautions were followed, as outlined in the North Slope Water Resources 2017 Health, Safety, and Environmental Plan (Michael Baker 2017a) and the 2017 Summery Hydrology Monitoring – Job Safety Analysis (Michael Baker 2017b). Michael Baker employees worked in groups of two while working on the lakes, and a third person performed wildlife scans from the bank during sampling at Lake M9313. At lakes L9323 and L9324, Michael Baker employees checked in with Alpine security before and after sampling. Personnel were equipped with dry suits and U.S. Coast Guard-approved Type III personal floatation devices during sampling.



Photo 2.1: Equipment used to collect water quality data and samples; August 23, 2017



Photo 2.2: Preparing for sampling at Lake M9313; August 23, 2017



2.1 IN-SITU WATER QUALITY

SAMPLING LOCATIONS

Previous in-situ water quality monitoring of North Slope lakes indicate 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 data collected at specific locations are representative of conditions throughout the well-mixed water body and thus, water samples collected at a single location are representative of the lake.

Selection of the appropriate location for samples was based on maximum lake depth and relative proximity to gravel facilities. The bathymetry of each lake was used to identify the deepest part of the water body, and a single representative sampling location was selected. The locations of the deepest part of lakes L9323, L9324, and M9313 were confirmed in 2010 using a hand-held sonar depth finder (Michael Baker 2010).

Sampling locations were identified in the field using a handheld global positioning system Garmin Oregon 650t referenced to the World Geodetic System of 1984 coordinate system. The sampling locations for lakes L9323 and L9324 are shown in Figure 2.1. Figure 2.2 shows the sampling location for Lake M9313.



Date: 09/29/2017	Project: 161682
Drawn: BTG	File: Figure 2.1
Checked: JMG	Scale: 1 in = 2000 feet

Legend	
	Water Quality Sampling Point
	Pipeline
	Road
	Sample Lake
	Facility

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Lakes L9323 & L9324 ASDP Water Quality Sampling Locations
FIGURE: 2.1
(SHEET 1 of 1)



		Date: 09/29/2017	Project: 161682
Drawn: BTG	File: Figure 2.2		
Checked: JMG	Scale: 1 in = 1000 feet		

Legend	
	Water Quality Sampling Point
	Sample Lake
	Pipeline
	Facility

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Lake M9313
ASDP Water Quality
Sampling Location

FIGURE: 2.2
(SHEET 1 of 1)



IN-SITU MEASUREMENTS

In-situ water quality was measured at 1- and 2-foot intervals throughout the water column. A list of water quality parameters collected is presented in Table 2.1.

Table 2.1: In-Situ Water Quality Parameters

Parameter	Units	
Total Depth	ft	feet
Turbidity	NTU	Nephelometric Turbidity Units
Temperature	°C	degrees Celsius
Conductivity	µS/cm	microsiemens per centimeter
Specific Conductance	µS/cm	microsiemens per centimeter
Dissolved Oxygen	mg/L	milligrams per liter
	% saturation	percent saturation
Salinity	ppt	parts per thousand
pH	SU	standard units

Turbidity refers to the cloudiness of a fluid caused by suspended solids that tend to be invisible to the naked eye. As particles in a fluid will scatter light focused on them, turbidity can be measured by the quantity of reflected light for a given amount of particulates. A Nephelometer is equipped with a detector next to the light beam and is used to measure turbidity. When using a calibrated Nephelometer, the units of turbidity are Nephelometric Turbidity Units (NTU).

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 and temperature, and the conversions defined by the Practical Salinity Scale (PSS) of 1978 (YSI 2012). The PSS is derived for standard seawater with a known ion composition; therefore, using the PSS for freshwater with unknown ion composition provides an estimate of the salinity.

Specific conductance is a metric 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 (°C). Michael Baker completed this analysis for the Colville River in 2005 resulting in a correction coefficient of 0.0196 (Michael Baker 2006). The recharge of lakes from the Colville River flood waters during spring break-up justifies using the same correction coefficient for the lake measurements.

A. INSTRUMENT CALIBRATION

A YSI 650 MDS handheld unit with YSI 6920 V2 Sonde sensor was calibrated by TTT Environmental according to the manufacturer’s specifications. The morning of sampling, the YSI 6920 V2 meter was calibrated for conductivity and pH and checked for DO by Michael Baker field team members 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.



B. INSTRUMENT ACCURACY

The accuracy of the YSI 6920 V2 Sonde sensor is presented in Table 2.2 (YSI 2012).

Table 2.2: Instrument Accuracy

Parameter	Accuracy
Turbidity	+/- 2% of the reading or 0.3 NTU (whichever is greater)
Temperature	+/- 0.15°C
Conductivity	+/- 0.5% of reading + 0.001 mS/cm
Dissolved Oxygen	+/-1% of the reading or 0.1 mg/L (whichever is greater)
	+/-1% of the reading or 1% air saturation (whichever is greater)
Salinity	+/- 1.0% of reading or 0.1 ppt (whichever is greater)
pH	+/- 0.2 units

2.2 LABORATORY SAMPLE COLLECTION & ANALYSES

SAMPLE COLLECTION

Frequent wind and shallow depths typically prevent oxyclines (notable change in oxygen concentration with depth), haloclines (notable change in salinity with depth), and thermoclines (notable change in temperature with depth) from developing at any of lakes during the summer. The in-situ water quality measurements confirmed water quality constituents were well-mixed within the water column at each lake; therefore, a representative single point laboratory sample at mid-depth was collected at each sampling location. In the event of significant 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 12” disposable polyethylene bailer (350 milliliter capacity). Nitrile gloves were worn during sample collection and changed between samples. A new bailer was used for each lake and discarded after use.

Sample bottles provided by SGS were stored in the provided cooler before, during, and after sample collection to maintain adequate storage temperature and ensure chain of custody procedures were followed. Field samples were transported to SGS within 48 hours of initial sample collection.

LABORATORY ANALYSES

The laboratory analyses performed for each water sample included RCRA metals, DRO, and RRO. The laboratory analyses for the samples collected on August 23, 2017 included water samples obtained from lakes L9323, L9324, M9313. The laboratory analyses for the samples collected on September 11, 2017 included water samples obtained from Lake M9313.

A. SW6020 (RCRA METALS)

The RCRA metals laboratory analysis method SW6020, developed by the U.S. Environmental Protection Agency Office of Solid Waste, employs inductively coupled plasma– mass spectrometry (ICP-MS) 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.

B. AK 102 (DIESEL RANGE ORGANICS)

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 non-petroleum 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.

C. AK 103 (RESIDUAL RANGE ORGANICS)

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 AK 102, employing solvent extractions and GC to identify heavier RRO. Quantification is based on FID response compared to a residuals calibration standard.

D. SILICA GEL CLEANUP FOR DRO & RRO

Laboratory samples containing organic plant material are especially susceptible to background biogenic interference and may result in false positive results for DRO or RRO defined petroleum hydrocarbon ranges (ADEC 2006). The silica gel (SG) procedure is recommended by the ADEC in *Technical Memorandum 06-001, Biogenic Interference and Silica Gel Cleanup* (ADEC 2006) to evaluate the presence and degree of biogenic interference. This procedure is used to preferentially remove biogenic compounds from a sample leaving the non-biodegraded petroleum hydrocarbon compounds. The remaining sample, presumably free of biogenic interference, is then tested for DRO and RRO according to AK 102 and AK 103, respectively.

The laboratory analytical methods for each sampling event are presented in Table 2.3.

Table 2.3: Laboratory Analytical Methods Per Sampling Event

Analytical Method	Method Description	August 23, 2017				September 11, 2017	
		Lake L9323	Lake L9324	Lake M9313	Lake M9313 Duplicate	Lake M9313	Lake M9313 Duplicate
SW6020A	RCRA Metals by ICP-MS	✓	✓	✓	✓	✓	✓
AK 102 & AK 103	DRO & RRO Low Volume Water	✓	✓	✓	✓	--	--
AK 102 & AK 103	DRO & RRO Water	--	--	--	--	✓	✓
AK 102 & AK 103	DRO & RRO Silica Gel	--	--	--	--	✓	✓



3. RESULTS

3.1 IN-SITU WATER QUALITY - AUGUST 23, 2017

SAMPLING LOCATIONS

A. LAKE L9323

Located east of the Nigliq Channel, Lake L9323 is moderately sized with grassy banks and some taller vegetation on the periphery. Lake L9323 was hydraulically isolated at the time of sampling. No odor or film was observed while sampling the lake.



Photo 3.1: Lake L9323, looking south toward Nigliq Channel and CD4 pad; August 23, 2017



Photo 3.2: Lake L9323, looking west toward Nigliq Channel and CD5 road; August 23, 2017



Photo 3.3: Lake L9323, looking southeast toward culvert battery CD4-29 to CD4-33; August 23, 2017



Photo 3.4: Lake L9323, looking northeast toward culvert battery CD4-20A to CD4-23D; August 23, 2017



B. LAKE L9324

Located east of the Nigliq Channel, Lake L9324 is moderately sized with grassy banks and willows. Some large bluffs surround the lake. At the time of sampling, Lake L9324 was hydraulically connected to the South Paleo Lake and Sakoongang Channel. No odor or film was observed while sampling the lake.



Photo 3.5: Lake L9324, looking southeast toward Lake M9929; August 23, 2017



Photo 3.6: Lake L9324, looking northwest toward Nigliq Channel and CD4 pad; August 23, 2017



Photo 3.7: Hydraulic connection between Lake L9324 and South Paleo Lake, looking southeast; August 23, 2017



Photo 3.8: Hydraulic connection between South Paleo Lake and Sakoongang Channel, looking southeast; August 23, 2017

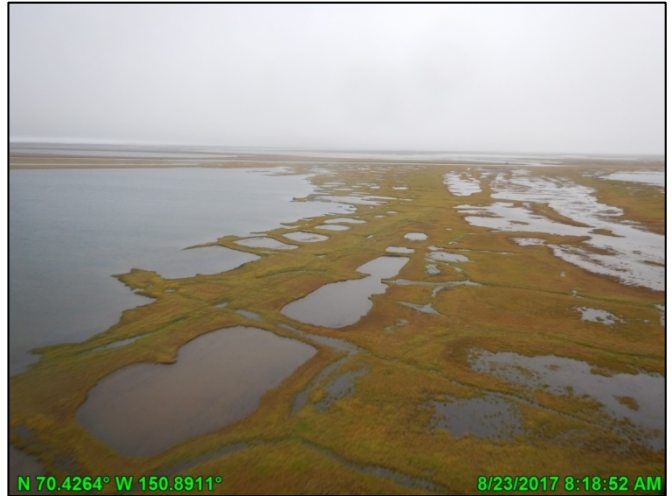


C. LAKE M9313

Located east of the Ulamnigiaq Channel, Lake M9313 is large with low grassy banks. At the time of sampling on August 23 and September 11, Lake M9313 was connected to some areas of ponded water in adjacent polygons, but flow was not observed between water bodies. No odor or film was observed while sampling the lake.



**Photo 3.9: Lake M9313, looking northeast;
August 23, 2017**



**Photo 3.10: Lake M9313, looking northwest
toward M0019; August 23, 2017**



**Photo 3.11: Lake M9313, looking southwest
toward CD3 pad; August 23, 2017**



**Photo 3.12: Lake M9313, looking south toward
CD3 runway; August 23, 2017**



IN-SITU MEASUREMENTS

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. The in-situ water quality results are tabulated in Table 3.1.

Table 3.1: In-Situ Water Quality Results

Lake, Location & Time	Total Depth (ft)	Turbidity (NTU)	Depth (ft)	Temp (°C)	Conductivity (µS/cm)	Specific Conductance (µS/cm)	DO (mg/L)	DO (% Saturation)	Salinity (ppt)	pH SU
L9323 N70.2960° W150.9886° 13:52	11.5	0.7	3	8.4	87	129	11.20	93.5	0.06	7.9
			5	8.4	87	129	11.11	93.6	0.06	7.9
			7	8.4	87	129	11.03	93.9	0.06	7.9
			9	8.4	87	129	10.99	94.6	0.06	7.9
			11	8.4	87	129	10.97	95.3	0.06	7.9
L9324 N70.2901° W150.9828° 15:18	6.0	8.3	2	8.4	75	111	11.44	97.6	0.05	9.4
			3	8.4	75	111	11.47	97.9	0.05	9.4
			4	8.4	75	111	11.57	98.6	0.05	9.4
			5	8.4	75	111	11.79	100.5	0.05	9.4
M9313 N70.4217° W150.9001° 9:42	24.0	0.6	2	7.7	459	694	10.88	91.4	0.33	8.0
			4	7.7	459	694	10.89	91.5	0.33	8.0
			6	7.7	459	694	10.89	91.5	0.33	8.0
			8	7.7	459	694	10.88	91.5	0.33	8.0
			10	7.7	459	694	10.90	91.5	0.33	8.0
			12	7.7	459	694	10.91	91.7	0.33	8.0
			14	7.7	459	694	10.91	91.7	0.33	8.0
			16	7.7	459	694	10.94	91.9	0.33	8.0
			18	7.7	459	694	10.96	92.1	0.33	8.0
			20	7.7	459	694	11.02	92.5	0.33	8.0
			22	7.7	459	694	10.96	92.1	0.33	8.0
Notes: 1. Sample depth is measured from the water surface 2. Turbidity, temperature, conductivity, dissolved oxygen, salinity, and pH were measured using a YSI 650-6920V2 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 (Michael Baker 2006)										

Average turbidity for lakes L9323, L9324, and M9313 was 0.7 NTU, 8.3 NTU, and 0.6 NTU, respectively. The higher NTU value for Lake L9324 has been observed in previous years of sampling and is likely the result of the hydraulic connection to the South Paleo Lake and Sagoonang Channel during sampling.

Temperatures in all lakes ranged from a maximum of 8.4°C in Lake L9324 to a minimum of 7.7°C in Lake M9313. The temperature in all three lakes remained consistent with depth. Specific conductance was homogenous throughout the water column at all sample locations, but was notably different between lakes. Measured specific conductance values exceeding 500 µS/cm are indicative of saline environments which are usually observed in lakes near the coast (ADF&G 2008). The average specific conductance was 129 µS/cm in Lake L9323 and 111 µS/cm in Lake L9324. Average specific conductance in Lake M9313, located nearest to the coast, was 694 µS/cm.



Concentrations of DO were considered homogenous throughout the water column at all sample locations. The average DO was 11.06 mg/L in Lake L9323, 11.57 mg/L in Lake L9324, and 10.92 mg/L in Lake M9313. A 100% saturation level is based on standard temperature and pressure conditions. The average percent-saturation at Lake L9323 was 94.2%, Lake L9324 was 98.7%, and Lake M9313 was 91.8%.

Salinity remained consistent with depth at all sampling locations. The greatest concentration was measured in Lake M9313 at 0.33 ppt, likely due to its coastal proximity. Lake L9323 and Lake L9324 had concentrations of 0.06 ppt and 0.05 ppt, respectively.

Average pH was 7.9 in Lake L9323, 9.4 in Lake L9324, and 8.0 in Lake M9313 and remained consistent with depth at all sampling locations.

3.2 LABORATORY ANALYSES

With the exception of barium, analytical results from both sampling events show that targeted metals were not detected above the laboratory detection limit. 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 0.219 mg/L in Lake M9313 from the August 23, 2017 sampling event. Barium is not uncommon in arctic waters at concentrations similar to those measured at the three lakes (Guay and Falkner 1998).

Lakes L9323, L9324, and M9313 were sampled on August 23, 2017 and analyzed using standard methods. The laboratory results indicated DRO and RRO were not detected above the laboratory detection limits in samples collected from lakes L9323 and L9324. At Lake M9313, the laboratory results indicated RRO was detected above the laboratory detection limit in the primary sample, RRO was detected above the ADEC cleanup level limit of 1.1 mg/L in the duplicate sample, and DRO was detected above the laboratory detection limit in the duplicate sample. The DRO and RRO laboratory results from Lake M9313 may have been false positives due to the presence of biogenics, or naturally occurring organic materials. Biogenics are present in many soils in Alaska, especially tundra peat. Biogenic interference complicates petroleum range organic analysis for DRO (AK 102) and RRO (AK 103) methods (ADEC 2006). RRO has historically been detected in Lake M9313 above the laboratory detection limit and above the ADEC cleanup level limit likely due to the presence of biogenics (Michael Baker 2011 and 2012).

Lake M9313 was resampled again on September 11, 2017 and analyzed using standard sampling methods and the silica gel cleanup method which is an established analytical procedure used to separate analytes from interfering compounds (ADEC 2006). The laboratory results from the September 11, 2017 sampling event indicated DRO and RRO were not detected above the laboratory detection limits.

Laboratory analytical results for both sampling events are presented in Table 3.2. The August 23, 2017 laboratory analytical results are provided in Appendix A.1 and the September 11, 2017 laboratory analytical results are provided in Appendix A.2.



Table 3.2: Laboratory Analytical Results Summary

Parameter	ADEC Cleanup Level ¹ (mg/L)	August 23, 2017 ²				September 11, 2017 ³	
		Lake L9323 (mg/L)	Lake L9324 (mg/L)	Lake M9313 (mg/L)	Lake M9313 Duplicate (mg/L)	Lake M9313 (mg/L)	Lake M9313 Duplicate (mg/L)
Arsenic	0.01	ND ⁴	ND	ND	ND	ND	ND
Barium	2.0	0.0503	0.0629	0.219	0.217	0.213	0.202
Cadmium	0.005	ND	ND	ND	ND	ND	ND
Chromium	0.1	ND	ND	ND	ND	ND	ND
Lead	0.015	ND	ND	ND	ND	ND	ND
Mercury	0.002	ND	ND	ND	ND	ND	ND
Selenium	0.05	ND	ND	ND	ND	ND	ND
Silver	0.1	ND	ND	ND	ND	ND	ND
DRO (low volume water)	1.5	ND	ND	ND	0.624	--	--
RRO (low volume water)	1.1	ND	ND	0.598	1.35	--	--
DRO (water)	1.5	--	--	--	--	ND	ND
RRO (water)	1.1	--	--	--	--	ND	ND
DRO (silica gel)	1.5	--	--	--	--	ND	ND
RRO (silica gel)	1.1	--	--	--	--	ND	ND

Notes:

1. ADEC Water Quality Standards 18 AAC 75.345 Table C Groundwater Cleanup Waters (ADEC 2009)
2. Sample results from SGS Laboratory Analysis Report 1176024
3. Sample results from SGS Laboratory Analysis Report 1176481
4. ND indicates analyte was not detected above the laboratory detection limit



4. REFERENCES

- Alaska Department of Environmental Conservation (ADEC). 2006. Biogenic Interference and Silica Gel Cleanup. Technical Memorandum – 06-001. Division of Spill Prevention and Response, Contaminated Sites Remediation Program.
- 2009. Water Quality Standards. 18 AAC 70. Underground Storage Tanks Procedures. Division of Spill Prevention and Response, Contaminated Sites Remediation Program.
- Alaska Department of Fish and Game (ADF&G). 2008. Fish Habitat Permit FH04-111-0135 Amendment #1.
- Guay, C.K. and K.K. Falkner (Guay and Falkner). 1998. A Survey of Dissolved Barium in the Estuaries of Major Arctic Rivers and Adjacent Seas. *Continental Shelf Research* 18:8 859-882.
- Michael Baker International (Michael Baker) 2017a. North Slope Water Resources 2017 Health, Safety, and Environment Plan. Prepared for ConocoPhillips Alaska, Inc.
- 2017b. 2017 Summer Hydrology Monitoring Programs – Job Safety Analysis. Prepared for ConocoPhillips Alaska, Inc.
- 2012. Alpine Satellite Development Plan 2012 Water Quality Monitoring Report. November.
- 2011. Alpine Satellite Development Plan 2011 Water Quality Monitoring Report. October.
- 2006. Colville River Ice Bridge Monitoring. April.
- North Slope Borough (NSB). 2004 North Slope Borough Ordinance Serial No. 75-6-46
- Sadar, M. 2004. Making Sense of Turbidity Measurements - Advantages In Establishing Traceability Between Measurements and Technology.
- <http://acwi.gov/monitoring/conference/2004/conference_agenda_links/papers/poster_papers/215_SadarMike.pdf>
- United States Army Corps of Engineers (USACE). 1987. Reservoir Water Quality Analysis. Engineering Manual EM-1110-2-1201.
- United States Environmental Protection Agency (EPA). 2006. 2006 Edition of the Drinking Water Standards and Health Advisories. EPA 822-R-06-013.
- United States Geological Survey (USGS). 2006. National Field Manual for the Collection of Water-Quality Data. Book 9 Handbooks for Water-Resources Investigations. Chapter A4 Collection of Water Samples.
- Ward, J.R. and C.A. Harr eds. 1990. Methods for Collection and Processing Surface-Water and Bed-Material Samples for Physical and Chemical Analyses. Open-File Report 90-147.
- YSI Incorporated. 2012. YSI 6-Series Multiparameter Water Quality Sonde User Manual.



Appendix A LABORATORY ANALYTICAL RESULTS

A.1 LABORATORY REPORT 1176024 - AUGUST 23, 2017 SAMPLING EVENT



Laboratory Report of Analysis

To: Michael Baker International
,
(949)246-2953

Report Number: **1176024**

Client Project: **ASDP WQ 161682**

Dear Jen Gillenwater,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Forest at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Forest Taylor
Project Manager
Forest.Taylor@sgs.com

Date

Print Date: 09/06/2017 4:03:07PM

SGS North America Inc. | 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Member of SGS Group

Case Narrative

SGS Client: **Michael Baker International**
SGS Project: **1176024**
Project Name/Site: **ASDP WQ 161682**
Project Contact: **Jen Gillenwater**

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 09/06/2017 4:03:08PM

Laboratory Qualifiers

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. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 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/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
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.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
M9313	1176024001	08/23/2017	08/24/2017	Water (Surface, Eff., Ground)
M9313 Dup	1176024002	08/23/2017	08/24/2017	Water (Surface, Eff., Ground)
L9323	1176024003	08/23/2017	08/24/2017	Water (Surface, Eff., Ground)
L9324	1176024004	08/23/2017	08/24/2017	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
SW6020A	Metals by ICP-MS

Detectable Results Summary

Client Sample ID: **M9313**
 Lab Sample ID: 1176024001
Metals by ICP/MS
Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Barium	219	ug/L
Residual Range Organics	0.598	mg/L

Client Sample ID: **M9313 Dup**
 Lab Sample ID: 1176024002
Metals by ICP/MS
Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Barium	217	ug/L
Diesel Range Organics	0.624	mg/L
Residual Range Organics	1.35	mg/L

Client Sample ID: **L9323**
 Lab Sample ID: 1176024003
Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Barium	50.3	ug/L

Client Sample ID: **L9324**
 Lab Sample ID: 1176024004
Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Barium	62.9	ug/L



Results of M9313

Client Sample ID: **M9313**
Client Project ID: **ASDP WQ 161682**
Lab Sample ID: 1176024001
Lab Project ID: 1176024

Collection Date: 08/23/17 10:05
Received Date: 08/24/17 15:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Arsenic	5.00 U	5.00	1.50	ug/L	5		09/05/17 20:19
Barium	219	3.00	0.940	ug/L	5		09/05/17 20:19
Cadmium	2.00 U	2.00	0.620	ug/L	5		09/05/17 20:19
Chromium	4.00 U	4.00	1.30	ug/L	5		09/05/17 20:19
Lead	1.00 U	1.00	0.310	ug/L	5		09/05/17 20:19
Mercury	0.200 U	0.200	0.0620	ug/L	5		09/05/17 20:19
Selenium	20.0 U	20.0	6.20	ug/L	5		09/05/17 20:19
Silver	2.00 U	2.00	0.620	ug/L	5		09/05/17 20:19

Batch Information

Analytical Batch: MMS9924
Analytical Method: SW6020A
Analyst: VDL
Analytical Date/Time: 09/05/17 20:19
Container ID: 1176024001-C

Prep Batch: MXX30993
Prep Method: SW3010A
Prep Date/Time: 08/30/17 09:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Print Date: 09/06/2017 4:03:14PM



Results of M9313

Client Sample ID: M9313
Client Project ID: ASDP WQ 161682
Lab Sample ID: 1176024001
Lab Project ID: 1176024

Collection Date: 08/23/17 10:05
Received Date: 08/24/17 15:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane (surr)).

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 08/31/17 12:02
Container ID: 1176024001-A
Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62 (surr)).

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK103
Analyst: JMG
Analytical Date/Time: 08/31/17 12:02
Container ID: 1176024001-A
Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL



Results of M9313 Dup

Client Sample ID: **M9313 Dup**
Client Project ID: **ASDP WQ 161682**
Lab Sample ID: 1176024002
Lab Project ID: 1176024

Collection Date: 08/23/17 10:10
Received Date: 08/24/17 15:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Arsenic	5.00 U	5.00	1.50	ug/L	5		09/05/17 20:24
Barium	217	3.00	0.940	ug/L	5		09/05/17 20:24
Cadmium	2.00 U	2.00	0.620	ug/L	5		09/05/17 20:24
Chromium	4.00 U	4.00	1.30	ug/L	5		09/05/17 20:24
Lead	1.00 U	1.00	0.310	ug/L	5		09/05/17 20:24
Mercury	0.200 U	0.200	0.0620	ug/L	5		09/05/17 20:24
Selenium	20.0 U	20.0	6.20	ug/L	5		09/05/17 20:24
Silver	2.00 U	2.00	0.620	ug/L	5		09/05/17 20:24

Batch Information

Analytical Batch: MMS9924
Analytical Method: SW6020A
Analyst: VDL
Analytical Date/Time: 09/05/17 20:24
Container ID: 1176024002-C

Prep Batch: MXX30993
Prep Method: SW3010A
Prep Date/Time: 08/30/17 09:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Print Date: 09/06/2017 4:03:14PM



Results of M9313 Dup

Client Sample ID: **M9313 Dup**
Client Project ID: **ASDP WQ 161682**
Lab Sample ID: 1176024002
Lab Project ID: 1176024

Collection Date: 08/23/17 10:10
Received Date: 08/24/17 15:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.624	0.588	0.176	mg/L	1		08/31/17 12:12
Surrogates							
5a Androstane (surr)	78.2	50-150		%	1		08/31/17 12:12

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 08/31/17 12:12
Container ID: 1176024002-A

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	1.35	0.490	0.147	mg/L	1		08/31/17 12:12
Surrogates							
n-Triacontane-d62 (surr)	90.1	50-150		%	1		08/31/17 12:12

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK103
Analyst: JMG
Analytical Date/Time: 08/31/17 12:12
Container ID: 1176024002-A

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 09/06/2017 4:03:14PM



Results of L9323

Client Sample ID: **L9323**
Client Project ID: **ASDP WQ 161682**
Lab Sample ID: 1176024003
Lab Project ID: 1176024

Collection Date: 08/23/17 14:00
Received Date: 08/24/17 15:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Arsenic	5.00 U	5.00	1.50	ug/L	5		09/05/17 20:28
Barium	50.3	3.00	0.940	ug/L	5		09/05/17 20:28
Cadmium	2.00 U	2.00	0.620	ug/L	5		09/05/17 20:28
Chromium	4.00 U	4.00	1.30	ug/L	5		09/05/17 20:28
Lead	1.00 U	1.00	0.310	ug/L	5		09/05/17 20:28
Mercury	0.200 U	0.200	0.0620	ug/L	5		09/05/17 20:28
Selenium	20.0 U	20.0	6.20	ug/L	5		09/05/17 20:28
Silver	2.00 U	2.00	0.620	ug/L	5		09/05/17 20:28

Batch Information

Analytical Batch: MMS9924
Analytical Method: SW6020A
Analyst: VDL
Analytical Date/Time: 09/05/17 20:28
Container ID: 1176024003-C

Prep Batch: MXX30993
Prep Method: SW3010A
Prep Date/Time: 08/30/17 09:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Print Date: 09/06/2017 4:03:14PM



Results of L9323

Client Sample ID: L9323
Client Project ID: ASDP WQ 161682
Lab Sample ID: 1176024003
Lab Project ID: 1176024

Collection Date: 08/23/17 14:00
Received Date: 08/24/17 15:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 08/31/17 12:22
Container ID: 1176024003-A
Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK103
Analyst: JMG
Analytical Date/Time: 08/31/17 12:22
Container ID: 1176024003-A
Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 09/06/2017 4:03:14PM



Results of L9324

Client Sample ID: **L9324**
Client Project ID: **ASDP WQ 161682**
Lab Sample ID: 1176024004
Lab Project ID: 1176024

Collection Date: 08/23/17 15:30
Received Date: 08/24/17 15:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Arsenic	5.00 U	5.00	1.50	ug/L	5		09/05/17 20:42
Barium	62.9	3.00	0.940	ug/L	5		09/05/17 20:42
Cadmium	2.00 U	2.00	0.620	ug/L	5		09/05/17 20:42
Chromium	4.00 U	4.00	1.30	ug/L	5		09/05/17 20:42
Lead	1.00 U	1.00	0.310	ug/L	5		09/05/17 20:42
Mercury	0.200 U	0.200	0.0620	ug/L	5		09/05/17 20:42
Selenium	20.0 U	20.0	6.20	ug/L	5		09/05/17 20:42
Silver	2.00 U	2.00	0.620	ug/L	5		09/05/17 20:42

Batch Information

Analytical Batch: MMS9924
Analytical Method: SW6020A
Analyst: VDL
Analytical Date/Time: 09/05/17 20:42
Container ID: 1176024004-C

Prep Batch: MXX30993
Prep Method: SW3010A
Prep Date/Time: 08/30/17 09:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Print Date: 09/06/2017 4:03:14PM



Results of L9324

Client Sample ID: L9324
Client Project ID: ASDP WQ 161682
Lab Sample ID: 1176024004
Lab Project ID: 1176024

Collection Date: 08/23/17 15:30
Received Date: 08/24/17 15:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Diesel Range Organics, 0.600 U, 0.600, 0.180, mg/L, 1, 08/31/17 12:33

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 5a Androstane (surr), 68.4, 50-150, %, 1, 08/31/17 12:33

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 08/31/17 12:33
Container ID: 1176024004-A

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Residual Range Organics, 0.500 U, 0.500, 0.150, mg/L, 1, 08/31/17 12:33

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: n-Triacontane-d62 (surr), 85.5, 50-150, %, 1, 08/31/17 12:33

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK103
Analyst: JMG
Analytical Date/Time: 08/31/17 12:33
Container ID: 1176024004-A

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 09/06/2017 4:03:14PM



Method Blank

Blank ID: MB for HBN 1767161 [MXX/30993]
Blank Lab ID: 1409035

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176024001, 1176024002, 1176024003, 1176024004

Results by SW6020A

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Arsenic	2.50U	5.00	1.50	ug/L
Barium	1.50U	3.00	0.940	ug/L
Cadmium	1.00U	2.00	0.620	ug/L
Chromium	2.00U	4.00	1.30	ug/L
Lead	0.500U	1.00	0.310	ug/L
Mercury	0.100U	0.200	0.0620	ug/L
Selenium	10.0U	20.0	6.20	ug/L
Silver	1.00U	2.00	0.620	ug/L

Batch Information

Analytical Batch: MMS9924
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: VDL
Analytical Date/Time: 9/5/2017 6:53:48PM

Prep Batch: MXX30993
Prep Method: SW3010A
Prep Date/Time: 8/30/2017 9:00:57AM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Analytical Batch: MMS9925
Analytical Method: SW6020A
Instrument: Perkin Elmer Nexlon P5
Analyst: VDL
Analytical Date/Time: 9/6/2017 12:49:45PM

Prep Batch: MXX30993
Prep Method: SW3010A
Prep Date/Time: 8/30/2017 9:00:57AM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Print Date: 09/06/2017 4:03:16PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176024 [MXX30993]
 Blank Spike Lab ID: 1409036
 Date Analyzed: 09/05/2017 18:58

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176024001, 1176024002, 1176024003, 1176024004

Results by SW6020A

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Arsenic	1000	1060	106	(84-116)
Barium	1000	1010	101	(86-114)
Cadmium	100	102	102	(87-115)
Chromium	400	437	109	(85-116)
Lead	1000	1070	107	(88-115)
Mercury	10	10.3	103	(70-124)
Selenium	1000	1070	107	(80-120)
Silver	100	108	108	(85-116)

Batch Information

Analytical Batch: **MMS9924**
 Analytical Method: **SW6020A**
 Instrument: **Perkin Elmer Nexlon P5**
 Analyst: **VDL**

Prep Batch: **MXX30993**
 Prep Method: **SW3010A**
 Prep Date/Time: **08/30/2017 09:00**
 Spike Init Wt./Vol.: 1000 ug/L Extract Vol: 25 mL
 Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1409037
 MS Sample ID: 1409038 MS
 MSD Sample ID: 1409039 MSD

Analysis Date: 09/05/2017 19:02
 Analysis Date: 09/05/2017 19:07
 Analysis Date: 09/05/2017 19:11
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176024001, 1176024002, 1176024003, 1176024004

Results by SW6020A

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Arsenic	12.2	1000	1050	104	1000	1020	100	84-116	3.40	(< 20)
Barium	28.6	1000	1070	104	1000	1030	100	86-114	3.77	(< 20)
Cadmium	1.00U	100	104	104	100	99.3	99	87-115	4.39	(< 20)
Chromium	2.00U	400	424	106	400	418	104	85-116	1.53	(< 20)
Lead	0.878J	1000	1060	106	1000	1060	106	88-115	0.20	(< 20)
Mercury	0.0859J	10.0	10.4	103	10.0	10.2	101	70-124	2.05	(< 20)
Selenium	10.0U	1000	1050	105	1000	1000	100	80-120	5.09	(< 20)
Silver	1.00U	100	113	113	100	110	110	85-116	3.05	(< 20)

Batch Information

Analytical Batch: MMS9924
 Analytical Method: SW6020A
 Instrument: Perkin Elmer Nexlon P5
 Analyst: VDL
 Analytical Date/Time: 9/5/2017 7:07:20PM

Prep Batch: MX30993
 Prep Method: 3010 H2O Digest for Metals ICP-MS
 Prep Date/Time: 8/30/2017 9:00:57AM
 Prep Initial Wt./Vol.: 25.00mL
 Prep Extract Vol: 25.00mL

Method Blank

Blank ID: MB for HBN 1767040 [XXX/38284]
 Blank Lab ID: 1408492

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1176024001, 1176024002, 1176024003, 1176024004

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	76.2	60-120		%

Batch Information

Analytical Batch: XFC13740
 Analytical Method: AK102
 Instrument: Agilent 7890B F
 Analyst: JMG
 Analytical Date/Time: 8/31/2017 10:59:00AM

Prep Batch: XXX38284
 Prep Method: SW3520C
 Prep Date/Time: 8/28/2017 8:55:33AM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176024 [XXX38284]
 Blank Spike Lab ID: 1408493
 Date Analyzed: 08/31/2017 11:10

Spike Duplicate ID: LCSD for HBN 1176024 [XXX38284]
 Spike Duplicate Lab ID: 1408494
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176024001, 1176024002, 1176024003, 1176024004

Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	20	18.7	94	20	18.5	92	(75-125)	1.30	(< 20)

Surrogates

5a Androstane (surr)	0.4	101	101	0.4	101	101	(60-120)	0.81	
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Batch Information

Analytical Batch: **XFC13740**
 Analytical Method: **AK102**
 Instrument: **Agilent 7890B F**
 Analyst: **JMG**

Prep Batch: **XXX38284**
 Prep Method: **SW3520C**
 Prep Date/Time: **08/28/2017 08:55**
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Method Blank

Blank ID: MB for HBN 1767040 [XXX/38284]
 Blank Lab ID: 1408492

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1176024001, 1176024002, 1176024003, 1176024004

Results by AK103

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Residual Range Organics	0.178J	0.500	0.150	mg/L
Surrogates				
n-Triacontane-d62 (surr)	95.1	60-120		%

Batch Information

Analytical Batch: XFC13740
 Analytical Method: AK103
 Instrument: Agilent 7890B F
 Analyst: JMG
 Analytical Date/Time: 8/31/2017 10:59:00AM

Prep Batch: XXX38284
 Prep Method: SW3520C
 Prep Date/Time: 8/28/2017 8:55:33AM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176024 [XXX38284]
 Blank Spike Lab ID: 1408493
 Date Analyzed: 08/31/2017 11:10

Spike Duplicate ID: LCSD for HBN 1176024
 [XXX38284]
 Spike Duplicate Lab ID: 1408494
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176024001, 1176024002, 1176024003, 1176024004

Results by AK103

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Residual Range Organics	20	20.0	100	20	19.4	97	(60-120)	2.90	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	0.4	96.2	96	0.4	96.8	97	(60-120)	0.63	

Batch Information

Analytical Batch: **XFC13740**
 Analytical Method: **AK103**
 Instrument: **Agilent 7890B F**
 Analyst: **JMG**

Prep Batch: **XXX38284**
 Prep Method: **SW3520C**
 Prep Date/Time: **08/28/2017 08:55**
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL



SGS North America
CHAIN OF CUSTODY

1176024



- Locations Nationwide
- Alaska
- Maryland
- New Jersey
- North Carolina
- West Virginia
- Indiana
- Kentucky

WWW.US.SGS.COM

CLIENT: MICHAEL BAKER INTL.
 CONTACT: JEN GILLENWATER
 PHONE NO: 949-246-2953
 PROJECT PWSID/ PERMIT#: 161687
 NAME: ASDP WQ
 E-MAIL: JEN.GILLENWATER@MBAORIENTAL.COM
 REPORTS TO: JEN GILLENWATER
 QUOTE #: 338722
 INVOICE TO: MICHAEL BAKER INTL.
 P.O. #:

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Section 1

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX MATRIX CODE	#	Type	CONTAINERS	Section 3	Section 4	DOD Project?	Yes	No	Data Deliverable Requirements:
①	A-C M9313	8/23/17	10:05	WATER	3	G	3	✓ HCL ✓ RCRA METAL					
②	A-C M9313 DUP	8/23/17	10:10	WATER	3	G	3	✓ DRO/BRO ✓ S/G					
③	A-C L9323	8/23/17	11:00	WATER	3	G	3						
④	A-C L9324	8/23/17	15:30	WATER	3	G	3						

Section 2

Section 3

Section 4

Section 5

Requested Turnaround Time and/or Special Instructions:
 proceed per client request
 Temp Blank °C: 6.9 #020
 or Ambient []
 Chain of Custody/Seal: (Circle)
 HAND DELIVERED
 INTACT
 BROKEN
 ABSENT
 (See attached Sample Receipt Form)

Received For Laboratory By: [Signature]



e-Sample Receipt Form

SGS Workorder #:

1176024



1 1 7 6 0 2 4

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		
Were Custody Seals intact? Note # & location	N/A	Absent
COC accompanied samples?	Yes	
No **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	No	Cooler ID: 1 @ 6.9 °C Therm. ID: D20
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	No	Proceed per client request
If <0°C, were sample containers ice free?	N/A	
If samples received <u>without</u> 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".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		
Were samples received within holding time?	Yes	Note: Refer to form F-083 "Sample Guide" for specific holding times.
Do samples match COC ** (i.e., sample IDs, dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	No	Insufficient volume for silica gel clean up method. Logged in for DRO/RRO only per Forest Taylor.
Were proper containers (type/mass/volume/preservative***) used?	Yes	N/A ***Exemption permitted for metals (e.g.200.8/6020A).
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1176024001-A	HCL to pH < 2	OK			
1176024001-B	HCL to pH < 2	OK			
1176024001-C	HNO3 to pH < 2	OK			
1176024002-A	HCL to pH < 2	OK			
1176024002-B	HCL to pH < 2	OK			
1176024002-C	HNO3 to pH < 2	OK			
1176024003-A	HCL to pH < 2	OK			
1176024003-B	HCL to pH < 2	OK			
1176024003-C	HNO3 to pH < 2	OK			
1176024004-A	HCL to pH < 2	OK			
1176024004-B	HCL to pH < 2	OK			
1176024004-C	HNO3 to pH < 2	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM- The container was received damaged.

FR- The container was received frozen and not usable for Bacteria or BOD analyses.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.



A.2 LABORATORY REPORT 1176481 – SEPTEMBER 11, 2017 SAMPLING EVENT



Laboratory Report of Analysis

To: Michael Baker International

,
(949)246-2953

Report Number: **1176481**

Client Project: **ASDP WQ 161682**

Dear Jen Gillenwater,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Forest at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Forest Taylor
Project Manager
Forest.Taylor@sgs.com

Date

Print Date: 09/27/2017 4:55:12PM

SGS North America Inc. | 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Member of SGS Group

Case Narrative

SGS Client: **Michael Baker International**

SGS Project: **1176481**

Project Name/Site: **ASDP WQ 161682**

Project Contact: **Jen Gillenwater**

Refer to sample receipt form for information on sample condition.

1176547002(1412754MS) (1412755) MS

6020A - Metals MS recovery for manganese (83.2%) does not meet QC criteria. The post digestion spike was successful.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 09/27/2017 4:55:19PM

Laboratory Qualifiers

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. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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) for which SGS North America Inc. is Provisionally Certified as of 9/21/2017 & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 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/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
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.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
M9313	1176481001	09/11/2017	09/12/2017	Water (Surface, Eff., Ground)
M9313 Dup	1176481002	09/11/2017	09/12/2017	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
AK102	Diesel/Residual Range Organics w/ Silica
AK103	Diesel/Residual Range Organics w/ Silica
AK102	Diesel/Residual Range Organics Water
AK103	Diesel/Residual Range Organics Water
SW6020A	Metals by ICP-MS

Print Date: 09/27/2017 4:55:26PM

Detectable Results Summary

Client Sample ID: **M9313**
 Lab Sample ID: 1176481001

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Barium	213	ug/L

Client Sample ID: **M9313 Dup**
 Lab Sample ID: 1176481002

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Barium	202	ug/L



Results of M9313

Client Sample ID: **M9313**
Client Project ID: **ASDP WQ 161682**
Lab Sample ID: 1176481001
Lab Project ID: 1176481

Collection Date: 09/11/17 17:14
Received Date: 09/12/17 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Arsenic	5.00 U	5.00	1.50	ug/L	5		09/15/17 19:03
Barium	213	3.00	0.940	ug/L	5		09/15/17 19:03
Cadmium	2.00 U	2.00	0.620	ug/L	5		09/15/17 19:03
Chromium	4.00 U	4.00	1.30	ug/L	5		09/15/17 19:03
Lead	1.00 U	1.00	0.310	ug/L	5		09/15/17 19:03
Mercury	0.200 U	0.200	0.0620	ug/L	5		09/15/17 19:03
Selenium	20.0 U	20.0	6.20	ug/L	5		09/15/17 19:03
Silver	2.00 U	2.00	0.620	ug/L	5		09/15/17 19:03

Batch Information

Analytical Batch: MMS9937
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 09/15/17 19:03
Container ID: 1176481001-C

Prep Batch: MXX31041
Prep Method: SW3010A
Prep Date/Time: 09/14/17 13:15
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Print Date: 09/27/2017 4:55:31PM

Results of M9313

Client Sample ID: **M9313**
 Client Project ID: **ASDP WQ 161682**
 Lab Sample ID: 1176481001
 Lab Project ID: 1176481

Collection Date: 09/11/17 17:14
 Received Date: 09/12/17 12:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	1.28 U	1.28	0.383	mg/L	1		09/23/17 15:55

Surrogates

5a Androstane (surr)	89.6	50-150		%	1		09/23/17 15:55
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Batch Information

Analytical Batch: XFC13827
 Analytical Method: AK102
 Analyst: JMG
 Analytical Date/Time: 09/23/17 15:55
 Container ID: 1176481001-A

Prep Batch: XXX38484
 Prep Method: SW3520C
 Prep Date/Time: 09/21/17 07:49
 Prep Initial Wt./Vol.: 940 mL
 Prep Extract Vol: 2 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	1.06 U	1.06	0.319	mg/L	1		09/23/17 15:55

Surrogates

n-Triacontane-d62 (surr)	92.6	50-150		%	1		09/23/17 15:55
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Batch Information

Analytical Batch: XFC13827
 Analytical Method: AK103
 Analyst: JMG
 Analytical Date/Time: 09/23/17 15:55
 Container ID: 1176481001-A

Prep Batch: XXX38484
 Prep Method: SW3520C
 Prep Date/Time: 09/21/17 07:49
 Prep Initial Wt./Vol.: 940 mL
 Prep Extract Vol: 2 mL



Results of M9313

Client Sample ID: M9313
Client Project ID: ASDP WQ 161682
Lab Sample ID: 1176481001
Lab Project ID: 1176481

Collection Date: 09/11/17 17:14
Received Date: 09/12/17 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels Department, Silica G

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include DRO Silica Gel and Surrogates (5a Androstane (surr)).

Batch Information

Analytical Batch: XFC13828
Analytical Method: AK102-
Analyst: JMG
Analytical Date/Time: 09/23/17 16:26
Container ID: 1176481001-A

Prep Batch: XXX38485
Prep Method: SW3520C-SG
Prep Date/Time: 09/21/17 07:49
Prep Initial Wt./Vol.: 940 mL
Prep Extract Vol: 2 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include RRO Silica Gel and Surrogates (n-Triacontane-d62 (surr)).

Batch Information

Analytical Batch: XFC13828
Analytical Method: AK103-
Analyst: JMG
Analytical Date/Time: 09/23/17 16:26
Container ID: 1176481001-A

Prep Batch: XXX38485
Prep Method: SW3520C-SG
Prep Date/Time: 09/21/17 07:49
Prep Initial Wt./Vol.: 940 mL
Prep Extract Vol: 2 mL

Print Date: 09/27/2017 4:55:31PM



Results of M9313 Dup

Client Sample ID: **M9313 Dup**
Client Project ID: **ASDP WQ 161682**
Lab Sample ID: 1176481002
Lab Project ID: 1176481

Collection Date: 09/11/17 17:24
Received Date: 09/12/17 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Arsenic	5.00 U	5.00	1.50	ug/L	5		09/15/17 19:45
Barium	202	3.00	0.940	ug/L	5		09/15/17 19:45
Cadmium	2.00 U	2.00	0.620	ug/L	5		09/15/17 19:45
Chromium	4.00 U	4.00	1.30	ug/L	5		09/15/17 19:45
Lead	1.00 U	1.00	0.310	ug/L	5		09/15/17 19:45
Mercury	0.200 U	0.200	0.0620	ug/L	5		09/15/17 19:45
Selenium	20.0 U	20.0	6.20	ug/L	5		09/15/17 19:45
Silver	2.00 U	2.00	0.620	ug/L	5		09/15/17 19:45

Batch Information

Analytical Batch: MMS9937
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 09/15/17 19:45
Container ID: 1176481002-C

Prep Batch: MXX31041
Prep Method: SW3010A
Prep Date/Time: 09/14/17 13:15
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Print Date: 09/27/2017 4:55:31PM



Results of M9313 Dup

Client Sample ID: M9313 Dup
Client Project ID: ASDP WQ 161682
Lab Sample ID: 1176481002
Lab Project ID: 1176481

Collection Date: 09/11/17 17:24
Received Date: 09/12/17 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Diesel Range Organics, 1.29 U, 1.29, 0.387, mg/L, 1, 09/23/17 16:05

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 5a Androstane (surr), 93.9, 50-150, %, 1, 09/23/17 16:05

Batch Information

Analytical Batch: XFC13827
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 09/23/17 16:05
Container ID: 1176481002-A

Prep Batch: XXX38484
Prep Method: SW3520C
Prep Date/Time: 09/21/17 07:49
Prep Initial Wt./Vol.: 930 mL
Prep Extract Vol: 2 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Residual Range Organics, 1.08 U, 1.08, 0.323, mg/L, 1, 09/23/17 16:05

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: n-Triacontane-d62 (surr), 96.7, 50-150, %, 1, 09/23/17 16:05

Batch Information

Analytical Batch: XFC13827
Analytical Method: AK103
Analyst: JMG
Analytical Date/Time: 09/23/17 16:05
Container ID: 1176481002-A

Prep Batch: XXX38484
Prep Method: SW3520C
Prep Date/Time: 09/21/17 07:49
Prep Initial Wt./Vol.: 930 mL
Prep Extract Vol: 2 mL

Print Date: 09/27/2017 4:55:31PM



Results of M9313 Dup

Client Sample ID: M9313 Dup
Client Project ID: ASDP WQ 161682
Lab Sample ID: 1176481002
Lab Project ID: 1176481

Collection Date: 09/11/17 17:24
Received Date: 09/12/17 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels Department, Silica G

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include DRO Silica Gel and Surrogates (5a Androstane (surr)).

Batch Information

Analytical Batch: XFC13828
Analytical Method: AK102-
Analyst: JMG
Analytical Date/Time: 09/23/17 16:37
Container ID: 1176481002-A

Prep Batch: XXX38485
Prep Method: SW3520C-SG
Prep Date/Time: 09/21/17 07:49
Prep Initial Wt./Vol.: 930 mL
Prep Extract Vol: 2 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include RRO Silica Gel and Surrogates (n-Triacontane-d62 (surr)).

Batch Information

Analytical Batch: XFC13828
Analytical Method: AK103-
Analyst: JMG
Analytical Date/Time: 09/23/17 16:37
Container ID: 1176481002-A

Prep Batch: XXX38485
Prep Method: SW3520C-SG
Prep Date/Time: 09/21/17 07:49
Prep Initial Wt./Vol.: 930 mL
Prep Extract Vol: 2 mL

Print Date: 09/27/2017 4:55:31PM

Method Blank

Blank ID: MB for HBN 1768284 [MXX/31041]
 Blank Lab ID: 1412752

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1176481001, 1176481002

Results by SW6020A

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Arsenic	2.50U	5.00	1.50	ug/L
Barium	1.50U	3.00	0.940	ug/L
Cadmium	1.00U	2.00	0.620	ug/L
Chromium	2.08J	4.00	1.30	ug/L
Lead	0.500U	1.00	0.310	ug/L
Mercury	0.100U	0.200	0.0620	ug/L
Selenium	10.0U	20.0	6.20	ug/L
Silver	1.00U	2.00	0.620	ug/L

Batch Information

Analytical Batch: MMS9937
 Analytical Method: SW6020A
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/15/2017 6:27:28PM

Prep Batch: MXX31041
 Prep Method: SW3010A
 Prep Date/Time: 9/14/2017 1:15:28PM
 Prep Initial Wt./Vol.: 25 mL
 Prep Extract Vol: 25 mL

Print Date: 09/27/2017 4:55:44PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176481 [MXX31041]
 Blank Spike Lab ID: 1412753
 Date Analyzed: 09/15/2017 18:32

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176481001, 1176481002

Results by SW6020A

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Arsenic	1000	993	99	(84-116)
Barium	1000	979	98	(86-114)
Cadmium	100	98.1	98	(87-115)
Chromium	400	399	100	(85-116)
Lead	1000	1020	102	(88-115)
Mercury	10	9.85	99	(70-124)
Selenium	1000	966	97	(80-120)
Silver	100	99.8	100	(85-116)

Batch Information

Analytical Batch: **MMS9937**
 Analytical Method: **SW6020A**
 Instrument: **Perkin Elmer Nexlon P5**
 Analyst: **ACF**

Prep Batch: **MXX31041**
 Prep Method: **SW3010A**
 Prep Date/Time: **09/14/2017 13:15**
 Spike Init Wt./Vol.: 1000 ug/L Extract Vol: 25 mL
 Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1412754
 MS Sample ID: 1412755 MS
 MSD Sample ID: 1412756 MSD

Analysis Date: 09/15/2017 18:36
 Analysis Date: 09/15/2017 18:41
 Analysis Date: 09/15/2017 18:45
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176481001, 1176481002

Results by SW6020A

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Arsenic	2.50U	1000	978	98	1000	999	100	84-116	2.09	(< 20)
Barium	83.2	1000	1070	99	1000	1060	98	86-114	1.08	(< 20)
Cadmium	1.00U	100	101	101	100	99.5	100	87-115	1.42	(< 20)
Chromium	2.89J	400	399	99	400	404	100	85-116	1.34	(< 20)
Lead	0.500U	1000	1040	104	1000	1010	101	88-115	1.97	(< 20)
Mercury	0.100U	10.0	10.4	104	10.0	10.2	102	70-124	1.93	(< 20)
Selenium	10.0U	1000	966	97	1000	975	98	80-120	0.91	(< 20)
Silver	1.00U	100	106	106	100	100	100	85-116	5.20	(< 20)

Batch Information

Analytical Batch: MMS9937
 Analytical Method: SW6020A
 Instrument: Perkin Elmer NexIon P5
 Analyst: ACF
 Analytical Date/Time: 9/15/2017 6:41:00PM

Prep Batch: MX31041
 Prep Method: 3010 H2O Digest for Metals ICP-MS
 Prep Date/Time: 9/14/2017 1:15:28PM
 Prep Initial Wt./Vol.: 25.00mL
 Prep Extract Vol: 25.00mL



Method Blank

Blank ID: MB for HBN 1768879 [XXX/38484]

Blank Lab ID: 1414674

QC for Samples:

1176481001, 1176481002

Matrix: Water (Surface, Eff., Ground)

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.600U	1.20	0.360	mg/L
Surrogates				
5a Androstane (surr)	90.1	60-120		%

Batch Information

Analytical Batch: XFC13827

Analytical Method: AK102

Instrument: Agilent 7890B F

Analyst: JMG

Analytical Date/Time: 9/23/2017 3:24:00PM

Prep Batch: XXX38484

Prep Method: SW3520C

Prep Date/Time: 9/21/2017 7:49:15AM

Prep Initial Wt./Vol.: 1000 mL

Prep Extract Vol: 2 mL

Print Date: 09/27/2017 4:55:49PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176481 [XXX38484]
 Blank Spike Lab ID: 1414675
 Date Analyzed: 09/23/2017 15:34

Spike Duplicate ID: LCSD for HBN 1176481
 [XXX38484]
 Spike Duplicate Lab ID: 1414676
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176481001, 1176481002

Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	10	9.94	99	10	9.89	99	(75-125)	0.48	(< 20)

Surrogates

5a Androstane (surr)	0.2	101	101	0.2	103	103	(60-120)	1.60	
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Batch Information

Analytical Batch: **XFC13827**
 Analytical Method: **AK102**
 Instrument: **Agilent 7890B F**
 Analyst: **JMG**

Prep Batch: **XXX38484**
 Prep Method: **SW3520C**
 Prep Date/Time: **09/21/2017 07:49**
 Spike Init Wt./Vol.: 10 mg/L Extract Vol: 2 mL
 Dupe Init Wt./Vol.: 10 mg/L Extract Vol: 2 mL

Print Date: 09/27/2017 4:55:51PM

Method Blank

Blank ID: MB for HBN 1768879 [XXX/38484]

Blank Lab ID: 1414674

QC for Samples:

1176481001, 1176481002

Matrix: Water (Surface, Eff., Ground)

Results by AK103

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Residual Range Organics	0.500U	1.00	0.300	mg/L
Surrogates				
n-Triacontane-d62 (surr)	92.4	60-120		%

Batch Information

Analytical Batch: XFC13827

Analytical Method: AK103

Instrument: Agilent 7890B F

Analyst: JMG

Analytical Date/Time: 9/23/2017 3:24:00PM

Prep Batch: XXX38484

Prep Method: SW3520C

Prep Date/Time: 9/21/2017 7:49:15AM

Prep Initial Wt./Vol.: 1000 mL

Prep Extract Vol: 2 mL

Print Date: 09/27/2017 4:55:52PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176481 [XXX38484]
 Blank Spike Lab ID: 1414675
 Date Analyzed: 09/23/2017 15:34

Spike Duplicate ID: LCSD for HBN 1176481
 [XXX38484]
 Spike Duplicate Lab ID: 1414676
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176481001, 1176481002

Results by AK103

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Residual Range Organics	10	9.32	93	10	9.26	93	(60-120)	0.66	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	0.2	94.9	95	0.2	101	101	(60-120)	6.20	

Batch Information

Analytical Batch: **XFC13827**
 Analytical Method: **AK103**
 Instrument: **Agilent 7890B F**
 Analyst: **JMG**

Prep Batch: **XXX38484**
 Prep Method: **SW3520C**
 Prep Date/Time: **09/21/2017 07:49**
 Spike Init Wt./Vol.: 10 mg/L Extract Vol: 2 mL
 Dupe Init Wt./Vol.: 10 mg/L Extract Vol: 2 mL

Print Date: 09/27/2017 4:55:54PM

Method Blank

Blank ID: MB for HBN 1768881 [XXX/38485]

Blank Lab ID: 1414681

QC for Samples:

1176481001, 1176481002

Matrix: Water (Surface, Eff., Ground)

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
DRO Silica Gel	0.600U	1.20	0.360	mg/L
Surrogates				
5a Androstane (surr)	79.1	70-125		%

Batch Information

Analytical Batch: XFC13828

Analytical Method: AK102

Instrument: Agilent 7890B R

Analyst: JMG

Analytical Date/Time: 9/23/2017 3:55:00PM

Prep Batch: XXX38485

Prep Method: SW3520C

Prep Date/Time: 9/21/2017 7:49:12AM

Prep Initial Wt./Vol.: 1000 mL

Prep Extract Vol: 2 mL

Print Date: 09/27/2017 4:55:55PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176481 [XXX38485]
 Blank Spike Lab ID: 1414682
 Date Analyzed: 09/23/2017 16:05

Spike Duplicate ID: LCSD for HBN 1176481 [XXX38485]
 Spike Duplicate Lab ID: 1414683
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176481001, 1176481002

Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
DRO Silica Gel	10	8.75	88	10	9.03	90	(70-125)	3.10	(< 20)
Surrogates									
5a Androstane (surr)	0.2	95.2	95	0.2	100	100	(70-125)	5.10	

Batch Information

Analytical Batch: **XFC13828**
 Analytical Method: **AK102**
 Instrument: **Agilent 7890B R**
 Analyst: **JMG**

Prep Batch: **XXX38485**
 Prep Method: **SW3520C**
 Prep Date/Time: **09/21/2017 07:49**
 Spike Init Wt./Vol.: 10 mg/L Extract Vol: 2 mL
 Dupe Init Wt./Vol.: 10 mg/L Extract Vol: 2 mL

Method Blank

Blank ID: MB for HBN 1768881 [XXX/38485]

Blank Lab ID: 1414681

QC for Samples:

1176481001, 1176481002

Matrix: Water (Surface, Eff., Ground)

Results by AK103

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
RRO Silica Gel	0.500U	1.00	0.300	mg/L
Surrogates				
n-Triacontane-d62 (surr)	88.3	70-125		%

Batch Information

Analytical Batch: XFC13828

Analytical Method: AK103

Instrument: Agilent 7890B R

Analyst: JMG

Analytical Date/Time: 9/23/2017 3:55:00PM

Prep Batch: XXX38485

Prep Method: SW3520C

Prep Date/Time: 9/21/2017 7:49:12AM

Prep Initial Wt./Vol.: 1000 mL

Prep Extract Vol: 2 mL

Print Date: 09/27/2017 4:56:00PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176481 [XXX38485]
 Blank Spike Lab ID: 1414682
 Date Analyzed: 09/23/2017 16:05

Spike Duplicate ID: LCSD for HBN 1176481 [XXX38485]
 Spike Duplicate Lab ID: 1414683
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176481001, 1176481002

Results by AK103

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
RRO Silica Gel	10	8.38	84	10	8.96	90	(70-125)	6.70	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	0.2	93.8	94	0.2	101	101	(70-125)	7.60	

Batch Information

Analytical Batch: **XFC13828**
 Analytical Method: **AK103**
 Instrument: **Agilent 7890B R**
 Analyst: **JMG**

Prep Batch: **XXX38485**
 Prep Method: **SW3520C**
 Prep Date/Time: **09/21/2017 07:49**
 Spike Init Wt./Vol.: 10 mg/L Extract Vol: 2 mL
 Dupe Init Wt./Vol.: 10 mg/L Extract Vol: 2 mL



SGS North America Inc.
CHAIN OF CUSTODY RECORD

1176481



CLIENT: Michael Baker Intl CONTACT: Jenn Gillenwater PROJECT: ASDP WQ NAME: 161682 REPORTS TO: Jenn Gillenwater E-MAIL: Jen.Gillenwater@mbakerintl.com INVOICE TO: Michael Baker International QUOTE #: 338422 P.O. #:		PHONE NO: 907-273-1684 PROJECT/ PWSID/ PERMIT#: 161682 E-MAIL: Jen.Gillenwater@mbakerintl.com QUOTE #: 338422 P.O. #:		Section 3 # CONTAINERS Type C = COMP G = GRAB M = Multi I = Incre-mental S = Soils		Section 4 DOD Project? Yes No Cooler ID: Requested Turnaround Time and/or Special Instructions:		Section 5 Relinquished By: (1) Brian Gutzwiller Relinquished By: (2) Relinquished By: (3) Relinquished By: (4)		Section 2 MATRIX/ MATRIX CODE TIME HH:MM DATE mm/dd/yy SAMPLE IDENTIFICATION RESERVED for lab use		Section 1 Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis. Preservative HCL HNO3 DRD/RRO w/56 cleanup RCRA Metal REMARKS/ LOC ID Page ___ of ___		Data Deliverable Requirements: Chain of Custody Seal: (Circle) INTACT <input checked="" type="radio"/> BROKEN <input type="radio"/> ABSENT <input type="radio"/> Temp Blank °C: 0.1 #PZ4 or Ambient [] (See attached Sample Receipt Form)	
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[] 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

<http://www.sgs.com/terms-and-conditions>



e-Sample Receipt Form

SGS Workorder #:

1176481



1 1 7 6 4 8 1

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements	N/A	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	Yes	1 Front
COC accompanied samples?	Yes	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 0.1 °C Therm. ID: D24
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	No	Sample 1B for DRO/RRO was received with ice in the container.
<p>If samples received <u>without</u> 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".</p> <p>Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.</p>		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples match COC ** (i.e., sample IDs, dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	Yes	
Were proper containers (type/mass/volume/preservative***) used?	Yes	N/A ***Exemption permitted for metals (e.g. 200.8/6020A).
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1176481001-A	HCL to pH < 2	OK			
1176481001-B	HCL to pH < 2	OK			
1176481001-C	HNO3 to pH < 2	OK			
1176481002-A	HCL to pH < 2	OK			
1176481002-B	HCL to pH < 2	OK			
1176481002-C	HNO3 to pH < 2	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM- The container was received damaged.

FR- The container was received frozen and not usable for Bacteria or BOD analyses.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.