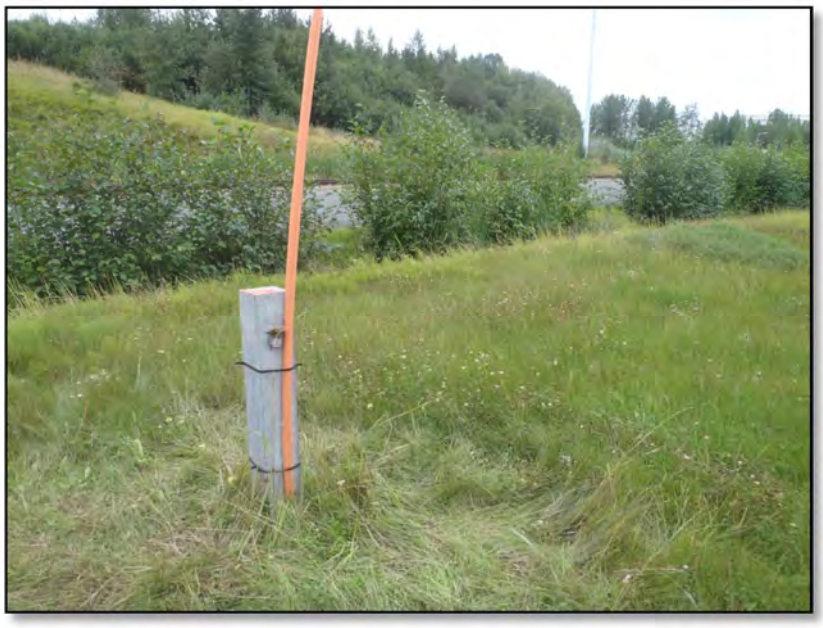
2016 Annual Monitoring Report
Former Defense Fuel Support Point–Anchorage
Port of Anchorage, Alaska



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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
-dup	duplicate sample designation
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
btoc	below top of casing
DFSP-A	Defense Fuel Support Point (Anchorage)
DL	detection limit
DRO	diesel-range organics
FTFA	Former Tidal Flats Area
GRO	gasoline-range organics
IDW	investigation derived waste
LCS	laboratory control spike
LCSD	laboratory control spike duplicate
LOQ	limit of quantitation
MB	method blank
mg/L	milligrams per liter
MW	monitoring well
ND	non-detect (above the limit of detection)
NS	not sampled
PAH	polycyclic aromatic hydrocarbons
Port	Port of Anchorage
R&M	R&M Consultants, Inc.
ROD	record of decision
RPD	relative percent difference
SDA	Slope Deposits Area
SGS	SGS North America, Inc.
TAH	total aromatic hydrocarbons
TAqH	total aqueous hydrocarbons
TB	trip blank
toc	top of casing
TSDF	treatment, storage, and disposal facilities
UBA	Upper Bluff Area
USGS	U.S. Geological Society

EXECUTIVE SUMMARY

Groundwater and surface water monitoring activities were conducted from 18 to 19 August 2016 by R&M Consultants, Inc. (R&M) at the Former Defense Fuel Support Point – Anchorage (DFSP-A) in Anchorage, Alaska. Monitoring included collecting groundwater samples from six monitoring wells and two surface water locations. Groundwater samples were analyzed for gasoline-range organics (GRO), diesel-range organics (DRO), and benzene, toluene, ethylbenzene, and xylenes (BTEX). The surface water samples were analyzed for BTEX and polycyclic aromatic hydrocarbons (PAH) to allow calculation of total aromatic hydrocarbons (TAH) and total aqueous hydrocarbons (TAqH) values.

Annual monitoring for 2016 was designed to meet the following field objectives based on the 2008 work plan and 2003 Record of Decision (ROD) (MLF, 2008 and ADEC, 2003):

- Collect and analyze groundwater samples from the eight monitoring wells and three surface water locations as identified in the ROD.
- Assess the current groundwater flow direction.
- Compare 2016 results and results from previous sampling events with the ROD specified cleanup levels.

Two monitoring wells (MW4-R and MW25C) were not sampled due to insufficient water and/or recharge at the time of sampling.

BACKGROUND

The DFSP-A site served as a bulk fuel storage and distribution facility from 1942 until 1996. Several releases of diesel, gasoline, and aviation fuels were documented at the DFSP-A between 1960 and 1989, and the DFSP-A is listed in ADEC's Contaminated Sites Database under File #2102.38.021 (Record Key # 1988-21-X1-119-01).

GROUNDWATER ANALYTICAL RESULTS

Groundwater results are summarized in the following text and in Table ES-1 following the text summary.

Benzene was detected in groundwater collected from monitoring well MW15-R at 0.459 mg/L in exceedance of the cleanup level of 0.05 mg/L. Detected concentrations of benzene from monitoring wells MW25A and MW25B were below the cleanup level. Toluene, ethylbenzene, and total xylenes were detected in samples from monitoring wells MW15-R, MW25A, and MW25B at concentrations below the cleanup levels. The sample from monitoring well MW23 had detectable levels of toluene and total xylenes that were below the cleanup level.

Detected concentrations of GRO were below the cleanup level of 13 mg/L in samples from monitoring wells MW2-R, MW15-R, MW22, MW23, MW25A, and MW25B.

DRO was detected above the cleanup level of 15 mg/L in the sample from monitoring well MW25B at 27.2 mg/L. Results for samples from monitoring wells MW2-R, MW15-R, MW23, and MW25A had detectable concentrations of DRO that were below the cleanup level. DRO was not detected in the sample from monitoring well MW22.

TABLE ES-1: 2016 SUMMARIZED GROUNDWATER ANALYTICAL RESULTS

Monitoring Well ID	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
Cleanup Levels[1]	--	0.05	10	7	100	13	15
MW2-R	8/18/2016	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	0.185	0.500 J
MW4-R	8/19/2016	NS	NS	NS	NS	NS	NS
MW15-R	8/19/2016	**0.459**	0.0155	0.699	1.07	3.97	3.89
MW15-R-dup	8/19/2016	**0.455**	0.0150	0.690	1.06	3.93	3.18
MW22	8/18/2016	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	0.134	ND (0.603)
MW23	8/18/2016	ND (0.0004)	0.000740 J	ND (0.001)	0.000510 J	1.17	1.74
MW25A	8/19/2016	0.00534	0.000510 J	0.0375	0.0599	0.858	5.07
MW25B	8/19/2016	0.0125	0.000690 J	0.0982	0.110	1.22	**27.2**
MW25C	8/18/2016	NS	NS	NS	NS	NS	NS

NOTES:
J = estimated value as the detection was below the limit of quantitation but above the limit of detection.
mg/L = milligrams per liter
ND = non-detect above the limit of detection (in parentheses).
NS = not sampled in 2016 (insufficient water or recharge)
Results exceeding a cleanup level are highlighted in red and are **BOLD**.
1 Site specific cleanup levels were designated in the 2003 ROD (ADEC, 2003).

SURFACE WATER ANALYTICAL RESULTS

TAH and TAqH summations were below the cleanup levels of 0.01 and 0.015 mg/L for surface water sampling locations SS12 and SS14. Location SS04 remained dry and could not be sampled. Sheen was noted on surface water at the SS12 location.

CONCLUSIONS AND RECOMMENDATIONS

Groundwater and surface water results from the 2016 and previous sampling events appear to show an overall decreasing or steady concentration trend in samples from the monitoring well and surface water monitoring network. Sentry monitoring well locations (MW2-R, MW4-R, and MW23) have remained below the 2003 ROD cleanup levels for the target analytes during periodic monitoring between 2009 and 2016. Benzene consistently exceeds the cleanup level of 0.05 mg/L in monitoring well MW15-R at concentrations ranging from 0.236 to 0.59 mg/L. DRO has consistently exceeded the cleanup level of 15 mg/L in samples from monitoring well MW25B at concentrations ranging from 17.5 to 110 mg/L and has been below the cleanup level during two of the eight sampling events from 2009 to 2016. TAH and TAqH values have been below the cleanup levels since 2009 (beginning of this data set) for surface water location SS12 and since 2012 for surface water location SS14. Surface water location SS12 exceeded surface water quality standards (18 AAC 70) in 2015 and 2016 due to observed petroleum sheen. Formal analysis (Mann-Kendall statistical analysis) of trends related to contaminant levels is proposed as part of the planned 2016 or 2017 five-year review of the ROD. Groundwater conditions in the upper, unconfined aquifer continue to indicate flow generally moving from east to west across the site mimicking general topographic conditions.

R&M provides the following recommendations for the site:

- Perform a five-year review of the ROD in 2016 or 2017 and include a Mann-Kendall statistical analysis of existing groundwater and surface water data.
- Continue yearly sampling of the monitoring network until results from sampling locations are below cleanup levels for four consecutive sampling events as specified by the ROD.
- Repair or replace monitoring wells in the monitoring network.
    - Three monitoring wells need redevelopment or replacement and five wells need repair.
- Dispose of investigation derived waste (IDW) in accordance with Section 3.4 and Table 3-8.

2016 ANNUAL MONITORING REPORT
FORMER DEFENSE FUEL SUPPORT POINT – ANCHORAGE
PORT OF ANCHORAGE, ALASKA

1.0 INTRODUCTION

The Port of Anchorage (Port) retained R&M Consultants, Inc. (R&M) under Municipality of Anchorage contract number 2014POA103 to perform annual groundwater monitoring at the former Defense Fuel Support Point (DFSP-A) in Anchorage, Alaska. Sampling and analytical testing were performed in accordance with Updated Long-Term Monitoring Plan (MLF, 2008), the Record of Decision for Cleanup, Defense Fuel Support Point-Anchorage, U.S. Defense Energy Support Center (ADEC, 2003) issued by the Alaska Department of Environmental Conservation (ADEC) and subsequent communications with ADEC.

1.1 INVESTIGATION OBJECTIVES

Annual groundwater monitoring for 2016 was designed to meet the following field objectives based on the 2008 work plan and 2003 Record of Decision (ROD) (MLF, 2008 and ADEC, 2003):

- Collect and analyze groundwater samples from the eight monitoring wells and three surface water locations as identified in the ROD.
- Assess the current groundwater flow direction.
- Compare 2016 results and results from previous sampling events with the ROD specified cleanup levels.

1.2 BACKGROUND

The DFSP-A site served as a bulk fuel storage and distribution facility from 1942 until 1996. Several releases of diesel, gasoline, and aviation fuels were documented at the DFSP-A between 1960 and 1989, and the DFSP-A is listed in ADEC's Contaminated Sites Database under File #2102.38.021 (Record Key # 1988-21-X1-119-01).

1.3 WORK PLAN DEVIATIONS

A groundwater sample was not collected from monitoring well MW4-R due to insufficient recharge. Per ADEC Field Sampling Guidance, recharge needs to be at least 80 percent of the initial reading at the time of sampling, which corresponds to a water column of 6.74 feet in MW4-R when the water level was measured on 18 August 2016. Recharge of 0.3 feet in over 24 hours provided insufficient groundwater for sampling in addition to failing the recharge criteria.

A groundwater sample was not collected from monitoring well MW25C due insufficient water in the well to prime the submersible pump. The well is effectively dry for sampling activities, but a

water depth was obtained to evaluate the groundwater flow direction and collect water quality observations.

A surface water sample was not collected from surface water location SS04 as surface water no longer flows through the former DFSP-A site at this sampling location. As a result, surface water location SS04 is no longer a viable surface water sample location and has been deleted from this sampling program. ADEC concurred with this deviation via e-mail on 30 August 2011.

2.0 SETTING AND SITE CONDITIONS

2.1 SITE DESCRIPTION

The former DFSP-A site is located in the southeast corner of the Port within the Municipality of Anchorage, Alaska (Section 7, Township 13 North, Range 3 West, USGS Quadrangle Anchorage A-8 NW of the Seward Meridian). The site is located at 61.232903 degrees north and 149.879873 degrees west in North American Datum 1983 decimal degree coordinates based on the ADEC Contaminated Sites Program database listing for file number 2102.38.021. Property ownership was transferred from the Department of the Army to the Port in April 2011. General site location and monitoring well locations are shown on Drawing A-01.

2.2 TOPOGRAPHY AND SURFACE DRAINAGE

The site steeply slopes from east to west from the western side of the Government Hill to Cook Inlet. The DFSP-A site is divided into three areas based on topography; the Upper Bluff Area (UBA), the Former Tidal Flats Area (FTFA), and the Slope Deposits Area (SDA) (ADEC, 2003). The general characteristics of the three areas are described below; specific tank and building locations are identified in Figure 1 of the ROD.

> *"UBA: The UBA occupies the generally flat-lying ground at the higher elevations of the site. In the ROD, the forested northeastern portion of the site is included with the UBA although its topography differs from the remainder of the UBA. This is because the forest is potentially suitable to [recreational users]. There are currently no structures in this area. Two 2.1 million gallon fuel tanks (Tanks 20-616 and 20-617) and three large buildings have been removed from the UBA.*
>
> *FTFA: The FTFA occupies the generally flat-lying ground at the lower elevations of the site. The FTFA is in proximity to the surrounding Chevron, Tesoro, and Signature bulk fuel terminals. There are currently no structures in this area. A railcar loading rack, a truck loading rack, and an operation building have been removed from the FTFA.*
>
> *SDA: Excluding the forest, the SDA includes the remainder of the DFSP-A property that is best described as sloping topography situated between the UBA and FTFA. There are currently no structures in this area. Numerous fuel storage tanks, including two 2.1 million gallon tanks (20-618 and 20-619), four 546,000 gallon tanks (20-621, 20-622, 20-623, and 20-624), and ten aboveground storage tanks, a fuel transfer pumphouse (Building 20-517), a waste collection area, a drum dump area, a tank cleaning sludge dump area, and a hazardous materials storage area have been removed from the SDA."*

2.3 GENERAL GEOLOGY

Soils beneath the site were described in the ROD as follows (ADEC, 2003):

> *"Soils at DFSP-A typically consist of gravelly sand overlying clay. The gravelly sand, which is exposed over most of the site surface, is a relatively porous soil that was deposited as part of the Naptowne Outwash Formation. The Bootlegger Cove*

Formation clay is encountered beneath the outwash in borings and excavations that penetrate through the gravelly sand. The clay formation is a relatively impervious soil that forms a competent confining layer beneath the DFSP-A site. The Bootlegger Cove Formation was encountered as deep as 35 feet below ground surface (bgs) on the UBA, as shallow as 10 feet bgs on the FTFA, and near the surface north of former Tank 20-618."

2.4 GROUNDWATER CONDITIONS

Groundwater beneath the site was described in the ROD as follows (ADEC, 2003):

"Groundwater at the site occurs primarily in two zones: a deep confined aquifer below the Bootlegger Cove Formation and a near-surface unconfined aquifer perched above the Bootlegger Cove Formation clay. The deeper aquifer is artesian and not in direct communication with the shallow perched water. The movement of perched water generally mimics the surface topography and migration is towards surface drainages that typically discharge into Knik Arm. At DFSP-A, perched water underlies about two-thirds of the site, with greatest saturated thickness (up to 31 feet) along the eastern portion of the facility (ADEC, 2003)."

Based on measured groundwater elevations from 2009 to 2016, the perched groundwater table is located near the ground surface at monitoring wells MW4-R, MW15-R, MW-22, and MW-23. Perched groundwater is located approximately 40 feet bgs in the vicinity of monitoring wells MW25A, MW25B, and MW25C. Groundwater appears to generally flow to the west across the site.

2.5 CLIMATE

Based on climate data (1931 to 2012) recorded at the Anchorage Merrill Field, Alaska (500285) weather station near the DFSP-A site, the mean annual air temperature is 36 degrees Fahrenheit (°F), with minimum and maximum monthly averages of about 58 °F (July) and 12.7 °F (January), respectively. The area receives an average of 14.6 inches of precipitation per year, with a maximum monthly mean of approximately 2.6 inches in August (WRCC, 2016)

3.0 INVESTIGATION METHODS AND RESULTS

Groundwater and surface water samples were collected according to procedures specified by the work plan (MLF, 2008), correspondence with ADEC, the ROD (ADEC, 2003), and ADEC Field Sampling Guidance (ADEC, 2016b). Samples were submitted to SGS North America, Inc. in Anchorage, Alaska (SGS). SGS is an ADEC approved laboratory (#UST-005, expires 18 December 2016). Complete analytical results and Level 2 reports from SGS are included in Appendix D. Christopher D. Fell with R&M was the ADEC qualified environmental professional on site as required by 18 Alaska Administrative Code (AAC) 75 (ADEC, 2016a). Field notes from 2016 are provided in Appendix B. Groundwater purging and sampling forms are provided in Appendix C. Table 3-1 details the types of analyses performed by the analytical lab and the number of samples collected during this investigation.

TABLE 3-1: ANALYTICAL SUITE AND SAMPLES BY LOCATION

Sampling Locations	Analysis	Number Primary Samples	Number Duplicate Samples	Total Number Samples
MW2-R, MW15-R, MW22, MW23, MW25A, and MW25B	GRO (AK101) DRO (AK102) BTEX (SW8260B)	6	1	7
SS12 and SS14	BTEX (SW8260B) PAH (SW8270D SIM)[1]	2	1	3
MW4-R, MW25C, and SS04	No Samples Collected			

NOTES:
For definitions, see the Acronyms and Abbreviations table.
1 BTEX and PAH analysis performed to allow calculation of TAH and TAqH.

Investigation methods observations and analytical results from the 2016 groundwater sampling event are discussed in detail in the following sections. Sampling locations are shown on Drawing A-01.

3.1 GROUNDWATER INVESTIGATION AND OBSERVATIONS

The eight monitoring wells identified in the 2008 work plan were inspected for condition, had depth to groundwater measured, were purged if adequate water was present, and were sampled if purging and recharge met EPA and ADEC low-flow sampling guidelines (ADEC 2016b and Puls et. al., 1996). Components of the 2016 monitoring event are discussed in the following sections.

3.1.1 MONITORING WELL CONDITION ASSESSMENT

Initial site activities at each monitoring well involved a condition assessment which evaluated general well construction and performance along with the current status of monitoring wells, locks, plugs, and protective casings (Table 3-2).

TABLE 3-2: MONITORING WELL CONDITION NOTES

Monitoring Well Location	Date	Condition Notes	Action Items / Recommendations
MW2-R	8/18/2016	Locking well-plug (4-inch) is damaged and lock is missing. Casing needs to be trimmed to allow a locking cap to be fitted followed by re-survey. Protective casing (flush mount) is in good condition.	Replace well plug and lock. Trim casing and re-survey.
MW4-R	8/18/2016	Protective casing (stick-up) is in fair condition. Well runs dry when purging and recharges extremely slowly preventing sampling. Lock is damaged.	Replace lock. Re-develop or replace well.
MW15-R	8/19/2016	Well and components are in good condition. Lock is damaged.	Replace lock.
MW22	8/18/2016	Well and components are in ok condition. Lock is damaged.	Replace lock.
MW23	8/18/2016	No locking well plug present, lock is damaged. Well protective casing (stick-up) is loose and lid barely closes.	Replace well plug and lock.
MW25A	8/19/2016	Well and components are in good condition. Lock is damaged.	Replace lock.
MW25B	8/18/2016	Well and components are in good condition. Well runs dry when purging and recharges slowly. Lock is damaged.	Replace lock. Re-develop or replace well.
MW25C	8/18/2016	Well had a short column of water in 2016 and was dry in 2015 preventing sampling.	Replace well to a greater depth.

3.1.2 MONITORING WELL PURGING AND SAMPLING

Monitoring wells MW2-R, MW4-R, MW15-R, MW22, MW23, MW25A, and MW25B were purged of at least three well casing volumes using a Proactive SS Monsoon® stainless-steel submersible centrifugal pump equipped with 1/2-inch inside diameter Teflon lined polyethylene tubing. New tubing was utilized at each monitoring well location. The pump was decontaminated using an Alconox® wash followed by two distilled water rinses between well locations. Monitoring wells MW4-R and MW25C were not sampled due to insufficient water (See Section 1.3 for further information). Groundwater samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), gasoline-range organics (GRO), and diesel-range organics (DRO) (Table 3-1).

Purge volumes were calculated based on current water level measurements and casing depths measured in previous years. An interface probe was used to determine if free product was present in any of the monitoring wells. Well casings were sounded using the interface probe to measure current total depth after collection of samples to prevent agitation of any sediment located at the bottom of the well casing.

Following purging, samples were collected using the same pump and tubing used for purging. Monitoring well MW25B was sampled the day following purging to allow the well to recharge as it went dry during purging activities. The well had completely recharged at the time of sampling. Samples for all wells were collected into laboratory provided glassware and immediately placed in pre-chilled coolers following collection and labeling. Analytical results are discussed in Section 3.2.

Observations from each monitoring well are tabulated in Table 3-3 and groundwater elevation readings from 2009 to 2016 are provided in Table 3-4.

TABLE 3-3: GROUNDWATER CONDITION OBSERVATIONS

Monitoring Well Location	Sheen	Odor	Free Product Presence	Water Color (Purge Start)	Water Color (Purge End)
MW2-R	None	None	None	Clear	Clear
MW4-R	None	None	None	Clear	Clear
MW15-R	None	Petroleum	None	Light Brown	Clear
MW22	None	None	None	Clear	Clear
MW23	Slight Sheen	None	None	Light Brown	Clear
MW25A	Moderate Sheen	Petroleum	None	Clear	Clear
MW25B	Moderate Sheen	Petroleum	None	Light Grey	Light Grey
MW25C[1]	Moderate Sheen	Petroleum	None	Not Observed	Not Observed

NOTES:
Sheen descriptions are based on State of Washington Department of Ecology descriptions (Ecology, 2016).
1 Observations of groundwater in MW25C are based on water present on the water level indicator during collection of groundwater level data.

TABLE 3-4: CURRENT AND HISTORIC GROUNDWATER ELEVATIONS[1]

Monitoring Well Location	Date	Top of Casing (toc) Elevation (feet)[2]	Depth to Groundwater (feet btoc)	Groundwater Elevation (feet)
MW2-R	*8/18/2016*	*Not Available*[3]	*3.05*	*Not Available*
MW2-R	8/13/2015	Not Available[3]	3.51	Not Available
MW2-R	8/21/2014	36.87	4.12	33.75[4]
MW2-R	9/25/2013	36.87	2.25	34.62
MW2-R	8/28/2012	36.87	3.57	33.30
MW2-R	8/29/2011	36.87	3.43	33.44
MW2-R	8/25/2010	Not Available	3.85	Not Available
MW2-R	8/24/2009	Not Available	4.57	Not Available
MW4-R	*8/18/2016*	*44.07*	*3.98*	*40.09*
MW4-R	8/13/2015	44.07	4.20	39.87[(4)]
MW4-R	8/21/2014	44.07	3.95	40.12
MW4-R	9/25/2013	44.07	3.91	40.16
MW4-R	8/28/2012	44.07	4.41	39.66
MW4-R	8/29/2011	44.07	5.56	38.51
MW4-R	8/25/2010	Not Available	4.20	Not Available
MW4-R	8/24/2009	Not Available	5.77	Not Available
MW15-R	*8/19/2016*	*38.02*	*3.37*	*34.65*
MW15-R	8/14/2015	38.02	3.36	34.66[(4)]
MW15-R	8/21/2014	38.02	3.40	34.62
MW15-R	9/26/2013	38.02	2.17	35.85
MW15-R	8/28/2012	38.02	3.23	34.79
MW15-R	8/29/2011	38.02	3.28	34.74
MW15-R	8/25/2010	Not Available	4.06	Not Available
MW15-R	8/24/2009	Not Available	4.67	Not Available
MW22	*8/18/2016*	*84.98*	*3.17*	*81.81*
MW22	8/13/2015	84.98	3.38	81.60[(4)]
MW22	8/21/2014	84.98	3.11	81.87
MW22	9/26/2013	84.98	2.91	82.07
MW22	8/28/2012	84.98	2.93	82.05
MW22	8/29/2011	84.98	3.14	81.84
MW22	8/25/2010	Not Available	3.50	Not Available
MW22	8/24/2009	Not Available	4.25	Not Available
MW23	*8/18/2016*	*38.75*	*4.18*	*34.57*
MW23	8/13/2015	38.75	4.54	34.21[(4)]
MW23	8/21/2014	38.75	4.20	34.55
MW23	9/25/2013	38.75	3.68	35.07
MW23	8/28/2012	38.75	3.75	35.00
MW23	8/29/2011	38.75	3.97	34.78
MW23	8/25/2010	Not Available	3.85	Not Available
MW23	8/24/2009	Not Available	4.90	Not Available
MW25A	*8/19/2016*	*96.78*	*45.67*	*51.11*
MW25A	8/13/2015	96.78	46.39	50.39[(4)]
MW25A	8/21/2014	96.78	44.59	52.19
MW25A	9/26/2013	96.78	42.41	54.37
MW25A	8/28/2012	96.78	44.11	52.67
MW25A	8/29/2011	96.78	45.76	51.02
MW25A	8/25/2010	Not Available	45.25	Not Available
MW25A	8/24/2009	Not Available	46.82	Not Available
MW25B	*8/18/2016*	*93.69*	*42.19*	*51.50*
MW25B	8/14/2015	93.69	42.92	50.77[(4)]
MW25B	8/21/2014	93.69	41.12	52.57
MW25B	9/26/2013	93.69	38.92	54.77
MW25B	8/28/2012	93.69	41.81	51.88
MW25B	8/29/2011	93.69	42.29	51.40
MW25B	8/25/2010	Not Available	41.85	Not Available
MW25B	8/24/2009	Not Available	43.40	Not Available
MW25C	*8/18/2016*	*95.81*	*42.42*	*53.39*
MW25C	8/13/2015	95.81	DRY	DRY
MW25C	8/21/2014	95.81	41.62	54.19
MW25C	9/26/2013	95.81	39.36	56.45
MW25C	8/28/2012	95.81	41.12	54.69
MW25C	8/29/2011	95.81	42.50	53.31
MW25C	8/25/2010	Not Available	42.15	Not Available
MW25C	8/24/2009	Not Available	43.66	Not Available

NOTES:
For definitions, see the Acronyms and Abbreviations table. Data from the current year are italicized.
1 Data from 2009 to 2015 is after R&M, 2015; R&M, 2014; R&M, 2013; R&M, 2012; R&M, 2011; MLF, 2010; and MLF, 2009.
2 Wells were surveyed on 26 August 2011. Elevations are referenced to mean lower low water, based on U.S. Coast Guard and Geodetic Benchmark "Tidal 16."
3 Well was repaired in 2015 and needs to be resurveyed.
4 Groundwater elevation estimated based on above-grade location of casing at time of sampling.

3.2 GROUNDWATER ANALYTICAL RESULTS

Monitoring wells MW4-R and MW25C were not sampled in 2016 due to inadequate recovery and water volume following purging. Discussion of results from the remaining six monitoring wells is provided in the following paragraphs and Table 3-5.

Benzene was detected in groundwater collected from monitoring well MW15-R at 0.459 mg/L in exceedance of the cleanup level of 0.05 mg/L. Detected concentrations of benzene from monitoring wells MW25A and MW25B were below the cleanup level. Toluene, ethylbenzene, and total xylenes were detected in samples from monitoring wells MW15-R, MW25A, and MW25B at concentrations below cleanup levels. The sample from monitoring well MW23 had detectable levels of toluene and total xylenes that were below the cleanup levels.

Detected concentrations of GRO were below the cleanup level of 13 mg/L in all samples.

DRO was detected above the cleanup level of 15 mg/L in the sample from monitoring well MW25B at 27.2 mg/L. Results for samples from monitoring wells MW2-R, MW15-R, MW23, and MW25A had detectable concentrations of DRO that were below the cleanup level. DRO was not detected in the sample from monitoring well MW22.

Summarized groundwater analytical results from 2009 to 2016 are provided in Table 3-5. Complete analytical results from the 2016 sampling event are provided in Appendix D and in previous reports for data from 2009 to 2015 (R&M, 2015; R&M, 2014; R&M, 2013; R&M, 2012; R&M, 2011; MLF, 2010; and MLF, 2009).

TABLE 3-5: SUMMARIZED GROUNDWATER ANALYTICAL RESULTS[1]

Monitoring Well ID	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
Cleanup Levels[2]	--	**0.05**	**10**	**7**	**100**	**13**	**15**
MW2-R	*8/18/2016*	*ND (0.0004)*	*ND (0.001)*	*ND (0.001)*	*ND (0.003)*	*0.185*	*0.500 J*
MW2-R	8/13/2015	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	ND (0.625)
MW2-R	8/21/2014	ND (0.0005)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.050)	0.616
MW2-R	9/25/2013	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	ND (0.600)
MW2-R-dup	9/25/2013	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	ND (0.600)
MW2-R	8/28/2012	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	0.732
MW2-R	8/29/2011	ND (0.0005)	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	0.671
MW2-R	8/25/2010	ND (0.0005)	ND (0.002)	ND (0.002)	0.000110 J	ND (0.100)	1.04
MW2-R	8/24/2009	ND (0.0005)	ND (0.002)	ND (0.002)	0.000735 J	ND (0.100)	0.432 J
MW4-R	*8/19/2016*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
MW4-R	8/13/2015	0.00604	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	1.10
MW4-R	8/21/2014	0.00344	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.050)	2.72
MW4-R	9/26/2013	0.00354	Not Reported	ND (0.001)	ND (0.003)	ND (0.100)	2.55
MW4-R	8/29/2012	0.00325	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	3.43
MW4-R	8/30/2011	0.00401	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	2.72
MW4-R	8/25/2010	0.00828	ND (0.002)	ND (0.002)	ND (0.004)	0.0813 J	2.76
MW4-R	8/24/2009	0.00413	ND (0.002)	ND (0.002)	ND (0.004)	0.0376 J	0.915
MW15-R	*8/19/2016*	***0.459***	*0.0155*	*0.699*	*1.07*	*3.97*	*3.89*
MW15-R-dup	*8/19/2016*	***0.455***	*0.0150*	*0.690*	*1.06*	*3.93*	*3.18*
MW15-R	8/14/2015	**0.362**	0.0120	0.430	0.631	3.62	3.81
MW15-R	8/21/2014	**0.406**	0.00961	0.342	0.369	4.21	4.59
MW15-R	9/26/2013	**0.371**	0.00875	0.338	0.441	3.44	4.20
MW15-R	8/28/2012	**0.321**	ND (0.01)	0.354	0.402	3.35	5.57
MW15-R	8/29/2011	**0.249**	0.00661	0.270	0.346	2.49	4.52
MW15-R	8/25/2010	**0.261**	0.0048	0.251	0.380	2.52	6.94
MW15-R	8/24/2009	**0.236**	0.00454	0.225	0.23157	2.13	3.59
MW22	*8/18/2016*	*ND (0.0004)*	*ND (0.001)*	*ND (0.001)*	*ND (0.003)*	*0.134*	*ND (0.603)*
MW22	8/13/2015	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	0.152	ND (0.600)
MW22	8/21/2014	ND (0.0005)	ND (0.001)	ND (0.001)	ND (0.001)	0.193	0.393
MW22	9/26/2013	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	ND (0.600)
MW22	8/28/2012	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	0.102	1.11
MW22-dup	8/28/2012	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	0.108	1.63
MW22	8/29/2011	0.000770	ND (0.001)	ND (0.001)	ND (0.003)	0.120	ND (0.600)
MW22	8/25/2010	0.00112	ND (0.002)	ND (0.002)	0.00174J	0.156	0.356 J
MW22	8/24/2009	0.000920	ND (0.002)	ND (0.002)	0.00082 J	0.122	ND
MW23	*8/18/2016*	*ND (0.0004)*	*0.000740 J*	*ND (0.001)*	*0.000510 J*	*1.17*	*1.74*
MW23	8/13/2015	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	0.850
MW23	8/21/2014	ND (0.0005)	ND (0.001)	ND (0.001)	0.00234	ND (0.050)	1.33
MW23	9/25/2013	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	0.845
MW23	8/28/2012	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	0.950
MW23	8/29/2011	ND (0.0005)	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.100)	1.18
MW23	8/25/2010	ND (0.0005)	ND (0.002)	ND (0.002)	0.00134J	ND (0.100)	1.38
MW23	8/24/2009	0.000312 J	ND (0.002)	ND (0.002)	0.000692 J	ND (0. 100)	0.921
MW25A	*8/19/2016*	*0.00534*	*0.000510 J*	*0.0375*	*0.0599*	*0.858*	*5.07*
MW25A	8/13/2015	0.00217	ND (0.001)	0.0262	0.0384	0.928	6.47
MW25A	8/21/2014	0.00400	ND (0.001)	0.0418	0.0622	1.69	5.32
MW25A	9/26/2013	0.00567	ND (0.001)	0.037	0.0577	1.36	6.06
MW25A	8/28/2012	0.00896	ND (0.001)	0.0337	0.0513	1.32	**28.6**
MW25A	8/29/2011	0.00744	ND (0.001)	0.0377	0.0658	0.858	**18.8**
MW25A	8/25/2010	0.00665	0.00125 J	0.0295	0.055	0.633	**36.3**
MW25A	8/24/2009	0.0156	ND (0.02)	0.095	0.466	**18.4**	**23.9**
MW25B	*8/19/2016*	*0.0125*	*0.000690 J*	*0.0982*	*0.110*	*1.22*	***27.2***
MW25B	8/14/2015	0.00821	ND (0.001)	0.0683	0.0663	1.15	**17.5**
MW25B-dup	8/14/2015	0.00816	ND (0.001)	0.0545	0.0690	0.910	13.7
MW25B	8/21/2014	0.0134	ND (0.001)	0.116	0.127	1.85	**19.0**
MW25B-dup	8/21/2014	0.0136	ND (0.001)	0.119	0.129	1.83	**31.6**
MW25B	9/26/2013	0.0169	ND (0.001)	0.105	0.126	2.02	10.6
MW25B	8/28/2012	0.0175	ND (0.001)	0.0952	0.116	1.89	**110**
MW25B	8/29/2011	0.0178	ND (0.001)	0.137	0.146	1.41	**30.1**
MW25B-dup	8/29/2011	0.0182	ND (0.001)	0.144	0.153	1.46	**33.3**
MW25B	8/25/2010	0.0187	ND (0.02)	0.133	0.152	1.48	**21.0**
MW25B	8/24/2009	0.0143	ND (0.02)	0.138	0.170	2.79	11.6
MW25C	*8/18/2016*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
MW25C	8/13/2015	NS	NS	NS	NS	NS	NS
MW25C	8/21/2014	0.0192	0.00131	0.0688	0.228	2.16	3.30
MW25C	9/26/2013	0.0326	0.00146	0.0659	0.195	2.11	3.43
MW25C	8/28/2012	0.0277	0.0014	0.0785	0.252	1.84	**67.4**
MW25C	8/29/2011	0.0332	0.00208	0.0842	0.256	2.36	**114**
MW25C	8/25/2010	0.033	0.0206	0.115	0.366	4.66	**232**
MW25C-dup	8/25/2010	0.0317	0.0141 J	0.0988	0.346	3.37	**160**
MW25C	8/24/2009	0.0343	0.00677 J	0.176	0.549	10.1	**112**
MW25C-dup	8/24/2009	0.0331	ND (0.02)	0.178	0.566	12.2	**76.0**

NOTES:
For definitions, see the Acronyms and Abbreviations table. Data from the current year are italicized.
Data flag definitions are provided in the complete laboratory report in Appendix D.
Results exceeding a cleanup level are highlighted in red and are **BOLD**.
1 Data from 2009 to 2015 are from R&M, 2016; R&M, 2015; R&M, 2014; R&M, 2013; R&M, 2011; MLF, 2010; and MLF, 2009.
2 Site specific cleanup levels were designated in the 2003 ROD (ADEC, 2003).

3.3 SURFACE WATER SAMPLING AND ANALYTICAL RESULTS

Surface water samples were collected from locations SS12 and SS14, as shown on Drawing A-01. Location SS04 was dry as has been the case since the 2010 sampling event. Sample containers were filled by dipping directly from the locations. Samples were collected into laboratory provided glassware and immediately placed in pre-chilled coolers following collection and labeling. TAH values were calculated by summing BTEX detections. TAqH values were calculated by summing PAH and BTEX detections. The analytes 1-methylnaphthalene and 2-methylnaphthalene were excluded from the summations in accordance with EPA Method 610 and Note 7 in 18 AAC 70 concerning calculation of TAqH values. Non-detect values were included in the calculations at 50 percent of the reported limit of quantitation (LOQ) in accordance with ADEC technical guidance (ADEC, 2012). TAH and TAqH values from previous years were calculated using zero values for non-detects. The summations for TAH and TAqH were recalculated for 2009 to 2015 data using the methodology described above.

Total aromatic hydrocarbons (TAH) and total aqueous hydrocarbons (TAqH) summations were below the cleanup levels of 0.010 and 0.015 mg/L, respectively, for surface water sampling locations SS12 and SS14. Location SS04 remained dry and could not be sampled.

Observations from each location are tabulated in Table 3-6 and summarized surface water analytical results from 2009 to 2016 are provided in Table 3-7. Complete analytical results from the 2016 sampling event are provided in Appendix D and in previous reports for data from 2009 to 2015 (R&M, 2016; R&M, 2015; R&M, 2014; R&M, 2013; R&M, 2011; MLF, 2010; and MLF, 2009).

TABLE 3-6: SURFACE WATER CONDITION OBSERVATIONS

Surface Water Location	Sheen	Odor	Free Product Presence	Water Color
SS04	No surface water present			
SS12	Slight to Moderate	None	None	Clear
SS14	Organic (brittle)	None	None	Clear

NOTES:
Sheen descriptions are based on State of Washington Department of Ecology descriptions (Ecology, 2016).

TABLE 3-7: SUMMARIZED SURFACE WATER ANALYTICAL RESULTS[1]

Monitoring Well ID	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	TAH (mg/L)	TAqH (mg/L)
Cleanup Levels		0.05	10	7	100	0.01	0.015
SS04	*8/19/2016*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
SS04	8/14/2015	NS	NS	NS	NS	NS	NS
SS04	8/22/2014	NS	NS	NS	NS	NS	NS
SS04	9/26/2013	NS	NS	NS	NS	NS	NS
SS04	8/29/2012	NS	NS	NS	NS	NS	NS
SS04	8/30/2011	NS	NS	NS	NS	NS	NS
SS04	8/25/2010	NS	NS	NS	NS	NS	NS
SS04	8/24/2009	ND (0.0005)	ND (0.002)	ND (0.002)	ND (0.004)	0.00425	0.00471
SS12	*8/19/2016*	*0.00566*	*0.000380 J*	*0.000500 J*	*0.000890 J*	*0.00793*	*0.00840*
SS12	8/14/2015	0.000930	0.00387	ND (0.001)	ND (0.003)	0.00680	0.00798
SS12-dup	8/14/2015	0.000950	0.00400	ND (0.001)	ND (0.003)	0.00695	0.00837
SS12	8/22/2014	0.00103	ND (0.001)	ND (0.001)	ND (0.001)	0.00253	0.00333
SS12	9/26/2013	0.00064	ND (0.001)	ND (0.001)	ND (0.003)	0.00282	0.00325
SS12	8/29/2012	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	0.00270	0.00318
SS12-dup	8/29/2012	0.000600	ND (0.001)	ND (0.001)	ND (0.003)	0.00310	0.00363
SS12	8/30/2011	0.000820	ND (0.001)	ND (0.001)	ND (0.003)	0.00332	0.00390
SS12-dup	8/30/2011	0.000620	ND (0.001)	ND (0.001)	ND (0.003)	0.00312	0.00363
SS12	8/25/2010	0.000560	ND (0.002)	ND (0.002)	ND (0.004)	0.00456	0.00498
SS12	8/24/2009	ND (0.0005)	ND (0.002)	ND (0.002)	ND (0.004)	0.00425	0.00468
SS14	*8/19/2016*	*0.000130 J*	*0.000310 J*	*0.000830 J*	*0.00273*	*0.00450*	*0.00502*
SS14-dup	*8/19/2016*	*0.000170 J*	*ND (0.001)*	*0.000760 J*	*0.00244*	*0.00437*	*0.00484*
SS14	8/14/2015	ND (0.0004)	ND (0.001)	ND (0.001)	ND (0.003)	0.00270	0.00313
SS14	8/22/2014	ND (0.0005)	ND (0.001)	ND (0.001)	ND (0.001)	0.00175	0.00253
SS14	9/26/2013	0.000500	ND (0.001)	0.00100	0.00389	0.00611	0.00654
SS14	8/29/2012	ND (0.0004)	ND (0.001)	ND (0.001)	0.00563	0.00683	0.00778
SS14	8/30/2011	ND (0.0005)	ND (0.001)	0.00187	0.0191	**0.0217**	**0.0227**
SS14	8/25/2010	ND (0.0005)	ND (0.002)	ND (0.002)	0.000720 J	0.00297	0.00346
SS14-dup	8/25/2010	ND (0.0005)	ND (0.002)	0.000630 J	0.000760 J	0.00264	0.00318
SS14	8/24/2009	ND (0.0005)	ND (0.002)	0.00141 J	0.0247	**0.0274**	**0.0279**
SS14-dup	8/24/2009	ND (0.0005)	ND (0.002)	0.00136 J	0.0242	**0.0268**	**0.0273**

NOTES:
For definitions, see the Acronyms and Abbreviations table. Data from the current year are italicized.
Data flag definitions are provided in the complete laboratory report in Appendix D.
Results exceeding a cleanup level are highlighted in red and are **BOLD**.
1 Data from 2009 to 2015 are from R&M, 201b; R&M, 2015; R&M, 2014; R&M, 2013; R&M, 2011; MLF, 2010; and MLF, 2009.
2 Site specific cleanup levels were designated in the 2003 ROD (ADEC, 2003).

3.4 INVESTIGATION DERIVED WASTE

Investigation derived waste (IDW) consisted of purge and decontamination wastewater that were containerized in two 55-gallon open top drums. Water disposal was determined based on analytical results and observations from this investigation. Wastewater was placed in drum POA-1 or POA-2 based on historical analytical results and field observations (such as sheen or odor) made during this investigation. Details on wastewater contained by the two drums are provided along with disposal recommendations in Table 3-8.

TABLE 3-8: INVESTIGATION DERIVED WASTE DRUM DETAILS

Drum Number	Quantity (Gallons)	Material	Source Locations	Recommended Disposal
POA-1	25	Wastewater	MW15-R, MW23, MW25A, MW25B, and sampling equipment decontamination water	Manifest and dispose offsite at an approved TSDF
POA-2	36	Wastewater	MW2-R, MW4-R, and MW22	Spill onsite

NOTES:
For definitions, see the Acronyms and Abbreviations table.

Drum POA-1 contains wastewater with observed sheen and analytical results exceeding the 2003 ROD cleanup levels for benzene, GRO, and DRO. Approval from ADEC should be sought via the "Transport, Treatment, & Disposal Approval Form for Contaminated Media" to remove the drum of wastewater from the site for disposal at an approved TSDF. A certificate of disposal should be obtained following disposal.

Drum POA-2 contains wastewater with no observed sheen and analytical results below the 2003 ROD cleanup levels. GRO and DRO were detected below the 2003 ROD and ADEC Method 2 cleanup levels. No results are available from monitoring well MW4-R, but based on past results (Table 3-5) analytes have been below cleanup levels historically. The drum is recommended for onsite disposal by spilling the water on the ground.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

Samples were collected by a qualified environmental professional, as defined in 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations (ADEC, 2016a). Quality assurance and quality control samples were collected in accordance with ADEC Field Sampling Guidance, which has been used in the evaluation presented below along with the ADEC Environmental Laboratory Data and Quality Assurance Requirements technical memorandum (ADEC, 2016b and ADEC, 2009).

Samples must be maintained at 0 to 6 degrees Celsius (°C) under standard chain-of-custody procedures until delivery to the analytical laboratory. R&M transported and delivered the samples to SGS under strict chain-of custody procedures. During laboratory check-in, temperatures in the three sample coolers were measured at between 1.6 and 4.1°C in accordance with ADEC Field Sampling Guidance (ADEC, 2016b). Samples were delivered to the laboratory within the specified holding times for each analytical method. Samples were analyzed within the holding time for each target analyte.

4.1 LABORATORY REPORT: SGS NO. 1164872 (GRO AND BTEX ANALYSES)

The following sections discuss quality assurance and quality control parameters for the above referenced laboratory report. This report is applicable to volatile analyses (GRO and BTEX) for primary samples from monitoring wells MW2-R, MW15-R, MW22, MW23, MW25A, and MW25B; surface water locations SS12 and SS14; and the two volatile analysis duplicates (MW16-R for groundwater from monitoring well MW15-R and SS13 for surface water from SS14).

4.1.1 PRECISION

Field duplicates must be collected at a rate of at least one per ten primary field samples (10 percent) for each matrix sampled, for each target analyte. For this project, one field duplicate was collected per media (groundwater and surface water) for six primary groundwater and two primary samples, rates of 17 and 50 percent, respectively. Data for duplicate analyses of PAH and DRO are provided in SGS report numbers 1164873 and 1164874.

Laboratory control spike (LCS) and laboratory control spike duplicates (LCSD) recoveries were within acceptable ranges.

4.1.2 ACCURACY

LCS and LCSD relative percent differences (RPD) were within acceptable ranges.

Surrogate recoveries were within acceptable ranges for BTEX analysis but exceeded the acceptable range (50 to 150 percent) for GRO analysis (4-bromofluorobenzene) at 245 to 321 percent due to matrix effects for samples MW15-R, MW16-R (MW15-R duplicate), MW25A, and MW25B. GRO surrogate recovery for GRO analysis for samples from monitoring wells MW2-R, MW22, MW23 were within acceptable ranges. Samples with elevated surrogate recoveries for GRO are considered usable as the elevated surrogate recovery indicates a potential high bias.

4.1.3 REPRESENTATIVENESS

Samples were collected from appropriate matrices and locations to adequately characterize the media targeted for investigation as defined in the approved work plan (MLF, 2008).

4.1.4 COMPARABILITY

Field screening data or observations such as odor or sheen relate to results obtained by laboratory analysis of the target analytes. Field screening observations are tabulated in Tables 3-3 and 3-6.

4.1.5 COMPLETENESS

A total of 57 analytical results were reported by this laboratory submittal for the 10 (eight primary and two duplicate) field samples and trip blank. All results (100 percent of the analytical data) were considered to be usable based on analysis of field and laboratory quality assurance and quality control parameters.

4.1.6 SENSITIVITY

The detection limit (DL) and LOQ were less than the ROD cleanup levels for the target analytes.

Analysis of trip blanks (TB) were non-detect or less than the LOQ for the target analytes.

Analysis of laboratory method blank (MB) were non-detect or less than the LOQ for the target analytes.

4.2 LABORATORY REPORT: SGS NO. 1164873 (DRO AND PAH ANALYSES)

The following sections discuss quality assurance and quality control parameters for the above referenced laboratory report. This report is applicable to DRO analysis for primary samples from monitoring wells MW25A, MW25B and PAH analysis for primary samples SS12, and SS14 and the duplicate SS13 associated with primary sample SS14.

4.2.1 PRECISION

Field duplicates must be collected at a rate of at least one per ten primary field samples (10 percent) for each matrix sampled, for each target analyte. For this project, one field duplicate was collected per media (groundwater and surface water) for six primary groundwater and two primary samples, rates of 17 and 50 percent, respectively. Data for duplicate analysis of GRO and DRO in groundwater and BTEX in groundwater and surface water are provided in SGS report numbers 1164872 and 1164874.

LCS and LCSD recoveries were within acceptable ranges.

4.2.2 ACCURACY

LCS and LCSD RPDs were within acceptable ranges.

Surrogate recoveries were within acceptable ranges with the exception of terphenyl-d14 for sample SS-13 which was below Department of Defense criteria (58 to 132 percent recovery) at 56.6 percent recovery. Terphenyl-d14 recovery was within SGS operating procedure criteria for non-Department of Defense analysis.

4.2.3 REPRESENTATIVENESS

Samples were collected from appropriate matrices and locations to adequately characterize the media targeted for investigation as defined in the approved work plan (MLF, 2008).

4.2.4 COMPARABILITY

Field screening data or observations such as odor or sheen relate to results obtained by laboratory analysis of the target analytes. Field screening observations are tabulated in Tables 3-3 and 3-6.

4.2.5 COMPLETENESS

A total of 56 analytical results were reported by this laboratory submittal for the five field samples (four primary and 1 duplicate). All results (100 percent of the analytical data) were considered to be usable based on analysis of field and laboratory quality assurance and quality control parameters.

4.2.6 SENSITIVITY

The DL and LOQ were less than the ROD cleanup levels for the target analytes.

No TBs were associated with this delivery group as the DRO and PAH analyses are considered non-volatile and TBs are not required by ADEC Field Sampling Guidance (ADEC, 2016b).

Analysis of laboratory MBs were non-detect or less than the LOQ for the target analytes.

4.3 LABORATORY REPORT: SGS NO. 1164874 (DRO ANALYSIS)

The following sections discuss quality assurance and quality control parameters for the above referenced laboratory report. This report is applicable to DRO analysis for primary samples from monitoring wells MW2-R, MW15-R, MW22, and MW23 and the duplicate sample MW16-R (associated with primary sample MW15-R).

4.3.1 PRECISION

Field duplicates must be collected at a rate of at least one per ten primary field samples (10 percent) for each matrix sampled, for each target analyte. For this project, one field duplicate was collected per media (groundwater and surface water) for six primary groundwater and two primary samples, rates of 17 and 50 percent, respectively. Data for duplicate analysis of DRO in surface water, GRO in groundwater, and BTEX in groundwater and surface water are provided in SGS report numbers 1164872 and 1164873.

LCS and LCSD recoveries were within acceptable ranges.

4.3.2 ACCURACY

LCS and LCSD RPDs were within acceptable ranges.

Surrogate recoveries were within acceptable ranges.

4.3.3 REPRESENTATIVENESS

Samples were collected from appropriate matrices and locations to adequately characterize the media targeted for investigation as defined in the approved work plan (MLF, 2008).

4.3.4 COMPARABILITY

Field screening data or observations such as odor or sheen relate to results obtained by laboratory analysis of the target analytes. Field screening observations are tabulated in Tables 3-3 and 3-6.

4.3.5 COMPLETENESS

A total of 5 analytical results were reported by this laboratory submittal for the five field samples (four primary and one duplicate). All results (100 percent of the analytical data) were considered to be usable based on analysis of field and laboratory quality assurance and quality control parameters.

4.3.6 SENSITIVITY

The DL and LOQ were less than the ROD cleanup levels for the target analytes.

No TBs were associated with this delivery group as DRO analysis is considered non-volatile and TBs are not required by ADEC Field Sampling Guidance (ADEC, 2016b).

Analysis of laboratory MBs were non-detect or less than the LOQ for the target analytes.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations based on data from 2009 to 2016 periodic sampling of the monitoring network at the DFSP-A are discussed in the following sub-sections.

5.1 INVESTIGATION CONCLUSIONS

Groundwater and surface water results from the 2016 and previous sampling events appear to show an overall decreasing or steady concentration trend in samples from the monitoring well and surface water monitoring network. Sentry monitoring well locations (MW2-R, MW4-R, and MW23) have remained below the 2003 ROD cleanup levels for the target analytes during periodic monitoring between 2009 and 2016. Benzene consistently exceeds the cleanup level of 0.05 mg/L in monitoring well MW15-R at concentrations ranging from 0.236 to 0.59 mg/L. DRO has consistently exceeded the cleanup level of 15 mg/L in samples from monitoring well MW25B at concentrations ranging from 17.5 to 110 mg/L and has been below the cleanup level during two of the eight sampling events from 2009 to 2016. TAH and TAqH values have been below the cleanup levels since 2009 (beginning of this data set) for surface water location SS12 and since 2012 for surface water location SS14. Surface water location SS12 exceeded surface water quality standards (18 AAC 70) in 2015 and 2016 due to observed petroleum sheen. Groundwater conditions in the upper, unconfined aquifer continue to indicate flow generally moving from east to west across the site mimicking general topographic conditions as shown on Drawing A-01 in Appendix A. Formal analysis (Mann-Kendall statistical analysis) of trends related to contaminant levels is proposed as part of the planned 2016 or 2017 five-year review of the ROD.

5.2 RECOMMENDATIONS

R&M provides the following recommendations for the site:

- Perform a five-year review of the ROD in 2016 or 2017 and include a Mann-Kendall statistical analysis of existing groundwater and surface water data.
- Continue yearly sampling of the monitoring network until results from sampling locations are below cleanup levels for four consecutive sampling events as specified by the ROD.
- Repair or replace monitoring wells in the monitoring network as detailed in Table 3-2.
- Dispose of IDW in accordance with Section 3-4 and Table 3-8.

6.0 CLOSURE

This report has been prepared for the exclusive use of the Port of Anchorage and their representatives in the study of this site. The findings presented within this report are based on limited sampling and laboratory analyses conducted by R&M. Since opinions of conditions prevailing on a particular site must be based on the work authorized by the client, all findings/data must be construed as representative of the site at a particular moment in time and the result of services performed within the scope, limitations, and cost of the work requested. Changes in the conditions of this site may occur with the passage of time and may be due to natural processes or the works of man. In addition, changes in government codes, either State or Federal regulations or laws, may occur. Due to such changes, which are beyond our control, observations and recommendations applicable to this site may need to be revised wholly or in part from time to time.

R&M Consultants, Inc. performed this work in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No warranty, express or implied, beyond exercise of reasonable care and professional diligence, is made. Should you require additional information regarding the investigation or this report, please contact us.

Sincerely,

R&M CONSULTANTS, INC

Christopher D. Fell, CPG
Senior Geologist

Kristi M. McLean, LEED AP BD+C
Group Manager – Environmental Services

7.0 REFERENCES

ADEC (Alaska Department of Environmental Conservation), 2016a. Oil and Other Hazardous Substances (18 AAC 75). 8 May 2016.

ADEC, 2016b. Field Sampling Guidance. March 2016.

ADEC, 2012. Technical Memorandum: Guidelines for Data Reporting, Data Averaging and treatment of Non-Detect Values. June 2012.

ADEC, 2009. "Environmental Laboratory Data and Quality Assurance Requirements." March 2009. Technical memorandum.

ADEC, 2003. Record of Decision for Cleanup: Defense Fuel Support Point – Anchorage, U.S. Defense Energy Support Center, ADEC Database Record Key 1988-21-X1-119-01.

Ecology (State of Washington Department of Ecology), 2016. Guidance for Remediation of Petroleum Contaminated Sites. Revised June 2016.

MLF (Michael L. Foster and Associates, Inc.), 2010. 2010 Annual Sampling Report: Defense Fuel Support Point – Anchorage, Anchorage, Alaska. Prepared for Defense Energy Support Center, 4 October 2010.

MLF, 2009. 2009 Annual Sampling Report: Defense Fuel Support Point – Anchorage, Anchorage, Alaska. Prepared for Defense Energy Support Center, 29 September 2009.

MLF, 2008. Updated Long-Term Monitoring Plan: Defense Fuel Support Point – Anchorage. Prepared for Defense Energy Support Center, 28 April 2008.

Puls, Robert W. and Barcelona, Michael J., (Puls et. al.) 1996. Ground Water Issue: Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures. Published by the EPA (U.S. Environmental Protection Agency).

R&M (R&M Consultants, Inc.), 2015. 2015 Annual Sampling Report: Former Defense Fuel Support Point – Anchorage. Prepared for the Port of Anchorage. 25 August 2016.

R&M, 2014. 2014 Annual Sampling Report: Former Defense Fuel Support Point – Anchorage. Prepared for the Port of Anchorage. 12 January 2015.

R&M, 2013. Revised 2013 Annual Sampling Report: Former Defense Fuel Support Point – Anchorage. Prepared for the Port of Anchorage. 27 May 2014.

R&M, 2012. 2012 Annual Sampling Report: Former Defense Fuel Support Point – Anchorage. Prepared for the Port of Anchorage. 19 June 2013.

R&M, 2011. 2011 Annual Sampling Report: Former Defense Fuel Support Point – Anchorage. Prepared for the Port of Anchorage. 1 November 2011.

WRCC (Western Regional Climate Center), http://www.wrcc.dri.edu/index.html, accessed 26 August 2016.

APPENDIX A
SITE DRAWING

N

PORT OF ANCHORAGE

JOINT BASE ELMENDORF - RICHARDSON

FORMER TIDAL FLATS AREA (FTFA)

TERMINAL ROAD

MW22 (81.81)

MW2-R (SEE NOTE)

MW23 (34.57)

MW4-R (40.09)

SLOPE DEPOSITS AREA (SDA)

ANCHORAGE PORT ROAD

SECURITY COMMAND & CONTROL CENTER

MW15-R (34.65)

SS12

SS14

MW25C (53.39)

MW25B (51.5)

MW25A (51.11)

UPPER BLUFF AREA (UBA)

AT&T ALASCOM FACILITY

GOVERNMENT HILL NEIGHBORHOOD

BLUFF ROAD

Legend

- Monitoring Well Location (MW)
- Surface Water Sample Location (SS)
- Approximate Groundwater Flow Direction
- ( ) Groundwater Elevation in feet (referenced to mean lower low water, based on U.S. Coast & Geodetic Benchmark "Tidal 16")
- Fence
- Approx. Boundary Between Terrain Areas
- Approx. Site Boundary (Tract J)

Note

The measuring point elevation at Monitoring Well MW2-R needs to be resurveyed.

0 100 200 400

APPROXIMATE SCALE IN FEET

FB: N/A
GRID: Anchorage A-8
PROJ.NO: 2186.02
DWG.: A-01

FORMER DEFENSE FUEL SUPPORT POINT
ANCHORAGE, ALASKA

WATER SAMPLE LOCATIONS
2016 ANNUAL SAMPLING

R&M CONSULTANTS, INC.

DWN: ALS
CKD: KMM
DATE: NOV. 2016
SCALE: AS SHOWN

Date Saved: 11/29/2016 3:06:04 PM by ASchmidt Z:_GIS\Projects\2186.02 MOA_POA 2014 Term Year 2\Map Documents\Former_DFSP-A_AnnualMonitoring\A-01_WaterSamplingLoc.mxd

APPENDIX B
FIELD NOTES

2016 R&M Environmental VOL #1
Miscellaneous Field Notes.

Rite in the Rain®
ALL-WEATHER
UNIVERSAL
№ 373-MX

POA GW Monitoring
8/18/2016

2186.02
C.Fell / A. Schmidt

0800 C.Fell and A. Schmidt arrived onsite to get security passes.

0810 Tailgate Safety meeting

Christopher Fell	R&M	QEP
Abraham Schmidt	R&M	QEP

WX: Overcast 60sF, calm

0815 IDW drums containing purge water from wells below cleanup levels from the 2015 sampling event.

MW23
MW2R
MW4R
MW22
} Purge water was spilled on site.

0827 Began work @ MW23

0925 Purge complete

0925 * SAMPLE *
MW23
C.Fell / A. Schmidt
SS
2 1-liter amber w/ HCl — DRO (AK102)
6 40ml VOA amber — GRO (AK101)
BTEX (8260)
Immediately placed in a prechilled cooler after sample collection.

1002 Finished at MW23, decontaminated pump and interface probe w/ Alconox wash and 2 distilled H_2O rinses.

Dumped purge water in a drum staged near the security bldg in a gravel lot. 10.65 liters. DRUM# POA-1

POA GW Monitoring
8/18/2016

2186.01
C. Fell / A. Schmidt

1018 Moved to MW4R, began taking measurements and setting up to purge.

1029 Started purging MW4R.

1051 Well purged dry

Cleaning up & deconing pump & interface probe.

Dumped purge water in drum # POA-2, 42 liters.

(AS)
~~1251~~ 1233 Started purging MW25B

1243 Well purged dry

Cleaning up and decon pump & interface probe

1302 Moving to MW25C, was dry in 2015.

Checking water level w/ interface probe

Well has less than 1ft of water

Decontaminating interface probe

Moving to ~~MW25C~~ MW2R

1316 Transferred 6 liters of purge water from MW25B and 3 liters of decon water to drum # POA-1.

1320 Setting up at MW2R.

1325 C. Fell & A. Schmidt offsite to get 1/2 inch socket to open well.

1350 C. Fell & A. Schmidt back onsite, setting up @ MW2R

1401 Started purging MW2R

Scale: 1 square = _____

p. 02

POA GW Monitoring
8/18/2016

2186.02
C.Fell / A.Schmidt

1437 *SAMPLE*
MW2R
C.Fell / A. Schmidt
4.5ft 2 1-liter amber w/HCL — DRO (AK102)
6 40mL VOA amber — GRO (AK101)
BTEX (SW8260)
Immediatly placed in pre-chilled cooler after collection

1455 Finished at MW2R
Decon'd pump and interface probe

Dumped purge water in drum # POA-2, 79 liters

1526 Started purging MW22

1538 *SAMPLE*
MW22
C.Fell / A.Schmidt
2 1-liter amber w/HCL — DRO (AK102)
6 40-mL VOA amber — GRO (AK101)
BTEX (SW8260)
Immediatly placed in pre-chilled cooler after collection

1600 Finished at MW22
-Decon'd pump and interface probe

Dumped purge water in drum # POA-2, 17 liters

1614 Arrive at MW4R to check for recharge

MW4R has recharged 0.2', pln to sample tomorrow

1630 Scouted surface water sampling locations SS12 and SS14

1631 C.Fell and A.Schmidt offsite for the day

Chris Fell 8/18/16

AOA Ground Water Monitoring
8/19/2016

2186.02
C. Fell /
A. Schmidt

0859 A. Schmidt/C. Fell on site

Check MW4-R for recharge, water level at 12.1' below top of casing

Wx: 60's, overcast, light to no wind

0913 Arrive at MW15-R

0927 begin purging MW15R, C. Fell at MW15R

0946 * SAMPLE *
SS12
A. Schmidt

Surface sample
2 1-liter amber — PAH (SW8270SIM)
3 40mL amber VOA — BTEX (SW8260)

Immediatly placed in pre-chilled cooler after collection

- Petroleum sheen observed at SS12
- no odor observed (AS)

1005 * SAMPLE *
SS14
SS13 (duplicate)
A. Schmidt

Surface sample
4 1-liter amber — PAH (SW8270SIM)
6 40mL VOA amber — BTEX (SW8260)

immediatly placed in pre-chilled cooler after collection

Scale: 1 square = _____

POA GW Monitoring
8/19/2016

218602
C. Fell / A. Schmidt

1002 * SAMPLE *
MW15R
MW16R (duplicate)
5.0 feet C. Fell / A. Schmidt
4 1-liter amber w/HCL — DRO (AK102)
12 40mL VOA amber — GRO (AK101)
BTEX (SW 8260)

immediatly placed in pre-chilled cooler after collection.

1033 Finished at SS12, SS14 and MW15R, decon'd pump and probe w/ alconox wash and 2 distilled H_2O rinses.

Dumped purge water from MW15R in drum # POM-1
.58 liters

1050 Arrive at MW25B, sufficently recharged
- ground water at 42.2' below TOC

1100 * SAMPLE *
MW25B
43.5 feet C. Fell / A. Schmidt
2 250mL amber w/HCL — DRO (AK102)
6 40mL VOA amber — GRO (AK101)
BTEX (SW 8260)

immediatly placed in pre-chilled cooler after collection

1129 Arrive at MW25A

1137 Begin purge at 1137 for MW25A

1156 Finished purge

POA GW Monitoring
8/19/2016

2186.02
CFell/ASchmidt

1156 * SAMPLE *
MW25A
C. Fell / A. Schmidt
2 1-liter Amber w/ HCL — DRO (AK102)
6 40mL VOA Amber — GRO (AK101)
BTEX (SW8260)

immediatly placed in pre-chilled cooler after collection

1227 Decon pump and interface probe.

1231 Dumping purge water from MW25B and MW25A into drum # POA-1

-locked down drums

-No water at SS-04

1250 A. Schmidt / C. Fell offsite

Chris Fell 8/19/2016

Scale: 1 square = _____

APPENDIX C
SAMPLING FORMS

Groundwater Sampling/Purging Data

Site Information	
Well ID	MW2R
Site Name/Location	Former DFSP POA
Job Number	2186.02
Date	8/18/2016
Sampler(s)	G. Fell, A. Schmidt
Weather/Site Conditions	M. Cloudy, light wind, 60s F

Well and Purging Data		
Well TOC Elevation (ft): —	Purge Start Time: 1401	PID Readings (ppm): Ambient: 0, Breathing Zone: 0, Well: 0
TOC Stickup (ft): -0.90'	Purge Finish Time:	
Depth to GW (ft btoc): 3.05	Sampling Depth (ft btoc): 4.5'	PID Calibration (Circle): ~~Bump Test~~ / Full Calibration
Well Casing Depth (ft btoc): 13.14 13.16	Tubing Length (ft): 15'	Odor: none
Start Color: clear; End Color: clear	Equipment Used: monsoon pump, Teflon-lined tubing	
Well Condition: Poor		

Well Purge Calculations (Casing /Borehole/Parameters)

Casing Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(casing)
Borehole Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(borehole)

DEFAULT PURGE (3 Volumes)
Casing Purge = (13.14 ft - 3.05 ft) * 0.653 gal/ft *3 = 19.77 gal *3.79 L/gal = 74.91 L
Borehole Purge = (— ft - — ft) * — gal/ft *3 = — gal *3.79 L/gal = — L

MAX PURGE (10 Volumes)
Casing Purge = (— ft - — ft) * — gal/ft *10 = — gal *3.79 L/gal = — L
Borehole Purge = (— ft - — ft) * — gal/ft *10 = — gal *3.79 L/gal = — L

Water Quality Parameter Data

Time	Volume (Gallons or Liters) Change	Volume (Gallons or Liters) Total	Water Quality Parameter Measurements: ± 3% (Min ± 0.2 °C) Temperature (°C)	± 0.1 pH (std units)	± 3% Conductivity (µS/cm)	No Standard ORP (mV)	± 10% DO (mg/L)	± 10% Turbidity (NTU)	Drawdown < 0.3 ft Water Level (feet btoc)
1401	0	0	—	—	—	—	—	—	3.05
1437	20	20	—	—	—	—	—	—	
End Purge									
Started Sampling at 1437									

Notes:
well Cond.: Casing is too close to flush mount, cap cannot be installed satisfactory, No lock
Samples collected at a pump rate of 500 mL/m, water level at 3.15'

Constants: Casing Diameter (in) / Gallons per Linear Foot: 1.25 / 0.041 2 / 0.163 4 / 0.653 6 / 1.47 8 / 2.61
Parameter stability: 4 consecutive readings are within ranges indicated in the Water Quality Parameter Table

Groundwater Sampling/Purging Data

Site Information	
Well ID	MW4R
Site Name/Location	Former DFSP POA
Job Number	2186.02
Date	8/18/2016
Sampler(s)	C. Bell, A. Schmidt
Weather/Site Conditions	P. Cloudy, 60s light wind

Well and Purging Data		
Well TOC Elevation (ft): 44.07	Purge Start Time: 1029	PID Readings (ppm): Ambient: 0.0; Breathing Zone: 0.0; Well: 0.0
TOC Stickup (ft): 2.68	Purge Finish Time: 1151	
Depth to GW (ft btoc): 3.98	Sampling Depth (ft btoc): 5.5	PID Calibration (Circle): Bump Test / Full Calibration
Well Casing Depth (ft btoc): 12.40	Tubing Length (ft): 13	Odor: none
Start Color: Clear; End Color: N/A	Equipment Used: Monsoon Pump, Teflon lined tubing, Interface Probe	
Well Condition: Fair - Good		

Well Purge Calculations (Casing /Borehole/Parameters)

Casing Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(casing)
Borehole Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(borehole)

DEFAULT PURGE (3 Volumes)

Casing Purge = (12.40 ft - 3.98 ft) * 0.653 gal/ft *3 = 16.49 gal *3.79 L/gal = 62.52 L

~~Borehole Purge = (ft - ft) * gal/ft *3 = gal *3.79 L/gal = L~~

MAX PURGE (10 Volumes)

~~Casing Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L~~

~~Borehole Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L~~

Water Quality Parameter Data

Time	Volume (Gallons or Liters) Change	Volume (Gallons or Liters) Total	± 3% (Min ± 0.2 °C) Temperature (°C)	± 0.1 pH (std units)	± 3% Conductivity (µS/cm)	No Standard ORP (mV)	± 10% DO (mg/L)	± 10% Turbidity (NTU)	Drawdown < 0.3 ft Water Level (feet btoc)
1029	~~0.4~~	0	~	~	~	~	~	~	3.98
1039	4	4	~	~	~	~	~	~	5.80
1112	15	19	~	~	~	~	~	~	9.07
1132	15	34	~	~	~	~	~	~	11.11
1151	8	42	—	—	—	—	—	—	DRY
	No sample, insufficient recovery								

Notes:
No free product detected w/interface ~~probe~~ probe.
Well Condition: Protective casing intact and stable. Well plug in place. Lock functions poorly.

Constants: Casing Diameter (in) / Gallons per Linear Foot: 1.25 / 0.041 2 / 0.163 4 / 0.653 6 / 1.47 8 / 2.61
Parameter stability: 4 consecutive readings are within ranges indicated in the Water Quality Parameter Table

Groundwater Sampling/Purging Data

Site Information	
Well ID	MW15R
Site Name/Location	Former DFSP PoA
Job Number	218102
Date	8/19/2016
Sampler(s)	C. Fell, A. Schmidt
Weather/Site Conditions	overcast, 60's °F

Well and Purging Data		
Well TOC Elevation (ft): 38.02	Purge Start Time: 0927	PID Readings (ppm): Ambient: 0; Breathing Zone: 0; Well: 0
TOC Stickup (ft): 2.06	Purge Finish Time: 1002	
Depth to GW (ft btoc): 3.37	Sampling Depth (ft btoc): 5.0	PID Calibration (Circle): Bump Test / Full Calibration
Well Casing Depth (ft btoc): 11.14	Tubing Length (ft): 15	Odor: petroleum odor
Start Color: lt brown; End Color: clear	Equipment Used: monsoon pump; Teflon-lined tubing	
Well Condition: Good		

Well Purge Calculations (Casing /Borehole/Parameters)

Casing Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(casing)
Borehole Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(borehole)

DEFAULT PURGE (3 Volumes)
Casing Purge = (11.14 ft - 3.37 ft) * 0.653 gal/ft *3 = 15.2 gal *3.79 L/gal = 57.69 L
Borehole Purge = (____ ft - ____ ft) * ____ gal/ft *3 = ____ gal *3.79 L/gal = ____ L

MAX PURGE (10 Volumes)
Casing Purge = (____ ft - ____ ft) * ____ gal/ft *10 = ____ gal *3.79 L/gal = ____ L
Borehole Purge = (____ ft - ____ ft) * ____ gal/ft *10 = ____ gal *3.79 L/gal = ____ L

Water Quality Parameter Data

Time	Volume (Gallons or Liters) Change	Volume (Gallons or Liters) Total	Water Quality Parameter Measurements: ±3% (Min ±0.2 °C) Temperature (°C)	±0.1 pH (std units)	±3% Conductivity (µS/cm)	No Standard ORP (mV)	±10% DO (mg/L)	±10% Turbidity (NTU)	Drawdown <0.3 ft Water Level (feet btoc)
0927	0	0	~	~	~	~	~	~	3.37
0952	14	14	~	~	~	~	~	~	3.58
1002	~~1.5~~	~~15.2~~	~	~	~	~	~	~	3.43
End	1.2	Purge	15.2 gallons / 58 liters						
		Sample @ 1002							

Notes: well in good condition. Lock does not work
No sheen obs. on purge water.

Constants: Casing Diameter (in) / Gallons per Linear Foot: 1.25 / 0.041 2 / 0.163 4 / 0.653 6 / 1.47 8 / 2.61
Parameter stability: 4 consecutive readings are within ranges indicated in the Water Quality Parameter Table

Groundwater Sampling/Purging Data

Site Information	
Well ID	MW22
Site Name/Location	Farmer DFSP POA
Job Number	2186.02
Date	8/18/2016
Sampler(s)	C. Fell, A. Schmidt
Weather/Site Conditions	M. Cloudy, 60sF, calm

Well and Purging Data		
Well TOC Elevation (ft): 84.98	Purge Start Time: 1526	PID Readings (ppm): Ambient: Breathing Zone: Well: N/A
TOC Stickup (ft): 3.29	Purge Finish Time: 1538	
Depth to GW (ft btoc): 3.17	Sampling Depth (ft btoc): 4.5	PID Calibration (Circle): Bump Test / Full Calibration
Well Casing Depth (ft btoc): 12.16 12.22	Tubing Length (ft): 8	Odor: none observed
Start Color: clear / End Color: clear	Equipment Used: Monsoon pump, Interface Probe, Teflon-lined tubing	
Well Condition: OK		

Well Purge Calculations (Casing /Borehole/Parameters)

Casing Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(casing)
Borehole Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(borehole)

DEFAULT PURGE (3 Volumes)

Casing Purge = (12.16 ft - 3.17 ft) * 0.163 gal/ft *3 = 4.40 gal *3.79 L/gal = 16.68 L

~~Borehole Purge = (ft - ft) * gal/ft *3 = gal *3.79 L/gal = L~~

MAX PURGE (10 Volumes)

~~Casing Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L~~

~~Borehole Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L~~

Water Quality Parameter Data

Time	Volume (Gallons or Liters) Change	Volume (Gallons or Liters) Total	± 3% (Min ± 0.2 °C) Temperature (°C)	± 0.1 pH (std units)	± 3% Conductivity (µS/cm)	No Standard ORP (mV)	± 10% DO (mg/L)	± 10% Turbidity (NTU)	Drawdown < 0.3 ft Water Level (feet btoc)
			Water Quality Parameter Measurements						
1526	0	0	✓	✓	✓	✓	✓	✓	3.17
1538	17	17	✓	✓	✓	✓	✓	✓	3.41
End Purge									
Started Sampling at 1538									

Notes:

Well is in good condition. Needs a new lock.

Constants: Casing Diameter (in) / Gallons per Linear Foot: 1.25 / 0.041 2 / 0.163 4 / 0.653 6 / 1.47 8 / 2.61
Parameter stability: 4 consecutive readings are within ranges indicated in the Water Quality Parameter Table

Groundwater Sampling/Purging Data

Site Information	
Well ID	MW23
Site Name/Location	Former DFSP POA
Job Number	2186.02
Date	8/18/2016
Sampler(s)	C. Fell, A. Schmidt
Weather/Site Conditions	Overcast, 60s, calm

Well and Purging Data		
Well TOC Elevation (ft): 38.75	Purge Start Time: ~~0844~~ 0853	PID Readings (ppm): Ambient: 0; Breathing Zone: 0; Well: 0
TOC Stickup (ft): 4.19'	Purge Finish Time: 0925	
Depth to GW (ft btoc): 4.18'	Sampling Depth (ft btoc): 5.5	PID Calibration (Circle): (Bump Test) / Full Calibration
Well Casing Depth (ft btoc): 4.51 9.54	Tubing Length (ft): 12'	Odor: none
Start Color: lt. brown; End Color: clear	Equipment Used: Monsoon pump/Teflon tubing; Interface probe	
Well Condition: Poor		

Well Purge Calculations (Casing /Borehole/Parameters)

Casing Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(casing)

Borehole Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(borehole)

DEFAULT PURGE (3 Volumes)

Casing Purge = (9.51 ft - 4.18 ft) * 0.163 gal/ft *3 = ~~2.61~~ 2.61 (A5) gal *3.79 L/gal = ~~33.46~~ 9.89 (A3) L

~~Borehole Purge = (ft - ft) * gal/ft *3 = gal *3.79 L/gal = L~~

MAX PURGE (10 Volumes)

~~Casing Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L~~

~~Borehole Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L~~

Water Quality Parameter Data

Time	Volume (Gallons or (Liters)) Change	Volume Total	± 3% (Min ± 0.2 °C) Temperature (°C)	± 0.1 pH (std units)	± 3% Conductivity (µS/cm)	No Standard ORP (mV)	± 10% DO (mg/L)	± 10% Turbidity (NTU)	Drawdown < 0.3 ft Water Level (feet btoc)
~~0844~~	Flow		\	\	\	\	\	\	~~5~~ 4.18
0853	0.25	3.75	\	\	\	\	\	\	4.90
0908	0.16	0.96	\	\	\	\	\	\	4.91
0914	0.54	5.94	\	\	\	\	\	\	5.35
0925	End Purge			10.65 liters					
Start Sample at 0925									
			See notebook for details						

Notes: well Cond: Protective casing loose, no cap on well, Protective casing 1/2 ~~bent~~ (CP) barely closes. Very slight sheen in collection bucket

Constants: Casing Diameter (in) / Gallons per Linear Foot: 1.25 / 0.041 2 / 0.163 4 / 0.653 6 / 1.47 8 / 2.61

Parameter stability: 4 consecutive readings are within ranges indicated in the Water Quality Parameter Table

Groundwater Sampling/Purging Data

Site Information	
Well ID	MW25A
Site Name/Location	Former DFSP POA
Job Number	2186.02
Date	8/19/2016
Sampler(s)	C. Fell, A. Schmidt
Weather/Site Conditions	M. Cloudy, 60s F, Calm

Well and Purging Data		
Well TOC Elevation (ft): 96.78	Purge Start Time: 1137	PID Readings (ppm): Ambient: 0; Breathing Zone: 0; Well: 0
TOC Stickup (ft): 2.37	Purge Finish Time: 1156	
Depth to GW (ft btoc): 45.67	Sampling Depth (ft btoc): 47	PID Calibration (Circle): Bump Test / Full Calibration
Well Casing Depth (ft btoc): 51.90	Tubing Length (ft): 50	Odor: Petroleum odor
Start Color: Clear; End Color: Clear	Equipment Used: Monsoon Pump, Teflon lined tubing, Interface Probe	
Well Condition: good		

Well Purge Calculations (Casing /Borehole/Parameters)

Casing Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(casing)

Borehole Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(borehole)

DEFAULT PURGE (3 Volumes)

Casing Purge = (51.90 ft - 45.67 ft) * 0.163 gal/ft * 3 = 3.05 gal * 3.79 L/gal = 11.55 L

~~Borehole Purge = (ft - ft) * gal/ft * 3 = gal * 3.79 L/gal = L~~

MAX PURGE (10 Volumes)

~~Casing Purge = (ft - ft) * gal/ft * 10 = gal * 3.79 L/gal = L~~

~~Borehole Purge = (ft - ft) * gal/ft * 10 = gal * 3.79 L/gal = L~~

Water Quality Parameter Data

Time	Volume (Gallons or Liters)		Water Quality Parameter Measurements						
			± 3% (Min ± 0.2 °C)	± 0.1	± 3%	No Standard	± 10%	± 10%	Drawdown < 0.3 ft
	Change	Total	Temperature (°C)	pH (std units)	Conductivity (µS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Water Level (feet btoc)
1137	0	0	—	—	—	—	—	—	45.67
1156	12	12	—	—	—	—	—	—	45.72
Sampled				at	1156				

Notes: lock does not work

Constants: Casing Diameter (in) / Gallons per Linear Foot: 1.25 / 0.041 2 / 0.163 4 / 0.653 6 / 1.47 8 / 2.61

Parameter stability: 4 consecutive readings are within ranges indicated in the Water Quality Parameter Table

Groundwater Sampling/Purging Data

Site Information	
Well ID	MW25B
Site Name/Location	Former DFSP POA
Job Number	2186.02
Date	8/18/2016 8/19/2016
Sampler(s)	C. Fell A. Schmidt
Weather/Site Conditions	~~M. Clo~~ P. Cloudy Calm, 60s

Well and Purging Data		
Well TOC Elevation (ft): 93.69	Purge Start Time: ~~1251~~ AS 1233	PID Readings (ppm): Ambient: 0.0
TOC Stickup (ft): 2.50	Purge Finish Time: 1243	Breathing Zone: 0.0
Depth to GW (ft btoc): 42.19	Sampling Depth (ft btoc): 43.5	Well: 0.0
Well Casing Depth (ft btoc): 47.71	Tubing Length (ft): 50	PID Calibration (Circle): Bump Test / Full Calibration
Start Color: Clear/Grey End Color: Clear	Equipment Used: Monsoon Pump, Teflon lined tubing, Interface Probe	Odor: Petroleum odor
Well Condition: Good		

Well Purge Calculations (Casing /Borehole/Parameters)

Casing Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(casing)

Borehole Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(borehole)

DEFAULT PURGE (3 Volumes)

Casing Purge = (47.71 ft - 42.19 ft) * 0.163 gal/ft *3 = 2.69 gal *3.79 L/gal = 10.23 L

~~Borehole Purge = (ft - ft) * gal/ft *3 = gal *3.79 L/gal = L~~

MAX PURGE (10 Volumes)

~~Casing Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L~~

~~Borehole Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L~~

Water Quality Parameter Data

Time	Volume (Gallons or Liters)		Water Quality Parameter Measurements						
			± 3% (Min ± 0.2 °C)	± 0.1	± 3%	No Standard	± 10%	± 10%	Drawdown < 0.3 ft
(AS)	Change	Total	Temperature (°C)	pH (std units)	Conductivity (µS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Water Level (feet btoc)
1233 ~~1251~~	0	0	—	—	—	—	—	—	42.19
1243	6	6	—	—	—	—	—	—	DRY
Purged dry on 8/18/2016									
Sample @ 1100 on 8/19/2016									

Notes:

Well condition: Well needs new lock (lock missing)

- moderate turbidity

Constants: Casing Diameter (in) / Gallons per Linear Foot: 1.25 / 0.041 2 / 0.163 4 / 0.653 6 / 1.47 8 / 2.61

Parameter stability: 4 consecutive readings are within ranges indicated in the Water Quality Parameter Table

Groundwater Sampling/Purging Data

Site Information	
Well ID	MW25C
Site Name/Location	Former DFSP POA
Job Number	2186.02
Date	8/18/2016
Sampler(s)	C. Fell, A. Schmidt
Weather/Site Conditions	M. Cloudy

Well and Purging Data		
Well TOC Elevation (ft): 95.81	Purge Start Time: N/A	PID Readings (ppm): Ambient: 0; Breathing Zone: 0; Well: 0
TOC Stickup (ft): 2.31	Purge Finish Time: N/A	
Depth to GW (ft btoc): 42.42	Sampling Depth (ft btoc): N/A	PID Calibration (Circle): Bump Test / Full Calibration
Well Casing Depth (ft btoc): 42.42 43.30	Tubing Length (ft): N/A	Odor: Petroleum Odor
Start Color: N/A; End Color: N/A	Equipment Used: Interface Probe	
Well Condition: Good / dry		

Well Purge Calculations (Casing /Borehole/Parameters)

Casing Purge = Depth casing - depth GW or top filter pack[submerged well] * gal/ft(casing)

Borehole Purge = Depth casing - depth GW or top filter pack[submerged well] * gal/ft(borehole)

DEFAULT PURGE (3 Volumes)

Casing Purge = (ft - ft) * gal/ft *3 = gal *3.79 L/gal = L

Borehole Purge = (ft - ft) * gal/ft *3 = gal *3.79 L/gal = L

MAX PURGE (10 Volumes)

Casing Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L

Borehole Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L

Chris Fell 8/18/2016

Water Quality Parameter Data

Time	Volume (Gallons or Liters)		Water Quality Parameter Measurements						
			± 3% (Min ± 0.2 °C)	± 0.1	± 3%	No Standard	± 10%	± 10%	Drawdown < 0.3 ft
	Change	Total	Temperature (°C)	pH (std units)	Conductivity (µS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Water Level (feet btoc)

Christopher D. Fell

Notes:

Well has less than 1ft of H_2O in it. Not enough to charge tubing w/ pump or use a bailer/hydrasleeve.

Constants: Casing Diameter (in) / Gallons per Linear Foot: 1.25 / 0.041 2 / 0.163 4 / 0.653 6 / 1.47 8 / 2.61

Parameter stability: 4 consecutive readings are within ranges indicated in the Water Quality Parameter Table

Groundwater Sampling/Purging Data

Site Information	
Well ID	SS12
Site Name/Location	Former DFSP POA
Job Number	2816.02
Date	8/19/2016
Sampler(s)	A. Schmidt
Weather/Site Conditions	Partly Cloudy

Well and Purging Data		
Well TOC Elevation (ft)	Purge Start Time	PID Readings (ppm) Ambient: Breathing Zone: Well: NA
TOC Stickup (ft)	Purge Finish Time	~~PID Calibration (Circle)~~ ~~Bump Test / Full Calibration~~
Depth to GW (ft btoc)	Sampling Depth (ft btoc) 0	
Well Casing Depth (ft btoc)	Tubing Length (ft)	Odor: none observed
Start Color: Clear / End Color: Clear Well Condition	Equipment Used: Surface Sample	

Well Purge Calculations (Casing /Borehole/Parameters)

Casing Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(casing)

Borehole Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(borehole)

DEFAULT PURGE (3 Volumes)

~~Casing Purge = (ft - ft) * gal/ft *3 = gal *3.79 L/gal = L~~

~~Borehole Purge = (ft - ft) * gal/ft *3 = gal *3.79 L/gal = L~~

MAX PURGE (10 Volumes)

~~Casing Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L~~

~~Borehole Purge = (ft - ft) * gal/ft *10 = gal *3.79 L/gal = L~~

Water Quality Parameter Data

Time	Volume (Gallons or Liters)		Water Quality Parameter Measurements						
			± 3% (Min ± 0.2 °C)	± 0.1	± 3%	No Standard	± 10%	± 10%	Drawdown < 0.3 ft
	Change	Total	Temperature (°C)	pH (std units)	Conductivity (µS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Water Level (feet btoc)
Sample Collected at 0946									

Notes:

Petroleum sheen observed on water surface, Not bailable

No parameters measured.

Constants: Casing Diameter (in) / Gallons per Linear Foot: 1.25 / 0.041 2 / 0.163 4 / 0.653 6 / 1.47 8 / 2.61

Parameter stability: 4 consecutive readings are within ranges indicated in the Water Quality Parameter Table

Groundwater Sampling/Purging Data

Site Information	
Well ID	SS14
Site Name/Location	Former DFSP PoA
Job Number	2816.02
Date	8/19/2016
Sampler(s)	A. Schmidt
Weather/Site Conditions	Partly cloudy

Well and Purging Data		
Well TOC Elevation (ft)	Purge Start Time	PID Readings (ppm) Ambient: Breathing Zone: Well: NA
TOC Stickup (ft)	Purge Finish Time	
Depth to GW (ft btoc) 0	Sampling Depth (ft btoc) 0	~~PID Calibration (Circle)~~ ~~Bump Test / Full Calibration~~
Well Casing Depth (ft btoc)	Tubing Length (ft)	Odor: None observed
Start Color: Clear / End Color: Clear	Equipment Used: Surface Sample	
Well Condition		

Well Purge Calculations (Casing /Borehole/Parameters)

Casing Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(casing)
Borehole Purge = Depth casing – depth GW or top filter pack[submerged well] * gal/ft(borehole)

DEFAULT PURGE (3 Volumes)

Casing Purge = (___ ft - ___ ft) * ___ gal/ft *3 = ___ gal *3.79 L/gal = ___ L
Borehole Purge = (___ ft - ___ ft) * ___ gal/ft *3 = ___ gal *3.79 L/gal = ___ L

MAX PURGE (10 Volumes)

Casing Purge = (___ ft - ___ ft) * ___ gal/ft *10 = ___ gal *3.79 L/gal = ___ L
Borehole Purge = (___ ft - ___ ft) * ___ gal/ft *10 = ___ gal *3.79 L/gal = ___ L

Water Quality Parameter Data

Time	Volume (Gallons or Liters)		Water Quality Parameter Measurements						
			± 3% (Min ± 0.2 °C)	± 0.1	± 3%	No Standard	± 10%	± 10%	Drawdown < 0.3 ft
	Change	Total	Temperature (°C)	pH (std units)	Conductivity (µS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Water Level (feet btoc)
Sampled at 1005									

Notes:
Organic sheen observed on surface water. Sheen breaks apart (brittle).
No parameters measured

Constants: Casing Diameter (in) / Gallons per Linear Foot: 1.25 / 0.041 2 / 0.163 4 / 0.653 6 / 1.47 8 / 2.61
Parameter stability: 4 consecutive readings are within ranges indicated in the Water Quality Parameter Table

APPENDIX D
ANALYTICAL RESULTS

Laboratory Report of Analysis

To: R & M Consultants Inc
9101 Vanguard Dr
Anchorage, AK 99507
(907)646-9655

Report Number: **1164872**

Client Project: **Former DFSP POA**

Dear Christopher Fell,

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 Stephen 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.

Stephen C. Ede
Alaska Division Technical Director

Stephen Ede
2016.08.31
08:56:50 -08'00'

Stephen Ede Date
Project Manager
Stephen.Ede@sgs.com

Print Date: 08/30/2016 4:51:43PM

Case Narrative

SGS Client: **R & M Consultants Inc**
SGS Project: **1164872**
Project Name/Site: **Former DFSP POA**
Project Contact: **Christopher Fell**

Refer to sample receipt form for information on sample condition.

MW15R (1164872007) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (245%) does not meet QC criteria due to matrix interference.

MW25B (1164872008) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (321%) does not meet QC criteria due to matrix interference.

MW25A (1164872009) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (263%) does not meet QC criteria due to matrix interference.

MW16R (1164872011) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (247%) does not meet QC criteria due to matrix interference.

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

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200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

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, indenmification 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, 8021B, 8082A, 8260B, 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
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
IB	Instrument Blank
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., 1/2 of the LOQ)
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.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
MW23	1164872001	08/18/2016	08/19/2016	Water (Surface, Eff., Ground)
MW2R	1164872002	08/18/2016	08/19/2016	Water (Surface, Eff., Ground)
MW22	1164872003	08/18/2016	08/19/2016	Water (Surface, Eff., Ground)
SS12	1164872004	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)
SS13	1164872005	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)
SS14	1164872006	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)
MW15R	1164872007	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)
MW25B	1164872008	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)
MW25A	1164872009	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)
TB-01	1164872010	08/18/2016	08/19/2016	Water (Surface, Eff., Ground)
MW16R	1164872011	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)

Method	Method Description
AK101	Gasoline Range Organics (W)
SW8260B	Volatile Organic Compounds (W)

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Detectable Results Summary

Client Sample ID: **MW23**
Lab Sample ID: 1164872001
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Gasoline Range Organics	1.17	mg/L
o-Xylene	0.510J	ug/L
Toluene	0.740J	ug/L

Client Sample ID: **MW2R**
Lab Sample ID: 1164872002
Volatile Fuels

Parameter	Result	Units
Gasoline Range Organics	0.185	mg/L

Client Sample ID: **MW22**
Lab Sample ID: 1164872003
Volatile Fuels

Parameter	Result	Units
Gasoline Range Organics	0.134	mg/L

Client Sample ID: **SS12**
Lab Sample ID: 1164872004
Volatile GC/MS

Parameter	Result	Units
Benzene	5.66	ug/L
Ethylbenzene	0.500J	ug/L
P & M -Xylene	0.890J	ug/L
Toluene	0.380J	ug/L

Client Sample ID: **SS13**
Lab Sample ID: 1164872005
Volatile GC/MS

Parameter	Result	Units
Benzene	0.170J	ug/L
Ethylbenzene	0.760J	ug/L
P & M -Xylene	2.44	ug/L

Client Sample ID: **SS14**
Lab Sample ID: 1164872006
Volatile GC/MS

Parameter	Result	Units
Benzene	0.130J	ug/L
Ethylbenzene	0.830J	ug/L
P & M -Xylene	2.73	ug/L
Toluene	0.310J	ug/L

Client Sample ID: **MW15R**
Lab Sample ID: 1164872007
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Gasoline Range Organics	3.97	mg/L
Benzene	459	ug/L
Ethylbenzene	699	ug/L
o-Xylene	3.85J	ug/L
P & M -Xylene	1070	ug/L
Toluene	15.5	ug/L

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Detectable Results Summary

Client Sample ID: **MW25B**
Lab Sample ID: 1164872008
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Gasoline Range Organics	1.22	mg/L
Benzene	12.5	ug/L
Ethylbenzene	98.2	ug/L
o-Xylene	1.60	ug/L
P & M -Xylene	108	ug/L
Toluene	0.690J	ug/L

Client Sample ID: **MW25A**
Lab Sample ID: 1164872009
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Gasoline Range Organics	0.858	mg/L
Benzene	5.34	ug/L
Ethylbenzene	37.5	ug/L
o-Xylene	2.36	ug/L
P & M -Xylene	57.5	ug/L
Toluene	0.510J	ug/L

Client Sample ID: **MW16R**
Lab Sample ID: 1164872011
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Gasoline Range Organics	3.93	mg/L
Benzene	455	ug/L
Ethylbenzene	690	ug/L
o-Xylene	3.70J	ug/L
P & M -Xylene	1060	ug/L
Toluene	15.0	ug/L

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Results of **MW23**

Client Sample ID: **MW23**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872001
Lab Project ID: 1164872

Collection Date: 08/18/16 09:25
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.17		0.100	0.0310	mg/L	1		08/20/16 21:44
Surrogates								
4-Bromofluorobenzene (surr)	113		50-150		%	1		08/20/16 21:44

Batch Information

Analytical Batch: VFC13244
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/20/16 21:44
Container ID: 1164872001-A

Prep Batch: VXX29392
Prep Method: SW5030B
Prep Date/Time: 08/20/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW23**

Client Sample ID: **MW23**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872001
Lab Project ID: 1164872

Collection Date: 08/18/16 09:25
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200	U	0.400	0.120	ug/L	1		08/30/16 02:27
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		08/30/16 02:27
o-Xylene	0.510	J	1.00	0.310	ug/L	1		08/30/16 02:27
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		08/30/16 02:27
Toluene	0.740	J	1.00	0.310	ug/L	1		08/30/16 02:27
Surrogates								
1,2-Dichloroethane-D4 (surr)	87.3		81-118		%	1		08/30/16 02:27
4-Bromofluorobenzene (surr)	102		85-114		%	1		08/30/16 02:27
Toluene-d8 (surr)	103		89-112		%	1		08/30/16 02:27

Batch Information

Analytical Batch: VMS16122
Analytical Method: SW8260B
Analyst: TJT
Analytical Date/Time: 08/30/16 02:27
Container ID: 1164872001-D

Prep Batch: VXX29457
Prep Method: SW5030B
Prep Date/Time: 08/29/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW2R**

Client Sample ID: **MW2R**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872002
Lab Project ID: 1164872

Collection Date: 08/18/16 14:37
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.185		0.100	0.0310	mg/L	1		08/20/16 22:03
Surrogates								
4-Bromofluorobenzene (surr)	91.9		50-150		%	1		08/20/16 22:03

Batch Information

Analytical Batch: VFC13244
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/20/16 22:03
Container ID: 1164872002-A

Prep Batch: VXX29392
Prep Method: SW5030B
Prep Date/Time: 08/20/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW2R**

Client Sample ID: **MW2R**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872002
Lab Project ID: 1164872

Collection Date: 08/18/16 14:37
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U		0.400	0.120	ug/L	1		08/30/16 02:44
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/30/16 02:44
o-Xylene	0.500 U		1.00	0.310	ug/L	1		08/30/16 02:44
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/30/16 02:44
Toluene	0.500 U		1.00	0.310	ug/L	1		08/30/16 02:44
Surrogates								
1,2-Dichloroethane-D4 (surr)	96.6		81-118		%	1		08/30/16 02:44
4-Bromofluorobenzene (surr)	99.9		85-114		%	1		08/30/16 02:44
Toluene-d8 (surr)	101		89-112		%	1		08/30/16 02:44

Batch Information

Analytical Batch: VMS16122
Analytical Method: SW8260B
Analyst: TJT
Analytical Date/Time: 08/30/16 02:44
Container ID: 1164872002-D

Prep Batch: VXX29457
Prep Method: SW5030B
Prep Date/Time: 08/29/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW22**

Client Sample ID: **MW22**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872003
Lab Project ID: 1164872

Collection Date: 08/18/16 15:38
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.134		0.100	0.0310	mg/L	1		08/20/16 22:22
Surrogates								
4-Bromofluorobenzene (surr)	94.4		50-150		%	1		08/20/16 22:22

Batch Information

Analytical Batch: VFC13244
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/20/16 22:22
Container ID: 1164872003-A

Prep Batch: VXX29392
Prep Method: SW5030B
Prep Date/Time: 08/20/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW22**

Client Sample ID: **MW22**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872003
Lab Project ID: 1164872

Collection Date: 08/18/16 15:38
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200	U	0.400	0.120	ug/L	1		08/30/16 03:00
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		08/30/16 03:00
o-Xylene	0.500	U	1.00	0.310	ug/L	1		08/30/16 03:00
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		08/30/16 03:00
Toluene	0.500	U	1.00	0.310	ug/L	1		08/30/16 03:00
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		81-118		%	1		08/30/16 03:00
4-Bromofluorobenzene (surr)	101		85-114		%	1		08/30/16 03:00
Toluene-d8 (surr)	102		89-112		%	1		08/30/16 03:00

Batch Information

Analytical Batch: VMS16122
Analytical Method: SW8260B
Analyst: TJT
Analytical Date/Time: 08/30/16 03:00
Container ID: 1164872003-D

Prep Batch: VXX29457
Prep Method: SW5030B
Prep Date/Time: 08/29/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **SS12**

Client Sample ID: **SS12**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872004
Lab Project ID: 1164872

Collection Date: 08/19/16 09:46
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	5.66		0.400	0.120	ug/L	1		08/30/16 03:16
Ethylbenzene	0.500	J	1.00	0.310	ug/L	1		08/30/16 03:16
o-Xylene	0.500	U	1.00	0.310	ug/L	1		08/30/16 03:16
P & M -Xylene	0.890	J	2.00	0.620	ug/L	1		08/30/16 03:16
Toluene	0.380	J	1.00	0.310	ug/L	1		08/30/16 03:16
Surrogates								
1,2-Dichloroethane-D4 (surr)	101		81-118		%	1		08/30/16 03:16
4-Bromofluorobenzene (surr)	97.6		85-114		%	1		08/30/16 03:16
Toluene-d8 (surr)	101		89-112		%	1		08/30/16 03:16

Batch Information

Analytical Batch: VMS16122
Analytical Method: SW8260B
Analyst: TJT
Analytical Date/Time: 08/30/16 03:16
Container ID: 1164872004-A

Prep Batch: VXX29457
Prep Method: SW5030B
Prep Date/Time: 08/29/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **SS13**

Client Sample ID: **SS13**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872005
Lab Project ID: 1164872

Collection Date: 08/19/16 10:05
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.170	J	0.400	0.120	ug/L	1		08/30/16 03:33
Ethylbenzene	0.760	J	1.00	0.310	ug/L	1		08/30/16 03:33
o-Xylene	0.500	U	1.00	0.310	ug/L	1		08/30/16 03:33
P & M -Xylene	2.44		2.00	0.620	ug/L	1		08/30/16 03:33
Toluene	0.500	U	1.00	0.310	ug/L	1		08/30/16 03:33
Surrogates								
1,2-Dichloroethane-D4 (surr)	101		81-118		%	1		08/30/16 03:33
4-Bromofluorobenzene (surr)	97.3		85-114		%	1		08/30/16 03:33
Toluene-d8 (surr)	104		89-112		%	1		08/30/16 03:33

Batch Information

Analytical Batch: VMS16122
Analytical Method: SW8260B
Analyst: TJT
Analytical Date/Time: 08/30/16 03:33
Container ID: 1164872005-A

Prep Batch: VXX29457
Prep Method: SW5030B
Prep Date/Time: 08/29/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **SS14**

Client Sample ID: **SS14**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872006
Lab Project ID: 1164872

Collection Date: 08/19/16 10:05
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.130	J	0.400	0.120	ug/L	1		08/30/16 00:10
Ethylbenzene	0.830	J	1.00	0.310	ug/L	1		08/30/16 00:10
o-Xylene	0.500	U	1.00	0.310	ug/L	1		08/30/16 00:10
P & M -Xylene	2.73		2.00	0.620	ug/L	1		08/30/16 00:10
Toluene	0.310	J	1.00	0.310	ug/L	1		08/30/16 00:10
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		81-118		%	1		08/30/16 00:10
4-Bromofluorobenzene (surr)	103		85-114		%	1		08/30/16 00:10
Toluene-d8 (surr)	101		89-112		%	1		08/30/16 00:10

Batch Information

Analytical Batch: VMS16123
Analytical Method: SW8260B
Analyst: TJT
Analytical Date/Time: 08/30/16 00:10
Container ID: 1164872006-A

Prep Batch: VXX29458
Prep Method: SW5030B
Prep Date/Time: 08/29/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW15R**

Client Sample ID: **MW15R**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872007
Lab Project ID: 1164872

Collection Date: 08/19/16 10:02
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	3.97		0.100	0.0310	mg/L	1		08/20/16 22:41
Surrogates								
4-Bromofluorobenzene (surr)	245	*	50-150		%	1		08/20/16 22:41

Batch Information

Analytical Batch: VFC13244
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/20/16 22:41
Container ID: 1164872007-A

Prep Batch: VXX29392
Prep Method: SW5030B
Prep Date/Time: 08/20/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW15R**

Client Sample ID: **MW15R**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872007
Lab Project ID: 1164872

Collection Date: 08/19/16 10:02
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	459		20.0	6.00	ug/L	50		08/30/16 02:38
Ethylbenzene	699		50.0	15.5	ug/L	50		08/30/16 02:38
o-Xylene	3.85	J	5.00	1.55	ug/L	5		08/30/16 03:27
P & M -Xylene	1070		100	31.0	ug/L	50		08/30/16 02:38
Toluene	15.5		5.00	1.55	ug/L	5		08/30/16 03:27
Surrogates								
1,2-Dichloroethane-D4 (surr)	98.6		81-118		%	5		08/30/16 03:27
4-Bromofluorobenzene (surr)	99		85-114		%	5		08/30/16 03:27
Toluene-d8 (surr)	101		89-112		%	5		08/30/16 03:27

Batch Information

Analytical Batch: VMS16123
Analytical Method: SW8260B
Analyst: TJT
Analytical Date/Time: 08/30/16 02:38
Container ID: 1164872007-D

Prep Batch: VXX29458
Prep Method: SW5030B
Prep Date/Time: 08/29/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW25B**

Client Sample ID: **MW25B**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872008
Lab Project ID: 1164872

Collection Date: 08/19/16 11:00
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.22		0.100	0.0310	mg/L	1		08/20/16 23:00
Surrogates								
4-Bromofluorobenzene (surr)	321	*	50-150		%	1		08/20/16 23:00

Batch Information

Analytical Batch: VFC13244
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/20/16 23:00
Container ID: 1164872008-A

Prep Batch: VXX29392
Prep Method: SW5030B
Prep Date/Time: 08/20/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW25B**

Client Sample ID: **MW25B**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872008
Lab Project ID: 1164872

Collection Date: 08/19/16 11:00
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	12.5		0.400	0.120	ug/L	1		08/30/16 03:10
Ethylbenzene	98.2		10.0	3.10	ug/L	10		08/30/16 02:21
o-Xylene	1.60		1.00	0.310	ug/L	1		08/30/16 03:10
P & M -Xylene	108		2.00	0.620	ug/L	1		08/30/16 03:10
Toluene	0.690	J	1.00	0.310	ug/L	1		08/30/16 03:10
Surrogates								
1,2-Dichloroethane-D4 (surr)	97.6		81-118		%	1		08/30/16 03:10
4-Bromofluorobenzene (surr)	97.9		85-114		%	1		08/30/16 03:10
Toluene-d8 (surr)	99.9		89-112		%	1		08/30/16 03:10

Batch Information

Analytical Batch: VMS16123
Analytical Method: SW8260B
Analyst: TJT
Analytical Date/Time: 08/30/16 03:10
Container ID: 1164872008-D

Prep Batch: VXX29458
Prep Method: SW5030B
Prep Date/Time: 08/29/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/30/2016 4:51:50PM

J flagging is activated

Results of **MW25A**

Client Sample ID: **MW25A**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872009
Lab Project ID: 1164872

Collection Date: 08/19/16 11:56
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.858		0.100	0.0310	mg/L	1		08/20/16 23:19
Surrogates								
4-Bromofluorobenzene (surr)	263	*	50-150		%	1		08/20/16 23:19

Batch Information

Analytical Batch: VFC13244
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/20/16 23:19
Container ID: 1164872009-A

Prep Batch: VXX29392
Prep Method: SW5030B
Prep Date/Time: 08/20/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW25A**

Client Sample ID: **MW25A**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872009
Lab Project ID: 1164872

Collection Date: 08/19/16 11:56
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	5.34		0.400	0.120	ug/L	1		08/30/16 00:26
Ethylbenzene	37.5		1.00	0.310	ug/L	1		08/30/16 00:26
o-Xylene	2.36		1.00	0.310	ug/L	1		08/30/16 00:26
P & M -Xylene	57.5		2.00	0.620	ug/L	1		08/30/16 00:26
Toluene	0.510	J	1.00	0.310	ug/L	1		08/30/16 00:26
Surrogates								
1,2-Dichloroethane-D4 (surr)	98.8		81-118		%	1		08/30/16 00:26
4-Bromofluorobenzene (surr)	98.1		85-114		%	1		08/30/16 00:26
Toluene-d8 (surr)	100		89-112		%	1		08/30/16 00:26

Batch Information

Analytical Batch: VMS16123
Analytical Method: SW8260B
Analyst: TJT
Analytical Date/Time: 08/30/16 00:26
Container ID: 1164872009-D

Prep Batch: VXX29458
Prep Method: SW5030B
Prep Date/Time: 08/29/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/30/2016 4:51:50PM

J flagging is activated

Results of **TB-01**

Client Sample ID: **TB-01**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872010
Lab Project ID: 1164872

Collection Date: 08/18/16 09:00
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		08/28/16 13:22
Surrogates								
4-Bromofluorobenzene (surr)	113		50-150		%	1		08/28/16 13:22

Batch Information

Analytical Batch: VFC13254
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/28/16 13:22
Container ID: 1164872010-A

Prep Batch: VXX29450
Prep Method: SW5030B
Prep Date/Time: 08/28/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **TB-01**

Client Sample ID: **TB-01**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872010
Lab Project ID: 1164872

Collection Date: 08/18/16 09:00
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200	U	0.400	0.120	ug/L	1		08/29/16 22:48
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		08/29/16 22:48
o-Xylene	0.500	U	1.00	0.310	ug/L	1		08/29/16 22:48
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		08/29/16 22:48
Toluene	0.500	U	1.00	0.310	ug/L	1		08/29/16 22:48
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		81-118		%	1		08/29/16 22:48
4-Bromofluorobenzene (surr)	106		85-114		%	1		08/29/16 22:48
Toluene-d8 (surr)	101		89-112		%	1		08/29/16 22:48

Batch Information

Analytical Batch: VMS16123
Analytical Method: SW8260B
Analyst: TJT
Analytical Date/Time: 08/29/16 22:48
Container ID: 1164872010-D

Prep Batch: VXX29458
Prep Method: SW5030B
Prep Date/Time: 08/29/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/30/2016 4:51:50PM

J flagging is activated

Results of **MW16R**

Client Sample ID: **MW16R**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872011
Lab Project ID: 1164872

Collection Date: 08/19/16 10:02
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	3.93		0.100	0.0310	mg/L	1		08/20/16 23:38
Surrogates								
4-Bromofluorobenzene (surr)	247	*	50-150		%	1		08/20/16 23:38

Batch Information

Analytical Batch: VFC13244
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/20/16 23:38
Container ID: 1164872011-A

Prep Batch: VXX29392
Prep Method: SW5030B
Prep Date/Time: 08/20/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW16R**

Client Sample ID: **MW16R**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164872011
Lab Project ID: 1164872

Collection Date: 08/19/16 10:02
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	455		20.0	6.00	ug/L	50		08/30/16 02:54
Ethylbenzene	690		50.0	15.5	ug/L	50		08/30/16 02:54
o-Xylene	3.70	J	5.00	1.55	ug/L	5		08/30/16 03:43
P & M -Xylene	1060		100	31.0	ug/L	50		08/30/16 02:54
Toluene	15.0		5.00	1.55	ug/L	5		08/30/16 03:43
Surrogates								
1,2-Dichloroethane-D4 (surr)	98.8		81-118		%	5		08/30/16 03:43
4-Bromofluorobenzene (surr)	102		85-114		%	5		08/30/16 03:43
Toluene-d8 (surr)	99.5		89-112		%	5		08/30/16 03:43

Batch Information

Analytical Batch: VMS16123
Analytical Method: SW8260B
Analyst: TJT
Analytical Date/Time: 08/30/16 02:54
Container ID: 1164872011-B

Prep Batch: VXX29458
Prep Method: SW5030B
Prep Date/Time: 08/29/16 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/30/2016 4:51:50PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1741938 [VXX/29392]
Blank Lab ID: 1346719

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1164872001, 1164872002, 1164872003, 1164872007, 1164872008, 1164872009, 1164872011

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	88.7	50-150		%

Batch Information

Analytical Batch: VFC13244
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/20/2016 6:31:00PM

Prep Batch: VXX29392
Prep Method: SW5030B
Prep Date/Time: 8/20/2016 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1164872 [VXX29392]
Blank Spike Lab ID: 1346722
Date Analyzed: 08/20/2016 17:53

Spike Duplicate ID: LCSD for HBN 1164872 [VXX29392]
Spike Duplicate Lab ID: 1346723
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1164872001, 1164872002, 1164872003, 1164872007, 1164872008, 1164872009, 1164872011

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.842	84	1.00	0.814	81	(60-120)	3.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	100	100	0.0500	94.2	94	(50-150)	6.20	

Batch Information

Analytical Batch: **VFC13244**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX29392**
Prep Method: **SW5030B**
Prep Date/Time: **08/20/2016 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1742337 [VXX/29450]
Blank Lab ID: 1348566

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1164872010

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	103	50-150		%

Batch Information

Analytical Batch: VFC13254
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 8/28/2016 10:40:00AM

Prep Batch: VXX29450
Prep Method: SW5030B
Prep Date/Time: 8/28/2016 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1164872 [VXX29450]
Blank Spike Lab ID: 1348569
Date Analyzed: 08/28/2016 12:46

Spike Duplicate ID: LCSD for HBN 1164872 [VXX29450]
Spike Duplicate Lab ID: 1348570
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1164872010

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.938	94	1.00	0.906	91	(60-120)	3.50	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	113	113	0.0500	120	120	(50-150)	6.50	

Batch Information

Analytical Batch: **VFC13254**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX29450**
Prep Method: **SW5030B**
Prep Date/Time: **08/28/2016 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1742377 [VXX/29457]
Blank Lab ID: 1348754

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1164872001, 1164872002, 1164872003, 1164872004, 1164872005

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	111	81-118		%
4-Bromofluorobenzene (surr)	100	85-114		%
Toluene-d8 (surr)	102	89-112		%

Batch Information

Analytical Batch: VMS16122
Analytical Method: SW8260B
Instrument: VPA 780/5975 GC/MS
Analyst: TJT
Analytical Date/Time: 8/29/2016 7:14:00PM

Prep Batch: VXX29457
Prep Method: SW5030B
Prep Date/Time: 8/29/2016 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1164872 [VXX29457]
Blank Spike Lab ID: 1348755
Date Analyzed: 08/29/2016 19:47

Spike Duplicate ID: LCSD for HBN 1164872 [VXX29457]
Spike Duplicate Lab ID: 1348756
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1164872001, 1164872002, 1164872003, 1164872004, 1164872005

Results by **SW8260B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	30	32.1	107	30	32.6	109	(79-120)	1.60	(< 20)
Ethylbenzene	30	33.5	112	30	33.3	111	(79-121)	0.51	(< 20)
o-Xylene	30	33.7	112	30	34.4	115	(78-122)	2.00	(< 20)
P & M -Xylene	60	67.2	112	60	68.6	114	(80-121)	2.00	(< 20)
Toluene	30	28.9	96	30	31.6	105	(80-121)	8.80	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	99.9	100	30	93.4	93	(81-118)	6.70	
4-Bromofluorobenzene (surr)	30	96.7	97	30	97.3	97	(85-114)	0.58	
Toluene-d8 (surr)	30	92.9	93	30	99.6	100	(89-112)	7.00	

Batch Information

Analytical Batch: **VMS16122**
Analytical Method: **SW8260B**
Instrument: **VPA 780/5975 GC/MS**
Analyst: **TJT**

Prep Batch: **VXX29457**
Prep Method: **SW5030B**
Prep Date/Time: **08/29/2016 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 08/30/2016 4:52:02PM

Method Blank

Blank ID: MB for HBN 1742389 [VXX/29458]
Blank Lab ID: 1348791

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1164872006, 1164872007, 1164872008, 1164872009, 1164872010, 1164872011

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	103	81-118		%
4-Bromofluorobenzene (surr)	105	85-114		%
Toluene-d8 (surr)	100	89-112		%

Batch Information

Analytical Batch: VMS16123
Analytical Method: SW8260B
Instrument: VSA Agilent GC/MS 7890B/5977A
Analyst: TJT
Analytical Date/Time: 8/29/2016 7:10:00PM

Prep Batch: VXX29458
Prep Method: SW5030B
Prep Date/Time: 8/29/2016 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1164872 [VXX29458]
Blank Spike Lab ID: 1348792
Date Analyzed: 08/29/2016 19:44

Spike Duplicate ID: LCSD for HBN 1164872 [VXX29458]
Spike Duplicate Lab ID: 1348793
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1164872006, 1164872007, 1164872008, 1164872009, 1164872010, 1164872011

Results by **SW8260B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	30	35.1	117	30	34.5	115	(79-120)	1.60	(< 20)
Ethylbenzene	30	35.5	118	30	35.6	119	(79-121)	0.20	(< 20)
o-Xylene	30	35.4	118	30	35.9	120	(78-122)	1.30	(< 20)
P & M -Xylene	60	70.7	118	60	70.7	118	(80-121)	0.01	(< 20)
Toluene	30	33.9	113	30	34.1	114	(80-121)	0.62	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	101	101	30	100	100	(81-118)	0.99	
4-Bromofluorobenzene (surr)	30	98.5	99	30	101	101	(85-114)	2.10	
Toluene-d8 (surr)	30	99.7	100	30	101	101	(89-112)	1.30	

Batch Information

Analytical Batch: **VMS16123**
Analytical Method: **SW8260B**
Instrument: **VSA Agilent GC/MS 7890B/5977A**
Analyst: **TJT**

Prep Batch: **VXX29458**
Prep Method: **SW5030B**
Prep Date/Time: **08/29/2016 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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CHAIN OF CUSTODY RECORD

1164872

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

Page 1 of 2

Section 1

CLIENT: R&M Consultants, Inc

CONTACT: Chris Fell / Abe Schmidt — PHONE NO: 907 646 9655 / 907 646 9639

PROJECT NAME: Former DFSP POA — PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Chris Fell, Abe Schmidt — E-MAIL: cfell@rmconsult.com, aschmidt@rmconsult.com

INVOICE TO: R&M Consultants — QUOTE #: Open Quote — P.O. #:

Section 3

Section 2 RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB M = Multi Incremental Soils	Preservative: 0-6°C HCL — GRO (AK101)	Preservative: 0-6°C HCL — BTEX (SW8260)	REMARKS/ LOC ID
1 A-F	MW23	8/18/16	0925	water	6	G	X	X	
2 A-F	MW2R	8/18/16	1437		6		X	X	
3 A-F	MW22	8/18/16	1538		6		X	X	
4 A-C	SS12	8/19/16	0946		3			X	
5 A-C	SS13	8/19/16	1005		3			X	
6 A-C	SS14	8/19/16	1005		3			X	
7 A-F	MW15R	8/19/16	1002		6		X	X	
8 A-F	MW25B	8/19/16	1100		6		X	X	
9 A-F	MW25A	8/19/16	1156		6		X	X	
10 A-F	TB-01	8/18/16	0900		6		X	X	

Section 5

	Date	Time	
Relinquished By: (1) Christopher Pell	8/19/16	1554	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date 8/19/16	Time 15:54	Received For Laboratory By:

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements: Level 2 PDF

Requested Turnaround Time and/or Special Instructions: Standard

Temp Blank °C: 2.2 06

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

Page 3 of 38

[X] 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

Handdelivered

F083-Kit_Request_and_COC_Templates-Blank
Revised 2013-03-24

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1164872

Page 2 of 2

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

Section 1

CLIENT: R2M Consultants, Inc.

CONTACT: Chris Fell / Abe Schmidt — PHONE NO: 907 646 9653 / 907 646 9639

PROJECT NAME: Former DFSP POA — PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Chris Fell / Abe Schmidt — E-MAIL: cfell@rmconsult.com / aschmidt@rmconsult.com

INVOICE TO: R2M Consultants — QUOTE #: Open Quote — P.O. #:

Section 3

# CONTAINERS	Type C = COMP G = GRAB M = Multi Incre-mental Soils	Preservative: 0-6°C HCL	Preservative: 0-6°C HCL								
		GRO (AK101)	BTEX (SW8260)								

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type	GRO (AK101)	BTEX (SW8260)	REMARKS/ LOC ID
(1) AF	MW16R	8/19/16	1002	Water	6				

Section 5

	Date	Time	Received By:
Relinquished By: (1) Christopher Dell	8/19/16	1554	
Relinquished By: (2)			
Relinquished By: (3)			
Relinquished By: (4)	8/19/16	15:54	Received For Laboratory By:

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements: Level 2 PDF

Requested Turnaround Time and/or Special Instructions: Standard

Temp Blank °C: 2.0 D6 or Ambient [ ] (See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) INTACT BROKEN (ABSENT) (See attached Sample Receipt Form)

[X] 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

SGS

e-SAMPLE RECEIPT FORM

1164872

Review Criteria	Y/N (yes/no)	Exceptions Noted below
	Y	exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location		Absent
COC accompanied samples?	Y	
Y **exemption permitted if chilled & collected <8hrs ago or chlling not required (i.e., waste, oil)		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Y	Cooler ID: 1 @ 2.7 °C Therm ID: D6
	Y	Cooler ID: @ °C Therm ID:
	Y	Cooler ID: @ °C Therm ID:
	Y	Cooler ID: @ °C Therm ID:
	Y	Cooler ID: @ °C Therm ID:
*If >6°C, were samples collected <8 hours ago?	Y	
If <0°C, were sample containers ice free?	Y	
If samples 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".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
		Note: Refer to form F-083 "Sample Guide" for hold times.
Were samples received within hold time?	Y	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Y	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous?	Y	
	Y	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Y	
IF APPLICABLE		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Y	
Were all VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Y	
Were all soil VOAs field extracted with MeOH+BFB?	Y	

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

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1164872001-A	HCL to pH < 2	OK	1164872009-D	HCL to pH < 2	OK
1164872001-B	HCL to pH < 2	OK	1164872009-E	HCL to pH < 2	OK
1164872001-C	HCL to pH < 2	OK	1164872009-F	HCL to pH < 2	OK
1164872001-D	HCL to pH < 2	OK	1164872010-A	HCL to pH < 2	OK
1164872001-E	HCL to pH < 2	OK	1164872010-B	HCL to pH < 2	OK
1164872001-F	HCL to pH < 2	OK	1164872010-C	HCL to pH < 2	OK
1164872002-A	HCL to pH < 2	OK	1164872010-D	HCL to pH < 2	OK
1164872002-B	HCL to pH < 2	OK	1164872010-E	HCL to pH < 2	OK
1164872002-C	HCL to pH < 2	OK	1164872010-F	HCL to pH < 2	OK
1164872002-D	HCL to pH < 2	OK	1164872011-A	HCL to pH < 2	OK
1164872002-E	HCL to pH < 2	OK	1164872011-B	HCL to pH < 2	OK
1164872002-F	HCL to pH < 2	OK	1164872011-C	HCL to pH < 2	OK
1164872003-A	HCL to pH < 2	OK	1164872011-D	HCL to pH < 2	OK
1164872003-B	HCL to pH < 2	OK	1164872011-E	HCL to pH < 2	OK
1164872003-C	HCL to pH < 2	OK	1164872011-F	HCL to pH < 2	OK
1164872003-D	HCL to pH < 2	OK			
1164872003-E	HCL to pH < 2	OK			
1164872003-F	HCL to pH < 2	OK			
1164872004-A	HCL to pH < 2	OK			
1164872004-B	HCL to pH < 2	OK			
1164872004-C	HCL to pH < 2	OK			
1164872005-A	HCL to pH < 2	OK			
1164872005-B	HCL to pH < 2	OK			
1164872005-C	HCL to pH < 2	OK			
1164872006-A	HCL to pH < 2	OK			
1164872006-B	HCL to pH < 2	OK			
1164872006-C	HCL to pH < 2	OK			
1164872007-A	HCL to pH < 2	OK			
1164872007-B	HCL to pH < 2	OK			
1164872007-C	HCL to pH < 2	OK			
1164872007-D	HCL to pH < 2	OK			
1164872007-E	HCL to pH < 2	OK			
1164872007-F	HCL to pH < 2	OK			
1164872008-A	HCL to pH < 2	OK			
1164872008-B	HCL to pH < 2	OK			
1164872008-C	HCL to pH < 2	OK			
1164872008-D	HCL to pH < 2	OK			
1164872008-E	HCL to pH < 2	OK			
1164872008-F	HCL to pH < 2	OK			
1164872009-A	HCL to pH < 2	OK			
1164872009-B	HCL to pH < 2	OK			
1164872009-C	HCL to pH < 2	OK			

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

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.

Laboratory Report of Analysis

To: R & M Consultants Inc
9101 Vanguard Dr
Anchorage, AK 99507
(907)646-9655

Report Number: **1164873**

Client Project: **Former DFSP POA**

Dear Christopher Fell,

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 Stephen 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.

Stephen C. Ede
Alaska Division Technical Director

Stephen Ede
2016.09.14
08:22:39 -08'00'

Stephen Ede Date
Project Manager
Stephen.Ede@sgs.com

Print Date: 09/13/2016 4:45:53PM

Case Narrative

SGS Client: **R & M Consultants Inc**
SGS Project: **1164873**
Project Name/Site: **Former DFSP POA**
Project Contact: **Christopher Fell**

Refer to sample receipt form for information on sample condition.

SS13 (1164873002) PS

8270D SIM - PAH surrogate recovery for terphenyl-d14 (56.6%) does not meet DOD recovery limits but is within in house control limits.

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

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIM (PAH)				
1164873001	SS12	XMS9571	2-Methylnaphthalene	RP

Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

Print Date: 09/13/2016 4:45:55PM

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, indenmification 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, 8021B, 8082A, 8260B, 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
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
IB	Instrument Blank
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., 1/2 of the LOQ)
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 North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
SS12	1164873001	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)
SS13	1164873002	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)
SS14	1164873003	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)
MW25B	1164873004	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)
MW25A	1164873005	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM (PAH)	8270 PAH SIM Semi-Vol GC/MS Liq/Liq ext.
AK102	Diesel Range Organics (W)
AK102	DRO Low Volume (W)

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Detectable Results Summary

Client Sample ID: **SS12**
Lab Sample ID: 1164873001
Polynuclear Aromatics GC/MS

Parameter	Result	Units
1-Methylnaphthalene	0.0606	ug/L
2-Methylnaphthalene	0.0242J	ug/L
Acenaphthene	0.0495J	ug/L
Fluorene	0.0347J	ug/L
Naphthalene	0.0716J	ug/L

Client Sample ID: **SS13**
Lab Sample ID: 1164873002
Polynuclear Aromatics GC/MS

Parameter	Result	Units
1-Methylnaphthalene	0.112	ug/L
2-Methylnaphthalene	0.0730	ug/L
Naphthalene	0.116	ug/L

Client Sample ID: **SS14**
Lab Sample ID: 1164873003
Polynuclear Aromatics GC/MS

Parameter	Result	Units
1-Methylnaphthalene	0.171	ug/L
2-Methylnaphthalene	0.101	ug/L
Naphthalene	0.157	ug/L

Client Sample ID: **MW25B**
Lab Sample ID: 1164873004
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	27.2	mg/L

Client Sample ID: **MW25A**
Lab Sample ID: 1164873005
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	5.07	mg/L

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Results of **SS12**

Client Sample ID: **SS12**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164873001
Lab Project ID: 1164873

Collection Date: 08/19/16 09:46
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0606		0.0532	0.0160	ug/L	1		08/26/16 00:14
2-Methylnaphthalene	0.0242	J	0.0532	0.0160	ug/L	1		08/26/16 00:14
Acenaphthene	0.0495	J	0.0532	0.0160	ug/L	1		08/26/16 00:14
Acenaphthylene	0.0266	U	0.0532	0.0160	ug/L	1		08/26/16 00:14
Anthracene	0.0266	U	0.0532	0.0160	ug/L	1		08/26/16 00:14
Benzo(a)Anthracene	0.0266	U	0.0532	0.0160	ug/L	1		08/26/16 00:14
Benzo[a]pyrene	0.0107	U	0.0213	0.0160	ug/L	1		08/26/16 00:14
Benzo[b]Fluoranthene	0.0266	U	0.0532	0.0160	ug/L	1		08/26/16 00:14
Benzo[g,h,i]perylene	0.0266	U	0.0532	0.0160	ug/L	1		08/26/16 00:14
Benzo[k]fluoranthene	0.0266	U	0.0532	0.0160	ug/L	1		08/26/16 00:14
Chrysene	0.0266	U	0.0532	0.0160	ug/L	1		08/26/16 00:14
Dibenzo[a,h]anthracene	0.0107	U	0.0213	0.0160	ug/L	1		08/26/16 00:14
Fluoranthene	0.0266	U	0.0532	0.0160	ug/L	1		08/26/16 00:14
Fluorene	0.0347	J	0.0532	0.0160	ug/L	1		08/26/16 00:14
Indeno[1,2,3-c,d] pyrene	0.0266	U	0.0532	0.0160	ug/L	1		08/26/16 00:14
Naphthalene	0.0716	J	0.106	0.0330	ug/L	1		08/26/16 00:14
Phenanthrene	0.0266	U	0.0532	0.0160	ug/L	1		08/26/16 00:14
Pyrene	0.0266	U	0.0532	0.0160	ug/L	1		08/26/16 00:14
Surrogates								
2-Fluorobiphenyl (surr)	69.1		53-106		%	1		08/26/16 00:14
Terphenyl-d14 (surr)	68.7		58-132		%	1		08/26/16 00:14

Batch Information

Analytical Batch: XMS9571
Analytical Method: 8270D SIM (PAH)
Analyst: BRV
Analytical Date/Time: 08/26/16 00:14
Container ID: 1164873001-A

Prep Batch: XXX36115
Prep Method: SW3520C
Prep Date/Time: 08/22/16 10:00
Prep Initial Wt./Vol.: 940 mL
Prep Extract Vol: 1 mL

Print Date: 09/13/2016 4:45:59PM

J flagging is activated

Results of **SS13**

Client Sample ID: **SS13**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164873002
Lab Project ID: 1164873

Collection Date: 08/19/16 10:05
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.112		0.0515	0.0155	ug/L	1		08/26/16 00:37
2-Methylnaphthalene	0.0730		0.0515	0.0155	ug/L	1		08/26/16 00:37
Acenaphthene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Acenaphthylene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Anthracene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Benzo(a)Anthracene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Benzo[a]pyrene	0.0103 U		0.0206	0.00639	ug/L	1		08/26/16 00:37
Benzo[b]Fluoranthene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Benzo[g,h,i]perylene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Benzo[k]fluoranthene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Chrysene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Dibenzo[a,h]anthracene	0.0103 U		0.0206	0.00639	ug/L	1		08/26/16 00:37
Fluoranthene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Fluorene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Indeno[1,2,3-c,d] pyrene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Naphthalene	0.116		0.103	0.0320	ug/L	1		08/26/16 00:37
Phenanthrene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Pyrene	0.0257 U		0.0515	0.0155	ug/L	1		08/26/16 00:37
Surrogates								
2-Fluorobiphenyl (surr)	61.6		53-106		%	1		08/26/16 00:37
Terphenyl-d14 (surr)	56.6	*	58-132		%	1		08/26/16 00:37

Batch Information

Analytical Batch: XMS9571
Analytical Method: 8270D SIM (PAH)
Analyst: S.G
Analytical Date/Time: 08/26/16 00:37
Container ID: 1164873002-A

Prep Batch: XXX36115
Prep Method: SW3520C
Prep Date/Time: 08/22/16 10:00
Prep Initial Wt./Vol.: 970 mL
Prep Extract Vol: 1 mL

Print Date: 09/13/2016 4:45:59PM

J flagging is activated

Results of **SS14**

Client Sample ID: **SS14**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164873003
Lab Project ID: 1164873

Collection Date: 08/19/16 10:05
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.171		0.0532	0.0160	ug/L	1		08/26/16 00:59
2-Methylnaphthalene	0.101		0.0532	0.0160	ug/L	1		08/26/16 00:59
Acenaphthene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Acenaphthylene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Anthracene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Benzo(a)Anthracene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Benzo[a]pyrene	0.0107 U		0.0213	0.0160	ug/L	1		08/26/16 00:59
Benzo[b]Fluoranthene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Benzo[g,h,i]perylene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Benzo[k]fluoranthene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Chrysene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Dibenzo[a,h]anthracene	0.0107 U		0.0213	0.0160	ug/L	1		08/26/16 00:59
Fluoranthene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Fluorene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Indeno[1,2,3-c,d] pyrene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Naphthalene	0.157		0.106	0.0330	ug/L	1		08/26/16 00:59
Phenanthrene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Pyrene	0.0266 U		0.0532	0.0160	ug/L	1		08/26/16 00:59
Surrogates								
2-Fluorobiphenyl (surr)	72.5		53-106		%	1		08/26/16 00:59
Terphenyl-d14 (surr)	75		58-132		%	1		08/26/16 00:59

Batch Information

Analytical Batch: XMS9571
Analytical Method: 8270D SIM (PAH)
Analyst: BRV
Analytical Date/Time: 08/26/16 00:59
Container ID: 1164873003-A

Prep Batch: XXX36115
Prep Method: SW3520C
Prep Date/Time: 08/22/16 10:00
Prep Initial Wt./Vol.: 940 mL
Prep Extract Vol: 1 mL

Print Date: 09/13/2016 4:45:59PM

J flagging is activated

Results of **MW25B**

Client Sample ID: **MW25B**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164873004
Lab Project ID: 1164873

Collection Date: 08/19/16 11:00
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	27.2		0.566	0.170	mg/L	1		09/01/16 02:48
Surrogates								
5a Androstane (surr)	94.7		50-150		%	1		09/01/16 02:48

Batch Information

Analytical Batch: XFC12770
Analytical Method: AK102
Analyst: NRO
Analytical Date/Time: 09/01/16 02:48
Container ID: 1164873004-A

Prep Batch: XXX36183
Prep Method: SW3520C
Prep Date/Time: 08/31/16 10:07
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL

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Results of **MW25A**

Client Sample ID: **MW25A**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164873005
Lab Project ID: 1164873

Collection Date: 08/19/16 11:56
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	5.07		0.612	0.184	mg/L	1		09/01/16 02:59
Surrogates								
5a Androstane (surr)	92.3		50-150		%	1		09/01/16 02:59

Batch Information

Analytical Batch: XFC12771
Analytical Method: AK102
Analyst: NRO
Analytical Date/Time: 09/01/16 02:59
Container ID: 1164873005-A

Prep Batch: XXX36182
Prep Method: SW3520C
Prep Date/Time: 08/31/16 10:07
Prep Initial Wt./Vol.: 980 mL
Prep Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1741958 [XXX/36115]
Blank Lab ID: 1346796

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1164873001, 1164873002, 1164873003

Results by **8270D SIM (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.0150	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.0150	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Fluorobiphenyl (surr)	68.4	53-106		%
Terphenyl-d14 (surr)	76.2	58-132		%

Batch Information

Analytical Batch: XMS9571
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: BRV
Analytical Date/Time: 8/25/2016 6:16:00PM

Prep Batch: XXX36115
Prep Method: SW3520C
Prep Date/Time: 8/22/2016 10:00:52AM
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1164873 [XXX36115]
Blank Spike Lab ID: 1346797
Date Analyzed: 08/25/2016 18:38

Spike Duplicate ID: LCSD for HBN 1164873 [XXX36115]
Spike Duplicate Lab ID: 1346798
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1164873001, 1164873002, 1164873003

Results by **8270D SIM (PAH)**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	0.5	0.477	95	0.5	0.474	95	(41-115)	0.52	(< 20)
2-Methylnaphthalene	0.5	0.462	92	0.5	0.458	92	(39-114)	0.84	(< 20)
Acenaphthene	0.5	0.511	102	0.5	0.509	102	(48-114)	0.21	(< 20)
Acenaphthylene	0.5	0.469	94	0.5	0.465	93	(35-121)	1.00	(< 20)
Anthracene	0.5	0.477	96	0.5	0.486	97	(53-119)	1.80	(< 20)
Benzo(a)Anthracene	0.5	0.452	91	0.5	0.430	86	(59-120)	5.00	(< 20)
Benzo[a]pyrene	0.5	0.492	98	0.5	0.476	95	(53-120)	3.40	(< 20)
Benzo[b]Fluoranthene	0.5	0.431	86	0.5	0.419	84	(53-126)	2.80	(< 20)
Benzo[g,h,i]perylene	0.5	0.456	91	0.5	0.439	88	(44-128)	3.60	(< 20)
Benzo[k]fluoranthene	0.5	0.440	88	0.5	0.440	88	(54-125)	0.03	(< 20)
Chrysene	0.5	0.464	93	0.5	0.463	93	(57-120)	0.14	(< 20)
Dibenzo[a,h]anthracene	0.5	0.450	90	0.5	0.449	90	(44-131)	0.22	(< 20)
Fluoranthene	0.5	0.454	91	0.5	0.457	92	(58-120)	0.86	(< 20)
Fluorene	0.5	0.469	94	0.5	0.466	93	(50-118)	0.58	(< 20)
Indeno[1,2,3-c,d] pyrene	0.5	0.443	89	0.5	0.443	89	(48-130)	0.19	(< 20)
Naphthalene	0.5	0.454	91	0.5	0.454	91	(43-114)	0.07	(< 20)
Phenanthrene	0.5	0.442	88	0.5	0.427	85	(53-115)	3.40	(< 20)
Pyrene	0.5	0.499	100	0.5	0.495	99	(53-121)	0.79	(< 20)
Surrogates									
2-Fluorobiphenyl (surr)	0.5	78.9	79	0.5	71.5	72	(53-106)	9.80	
Terphenyl-d14 (surr)	0.5	79.8	80	0.5	73.7	74	(58-132)	7.90	

Batch Information

Analytical Batch: **XMS9571**
Analytical Method: **8270D SIM (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **BRV**

Prep Batch: **XXX36115**
Prep Method: **SW3520C**
Prep Date/Time: **08/22/2016 10:00**
Spike Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1742447 [XXX/36182]
Blank Lab ID: 1349040

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1164873005

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	84.2	60-120		%

Batch Information

Analytical Batch: XFC12771
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: NRO
Analytical Date/Time: 8/31/2016 10:38:00PM

Prep Batch: XXX36182
Prep Method: SW3520C
Prep Date/Time: 8/31/2016 10:07:33AM
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1164873 [XXX36182]
Blank Spike Lab ID: 1349041
Date Analyzed: 08/31/2016 22:48

Spike Duplicate ID: LCSD for HBN 1164873 [XXX36182]
Spike Duplicate Lab ID: 1349042
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1164873005

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	5	4.66	93	5	4.69	94	(75-125)	0.68	(< 20)
Surrogates									
5a Androstane (surr)	0.1	99.7	100	0.1	99	99	(60-120)	0.70	

Batch Information

Analytical Batch: **XFC12771**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **NRO**

Prep Batch: **XXX36182**
Prep Method: **SW3520C**
Prep Date/Time: **08/31/2016 10:07**
Spike Init Wt./Vol.: 5 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 5 mg/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1742448 [XXX/36183]
Blank Lab ID: 1349043

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1164873004

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	84.2	60-120		%

Batch Information

Analytical Batch: XFC12770
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: NRO
Analytical Date/Time: 8/31/2016 10:38:00PM

Prep Batch: XXX36183
Prep Method: SW3520C
Prep Date/Time: 8/31/2016 10:07:36AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1164873 [XXX36183]
Blank Spike Lab ID: 1349044
Date Analyzed: 08/31/2016 22:48

Spike Duplicate ID: LCSD for HBN 1164873 [XXX36183]
Spike Duplicate Lab ID: 1349045
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1164873004

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	18.7	93	20	18.8	94	(75-125)	0.68	(< 20)
Surrogates									
5a Androstane (surr)	0.4	99.7	100	0.4	99	99	(60-120)	0.70	

Batch Information

Analytical Batch: **XFC12770**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **NRO**

Prep Batch: **XXX36183**
Prep Method: **SW3520C**
Prep Date/Time: **08/31/2016 10:07**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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CHAIN OF CUSTODY RECORD

1164873

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

Section 1

CLIENT: R&M Consultants, Inc

CONTACT: Chris Fell / Abe Schmidt — PHONE NO: 907 646 9655 / 907 646 9639

PROJECT NAME: Former DFSP POA — PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Chris Fell, Abe Schmidt — E-MAIL: cfell@rmconsult.com, aschmidt@rmconsult.com

INVOICE TO: R&M Consultants Inc. — QUOTE #: Open Quote — P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: 0-6°C HCL	Preservative: 0-6°C	REMARKS/ LOC ID
1 A-B	SS12	8/19/16	0946	water	2	G		X	
2 A-B	SS13	8/19/16	1005	↓	2	↓		X	
3 A-B	SS14	8/19/16	1005	↓	2	↓		X	
4 A-B	MW25B	8/19/16	1100	↓	2	↓	X		
5 A-B	MW25A	8/19/16	1156	↓	2	↓	X		

Preservative columns: DRO (AK102) | PAH (SW8270SIM)

Section 5

	Date	Time	
Relinquished By: (1) Christopher Fell	8/19/2016	1554	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	8/19/16	15:54	Received For Laboratory By:

Section 4

DOD Project? Yes (No)

Cooler ID: N/A

Data Deliverable Requirements: Level 2 PDF

Requested Turnaround Time and/or Special Instructions: Standard

Temp Blank °C: 4.2 3.8

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

Hard copy

[ ] 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

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e-SAMPLE RECEIPT FORM

1164873

Review Criteria	Y/N (yes/no)	Exceptions Noted below
	Y	exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location		ABSENT
COC accompanied samples?	Y	
		**exemption permitted if chilled & collected <8hrs ago or chlling not required (i.e., waste, oil)
	Y	Cooler ID: 1 @ 4.1 °C Therm ID: 238
		Cooler ID: @ °C Therm ID:
Temperature blank compliant* (i.e., 0-6 °C after CF)?		Cooler ID: @ °C Therm ID:
		Cooler ID: @ °C Therm ID:
		Cooler ID: @ °C Therm ID:
If >6°C, were samples collected <8 hours ago?		
If <0°C, were sample containers ice free?		
If samples 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".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
		Note: Refer to form F-083 "Sample Guide" for hold times.
Were samples received within hold time?	Y	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Y	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous?	Y	
		***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Y	
IF APPLICABLE		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?		
Were all VOA vials free of headspace (i.e., bubbles ≤ 6mm)?		
Were all soil VOAs field extracted with MeOH+BFB?		

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

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1164873001-A	No Preservative Required	OK			
1164873001-B	No Preservative Required	OK			
1164873002-A	No Preservative Required	OK			
1164873002-B	No Preservative Required	OK			
1164873003-A	No Preservative Required	OK			
1164873003-B	No Preservative Required	OK			
1164873004-A	HCL to pH < 2	OK			
1164873004-B	HCL to pH < 2	OK			
1164873005-A	HCL to pH < 2	OK			
1164873005-B	HCL 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.

Laboratory Report of Analysis

To: R & M Consultants Inc
9101 Vanguard Dr
Anchorage, AK 99507
(907)646-9655

Report Number: **1164874**

Client Project: **Former DFSP POA**

Dear Christopher Fell,

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 Stephen 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.

Stephen C. Ede
Alaska Division Technical Director

Stephen Ede
2016.08.29
13:34:06 -08'00'

Stephen Ede Date
Project Manager
Stephen.Ede@sgs.com

Print Date: 08/29/2016 11:19:21AM

Case Narrative

SGS Client: **R & M Consultants Inc**
SGS Project: **1164874**
Project Name/Site: **Former DFSP POA**
Project Contact: **Christopher Fell**

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.

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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, indenmification 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, 8021B, 8082A, 8260B, 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
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
IB	Instrument Blank
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., 1/2 of the LOQ)
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.

Print Date: 08/29/2016 11:19:24AM

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
MW23	1164874001	08/18/2016	08/19/2016	Water (Surface, Eff., Ground)
MW2R	1164874002	08/18/2016	08/19/2016	Water (Surface, Eff., Ground)
MW22	1164874003	08/18/2016	08/19/2016	Water (Surface, Eff., Ground)
MW15R	1164874004	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)
MW16R	1164874005	08/19/2016	08/19/2016	Water (Surface, Eff., Ground)

Method	Method Description
AK102	Diesel Range Organics (W)

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Detectable Results Summary

Client Sample ID: **MW23**
Lab Sample ID: 1164874001
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	1.74	mg/L

Client Sample ID: **MW2R**
Lab Sample ID: 1164874002
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	0.500J	mg/L

Client Sample ID: **MW15R**
Lab Sample ID: 1164874004
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	3.89	mg/L

Client Sample ID: **MW16R**
Lab Sample ID: 1164874005
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	3.18	mg/L

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Results of **MW23**

Client Sample ID: **MW23**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164874001
Lab Project ID: 1164874

Collection Date: 08/18/16 09:25
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.74		0.612	0.184	mg/L	1		08/27/16 21:50
Surrogates								
5a Androstane (surr)	79.8		50-150		%	1		08/27/16 21:50

Batch Information

Analytical Batch: XFC12750
Analytical Method: AK102
Analyst: CRA
Analytical Date/Time: 08/27/16 21:50
Container ID: 1164874001-A

Prep Batch: XXX36160
Prep Method: SW3520C
Prep Date/Time: 08/27/16 09:11
Prep Initial Wt./Vol.: 980 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2016 11:19:27AM

J flagging is activated

Results of **MW2R**

Client Sample ID: **MW2R**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164874002
Lab Project ID: 1164874

Collection Date: 08/18/16 14:37
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.500	J	0.606	0.182	mg/L	1		08/27/16 22:00
Surrogates								
5a Androstane (surr)	82		50-150		%	1		08/27/16 22:00

Batch Information

Analytical Batch: XFC12750
Analytical Method: AK102
Analyst: CRA
Analytical Date/Time: 08/27/16 22:00
Container ID: 1164874002-A

Prep Batch: XXX36160
Prep Method: SW3520C
Prep Date/Time: 08/27/16 09:11
Prep Initial Wt./Vol.: 990 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2016 11:19:27AM

J flagging is activated

Results of **MW22**

Client Sample ID: **MW22**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164874003
Lab Project ID: 1164874

Collection Date: 08/18/16 15:38
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.301	U	0.603	0.181	mg/L	1		08/27/16 22:11
Surrogates								
5a Androstane (surr)	81.7		50-150		%	1		08/27/16 22:11

Batch Information

Analytical Batch: XFC12750
Analytical Method: AK102
Analyst: CRA
Analytical Date/Time: 08/27/16 22:11
Container ID: 1164874003-A

Prep Batch: XXX36160
Prep Method: SW3520C
Prep Date/Time: 08/27/16 09:11
Prep Initial Wt./Vol.: 995 mL
Prep Extract Vol: 1 mL

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Results of **MW15R**

Client Sample ID: **MW15R**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164874004
Lab Project ID: 1164874

Collection Date: 08/19/16 10:02
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3.89		0.615	0.185	mg/L	1		08/27/16 22:21
Surrogates								
5a Androstane (surr)	86.8		50-150		%	1		08/27/16 22:21

Batch Information

Analytical Batch: XFC12750
Analytical Method: AK102
Analyst: CRA
Analytical Date/Time: 08/27/16 22:21
Container ID: 1164874004-A

Prep Batch: XXX36160
Prep Method: SW3520C
Prep Date/Time: 08/27/16 09:11
Prep Initial Wt./Vol.: 975 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2016 11:19:27AM

J flagging is activated

Results of **MW16R**

Client Sample ID: **MW16R**
Client Project ID: **Former DFSP POA**
Lab Sample ID: 1164874005
Lab Project ID: 1164874

Collection Date: 08/19/16 10:02
Received Date: 08/19/16 15:54
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3.18		0.615	0.185	mg/L	1		08/27/16 22:32
Surrogates								
5a Androstane (surr)	78.2		50-150		%	1		08/27/16 22:32

Batch Information

Analytical Batch: XFC12750
Analytical Method: AK102
Analyst: CRA
Analytical Date/Time: 08/27/16 22:32
Container ID: 1164874005-A

Prep Batch: XXX36160
Prep Method: SW3520C
Prep Date/Time: 08/27/16 09:11
Prep Initial Wt./Vol.: 975 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2016 11:19:27AM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1742300 [XXX/36160]
Blank Lab ID: 1348373

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1164874001, 1164874002, 1164874003, 1164874004, 1164874005

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	80.2	60-120		%

Batch Information

Analytical Batch: XFC12750
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: CRA
Analytical Date/Time: 8/27/2016 8:47:00PM

Prep Batch: XXX36160
Prep Method: SW3520C
Prep Date/Time: 8/27/2016 9:11:38AM
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1164874 [XXX36160]
Blank Spike Lab ID: 1348374
Date Analyzed: 08/27/2016 20:58

Spike Duplicate ID: LCSD for HBN 1164874 [XXX36160]
Spike Duplicate Lab ID: 1348375
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1164874001, 1164874002, 1164874003, 1164874004, 1164874005

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	5	4.67	93	5	4.65	93	(75-125)	0.45	(< 20)
Surrogates									
5a Androstane (surr)	0.1	92.1	92	0.1	96.9	97	(60-120)	5.10	

Batch Information

Analytical Batch: **XFC12750**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **CRA**

Prep Batch: **XXX36160**
Prep Method: **SW3520C**
Prep Date/Time: **08/27/2016 09:11**
Spike Init Wt./Vol.: 5 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 5 mg/L Extract Vol: 1 mL

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SGS North America Inc.
CHAIN OF CUSTODY RECORD

1164874

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

Section 1

CLIENT: R&M Consultants, Inc.

CONTACT: Chris Fell / Abe Schmidt — PHONE NO: 907 646 9655 / 907 646 9639

PROJECT NAME: Former DFSP PoA — PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Chris Fell, Abe Schmidt — E-MAIL: cfell@rmconsult.com, aschmidt@rmconsult.com

INVOICE TO: R&M Consultants, Inc. — QUOTE #: Open Quote — P.O. #:

Section 3

Section 2 RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: 0-6°C	Preservative: HCL	Preservative: DRO (AK102)	REMARKS/ LOC ID
1 A-B	MW23	8/18/16	0925	water	2	G			X	
2 A-B	MW2R	8/18/16	1437	↓	2	↓			X	
3 A-B	MW22	8/18/16	1538		2				X	
4 A-B	MW15R	8/19/16	1002		2				X	
5 A-B	MW16R	8/19/16	1002	↓	2	↓			X	

Section 5

	Date	Time	Received By:
Relinquished By: (1) Christopher Poa	8/19/16	1554	
Relinquished By: (2)			
Relinquished By: (3)			
Relinquished By: (4)	8/19/16	15:54	Received For Laboratory By:

Section 4

DOD Project? Yes (No)

Cooler ID: N/A

Data Deliverable Requirements: Level 2 PDF

Requested Turnaround Time and/or Special Instructions:

Standard

Temp Blank °C: 1.6 0.6

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

Hadddved

[ ] 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

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F083-Kit_Request_and_COC_Templates-Blank
Revised 2013-03-24

1164874

Review Criteria	Y/N (yes/no)	Exceptions Noted below
	Y	exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location		Absent
COC accompanied samples?	Y	
Y **exemption permitted if chilled & collected <8hrs ago or chlling not required (i.e., waste, oil)		
	Y	Cooler ID: 1 @ 1.6 °C Therm ID: D6
	Y	Cooler ID: @ °C Therm ID:
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Y	Cooler ID: @ °C Therm ID:
	Y	Cooler ID: @ °C Therm ID:
	Y	Cooler ID: @ °C Therm ID:
If >6°C, were samples collected <8 hours ago?	Y	
If <0°C, were sample containers ice free?	Y	
If samples 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".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
		Note: Refer to form F-083 "Sample Guide" for hold times.
Were samples received within hold time?	Y	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Y	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous?	Y	
	Y	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Y	
IF APPLICABLE		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Y	
Were all VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Y	
Were all soil VOAs field extracted with MeOH+BFB?	Y	

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

Additional notes (if applicable):

Samples MW2R and MW22 were unpreserved. These samples consisted of 4 containers total, and were preserved in the lab with 8 mL HCl.

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1164874001-A	HCL to pH < 2	OK			
1164874001-B	HCL to pH < 2	OK			
1164874002-A	HCL to pH < 2	OK			
1164874002-B	HCL to pH < 2	OK			
1164874003-A	HCL to pH < 2	OK			
1164874003-B	HCL to pH < 2	OK			
1164874004-A	HCL to pH < 2	OK			
1164874004-B	HCL to pH < 2	OK			
1164874005-A	HCL to pH < 2	OK			
1164874005-B	HCL 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.

APPENDIX E
ADEC LABORATORY DATA REVIEW CHECKLISTS

Laboratory Data Review Checklist

Completed by:	R&M Consultants, Inc (Christopher Fell, CPG)		
Title:	Senior Geologist	Date:	Sep 7, 2016
CS Report Name:	2016 ANNUAL MONITORING REPORT FORMER DEFENSE FUEL SUPPORT POINT – ANCHORAGE: PORT OF ANCHORAGE, ALASKA	Report Date:	Aug 31, 2016
Consultant Firm:	R&M Consultants, Inc.		
Laboratory Name:	SGS North America, Inc.	Laboratory Report Number:	1164872
ADEC File Number:	2102.38.021	ADEC RecKey Number:	Not Applicable

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

( ) Yes ( ) No (•) NA (Please explain) Comments:

No network laboratory used.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

See attachments to SGS Report No. 1164872.

b. Correct analyses requested?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

2.7°C

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

GRO and BTEX

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Samples did not have any deleterious conditions noted.

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

No discrepancies were observed. Cooler had no custody seals as it was hand delivered by the QEP.

e. Data quality or usability affected? (Please explain)

Comments:

Data quality or usability were not affected.

4. Case Narrative

a. Present and understandable?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Surrogate recovery for 4-bromofluorobenzene from GRO analysis did not meet QC criteria due to matrix interference for samples MW15R, MW25B, MW25A, and MW16R.

c. Were all corrective actions documented?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

No effect.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. All applicable holding times met?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

c. All soils reported on a dry weight basis?

( ) Yes ( ) No (•) NA (Please explain) Comments:

No soil samples were collected or submitted.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

e. Data quality or usability affected? (Please explain)

Comments:

Data quality or usability were not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected? Comments:

Not applicable.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Not applicable, no samples affected.

v. Data quality or usability affected? (Please explain) Comments:

Data quality or usability were not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

○ Yes ○ No ◉ NA (Please explain) Comments:

No metals or inorganic tests were run.

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Not applicable.

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Not applicable, no samples affected.

vii. Data quality or usability affected? (Please explain) Comments:

Data quality or usability were not affected.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

○ Yes ◉ No ○ NA (Please explain) Comments:

Surrogate recovery for 4-bromofluorobenzene from GRO analysis did not meet QC criteria due to matrix interference for samples MW15R, MW25B, MW25A, and MW16R.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ◉ No ○ NA (Please explain) Comments:

High recoveries of the surrogate indicate a high bias for samples MW15R, MW25B, MW25A, and MW16R.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

Data quality or usability were not affected.

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

Not applicable.

v. Data quality or usability affected? (Please explain.)

Comments:

Data quality or usability were not affected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

MW16R is the duplicate for primary sample MW15R and SS13 is the duplicate for primary sample SS14.

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

◉ Yes ○ No ○ NA (Please explain) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ◉ No ○ NA (Please explain) Comments:

Data quality or usability were not affected.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain) Comments:

No equipment blank specified by the approved sampling plan.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

No equipment blank collected

ii. If above PQL, what samples are affected?

Comments:

No equipment blank collected

iii. Data quality or usability affected? (Please explain.)

Comments:

Not applicable.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

◉ Yes ○ No ○ NA (Please explain) Comments:

Reset Form

Laboratory Data Review Checklist

Completed by:	R&M Consultants, Inc (Christopher Fell, CPG)		
Title:	Senior Geologist	Date:	Sep 15, 2016
CS Report Name:	2016 ANNUAL MONITORING REPORT FORMER DEFENSE FUEL SUPPORT POINT – ANCHORAGE: PORT OF ANCHORAGE, ALASKA	Report Date:	Sep 14, 2016
Consultant Firm:	R&M Consultants, Inc.		
Laboratory Name:	SGS North America, Inc.	Laboratory Report Number:	1164873
ADEC File Number:	2102.38.021	ADEC RecKey Number:	Not Applicable

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

(●) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

( ) Yes ( ) No (●) NA (Please explain) Comments:

No network laboratory used.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

See attachments to SGS Report No. 1164873.

b. Correct analyses requested?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

4.1°C, which is within the criteria required by ADEC Field Sampling Guidance.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

DRO

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Samples did not have any deleterious conditions noted.

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

No discrepancies were observed. Cooler had no custody seals as it was hand delivered by the QEP.

e. Data quality or usability affected? (Please explain)

Comments:

Data quality or usability were not affected.

4. Case Narrative

a. Present and understandable?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

No discrepancies or errors were identified. A surrogate recovery for PAH did not meet DOD criteria but met SGS internal criteria associated with sample SS13 (Duplicate of SS14).

c. Were all corrective actions documented?

( ) Yes (•) No ( ) NA (Please explain) Comments:

No corrective actions were taken or necessary.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality or usability were not affected.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. All applicable holding times met?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

c. All soils reported on a dry weight basis?

( ) Yes ( ) No (•) NA (Please explain) Comments:

No soil samples were collected or submitted.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

e. Data quality or usability affected? (Please explain)

Comments:

Data quality or usability were not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected? Comments:

Not applicable

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Not applicable, no samples affected.

v. Data quality or usability affected? (Please explain) Comments:

Data quality or usability were not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

○ Yes ○ No ◉ NA (Please explain) Comments:

No metals or inorganic tests were run.

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Not applicable.

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Not applicable, no samples affected.

vii. Data quality or usability affected? (Please explain) Comments:

Data quality or usability were not affected.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

Terphenyl-d14 failed DOD criteria but met SGS internal criteria.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ◉ No ○ NA (Please explain) Comments:

Failed DOD requirements, but this is not DOD work and the recovery met SGS internal criteria.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

Data quality or usability were not affected.

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

Only DRO and PAH analyses reported in this laboratory report.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No trip blank required.

iii. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No trip blank required.

iv. If above PQL, what samples are affected?

Comments:

No trip blank required.

v. Data quality or usability affected? (Please explain.)

Comments:

Not applicable.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

SS13 is the duplicate of SS14 (surface water PAH analysis). Duplicates for other analyses/matricies are included in SGS reports 1164872 and 1164874.

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

○ Yes ◉ No ○ NA (Please explain) Comments:

RPD for 1- and 2-methylnaphthalene are 42 and 32%, respectively. The values were low level with only 0.059 and 0.028 ppb differences. Naphthalene has an RPD of 30% but at low level with only a 0.041 ppb difference in concentration.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ◉ No ○ NA (Please explain) Comments:

1- and 2-methylnaphthalene are not used in the calculation of TAqH. Naphthalene concentrations are nearly identical with a 0.041 ppb difference and the 30% RPD is the result of the low level concentration and not a large numerical difference between primary and duplicate samples. Data quality or usability were not affected.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain) Comments:

No equipment blank specified by the approved sampling plan.

i. All results less than PQL?

○ Yes ○ No ○ NA (Please explain) Comments:

No equipment blank collected.

ii. If above PQL, what samples are affected?

Comments:

No equipment blank collected.

iii. Data quality or usability affected? (Please explain.)

Comments:

Not applicable.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Reset Form

Laboratory Data Review Checklist

Completed by:	R&M Consultants, Inc (Christopher Fell, CPG)		
Title:	Senior Geologist	Date:	Sep 7, 2016
CS Report Name:	2016 ANNUAL MONITORING REPORT FORMER DEFENSE FUEL SUPPORT POINT – ANCHORAGE: PORT OF ANCHORAGE, ALASKA	Report Date:	Aug 29, 2016
Consultant Firm:	R&M Consultants, Inc.		
Laboratory Name:	SGS North America, Inc.	Laboratory Report Number:	1164874
ADEC File Number:	2102.38.021	ADEC RecKey Number:	Not Applicable

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

(●) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

( ) Yes ( ) No (●) NA (Please explain) Comments:

No network laboratory used.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

See attachments to SGS Report No. 1164874.

b. Correct analyses requested?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

○ Yes ◉ No ○ NA (Please explain) Comments:

1.6°C, which is within the criteria required by 2016ADEC Field Sampling Guidance.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain) Comments:

DRO

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain) Comments:

Samples did not have any deleterious conditions noted.

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

◉ Yes ○ No ○ NA (Please explain) Comments:

No discrepancies were observed. Cooler had no custody seals as it was hand delivered by the QEP.

e. Data quality or usability affected? (Please explain)

Comments:

Data quality or usability were not affected.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ◉ No ○ NA (Please explain) Comments:

No discrepancies, errors, or QC failures were identified.

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain) Comments:

No corrective actions were taken.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality or usability were not affected.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. All applicable holding times met?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

c. All soils reported on a dry weight basis?

( ) Yes ( ) No (•) NA (Please explain) Comments:

No soil samples were collected or submitted.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

e. Data quality or usability affected? (Please explain)

Comments:

Data quality or usability were not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected? Comments:

Not applicable

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Not applicable, no samples affected.

v. Data quality or usability affected? (Please explain) Comments:

Data quality or usability were not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

○ Yes ○ No ◉ NA (Please explain) Comments:

No metals or inorganic tests were run.

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Not applicable.

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Not applicable, no samples affected.

vii. Data quality or usability affected? (Please explain) Comments:

Data quality or usability were not affected.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Not applicable, no samples affected.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

Data quality or usability were not affected.

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

Only DRO analysis reported in this laboratory report.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No trip blank required.

iii. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No trip blank required.

iv. If above PQL, what samples are affected?

Comments:

No trip blank required.

v. Data quality or usability affected? (Please explain.)

Comments:

Not applicable.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

MW16R is the duplicate for primary sample MW15R.

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

◉ Yes ○ No ○ NA (Please explain) Comments:

3.89 and 3.18 mg/L, RPD is 20 percent.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ◉ No ○ NA (Please explain) Comments:

Data quality or usability were not affected.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain) Comments:

No equipment blank specified by the approved sampling plan.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

No equipment blank collected.

ii. If above PQL, what samples are affected?

Comments:

No equipment blank collected.

iii. Data quality or usability affected? (Please explain.)

Comments:

Not applicable.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

◉ Yes ○ No ○ NA (Please explain) Comments:

Reset Form