



**US Army Corps
of Engineers**

Alaska District

2018 Groundwater Sampling Report

Wildwood Air Force Station Formerly Used Defense Site
Operations Facility -- F10AK025104
Kenai, Alaska

September 2018



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LIST OF ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AFS	Air Force Station
AST	aboveground storage tank
bgs	below ground surface
BLM	Bureau of Land Management
BTEX	benzene, toluene, ethylbenzene, and xylenes
°C	degrees Celsius
CDQR	Chemical Data Quality Review
DO	dissolved oxygen
DOD	Department of Defense
DRO	diesel-range organics
°F	Degrees Fahrenheit
FUDS	Formerly Used Defense Site
GRO	gasoline-range organics
HVAC	heating, ventilation and air conditioning
IDW	investigation-derived waste
HCl	hydrochloric acid
KNA	Kenai Natives Association Inc.
mg/L	milligrams per liter
mL	milliliter
MW	monitoring well
NALEMP	Native American Lands Environmental Mitigation Program
POL	petroleum, oil and lubricants
QC	quality control
QSM	Quality Systems Manual
RI	Remedial Investigation
ROST/LIF	Rapid Optical Screening Tool/Laser Induced Fluorescence
USACE	United States Army Corps of Engineers
USAF	United States Air Force
UST	underground storage tank

EXECUTIVE SUMMARY

Groundwater samples were collected from three monitoring wells (MWs) at the Former Wildwood Air Force Station (AFS) Operations Facility project location during the 2018 groundwater monitoring event. Groundwater monitoring was conducted to evaluate groundwater contaminant trends. The field work was conducted by U.S. Army Corps of Engineers (USACE) personnel on August 14-16, 2018. A total of 6 water samples were submitted for analysis including 3 primary samples, 1 field duplicate, 1 equipment blank, and 1 trip blank. No free product was observed in any of the wells and all project wells were sampled. Project groundwater samples were submitted for analysis of gasoline-range organics (GRO); diesel-range organics (DRO); and benzene, toluene, ethylbenzene, xylene (BTEX).

DRO was the only analyte detected at the site in excess of applicable Alaska Department of Environmental Conservation (ADEC) groundwater criteria. DRO was detected in monitoring well MW-2 at a concentration of 2.2 milligrams per liter (mg/L) QL (low bias) exceeding the ADEC criteria of 1.5 mg/L. DRO was also detected in MW-1 at a concentration of 1.2 mg/L QL, slightly below ADEC screening criteria. Because this result was low biased and near the screening criteria, DRO is potentially present above ADEC screening criteria in this well.

Continued annual groundwater monitoring is recommended for contaminant trend development. Wells should continue to be tested for GRO, DRO, and BTEX.

1.0 INTRODUCTION

This report describes chemical results of groundwater samples collected from wells at the former Wildwood Air Force Station (AFS) Operations Facility Formerly Used Defense Site (FUDS), Kenai, Alaska. The Alaska Department of Environmental Conservation (ADEC) file number for the project site is 2320.38.051, and the ADEC hazard ID is 25213.

1.1 Project Overview

The project objective at this site was to determine contaminant concentrations and annual trends. The three monitoring wells (MW) installed during the 2015 field effort (MW-1, MW-2 and MW-3) were sampled and analyzed for benzene, toluene, ethylbenzene, xylene (BTEX), gasoline-range organics (GRO), and diesel-range organics (DRO).

Native American Lands Environmental Mitigation Program (NALEMP) soil excavation operations are planned to occur at this site in the next few years. In the future, all wells not decommissioned during excavation will be sampled. The data will be used to determine contaminant trends at the project site.

1.2 Site Description and Background

1.2.1 Site Location

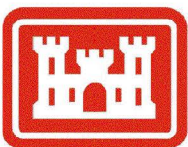
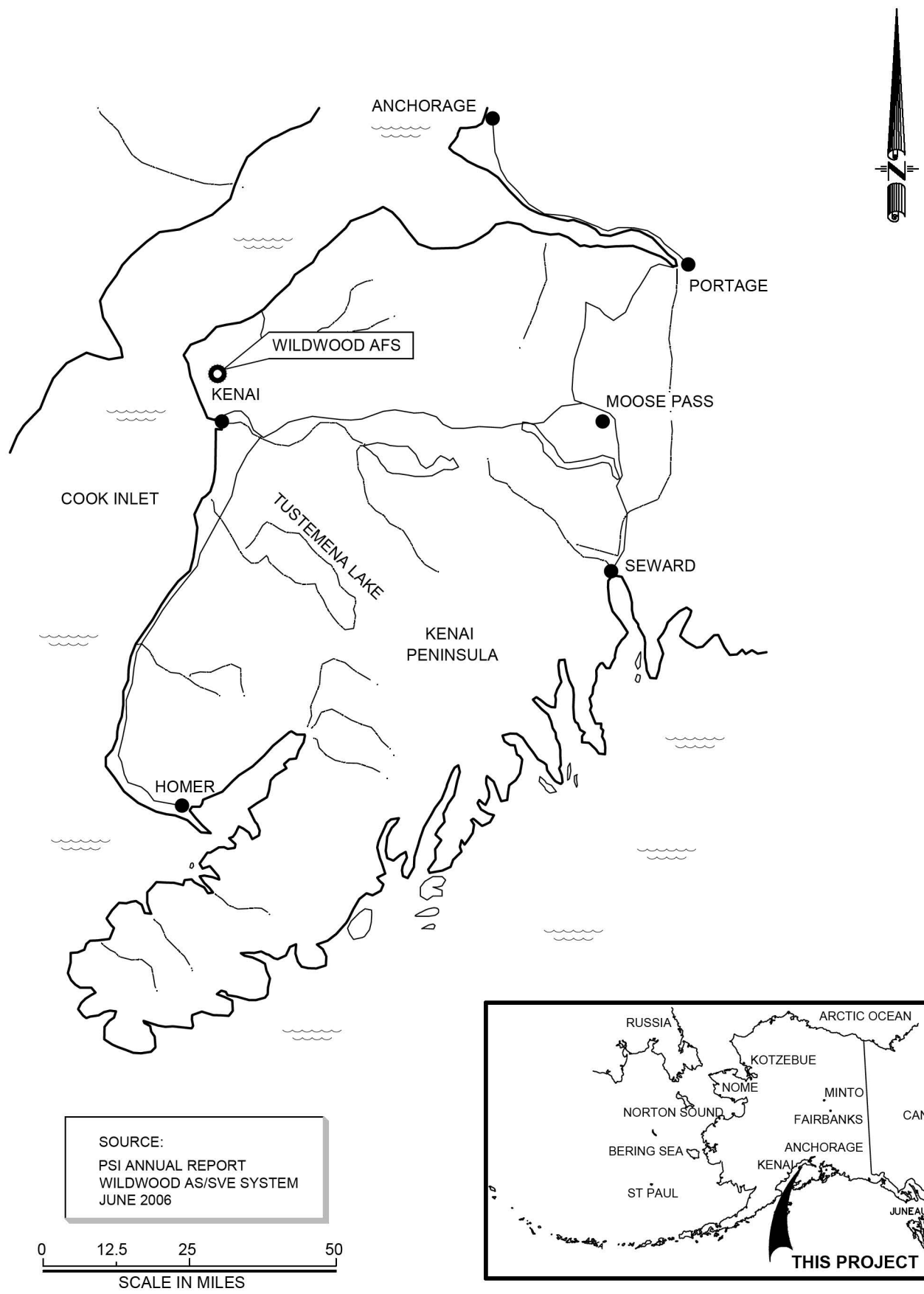
The former Wildwood Air Force Station (AFS) is located 3.5 miles northwest of Kenai, Alaska, accessed via Wildwood Drive East of the Kenai Spur Highway (Figures 1 and 2). The site is located at 60° 35' North (N) latitude and 151° 17.8' West (W) longitude, in Sections 24 and 25, Township 6N, Range 12W, of the Seward Meridian.

1.2.2 Site History

Wildwood AFS, originally named Seward Station, was constructed as a communications station and activated in 1953 by the United States Army. The total area of the station was approximately 5,300 acres; however, military construction was confined to a 125-acre tract. In May 1954, the station was renamed Wildwood Station, and in 1966 the property was transferred to the U.S. Air Force (USAF). Wildwood AFS was closed by the USAF in July 1972.

During military use, several aboveground storage tanks (AST) and underground storage tanks (UST) containing petroleum products were present. The site also included a network of underground piping that supplied the petroleum products to a power plant, pump house, and fuel dispensing stations.

Following closure, the entire 5,300 acres were transferred to the U.S. Department of the Interior, Bureau of Land Management (BLM). The Bureau of Land Management transferred 4,300 acres to the Kenai Natives Association Inc. (KNA) during 1974. KNA sold the 125-acre tract of land that the former Wildwood AFS was located on to the Alaska Department of Natural Resources in 1994

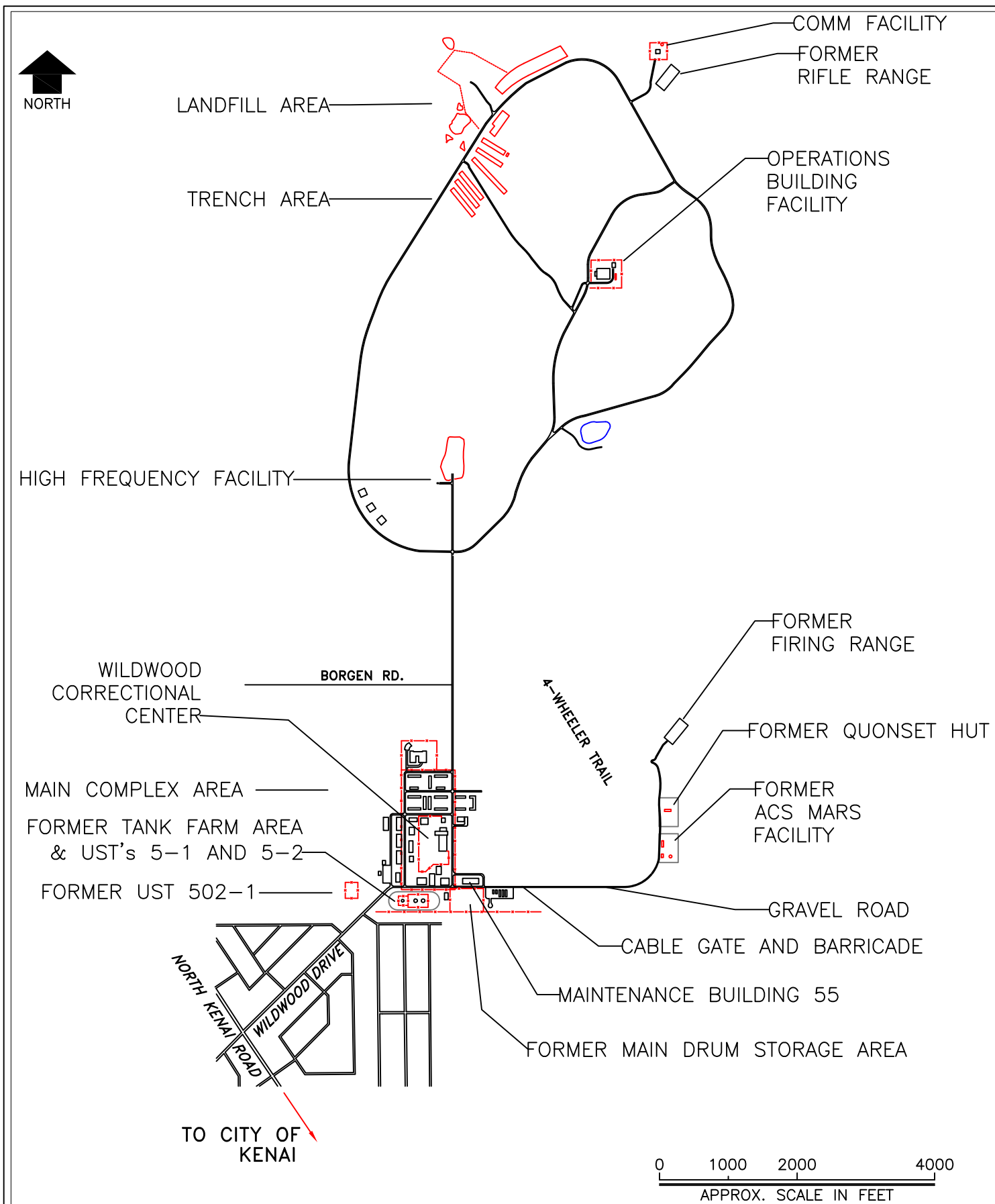


U.S. Army Corps
of Engineers
Alaska District

Wildwood Air Force Station
FUDS F10AK0251-05
Location and Vicinity

27 July 2011
Revision 0
Scale: Noted

Figure
1



NOTES

1. THIS FIGURE WAS ADAPTED FROM HLA/WILDER JV FIGURE 2, SITE PLAN, WILLOW AS/VE EXTENSION-GROUNDWATER MONITORING, KENAI, ALASKA, JANUARY 2002.

DATE: November 2014

FILE NAME:

DWN BY: GNO

RVW BY:

SCALE: AS NOTED

SOURCE AREA LOCATION MAP FORMER WILLOW AIR FORCE STATION KENAI, ALASKA



FIGURE 2

(USACE, 2011). The Alaska Department of Corrections currently operates the Wildwood Correctional Center on a portion of this tract, immediately north of the former Wildwood AFS Tank Farm site.

1.2.3 Site Description

The Operations Building Facility is located approximately 0.5 miles southeast of the Landfill Area and approximately 1.5 miles north of the Main Complex Area (Figure 2). The facility formerly consisted of an operations building that housed computer and heating, ventilating, and air conditioning (HVAC) systems (Building 100), a shop with a boiler and generator (Building 101), a transformer storage area, a drum storage location, two ASTs and two USTs. Currently, the site consists of a large level open area approximately 1 acre in size.

1.2.4 Site Environmental Setting

Geology and Land Surface

The former Wildwood AFS is located within the northwest region of the Kenai Peninsula, which extends approximately 150 miles into the Gulf of Alaska. The region is characterized by flat to undulating terrain with abundant wetlands, lakes, and streams. The western portion of Wildwood AFS, which includes the areas impacted by military construction, is generally well-drained, forested, and characterized by flat to gently sloping terrain.

Soils in the vicinity of Wildwood AFS are derived from glacial and fluvial deposits. On terraces and outwash plains, the well-drained soils consist of a surface mat of forest litter overlying silt loam. In depressions, the poorly drained soils consist of a surface layer of decomposed sphagnum moss overlying moss and sedge peat. These soils are approximately 2 to 10 feet thick. Sediments in the vicinity of Wildwood AFS consist of inter-bedded Quaternary-age glacial, fluvial, lacustrine, and marine deposits and underlie the soils described above. Bedrock beneath Wildwood AFS consists of the Tertiary-age Kenai Formation, which is composed of alternating strata of semi consolidated silt, sand, and gravel, and is locally coal-bearing (E&E, 1995).

Climate

Wildwood AFS is located in the transition climate zone of Alaska and experiences cool summers and cold winters. January temperatures typically range from 10 and 30 degrees Fahrenheit (°F) and July temperatures from 40 to 60 °F. Average annual precipitation is approximately 20 inches; average snowfall is approximately 70 inches.

1.2.5 Summary of Previous Investigations and Removal Actions

Two 3,500-gallon ASTs and two 15,000-gallon USTs were formerly located southeast of Building 101 (Figure 3). The tanks were used to supply diesel fuel to the facility's generator and were removed prior to the start of the Remedial Investigation (RI) in 1995.

APPROXIMATE
GROUNDWATER
FLOW DIRECTION ↘

MW-2	APRIL 2015	AUGUST 2016	AUGUST 2017	AUGUST 2018
DRO	1.7 QL	2.3 QL	1.5 QL	2.2 QL
GRO	0.084	0.76	0.1 B	0.069 B
BENZENE	ND (0.001)	ND (0.004)	ND (0.0004)	ND (0.0004)
TOLUENE	0.004	ND (0.008)	0.00026 J	0.00066 J
ETHYLBENZENE	ND (0.001)	ND (0.004)	0.00068 J	0.00084 J
XYLENES	0.0037	0.012 J	0.0091	0.013

MW-1	APRIL 2015	AUGUST 2016	AUGUST 2017	AUGUST 2018
DRO	1.3	0.91 QL	0.69 QL	1.2 QL
GRO	0.2	0.071 B	0.056 B	0.045 J, B
BENZENE	ND (0.001)	ND (0.0004)	ND (0.0004)	ND (0.0004)
TOLUENE	0.0072	ND (0.0008)	ND (0.0008)	ND (0.0008)
ETHYLBENZENE	ND (0.001)	ND (0.0004)	ND (0.0004)	ND (0.0004)
XYLENES	0.0019 J	0.00047 J	0.00046 J, QN, B	0.00044 J

MW-3	APRIL 2015	AUGUST 2016	AUGUST 2017	AUGUST 2018
DRO	0.47	0.43 B, QL	3.9 QL	0.44 QL
GRO	0.11	0.018 J, B	0.13 B	0.056 B
BENZENE	ND (0.001)	ND (0.0004)	ND (0.0004)	ND (0.0004)
TOLUENE	ND (0.001)	ND (0.0008)	ND (0.0008)	ND (0.0008)
ETHYLBENZENE	ND (0.001)	ND (0.0004)	ND (0.0004)	ND (0.0004)
XYLENES	0.00016 J	ND (0.0012)	ND (0.0012)	ND (0.0012)

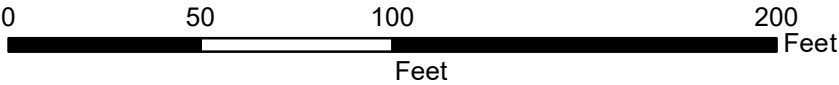
Legend

- MONITORING WELLS
- DRO = DIESEL RANGE ORGANICS
- GRO = GASOLINE RANGE ORGANICS
- BTEX = BENZENE, TOLUENE, ETHYLBENZENE, XYLENES
- ND = NOT DETECTED
- LOD = LIMIT OF DETECTION
- B = ANALYTE RESULT IS CONSIDERED A HIGH ESTIMATED VALUE DUE TO CONTAMINATION PRESENT IN THE METHOD BLANK
- J = ANALYTE RESULT IS CONSIDERED AN ESTIMATED VALUE BECAUSE THE LEVEL IS BELOW THE LABORATORY LIMIT OF QUANTITATION BUT ABOVE THE DETECTION LIMIT
- QL = ANALYTE RESULT IS CONSIDERED AN ESTIMATED VALUE BIASED LOW DUE TO A QUALITY CONTROL FAILURE
- mg/L = MILLIGRAMS PER LITER

ADEC TABLE C
GROUNDWATER CLEANUP LEVELS
in mg/L
(NOV 2017)
DRO = 1.5
GRO = 2.2
BENZENE = 0.0046
TOLUENE = 1.1
ETHYLBENZENE = 0.015
XYLENES = 0.190

NOTE:
EXCEEDANCES ARE BOLDED AND RED

FIGURE 3
Former Operations Building Facility - Groundwater Contaminant Concentrations
Former Wildwood AFS - F10AK0251-04
Kenai, Alaska



Surface soil, subsurface soil, and groundwater sampling was conducted during the RI. This included installation and sampling of two monitoring wells, nine micro-wells, and six soil borings. DRO concentrations were elevated in all three matrices (E&E, 1995).

Approximately 345 cubic yards of petroleum, oil and lubricant (POL) contaminated soil were removed during the removal action in 1997. Final excavation dimensions were 45 feet by 26 feet by 8 feet deep with DRO remaining in soil at the base of the excavation.

In 2005, a Rapid Optical Screening Tool/ Laser Induced Fluorescence (ROST/LIF) investigation delineated the lateral and vertical extent of the remaining soil POL contamination. The plume was estimated to extend 340 feet downgradient and toward the southwest. The plume was bounded on all sides except the east. POL contamination in soils existed at a depth interval extending from approximately 2 to 11 feet below ground surface (bgs).

In November 2009, three temporary monitoring wells were installed at locations where elevated DRO contamination in soil or groundwater had been detected. Groundwater samples were collected and analyzed for GRO and DRO. DRO was detected in one monitoring well located directly downgradient of the former ASTs at a concentration above the ADEC cleanup level at 3.8 milligram per liter (mg/L).

Three groundwater monitoring wells were installed in 2015 at the location of the 2009 groundwater exceedance and downgradient to determine contaminant concentrations and to determine groundwater flow direction. One well (MW-2) exceeded the ADEC cleanup level of 1.5 mg/L for DRO at 1.7 mg/L. All other compounds were below screening criteria in all wells (USACE, 2015).

The 2015 groundwater monitoring wells were sampled again in August 2016 and submitted for the analysis of GRO, DRO, and BTEX. DRO was the only analyte detected in excess of ADEC groundwater criteria in monitoring well MW-2 at a concentration of 2.3 mg/L.

All groundwater monitoring wells were sampled again in August 2017 and submitted for the analysis of GRO, DRO, and BTEX. DRO was the only analyte detected in excess of ADEC groundwater criteria in monitoring well MW-2 at a concentration of 1.5 mg/L QL, and in MW-3 at 3.9 mg/L QL.

2.0 FIELD ACTIVITIES AND OBSERVATIONS

Groundwater sampling was conducted according to procedures identified in the July 2016 *Wildwood AFS Former Tank Farm and Partly Mitigated Sites Groundwater Sampling Work Plan F10AK025104/05 HTRW* (USACE 2016) and the February 2018 *Groundwater Sampling Work Plan Addendum F10AK025104/05* (USACE 2018).

2.1 Groundwater Sampling

Static water levels were measured to the nearest 0.01 feet, relative to the top of the monitoring well casing. Water levels and total well depths were measured using an electronic oil/water interface probe. Groundwater samples were collected by ADEC-qualified environmental professionals, Jake Sweet and William Mangano from a total of three wells.

Bladder pumps were used to sample all monitoring wells. Bladder pumps were set in the well within the screened interval. Bladder pumps were connected to dedicated sample tubing inside each well, and the flow rate was set to 150 milliliters (mL)/minute. Groundwater parameters were measured in a flow-through cell prior to sampling. Measured parameters included pH, temperature, specific conductivity, turbidity, dissolved oxygen (DO) concentration, and oxidation/reduction potential. Water levels were also monitored and the pump flow rate was controlled to prevent excessive drawdown. Field parameters were recorded in the field logbook for each well. A copy of the field logbooks can be found in Attachment A. Once the parameters stabilized, the flow-through cell was disconnected and samples were collected using the pump set at a low flow rate. Sample containers were filled in order of volatility with GRO and BTEX collected first into hydrochloric acid (HCl) preserved 40 mL vials. DRO samples were collected by filling 250 mL HCl preserved containers. After sampling, the bladder pumps were disassembled, decontaminated and a new bladder installed for the next well.

The groundwater samples were stored in coolers containing frozen gel ice or in a hotel fridge. Ice was changed out when needed to keep samples at the proper holding temperature of 0-6 degrees Celsius (°C). Full sample coolers were stored in a hotel room. The samples were hand delivered in two coolers to TestAmerica Laboratories in Anchorage, Alaska on August 17, 2018. Samples were then shipped to TestAmerica Laboratories in Sacramento, California, where they were received on August 18, 2018.

Three primary groundwater samples, one field duplicate, one trip blank, and one equipment blank associated with the Wildwood Operations Facility were shipped to the laboratory in two coolers. Cooler “DRO” contained all DRO sample containers and was measured at 3.5° C upon receipt in Sacramento, California. Cooler “VOC” contained all sample containers for GRO and BTEX and was measured at 5.4° C upon receipt in Sacramento, California.

Section 3.0 discusses the chemical data results for the Wildwood Operations Facility sampling effort. Groundwater samples were analyzed for GRO, DRO, and BTEX. Sample tracking and analytical summary tables are presented in Attachment B. Field and laboratory data quality are

evaluated in the Chemical Data Quality Review (CDQR) included in Attachment C. ADEC laboratory data review checklists are also included in Attachment C.

2.2 Photographic Log

A photographic log is provided in Attachment D. The photographic log includes pictures that are representative of groundwater sampling activities conducted during the August 2018 field effort.

2.3 Investigation-Derived Waste Handling and Disposal

Decontamination and purge water was collected, filtered through a carbon filtration unit, and discharged into a designated vegetation area. Solid non-hazardous investigation-derived waste (IDW) produced during sampling activities was comprised of sampling gloves, paper towels, and sample tubing. At the end of the sampling event, USACE personnel disposed of this solid waste in local trash receptacles.

3.0 RESULTS OF CHEMICAL ANALYSIS

3.1 Groundwater Elevations and Flow Direction

Groundwater elevations were collected prior to groundwater sampling and were generally consistent with historical groundwater measurements. Figure 3 shows the groundwater flow direction as calculated for the August 2018 sampling event. The groundwater flow direction for the site is to the southwest.

3.2 Chemical Data Quality

A USACE chemist performed a review of project and quality control (QC) data in order to assess whether analytical data met data quality objectives and were acceptable for use. The project data were reviewed for deviations to the requirements presented in the Sampling and Analysis Plan; ADEC Technical Memorandum Data Quality Objectives, Checklists, Quality Assurance Requirements for Laboratory Data, and Sample Handling; and the Department of Defense (DOD) Quality Systems Manual (QSM), version 5.1. The results of the review are included in the CDQR and the ADEC Checklists in Attachment C.

3.3 Sample Results

Samples collected from the Operations Facility project site were analyzed by TestAmerica, an analytical laboratory located in Sacramento, California. The results of the chemical analyses were compared to the State of Alaska groundwater criteria under 18 Alaska Administrative Code (AAC) 75.345 Table C – Groundwater Cleanup Levels (amended November 2017). Contaminant concentrations exceeding ADEC groundwater criteria are summarized in Figure 3. Complete analytical results are presented in Attachment B. Groundwater sample results are summarized below:

- DRO was detected in MW-2 at a concentration of 2.2 mg/L QL exceeding the ADEC groundwater criteria of 1.5 mg/L.
- DRO was also detected in MW-1 at a concentration of 1.2 mg/L QL, slightly below ADEC screening criteria. Because this result was low biased and near the screening criteria, DRO is potentially present above ADEC screening criteria in this well.
- No other compounds were detected above ADEC groundwater criteria in any well.

4.0 SUMMARY AND RECOMMENDATIONS

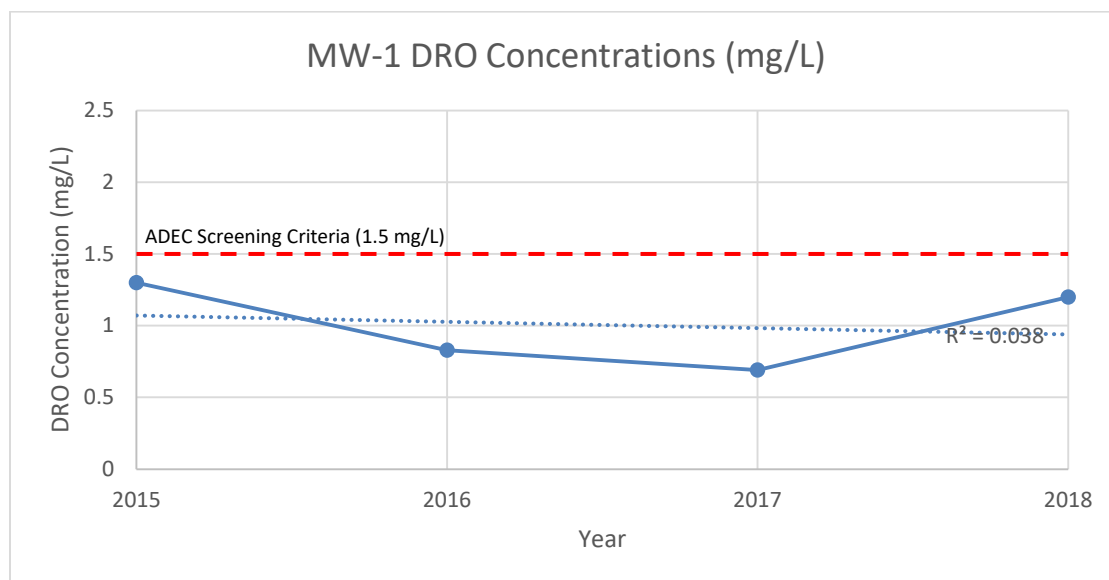
The following summarizes the evaluation of contaminant concentrations detected in groundwater samples collected from three monitoring wells at the Wildwood AFS Operations Facility site in 2018 and provides recommendations. DRO was detected in one well at a level exceeding ADEC groundwater criteria. No other compounds were found above ADEC groundwater criteria.

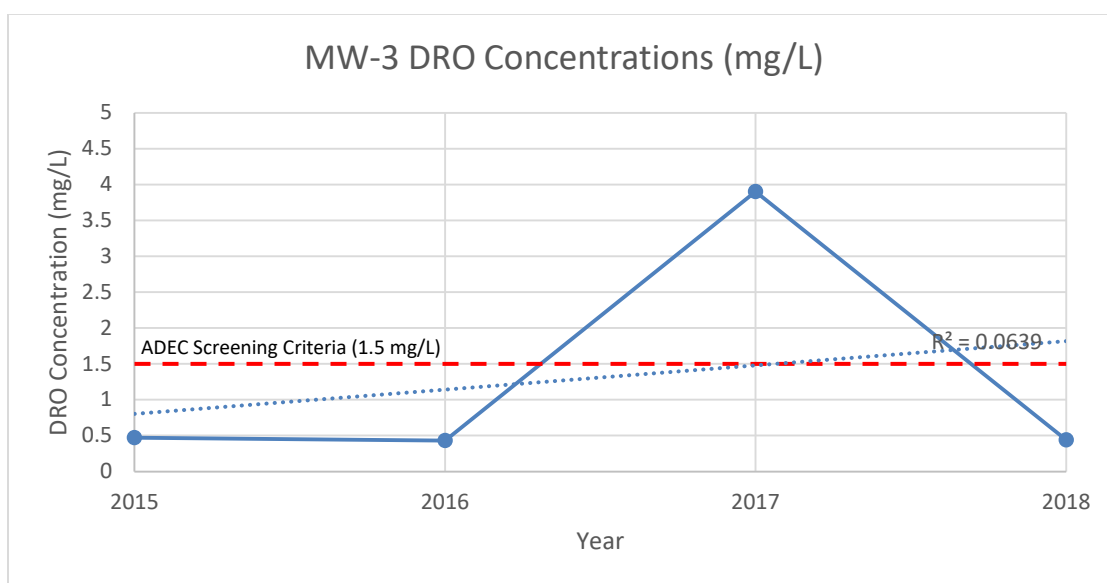
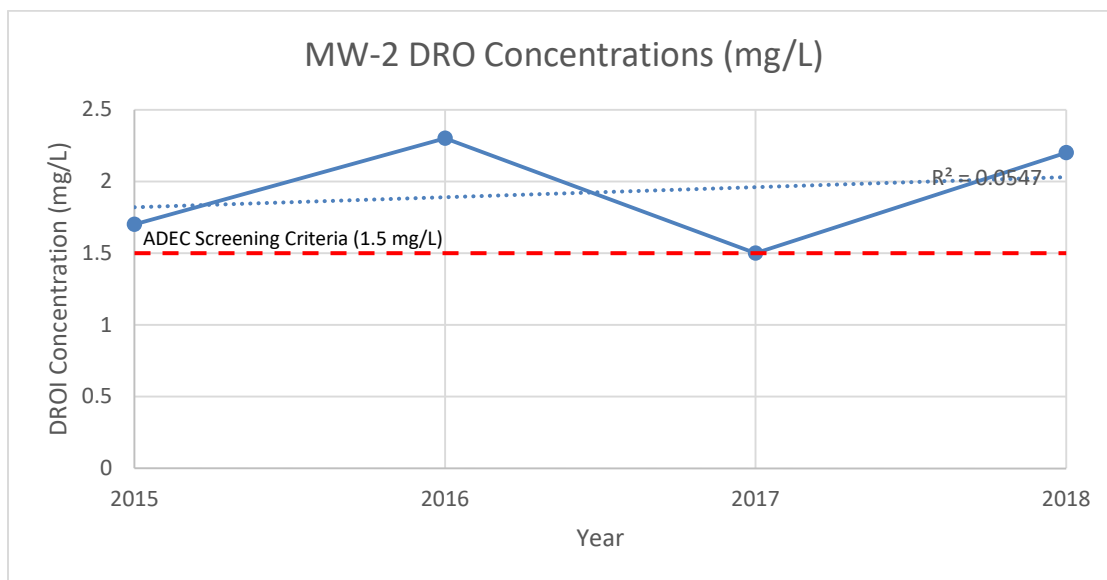
4.1 Groundwater Contaminant Evaluation

4.1.1 Extent of Groundwater Contamination

Free product was not measured in any of the wells.

DRO was detected in MW-2 at a concentration of 2.2 mg/L QL, exceeding the ADEC groundwater criteria of 1.5 mg/L. MW-1 reported DRO concentrations below the DRO cleanup level at 1.2 mg/L QL. This result should be used with caution as it is both biased low and just below the ADEC screening criteria. Low levels of ethylbenzene, toluene, xylene, and GRO were also detected in most wells at concentrations far below screening criteria. DRO concentrations over time were charted for each well and are presented below.





This is the fourth sampling event to collect groundwater samples from the wells installed in 2015. A Mann-Kendall trend analysis was performed on each well's DRO data set using the EPA ProUCL 5.1 statistical software package. The software determined that there were not enough data points to determine whether or not there was a definitive trend. Further annual sampling events are required to build the data set needed to determine site trends.

4.2 Groundwater Monitoring Recommendations

Continued annual groundwater sampling is recommended to monitor contaminant trends. Wells should continue to be sampled for GRO, DRO, and BTEX until enough information is gathered to warrant the removal of analytes from the sampling schedule.

5.0 REFERENCES

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Attachment A

Field Logbook

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CONTENTS

PAGE	REFERENCE	DATE
	PM: Rena Flint 753-2680	
	cell 907-201-3108	
	FAA Grant Code 2020	
	Josh Barsis (ADEC) 907 398 6153	
	Wildwood Security Office # 907 260 7236	
	POC Casey Desiena	
	John Sweet Cell 907 350 5430	
	NPDL 18-044	

8/14/18 60°F overcast, windy

0800 leave USACE. Head to TTT
to pick up rentals.

0930 - Head to Kenda.

1430 - arrive @ Wildwood operations
site

Josh Barsis (ADEL)

Jacob Sweet (USACE)

William Mangano (USACE)

1509 setup on MW-1 @ OPS Facility

DTW - 4.50' BTOL ^{low rate}
150 mL/min.

DTB - 12.39' BTOL

Time	Temp (°F)	Cond	pH	DO	ORP	Turb
1545	49.1	0.062	4.74	0.52	7.6	20.95
1550	49.8	0.059	4.79	0.16	-16.5	19
1555	49.8	0.058	4.80	0.10	-27.2	20.1
1600	49.7	0.058	4.81	0.09	-58.5	19.8

8/14/18 60°F overcast wind.

1601 Parameters stable @ OF-MW1

1615 - Sample OF-03 taken

1615 18WWOF-03GW taken from OF MW1

2x 250 mL DRO

3x 40 mL GRC

3x 40 mL BTEX

water clear. sulfur odor.

8/15/18 50°F sunny calm

0700 - meet @ hotel to try to
repair ITT air compressor &
USACE water meter. Took both
apart. Bad air release fitting on
compressor. Visited several stores
unable to find replacement
water meter not working
will get by with one.

Rite in the Rain.

8/15/18 60°F sunny calm.

1242 - Setup on TF-MW AP 397

DTW - 38.84' Flow rate 150 ^{ml}/min

PTB - 44.51' Water clear, no odor

Time Temp Cond pH DO ORP TURB

1310	6.37	0.260	5.57	64.79	147.4	19.0
1315	5.95	0.213	5.74	3.38	144.3	15.0
1320	5.81	0.200	5.78	3.13	141.4	12.7
1325	5.77	0.195	5.81	2.92	139.4	10.8
1330	5.76	0.193	5.83	2.72	137.7	9.8
1335	5.81	0.192	5.84	2.54	136.7	9.3
1340	5.83	0.193	5.83	2.37	135.1	8.9

- parameters stable, water clear, no odor.

1350 - sample # 18WWTF-036W from AP 397 TF

2 x 250 mL DRB
3 x 40 mL DCA

8/15/18 60°F clear, calm.

1400 - Setup on well TF MW-11

DTW: 23.05' Fuel odor, light

DTB: 31.92' orange color, clear.

Time Temp Cond pH DO ORP Turb

1427	7.28	0.628	5.82	3.94	35.1	12.3
1432	7.04	0.592	5.93	2.49	11.9	12.4
1437	6.90	0.575	5.97	2.06	3.8	12.9
1442	6.78	0.557	5.98	1.84	0.0	13.3
1447	6.69	0.546	6.01	1.72	-2.3	13.4
1452	6.65	0.538	6.02	1.58	-3.3	12.7
1457	6.63	0.524	6.03	1.5	-3.9	11.2

1510 - Sample 18WWTF-046W

from MW-11 TF

2 x 250 mL DRB

3 x 40 mL DCA

1600 - Head back to Hotel to pack/label samples etc. Will complete all Prison site wells on 8/16/18 *Rite in the Rain*

6 8/16/18 50°F Rain, calm.

0822 - Setup on TF-MW24

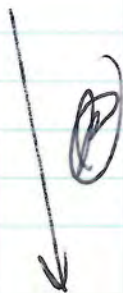
DTW - 26.23' BTDL Flow rate 150 mL/min
water clear, no odor.
DTB - 39.95' BTDL

TIME	TEMP ^(OF)	COND	PH	DO	ORP	Turb
0845	45.072	265.8	5.79	0.96	47.2	5.84
0850	44.760	218.3	5.86	0.49	44.8	4.39
0855	44.601	214.4	5.88	0.33	43.7	5.18
0900	44.626	213.8	5.89	0.24	43.1	5.22

- parameters stable -

0915 - Sample 18WWTF-056W TF-MW24

2x 250 mL ORC
3x 40 mL DCA



7 8/16/18 60°F cloudy, calm.

0928 - Setup on TF-MW6

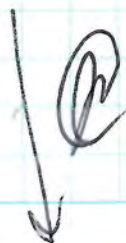
DTW - 28.29' BTDL clear water
DTB - 39.61' BTDL fuel odor
Flow rate 150 mL/min

TIME	TEMP ^{OF}	COND	PH	DO	ORP	Turb
0950	46.109	452.1	6.00	1.88	120	11.56
0955	45.381	395.4	6.17	0.63	-10.3	30.78
1000	45.609	314.8	6.17	0.37	-20.3	37.95
1005	45.120	358.4	6.08	0.48	-10.9	10.92
1010	45.108	356.0	6.06	0.54	-8.2	14.69
1015	45.149	353.2	6.06	0.67	-6.1	12.42

- parameters stable -

1025 - Sample 18WWTF-076W

2x 250 mL DCA
3x 40 mL DCA



Rite in the Rain

8/16/18 60°F overcast, breeze

1033 - Setup on TF MW 3

no tubing in well. put in new tubing.

OTW - 27.52' BTL Flowrate - 150 ml/min

DTB - 40.25' BTL water clear. Fuel odor.

(°F)

Time	Temp	Cond	pH	DO	ORP	Turb
------	------	------	----	----	-----	------

1103	47.392	338.8	5.98	3.05	5.3	28.21
------	--------	-------	------	------	-----	-------

1107	47.243	333.2	5.99	3.44	7.1	30.27
------	--------	-------	------	------	-----	-------

1111	46.999	328.0	5.99	3.89	10.9	49.86
------	--------	-------	------	------	------	-------

- turbidity meter is off, water is very clear *

1115	47.562	327.3	5.99	4.28	14.2	85.26*
------	--------	-------	------	------	------	--------

1119	47.292	324.9	5.99	4.48	19.5	85.91
------	--------	-------	------	------	------	-------

1123	47.376	327.4	5.99	4.51	16.1	86.11
------	--------	-------	------	------	------	-------

- turb readings off water is very clear. parameters stable.

1130 - Sample # 18WWTF-096W from TF MW 3

2x 250 mL DRO

3x 40 mL DLA

8/16/18

1355 - collect sample # 18WWTF-1061W

Equipment blank collected by pumping Distilled water through bladder pump into sample containers

2x 250 mL DRO

3x 40 mL BTEX + DCA / GEO

PURK samples / equipment

1600 - Sample # 18WWTF-1001TB

3x 40 mL GEO

3x 40 mL BTEX + DCA

PROJECT trip blank placed in cooler "VOC"

all ORP containers in cooler "DRO"

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Rite in the Rain

ALL-WEATHER

FIELD

Nº 351FX

2018

WILDWOOD GW
Sampling

(18-044)

2 of 2



Name USACE

Address PO Box 6898

JBER AK 99506

Phone 907 350 5430

Project 2018 Wildwood bwr
Sampling.



RiteintheRain.com

CONTENTS

PAGE	REFERENCE	DATE
	FRA code: 2020	
	Wildwood Security office 907 240 7236	
	POC Casey Desiena (D)	
	Desiena	
	NPD # 18-044	
	Josh Bavis 907 398 6153	

8/14/2018 WIDWOOD AFS OPS Facility
Partly Sunny ~55°F

0700 - ① office preparing to make
to Kani. Will Mangum +
Jake Sweet.

1430 - ② OPS Facility setting up
on wells. Josh Barz's (ADEL)
on-site observing field effort.

1450. Setting up ② OPS MW-2.

DTW - 5.68' Flow ~180 mL/min
DTB - 12.62' No Drawdown
Clear

Time	Temp	Cond	pH	ORP	D.O.	Turb
1528	10.42	0.174	4.71	167.7	99.2	2.5
1533	9.76	0.122	5.08	129.6	99.2	2.3
1538	9.63	0.112	5.32	130.3	99.2	2.0
1543	9.58	0.104	5.33	123.2	100.2	1.9
1548	9.64	0.105	5.38	120.3	100.2	1.8

Parameters
Stable

8/14/2018 OPS Facility

1616

Sample 18WWD-016W

from OF MW-2

2x250 mL DRO 3x40 mL BTX
3x40 mL BRO

1630

Sample 18WWD-026W

Dupe of -016W

from OF MW-2

2x250 mL DRO 3x40 mL BTX
3x40 mL BRO

1634 Setting up ② OPS MW-3

DTW - 5.44'

DTB - 12.23'

Flow rate 150 mL/min
54 L/hr clear

Time Temp Cond pH ORP D.O. Turb

1700	9.46	0.053	5.10	165.2	56.13	5.1
1705	9.05	0.117	5.31	146.8	1.93	3.8
1710	9.16	0.097	5.37	131.1	1.66	3.2
1715	9.16	0.093	5.38	132.3	1.49	2.3
1720	9.00	0.046	5.38	130.3	1.40	1.8

Rite in the Rain

8/14/2018 OPS Facility
continued OPS MW3

Time Temp Cond pH ORP DO Turb

1725 900 0.062 5.39 128.6 1.30 1.4

1730 8.99 0.000 5.39 127.1 1.22 1.2

1732 - Start collecting sample from OPS MW3

1736 - Sample 18WWOF-046W collected

2x 250 mL ORO

5x 40 mL GRC

3x 40 mL BTEX

ABEL Depart
this evening.

End of Day

Sunny ~ 55°F Tank
8/15/2018 W. Woodward AFS Farm
Area

10 A. Mangamp / Lake Sweet
0730 - Troubleshoot compressor + water-
meter. Walnut AFT to (ind)
tools + pressure relief valve.

0945 - @ W. Woodward Tank Farm area
setting up on TF MW-30.

DTW - 42.08'

DTB - 48.65'

~ 150 mL/min

Light orange

color water

No draw down.

Time Temp Cond pH ORP DO Turb

1016 6.61 0.406 6.06 87.0 63.61 113.4

1021 6.46 0.357 6.19 50.2 51.18 97.0

1026 6.38 0.333 6.17 37.1 2.49 78.0

1031 6.34 0.321 6.15 23.9 2.33 58.0

1036 6.31 0.315 6.16 20.3 2.16 46.9

1041 6.30 0.311 6.17 16.3 2.00 39.8

1046 6.35 0.306 6.16 14.9 1.85 29.3

1051 6.32 0.304 6.18 12.9 1.69 20.6

1056 6.34 0.304 6.17 11.0 1.63 17.4

1101 6.37 0.303 6.18 10.4 1.54 15.3

1106 6.40 0.302 6.19 9.3 1.45 12.4

1111 6.40 0.301 6.19 9.2 1.34 10.9

Return to Rain

6 8/15/18 60°F Sun, calm.

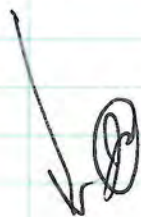
1137 - continue Tank Farm MW-30

1145 - Sample 18WWT-01GW collected from TF MW 30

6x 250 mL DRO
9x 40 mL DCA (+ATX MS/MSD)
9x 40 mL ~~ATX~~ (MS/MSD only) ~~ARO~~ *MS/MSD
~~4x 40 mL~~

1150 Sample #18WWT-02GW collected
false time 3x 40 mL DCA
2x 250 mL DRO *Dupl of TF - 01

1155 - Down @ MW-30 take lunch



7 8/16/18 50°F light Rain calm

0700 - Meet up @ Hotel pack up. Call Correctional facility & let them know we are coming.

0809 - Setup on TF MW-23

DTW: 25.46' ATOC ~150 mL/min
DTB: 40.10' BTOC Turbid, no fuel
odor

TIME	Temp	Cond	pH	DO	ORP	Turb
0843	7.13	0.330	5.85	8.49	143.0	126.7
0848	7.02	0.283	5.87	3.01	115.0	110.3
0853	6.96	0.268	5.88	2.61	105.0	100.2
0858	6.92	0.258	5.91	2.39	96.7	87.6
0903	6.94	0.252	5.92	2.19	89.0	77.3
0908	6.90	0.248	5.94	2.02	83.4	63.3
0913	6.92	0.247	5.95	1.92	80.2	57.0
0918	7.01	0.246	5.96	1.86	76.5	49.2
0923	7.09	0.244	5.97	1.70	74.0	45.6
0933	7.25	0.241	5.98	1.55	71.0	38.7
0938	7.34	0.241	5.98	1.50	69.6	34.2
0943	7.39	0.242	5.98	1.49	67.9	30.7
0948	7.39	0.241	5.99	1.46	66.5	29.6

stable ✓ *Return in 1 hr*

8/16/2018 Winwood Tank Farm Area

0950 - Begin sampling TF MW-23

1000 - Sample 18WWTF-066W

from TF MW-23

2x 250mL DRO

3x 40mL DCA

1005 - Setting up @ TF MW-4

NTW - 27.72' ~180mL/min

DTB - 40.25' fairly clear, slight
faint odor.

Time	Temp	Cond	pH	ORP	DO	Turb
1041	7.85	0.356	5.77	79.1	5.87	14.5
1046	7.73	0.342	5.83	68.7	2.44	13.0
1051	7.74	0.340	5.85	63.6	2.11	11.9
1056	7.70	0.341	5.85	59.9	1.95	11.2
1101	7.67	0.343	5.86	56.8	1.82	10.6

Parameters
Stable

8/16/2018 WWTF Area

1120 - Sample 18WWTF-086W

from TF MW-04

2x 250mL DRO

3x 40mL DCA

1142 - ^{TF}@ MW-16

NTW - 21.65' → 0.03' Product
DTW - 21.68' No Sample

Attachment B

Complete Chemical Data Tables with Sample Summary

Attachment B: Table 1 - 2018 Groundwater Sample Summary Table

Wildwood FUDS

Wildwood, Alaska

Sample Name	Location	Date and Time	Matrix	SW8260B/C (BTEX) ¹	SW8260B/C (DCA) ¹	AK101 (GRO) ¹	AK102/(DRO) ²	QC Type	Lab	Sample Delivery Group	Cooler Name	Sampler Initials
18WWOF-01GW	OF MW-2	08/14/2018 16:16:00	Water	X		X	X	Primary	TASC	320-42271-1	DRO/VOC	WM
18WWOF-02GW	OF MW-2	08/14/2018 16:30:00	Water	X		X	X	Dupe of OF-01GW	TASC	320-42271-1	DRO/VOC	WM
18WWOF-03GW	OF MW-1	08/14/2018 16:15:00	Water	X		X	X	Primary	TASC	320-42271-1	DRO/VOC	JS
18WWOF-04GW	OF MW-3	08/14/2018 17:36:00	Water	X		X	X	Primary	TASC	320-42271-1	DRO/VOC	JS
18WWTF-1001TB	Trip Blank	08/16/2018 16:00:00	Water	X	X	X		Trip Blank	TASC	320-42271-1	DRO/VOC	JS
18WWTF-10GW	E.Blank	08/16/2018 13:55:00	Water	X	X	X	X	Equipment Blank	TASC	320-42271-1	DRO/VOC	JS

Note: The standard 28-day turnaround time was requested for all analysis. All samples were stored at 0-6 °C.

All volatile analysis samples (8260/AK101) were shipped in cooler "VOC". All other analysis samples shipped in cooler "DRO".

All analysis was performed at TestAmerica in West Sacramento.

All SDG MS/MSD analysis were run on Tank Farm Samples.

1 - Water samples are collected in three HCl-preserved 40mL glass vials.

2 - Water samples are collected in two HCl-preserved one liter glass bottles.

BTEX - benzene, toluene, ethylbenzene, xylene

DRO - diesel range organics

GRO - gasoline range organics

GW - groundwater

HCL - hydrochloric acid

WM - William Mangano

JS - Jake Sweet

mL - milliliter

MS/MSD - Matrix Spike/Matrix Spike Duplicate

QC - quality control

TASC - TestAmerica West Sacramento, California

TB - Trip Blank

Attachment B: Table 2. 2018 Wildwood Operations Facility Groundwater Data Table

Sample ID Location ID Collection Date Lab Sample ID Matrix				18WWOF-01GW OF MW-2 08/14/2018 16:16 320-42271-1 Groundwater	18WWOF-02GW OF MW-2 08/14/2018 16:16 320-42271-2 Groundwater	18WWOF-03GW OF MW-1 08/14/2018 16:15 320-42271-3 Groundwater	18WWOF-04GW OF MW-3 08/14/2018 17:36 320-42271-4 Groundwater	18WWTF-10GW E_Blank 08/16/2018 13:55 320-42271-14 Groundwater	18WWTF-1001TB Trip Blank 08/16/2018 16:00 320-42271-15 Groundwater
Method	Units	Analyte	ADEC	Dupe of OF-01GW				Equip. Blank	Trip Blank
8260C	mg/L	Benzene	0.0046	ND [0.0004]	ND [0.0004]	ND [0.0004]	ND [0.0004]	ND [0.0004]	ND [0.0004]
8260C	mg/L	Ethylbenzene	0.015	0.00084 [0.0004] J	0.00083 [0.0004] J	ND [0.0004]	ND [0.0004]	ND [0.0004]	ND [0.0004]
8260C	mg/L	o-Xylene	0.19	0.0088 [0.0004]	0.0089 [0.0004]	0.00023 [0.0004] J	ND [0.0004]	ND [0.0004]	ND [0.0004]
8260C	mg/L	Toluene	1.1	0.00066 [0.0008] J	0.00065 [0.0008] J	ND [0.0008]	ND [0.0008]	ND [0.0008]	ND [0.0008]
8260C	mg/L	Xylene, Isomers m & p	0.19	0.0037 [0.0004]	0.0037 [0.0004]	0.00021 [0.0004] J	ND [0.0004]	ND [0.0004]	ND [0.0004]
8260C	mg/L	Xylenes	0.19	0.013 [0.0012]	0.013 [0.0012]	0.00044 [0.0012] J	ND [0.0012]	ND [0.0012]	ND [0.0012]
AK101	mg/L	Gasoline Range Organics (C6-C10)	2.2	0.068 [0.025] B	0.069 [0.025] B	0.045 [0.025] J,B	0.056 [0.025] B	0.1 [0.025]	ND [0.025]
AK102	mg/L	Diesel Range Organics (C10-C25)	1.5	2.2 [0.12] QL	2.2 [0.12] QL	1.2 [0.12] QL	0.44 [0.12] QL	ND [0.13]	

ADEC - 18 AAC 75 Table C groundwater screening criteria

[] - Laboratory LOD

Solid shade indicates screening value exceedance

Data Flags are defined at the end of the table

Data Flag Explanations

ND - Analyte is not detected; [] - Laboratory Limit of Detection (LOD)

	Analyte LOD is greater than the screening criteria
	Analyte was detected at a concentration greater than the screening criteria.
Qualifier	Definition
J	Analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL
B	Analyte result is considered a high estimated value due to contamination present in the method blank.
QH, QL, QN	Analyte result is considered an estimated value biased (high, low, uncertain) due to a quality control failure
R	Analyte result is rejected - result is not usable.

Flags may be combined when more than one quality deficiency exists

Attachment C

CDQR and Laboratory Data Review Checklists



**US Army Corps
of Engineers**

Alaska District

Chemical Data Quality Review

**Wildwood Former Air Force Station Formerly Used
Defense Site (FUDS)
Partly Mitigated Sites Operations Facility –
F10AK025104**

Wildwood, Alaska

September 2018



Prepared By:
U.S. Army Corps of Engineers - Alaska District
Environmental Engineering Branch
P.O. Box 6898
Joint Base Elmendorf Richardson, Alaska 99506-0898



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1. Introduction

- 1.1. The U.S. Army Corps of Engineers Alaska District (USACE-AK), Engineering and Construction Division, Environmental Engineering Branch (CEPOA-EC-EE) prepared this data review at the request of the USACE Environmental and Special Programs (CEPOA-PM-ESP) branch. This report presents a review of the results from the 2018 groundwater investigation conducted by USACE-AK personnel at the Wildwood Former Air Force Station project site located in Wildwood, Alaska. (18-044). This CDQR covers a single SDG (320-42771) that contained samples from both the Former Tank Farm and the Partly Mitigated Operations Building Site. This CDQR will only focus on data impacts to samples from the Partly Mitigated Sites Operations Building Site.

2. Project Description

- 2.1. See Section 1.2 of the Operations Facility 2018 Groundwater Sampling Report for a complete site description and history. The purpose of sampling was to determine contaminant concentrations in groundwater wells at the project locations. The results of the chemical analyses at the Partly Mitigated Operations Building Site were screened against State of Alaska groundwater cleanup levels under 18 AAC 75, Oil and Hazardous Substances Pollution Control (ref 5.2). The ADEC Method 2, Table C groundwater cleanup levels were used as evaluation criteria.
- 2.2. To that end, 3 primary groundwater samples, one equipment blank, one trip blank, and one duplicate sample were collected during the time period 14-16 August 2018. Groundwater samples were collected by Alaska Department of Environmental Conservation (ADEC) qualified environmental professionals, Jake Sweet and William Mangano from a total of three wells. Submersible bladder pumps were used to collect samples from all monitoring wells. The equipment blank was collected by running deionized water through a bladder pump into sample containers.
- 2.3. A total of 15 groundwater samples (including two duplicates, one equipment rinsate blank and one trip blank) were hand delivered in this Sample Delivery Group (SDG) to TestAmerica Laboratory in Anchorage, Alaska with proper custody procedures. All sample containers were repacked and shipped to TestAmerica Laboratory in Sacramento, California for analysis. Three primary samples and one duplicate were from the Wildwood Operations Facility and are discussed in this CDQR. This lab is approved by ADEC through the Underground Storage Tank (UST) Program and is certified by the Department of Defense (DOD) Environmental Laboratory Accreditation Program (ELAP) for all analytical methods utilized under this project.
- 2.4. The analytical methods utilized for this project site are as follows: AK101 gasoline-range organics (GRO), AK102 diesel-range organics (DRO), and SW8260C benzene, toluene, ethylbenzene, and xylene (BTEX). Table 1, located in Attachment B of the Sampling Report, presents the field identification of collected samples and the analyses performed at the laboratory. Table 2, also located in Attachment B, presents a comprehensive data tabulation with data qualifiers as detailed herein.
- 2.5. The project data was reviewed for deviations to the requirements presented in the Sampling and Analysis Plan, the DOD-QSM (Version 5.1), and the ADEC Technical Memorandum Data Quality Objectives, Checklists, Quality Assurance Requirements for Laboratory Data, and Sample Handling (dated March 2017) in the following areas – precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS). Elements reviewed include sample handling, holding times, method and trip blanks, laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries and relative percent differences (RPDs), matrix spikes and matrix spike duplicates (MS/MSD) recoveries and RPDs, surrogate recovery, and field duplicate comparability. Calibration curves and continuing calibration standard recoveries were not specifically reviewed; however, laboratories are required to document such failures in the appropriate case narratives. These narratives were reviewed for each sample delivery group.

- 2.6. The laboratory electronic data format (EDF) for this project was used to generate this report. When discrepancies between the hardcopy data and the EDF are found, the EDF has been modified to reflect values from the hardcopy, unless the hardcopy is found to be in error. Results used to generate this report are deemed to be accurate.
- 2.7. The following qualifiers, listed below in order of increasing severity, are used in the data tables to indicate quality control deficiencies. With the exception of J and B which provide additional usability information, the most severe flag will be utilized when quality issues indicate the use of more than one qualifier.

Qualifier	Definition
J	Analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the method or trip blank.
H	Analyte result is considered a low estimated value due to being analyzed outside of holding time.
QH, QL, QN	Analyte result is considered an estimated value (biased high, low, indeterminate) due to a quality control failure.
R	Analyte result is rejected - result is not usable.

2.8. Details of the data review are presented by SDG below:

3. SDG 320-42771

- 3.1. Collection and Preservation: Three primary groundwater samples, one duplicate, one trip blank, and one equipment blank associated with the Wildwood Operations Facility were shipped to the laboratory in two coolers. Cooler "VOC" contained the project trip blank and was measured at 5.4° C upon receipt. Cooler "DRO" was received with a temperature of 3.5° C. All temperatures met criteria and all preservation requirements were met. No data is impacted. The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): 18WWOF-04GW (320-42271-4). Three of six vials labels list 1738 as the collection time, while the COC lists 1736 for the collection time. The samples were logged in per the COC. There were no impacts to data.
- 3.2. Holding times: All reported sample analyses were completed within applicable holding times with the exception of the following:
- The following samples were analyzed outside of analytical holding time, the original analysis in analytical batch 320-242233 did not have laboratory control sample/laboratory control sample duplicate (LCS/LCSD) or closing continuing calibration verification (CCV). The results confirm the original analysis, both results are reported: 18WWOF-01GW (320-42271-1), 18WWOF-02GW (320-42271-2), 18WWOF-03GW (320-42271-3) and 18WWOF-04GW (320-42271-4). Samples were analyzed less than a day out of hold time and all results were comparable. There was no impact to data quality.
 - The following samples in analytical batch 320-242233 were analyzed with no laboratory control sample/laboratory control sample duplicate, closing continuing calibration verification and no Trifluorotoluene surrogate due to analyst oversight. The samples are re-analyzed in analytical batch 320-242645. Both analyses are reported and the re-analysis is past sample hold time. 18WWOF-01GW (320-42271-1), 18WWOF-02GW (320-42271-2), 18WWOF-03GW (320-42271-3) and 18WWOF-04GW (320-42271-4)

Samples were analyzed less than a day out of hold time and all results were comparable. There was no impact to data quality.

- 3.3. Method, equipment and trip blanks were analyzed at the required frequency and/or target analytes were not detected in any blank or detections do not impact data quality (sample results are at least 10 times greater than any associated blank concentration) with the following exceptions:
- GRO was detected in the project equipment blank at a concentration of 0.1 mg/L. GRO results for samples OF-01GW, OF-02GW, OF-03GW and OF-04GW are impacted and are flagged "B". There is no impact to data quality as all impacted results are biased high and are below screening criteria.
- 3.4. LCS/LCSDs were analyzed at the required frequency and recoveries were within the QSM acceptance limits for all analytes with the following exception:
- The following samples in analytical batch 320-242233 were analyzed with no laboratory control sample/laboratory control sample duplicate, closing continuing calibration verification and no Trifluorotoluene surrogate due to analyst oversight. The samples are re-analyzed in analytical batch 320-242645. Both analyses are reported and the re-analysis is marginally past sample hold time. 18WWOF-01GW (320-42271-1), 18WWOF-02GW (320-42271-2), 18WWOF-03GW (320-42271-3) and 18WWOF-04GW (320-42271-4). Samples were analyzed less than a day out of hold time and all results were comparable. There was no impact to data quality.
- 3.5. LCS precision: The LCS precision as measured by RPD was within QSM or method acceptance limits or any deviations do not impact data quality.
- Surrogate recoveries for all samples were within method and/or QSM acceptance limits or deviations do not impact data usability for Operations Facility primary samples.
- 3.6. MS/MSDs were analyzed at the required frequency and recoveries were within the QSM acceptance limits or did not affect data quality with the following exceptions:
- Due to insufficient sample volume there is no MS/MSD for lab batch 320-242629. The LCS/LCSD provides precision information for this batch.
- 3.7. The MS/MSD precision did not exceed QSM acceptance limits or did not affect data quality with the exception of the following:
- DRO was recovered marginally (73% vs.75%) low in the MS/MSD of lab batch 320-24291. All DRO results in this batch are potentially biased low. All project samples are impacted and are flagged "QL". There is no impact to the majority of the results as they are either over screening criteria, or were detected at a concentration far below screening criteria. The DRO result for sample 18WWOF-03GW should be used with caution as it is potentially low biased and is just below the screening criteria.
- 3.8. There were two duplicate pairs of site samples reported in this SDG, meeting the 10% frequency requirement. Sample OF-02GW was a duplicate of OF-01GW. Sample TF-01GW was a duplicate of TF-01GW. For comparison purposes, the limit of detection (LOD) is used for a nondetect result. All results are compliant with the criteria specified in ADEC Tech Memo.
- 3.9. Reporting/detection limits are defined by the QSM as follows: the Limit of Quantification (LOQ) is the lowest concentration that produces a quantitative result within specified limits of precision and bias. For DOD projects, the LOQ shall be set at or above the concentration of the lowest initial calibration standard corrected for sample preparation, dilution and moisture (if applicable). Laboratories can often detect analytes at levels less than the LOQ, albeit less quantitatively; therefore, the Limit of Detection (LOD) is defined as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false positive rate is 1%. Consequently, any nondetect result with an LOD greater than the associated cleanup limit cannot be used to prove the absence of that analyte at

that limit. The laboratory reporting limits meet or exceed ADEC regulatory requirements for all analytes.

4. Overall Assessment

All results for this project are usable as reported and flagged. The overall completeness goal of 95% was met.

5. References

- 5.1. ADEC, Technical Memorandum, Data Quality Objectives, Checklists, Quality Assurance Requirements for Laboratory Data, and Sample Handling, March 2017.
- 5.2. ADEC, 18 AAC 75 Oil and Other Hazardous Substances Pollution Control, November 2017.
- 5.3. Department of Defense, Quality Systems Manual for Environmental Laboratories, Final Version 5.1, January 2017.
- 5.4. Test America Sacramento, Analytical Report; Job # 320-42771-1, Wildwood, September 2018.

Laboratory Data Review Checklist

Completed By:

Jake Sweet

Title:

USACE Chemist

Date:

9/11/18

CS Report Name:

2018 Wildwood Groundwater Monitoring Report

Report Date:

September, 2018

Consultant Firm:

US Army Corps of Engineers

Laboratory Name:

Test America, Sacramento

Laboratory Report Number:

320-42271

ADEC File Number:

2320.38.051

Hazard Identification Number:

25199 (Tank Farm), 25213
(Operations Facility)

1. Laboratory

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

☒ Yes☐ No

Comments:

All analysis was performed at Test America Sacramento which holds both ADEC and ELAP certification for all analytes.

- 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

Comments:

Not applicable, no samples were transferred.

2. Chain of Custody (CoC)

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

☒ Yes☐ No

Comments:

- b. Correct Analyses requested?

☒ Yes☐ No

Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

☒ Yes☐ No

Comments:

Samples were hand delivered to the laboratory satellite office in Anchorage, AK. All samples were in two coolers. Cooler “DRO” had a cooler temperature of 3.5 °C. Cooler “VOC” had a cooler temperature of 5.4 °C.

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

☒ Yes☐ No

Comments:

All sample containers were HCl preserved and pH measurements were collected by the lab to verify adequate preservative was present.--

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

☒ Yes☐ No

Comments:

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

☒ Yes ☐ No

Comments:

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): 18WWOF-04GW (320-42271-4). Three of six vials labels list 1738 as the collection time, while the COC lists 1736 for the collection time. The samples were logged in per the COC. There were no impacts to data.

- e. Data quality or usability affected?

Comments:

None.

4. Case Narrative

- a. Present and understandable?

☒ Yes ☐ No

Comments:

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

☒ Yes ☐ No

Comments:

Internal standard (ISTD) response for Dioxane-d8 for the following samples were outside acceptance criteria: 18WWOF-02GW (320-42271-2) and 18WWTF-01GW (320-42271-5[MSD]). This ISTD does not correspond to any of the requested target compounds; therefore, the data have been reported.

The following samples were analyzed outside of analytical holding time, the original analysis in analytical batch 320-242233 did not have laboratory control sample/laboratory control sample duplicate (LCS/LCSD) or closing continuing calibration verification (CCV). The results confirm the original analysis, both results are reported: 18WWOF-01GW (320-42271-1), 18WWOF-02GW (320-42271-2), 18WWOF-03GW (320-42271-3) and 18WWOF-04GW (320-42271-4).

The following samples in analytical batch 320-242233 were analyzed with no laboratory control sample/laboratory control sample duplicate, closing continuing calibration verification and no Trifluorotoluene surrogate due to analyst oversight. The samples are re-analyzed in analytical batch 320-242645. Both analyses are reported and the re-analysis is past sample hold time. 18WWOF-01GW (320-42271-1), 18WWOF-02GW (320-42271-2), 18WWOF-03GW (320-42271-3) and 18WWOF-04GW (320-42271-4)

- c. Were all corrective actions documented?

☒ Yes ☐ No

Comments:

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

Comments:

The case narrative does not discuss data usability. See this checklist and the CDQR for the data usability discussion.

5. Samples Results

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

☒ Yes ☐ No

Comments:

b. All applicable holding times met?

☐ Yes ☒ No

Comments:

The following samples were analyzed outside of analytical holding time, the original analysis in analytical batch 320-242233 did not have laboratory control sample/laboratory control sample duplicate (LCS/LCSD) or closing continuing calibration verification (CCV). The results confirm the original analysis, both results are reported: 18WWOF-01GW (320-42271-1), 18WWOF-02GW (320-42271-2), 18WWOF-03GW (320-42271-3) and 18WWOF-04GW (320-42271-4).

Since the results were confirmed by re-analysis, the original in hold results were reported. There is no impact to data usability.

c. All soils reported on a dry weight basis?

☐ Yes ☐ No

Comments:

Not applicable. All samples were water samples.

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

☒ Yes ☐ No

Comments:

e. Data quality or usability affected?

☐ Yes ☒ No

Comments:

There are no impacts to data quality or usability.

6. QC Samples

a. Method Blank

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

☒ Yes ☐ No

Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

☒ Yes ☐ No

Comments:

iii. If above LOQ, 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

Comments:

Not applicable.

v. Data quality or usability affected?

Comments:

None.

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

Comments:

The following samples in analytical batch 320-242233 were analyzed with no laboratory control sample/laboratory control sample duplicate, closing continuing calibration verification and no Trifluorotoluene surrogate due to analyst oversight. The samples are re-analyzed in analytical batch 320-242645. Both analyses are reported and the re-analysis is marginally past sample hold time. 18WWOF-01GW (320-42271-1), 18WWOF-02GW (320-42271-2), 18WWOF-03GW (320-42271-3) and 18WWOF-04GW (320-42271-4). There is no impact to data as all results were comparable and the out of hold samples were less than 1 day out of hold.

Due to insufficient sample volume there is no MS/MSD for lab batch 320-242629. The LCS/LCSD provides precision information for this batch.

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

☐ Yes ☒ No

Comments:

Not applicable, no inorganics were analyzed.

- 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

Comments:

All LCS/LCSD recoveries were within lab limits.

DRO was recovered marginally (73% vs. 75%) low in the MS/MSD of lab batch 320-24291. All DRO results in this batch are potentially biased low. All project samples are impacted and are flagged “QL”.

- 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/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☒ Yes ☐ No

Comments:

All LCS/LCSD and MS/MSD RPDs are within laboratory limits.

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

Comments:

Not applicable.

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

☒ Yes ☐ No

Comments:

All MS/MSD low recovery impacted samples are flagged “QL”.

- vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

There is no impact to the majority of the results as they are either over screening criteria, or were detected at a concentration far below screening criteria. The DRO result for sample 18WWOF-03GW should be used with caution as it is potentially low biased and is just below the screening criteria.

- c. Surrogates – Organics Only

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

☒ Yes ☐ No

Comments:

All primary reported results have surrogates associated with them.

- 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

Comments:

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

☒ Yes ☐ No

Comments:

Not applicable, there were no surrogate failures.

- iv. Data quality or usability affected?

Comments:

None.

- 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

Comments:

Sample 18WWTF-1001TB was the project trip blank.

- 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

Comments:

The trip blank was transported to the lab in cooler “VOC” with all of the project VOA samples.

- iii. All results less than LOQ?

☒ Yes ☐ No

Comments:

- iv. If above LOQ, what samples are affected?

Comments:

Not applicable

v. Data quality or usability affected?

Comments:

Not applicable

e. Field Duplicate

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

☒ Yes ☐ No

Comments:

There were two field duplicate samples collected and 11 project samples collected, meeting the 10% frequency requirement.

Sample 18WWOF-02GW was a duplicate of sample 18WWOF-01GW. Sample 18WWTF-02GW was a duplicate of sample 18WWTF-01GW.

ii. Submitted blind to lab?

☒ Yes ☐ No

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

Comments:

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

Comments:

None.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below).

☒ Yes ☐ No ☐ Not Applicable

An equipment blank was collected by running deionized water through the decontaminated bladder pump and collecting the water in sample containers.

i. All results less than LOQ?

☐ Yes ☒ No

Comments:

GRO was detected at a concentration of 0.1 mg/L in the equipment blank.

ii. If above LOQ, what samples are affected?

Comments:

All GRO sample results were within 10X of the detected equipment blank and are flagged "B".

iii. Data quality or usability affected?

Comments:

Data usability is not impacted. All GRO results are far below screening criteria and are potentially biased high.

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

a. Defined and appropriate?

☒ Yes ☐ No

Comments:

All data flags are defined at the end of the data tables.

Attachment D

Site Photographs



Photo #1: Collecting water samples at Operations Facility MW-3, view NE (8/15/18)



Photo #2: Operations facility MW-2 water sample collection (8/15/18)

Attachment E

ADEC Comments