FINAL

INITIAL INVESTIGATION / SITE HAZARD ASSESSMENT AND NO FURTHER ACTION AT

OW056

PERFORMANCE-BASED REMEDIATION
FAIRCHILD AIR FORCE BASE, WASHINGTON

Contract FA8903-14-C-0011

August 2018

Revision: 0

Prepared for:
AFCEC/CZRW

U.S. Air Force Civil Engineer Center
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URS

REPORT CERTIFICATION STATEMENT

Final

Initial Investigation / Site Hazard Assessment and No Further Action at OW056

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Performance-Based Remediation
Fairchild Air Force Base, Washington

Prepared Under:

Contract Number: FA8903-14-C-0011

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Bay West LLC
5 Empire Drive
St. Paul, MN 55103

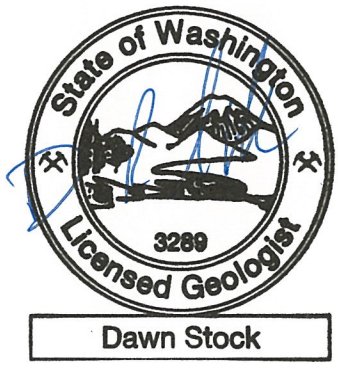
The information contained in this report is true and correct to the best of my knowledge.

August 23, 2018

Dawn Stock, LG — **Date**
Senior Geologist, URS

August 23, 2018

Sean Bayer — **Date**
Project Manager, URS



Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation.

Completion of this form is not sufficient to document your evaluation. You still need to document your analysis and the basis for your conclusion in your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to www.ecy.wa.gov/programs/tcp/policies/terrestrial/TEEHome.htm.

Step 1: IDENTIFY HAZARDOUS WASTE SITE	
Please identify below the hazardous waste site for which you are documenting an evaluation.	
Facility/Site Name: OW056	
Facility/Site Address: Fairchild Air Force Base, Washington	
Facility/Site No: 18165/12827	VCP Project No.: EA0311

Step 2: IDENTIFY EVALUATOR		
Please identify below the person who conducted the evaluation and their contact information.		
Name: Dawn Stock		Title: Geologist
Organization: AECOM		
Mailing address: 12120 Shamrock Plaza		
City: Omaha	State: NE	Zip code: 68154
Phone: 402-952-2535	Fax: 402-334-8181	E-mail: dawn.stock@aecom.com

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 2**.*

☒ No or Unknown *If you answered **"NO" or "UKNOWN,"** then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? *Check all that apply. Then skip to **Step 4** of this form.*

Point of Compliance: WAC 173-340-7491(1)(a)

☐ All soil contamination is, or will be,* at least 15 feet below the surface.

☐ All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

☐ All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

☐ There is less than 0.25 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

☐ For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

☐ Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

[±] "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

[#] "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.

1. Does the Site qualify for a simplified evaluation?

- ■ Yes — *If you answered **"YES,"** then answer **Question 2** below.*
- ☐ No or Unknown — *If you answered **"NO"** or **"UNKNOWN,"** then skip to **Step 3C** of this form.*

2. Did you conduct a simplified evaluation?

- ■ Yes — *If you answered **"YES,"** then answer **Question 3** below.*
- ☐ No — *If you answered **"NO,"** then skip to **Step 3C** of this form.*

3. Was further evaluation necessary?

- ☐ Yes — *If you answered **"YES,"** then answer **Question 4** below.*
- ■ No — *If you answered **"NO,"** then answer **Question 5** below.*

4. If further evaluation was necessary, what did you do?

- ☐ Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*
- ☐ Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

5. If no further evaluation was necessary, what was the reason? *Check all that apply. Then skip to **Step 4** of this form.*

Exposure Analysis: WAC 173-340-7492(2)(a)

- ☐ Area of soil contamination at the Site is not more than 350 square feet.
- ☐ Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

Pathway Analysis: WAC 173-340-7492(2)(b)

- ☐ No potential exposure pathways from soil contamination to ecological receptors.

Contaminant Analysis: WAC 173-340-7492(2)(c)

- ☒ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.
- ☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.
- ☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.
- ☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. *See* WAC 173-340-7493(1)(c).

1. Was there a problem? *See* WAC 173-340-7493(2).

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No *If you answered **"NO,"** then identify the reason here and then skip to **Question 5** below:*

- ☐ No issues were identified during the problem formulation step.
- ☐ While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? *See* WAC 173-340-7493(3).

☐ Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*

☐ Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

3. If you conducted further site-specific evaluations, what methods did you use?
Check all that apply. See WAC 173-340-7493(3).

- ☐ Literature surveys.
- ☐ Soil bioassays.
- ☐ Wildlife exposure model.
- ☐ Biomarkers.
- ☐ Site-specific field studies.
- ☐ Weight of evidence.
- ☐ Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

- ☐ Confirmed there was no problem.
- ☐ Confirmed there was a problem and established site-specific cleanup levels.

5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?

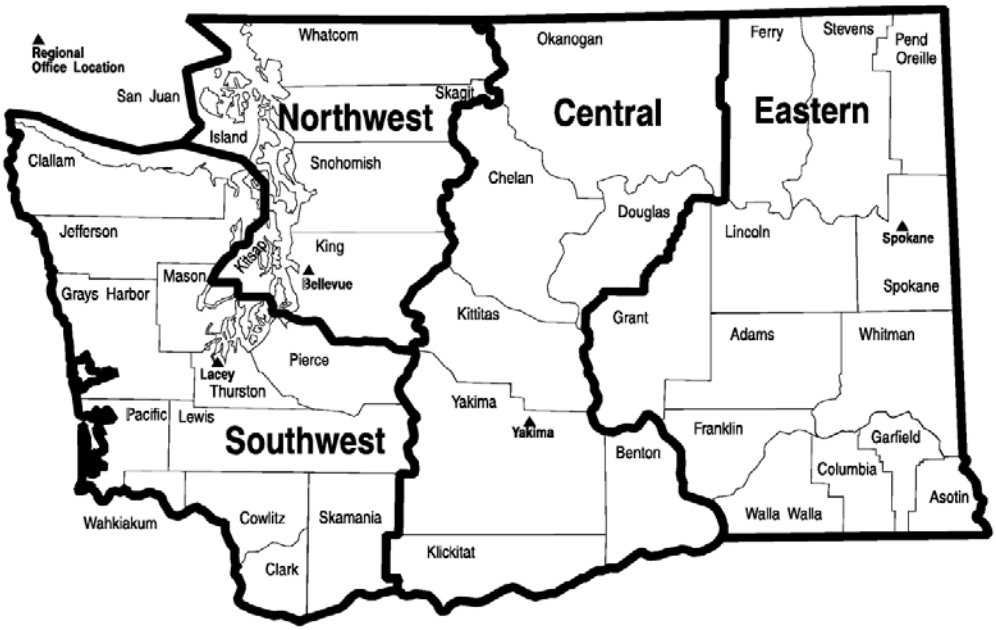
☐ Yes If so, please identify the Ecology staff who approved those steps:

☐ No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.

Northwest Region: Attn: VCP Coordinator 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: VCP Coordinator 1250 West Alder St. Union Gap, WA 98903-0009
Southwest Region: Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295



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Acronyms and Abbreviations

°F..... degrees Fahrenheit
AFB..... Air Force Base
AFCEC ..... Air Force Civil Engineer Center
ARW ..... Air-Refueling Wing
Bay West .. Bay West LLC
bgs..... below ground surface
cm/sec ..... centimeters per second
CUL ..... cleanup level
DoD ..... Department of Defense
DRO..... diesel range organics
EA, Inc. ..... EA Engineering, Science, and Technology, Inc.
ERP ..... Environmental Restoration Program
ERPIMS .... Environmental Resources Program Information Management System
ft/day..... feet per day
ft/yr..... feet per year
GPS..... global positioning system
GRO ..... gasoline range organics
HSL..... Hazardous Site List
IDW..... investigation derived waste
II ..... Initial Investigation
J..... estimated
LCS..... laboratory control sample
MEK..... methyl ethyl ketone
MS/MSD ... matrix spike/matrix spike duplicate
MTCA ..... Model Toxics Control Act
ORO……oil range organics
OWS..... oil water separator
PAH ..... polycyclic aromatic hydrocarbon
PCB ..... polychlorinated biphenyl
PCS ..... petroleum-contaminated soil
PID..... photoionization detector
PPE ..... personal protective equipment
ppm..... parts per million
QA ..... quality assurance
QC ..... quality control
SAC .....Strategic Air Command
SC.....site closure
SI .....site investigation
SHA .....Site Hazard Assessment
SOP .....standard operating procedure
SVOC.....semi-volatile organic compound
TCLP.....toxicity characteristic leaching procedure
TestAmerica...TestAmerica Laboratories, Inc.
TPH.....total petroleum hydrocarbons
UFP-QAPP.....Uniform Federal Policy - Quality Assurance Project Plan
UJ .....estimated nondetect
URS .....URS Group, Inc.
USACE .....United States Army Corps of Engineers
USAF .....United States Air Force
USEPA.....United States Environmental Protection Agency
VOC.....volatile organic compound
WAC .....Washington Administrative Code
WDOE.....Washington Department of Ecology
Weston.....Weston Solutions, Inc.
WOST .....waste oil storage tank

EXECUTIVE SUMMARY

This Initial Investigation/Site Hazard Assessment (II/SHA) Report has been prepared by Bay West LLC (Bay West) for oil water separator (OWS) OW056 at Fairchild Air Force Base (AFB), Spokane, Washington. The II/SHA report is prepared under the United States Air Force Civil Engineer Center Performance-Based Remediation Contract FA8903-14-C-0011. Work under this contract is led by Bay West in conjunction with its teaming partner URS Group, Inc. (URS).

OWS sites at Fairchild AFB are regulated under the State of Washington's Model Toxics Control Act (MTCA). The Washington Department of Ecology (WDOE) serves as the lead regulatory agency. Activities completed as part of the investigation included:

- Obtaining dig permits and locating/clearing subsurface utilities.
- Advancing direct push soil and groundwater points. Direct push activities met the requirements of Washington Administrative Code (WAC) 173-160 and WDOE guidance (WDOE, 2011) and consisted of:
    1. Collecting soil samples for lithologic logging.
    2. Collecting soil samples for chemical analysis from the vadose zone, targeting the estimated depth of the former OWS.
    3. Collecting a groundwater sample for chemical analysis.
    4. Decommissioning the direct push borings.
- Submitting all samples for chemical analysis to the fixed off-site laboratory.
- Surveying direct push sampling points. Survey activities met the requirements of WAC 332-130 and WDOE guidance (WDOE, 2011).

Concurrent with and following II/SHA data acquisition, data analysis, and interpretation tasks included:

- Reviewing and incorporating historical chemical and geological data.
- Validating recently acquired soil and groundwater characterization data.
- Identifying and analyzing of data gaps in historical site assessment activities.
- Summarizing, tabulating, and comparing analytical data with MTCA Method A cleanup levels (CULs), also referred to as project action levels. Method A levels are considered "unlimited use" levels under Washington law.

Development of a conceptual site model, contaminant fate and transport modeling, and risk assessment was not needed because contamination was not found above WDOE action levels. The levels of contaminants found at OW056 were below MTCA Method A CULs indicating there is not a threat to human health or the environment, and the site warrants no further action. OW056 should not be placed on the State of Washington's Hazardous Site List (HSL) and should be closed with unlimited use/unrestricted exposure. A letter concurring that OW056 warrants no further action per WAC 173-340-320(6) is requested from WDOE.

1.0 INTRODUCTION

1.1 Purpose

This Initial Investigation/Site Hazard Assessment (II/SHA) Report was prepared by Bay West LLC (Bay West) for oil water separator (OWS) OW056 at Fairchild Air Force Base (AFB), Spokane, Washington. The II/SHA report was prepared under the United States Air Force Civil Engineer Center (AFCEC) Performance-Based Remediation Contract FA8903-14-C-0011. Work under this contract is led by Bay West in conjunction with its teaming partner URS Group, Inc. (URS).

The Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) presenting the scope of the OWS II/SHA field program was approved by AFCEC/Fairchild AFB in November 2015 (Bay West, 2015a).

OWS sites at Fairchild AFB are regulated under the State of Washington's Model Toxics Control Act (MTCA). The Washington Department of Ecology (Ecology or WDOE) serves as the lead regulatory agency. Historical data collected at OW056 indicated that petroleum-related contamination may be present in soil and groundwater. Additional sampling to verify the existence of and delineate the extent of petroleum-related contamination in soil and groundwater was necessary to determine if a release occurred, to evaluate the threat to human health and the environment, and to determine whether or not OW056 should be placed on the State of Washington's Hazardous Site List (HSL) and undergo further action. This document constitutes the United States Air Force (USAF) site closure (SC) decision document and is the formal request for WDOE concurrence that OW056 warrants no further action.

1.2 Regulatory History

Environmental investigations have been conducted at Fairchild AFB since 1984 and are being conducted under the USAF Environmental Restoration Program (ERP). The ERP was developed by the Department of Defense (DoD) in 1981 to identify, investigate, and clean up environmentally contaminated sites on military bases. OW056 is a former OWS and was identified during DoD ERP eligibility assessments conducted in 2009 and 2011. The site is regulated under WDOE MTCA and WDOE is the lead regulatory agency for this II/SHA.

1.3 Site Location and Description

Fairchild AFB is located approximately 12 miles west of Spokane, Washington, and covers approximately 4,300 acres in Spokane County (**Figure 1-1**). Fairchild AFB is currently home to the 92nd Air-Refueling Wing (ARW) and 141st Air National Guard ARW, making it the largest ARW of the USAF. Other Fairchild AFB units include the USAF Survival, Evasion, Resistance and Escape school, medical detachments, a weapons squadron, and the Joint Personnel Recovery Agency. Fairchild AFB consists of one major runway supported by taxiways, support facilities, a hospital, housing, and an elementary school.

The base was established in 1942 as the Spokane Army Air Depot. The installation was transferred to the Strategic Air Command (SAC) in 1947, and remained an active SAC base until 1992 when Fairchild AFB became part of the Air Combat Command. In 1994, the installation was transferred to the Air Mobility Command.

OW056 is located outside of a maintenance building along the flight line and is currently paved (**Figure 1-2**). Further discussion about previous environmental investigations performed at OW056 is provided in **Section 2.0**.

2.0 STUDY AREA PREVIOUS INVESTIGATIONS

2.1 Physical and Analytical Data from OWS Removal

OW056, the Building 2045 OWS (OW-C558), received wastes from a trench drain in the wash rack. These wastes may have included used fuel/oil and detergents. When in use, the waste oil was stored in a built-in waste oil chamber until it was collected and disposed of, and the water was discharged from the OWS to the storm sewer (EA Engineering, Science, and Technology, Inc. [EA, Inc.] 1993). The disposal method of the waste oil is unknown. OW056 was identified as an environmental site upon removal of the OWS on 15 August 1995. Using a photoionization detector (PID), petroleum contamination was detected in the excavation ranging from 250 to 500 parts per million (ppm) and observed in excavated soils. Approximately 95 tons of petroleum-contaminated soil (PCS) was transported to the Graham Road Recycling and Disposal Facility. A composite soil sample was collected during excavation of the OWS composited from seven discrete samples collected during excavation. These discrete samples were collected from various locations within the excavation including: the side walls one-third and two-thirds up from the bottom; the bottom-edge of the excavation at opposite ends; and the bottom of the excavation directly below the OWS. The composite sample was analyzed for volatile organic compound (VOCs), semi-volatile organic compound (SVOCs), total petroleum hydrocarbons (TPH), and metals. Groundwater was not encountered in the excavation. Soil sample results are shown in **Table 2-1**. Soil sample results indicated gasoline, diesel, and heavy oils above WDOE action levels. Additional soil sampling was not authorized by the USACE at the time (URS, 2011).

2.2 Physical and Analytical Data from OWS Replacement

A new OWS (OW-C559) was installed in August 1995 approximately 15 feet northwest of former OW-C558 as a replacement (Blue Ridge Associates, Inc., 1996). During installation activities for OW-C559, excavated soils were visibly contaminated and petroleum contamination was detected in the excavation with PID readings ranging from 60 to 110 ppm. Approximately 249 tons of PCS was transported to the Graham Road Recycling and Disposal Facility. A composite soil sample was collected from seven discrete samples collected during installation of OW-C559. The discrete samples were collected from various locations within the excavation including: the side walls at one-third and two-thirds up from the bottom and the bottom-edge of the excavation. The composite sample was analyzed for VOCs, SVOCs, TPH, and metals. Groundwater was not encountered in the excavation. Soil sample results are shown in **Table 2-1** (URS, 2011).

Contamination present at this site was thought to be from the operation of the wash rack or OW-C558 (Blue Ridge Associates, Inc., 1996). No additional sampling or remediation activities have occurred at this site since the installation of the replacement OWS.

3.0 ENVIRONMENTAL SETTING

This section presents the site environmental setting from background information sources and field data collected during the 2015 II/SHA field effort.

3.1 Physical Environment

3.1.1 Site Features and Topography

OW056 is located north of the flightline, outside a maintenance facility. OW056 is currently in a concrete parking area. The topographic elevation at OW056 is approximately 2,432 feet above mean sea level. The ground surface at the site is generally flat with gentle sloping to the southeast.

Fairchild AFB rests in a high valley bounded to the west by the Cascade Mountains and to the east by the Rocky Mountains. The topography of the installation is relatively flat and gently slopes to the east and northeast. Most surface drainage at the installation is directed into ponds, wetlands, or swales located within the boundaries of the installation (EA Engineering and Technology (EA, Inc.), 1996).

3.1.2 Climate and Weather

Average monthly high temperatures at Fairchild AFB range from 33 degrees Fahrenheit (°F) in January to 83°F in August. Average monthly low temperatures range from 22°F in January to 55°F in July. The record high and low temperatures are 108°F in July 1961 and -30°F in January 1888, respectively. Fairchild AFB receives an average of 16.67 inches of precipitation per year, with an average maximum of 2.25 inches in December. The average evaporation during the years 1971-2000 was approximately 6.38 inches annually. Due to the northern latitude, much of the precipitation falls as snow in the winter months. Nearby Spokane receives an average of 48.8 inches of snow annually (Weston Solutions, Inc. [Weston], 2010).

3.1.3 Geology

3.1.3.1 *Regional Geology*

The shallow subsurface geology at Fairchild AFB is a mixture of Tertiary volcanics and Quaternary sediments consisting of eolian, glacial, fluvial, lacustrine, and catastrophic flood deposits. Flood waters from the glacial-era Missoula Lake scoured the basalt bedrock of this region of the Columbia Plateau. Coarse sediments were deposited during the early recession of flood waters, followed by finer sediments during the later stages of floodwater recession. Unconsolidated deposits in the vicinity of the base generally consist of fine-grained sediments deposited by receding glacial waters. Clays and silts are intermixed with sandy silts, clays, and gravels. Anthropogenic deposits, either as reworked alluvium for base development purposes or non-native fill material, are present at shallow depths within the developed portion of the installation. The glacial alluvium as a whole is very heterogeneous and ranges in thickness from about 10 to 60 feet. Unconsolidated deposits generally follow the slope of the underlying basalt bedrock (Parsons Engineering Science, Inc., 1996).

Bedrock in the vicinity of Fairchild AFB is mostly Tertiary basalts of the Columbia River Group, specifically of the Wanapum Formation. The basalt flows in the region are interbedded with sedimentary clay and silt units of the Latah Formation. The Wanapum basalt flow below the base appears to be divided into an upper and lower flow sequence by an interbed of the Latah

Formation silt unit. The upper basalt flow is 166 to 193 feet thick across the base. The underlying Latah Formation deposits consist of an extensive silty claystone that ranges in thickness from 8.5 to 10 feet (Parsons Engineering Science, Inc., 1996).

3.1.3.2 *Site Geology*

Soils encountered during the II/SHA Investigation at OW056 were primarily fill soils within the OWS excavation. These and underlying native soils consisted of 24 feet of sand and silty sand with gravel. Weathered basalt bedrock was not encountered at OW056 borings but has been encountered at about 40 feet below ground surface (bgs) during investigations completed at nearby sites located within Fairchild AFB (URS, 2017).

3.1.4 Hydrogeology and Groundwater Use

3.1.4.1 *Regional Hydrogeology*

Groundwater in the vicinity of Fairchild AFB is encountered between 8 and 12 feet bgs and is present in both the unconsolidated overburden material and the underlying basalt bedrock. Groundwater flow in the overburden is through intergranular pore space, while flow in the basalt is through interconnecting fractures. Flow across the base is generally to the east and east-northeast, but local variations may result from local changes in bedrock topography. Groundwater in the overburden and shallow bedrock is generally unconfined, with some locally semi-confined areas. The overburden and the shallow basalt are hydraulically connected in most, but not all, areas by fractures, vesicles, and weathered zones. The middle region of the shallow basalt flow, which is more competent with less fracturing, acts as an aquitard. The interbedded claystone between the basalt flows also acts as a confining layer (Parsons Engineering Science, Inc., 1996).

3.1.4.2 *Site Hydrogeology*

Depth to water elevations at OW056 direct push locations were noted on the boring logs. Groundwater was only encountered at the deepest boring at a depth of 21 feet bgs. No drinking water wells are located in the vicinity of OW056; however, groundwater is classified as a potential drinking water source by the State of Washington. Groundwater flow direction is generally to the east-northeast.

Water level data collected at Fairchild AFB in 2015 (**Table 3-1** and **Figure 3-1**) indicates the average horizontal gradient in the shallow aquifer (alluvium) ranges from about 0.0035 to 0.0041 feet/foot, indicating that a relatively shallow gradient exists across the site. The average horizontal gradient in the basalt aquifer ranges from about 0.0028 to 0.0045 feet/foot, also indicating a shallow gradient (Bay West, 2017).

3.1.4.3 *Hydraulic Conductivity*

Rising and falling slug tests were conducted at ERP site SS039 in 2011 at seven monitoring wells screened in the shallow alluvium (MW-382, MW-384, MW-390, MW-394, MW-404, MW-427, MW-432) to estimate hydraulic conductivity of the shallow alluvial sediments (**Figure 3-1**) (CH2MHill, 2013). Hydraulic conductivities ranged from 2×10^{-2} to 4×10^{-2} centimeters per second (cm/sec) (58 to 121 feet per day [ft/day]), with a median value of 4×10^{-2} cm/sec (108 ft/day). For wells completed in weathered basalt, hydraulic conductivities ranged from 5×10^{-5} to 2×10^{-2} cm/sec (0.15 to 59 ft/day), with a median value of 1×10^{-3} cm/sec (3.7 ft/day).

3.1.4.4 *Aquifer Flow Rate*

The seepage velocity (rate at which groundwater moves through the aquifer) for the shallow aquifer (alluvium) was calculated using the hydraulic conductivity and the hydraulic gradient presented above, and an estimated effective porosity of both 20 percent (typical for silt and clay) and 30 percent (typical for sand).

The seepage velocity formula is:

$$V = Ki / n$$

Where:

V = horizontal seepage velocity
K = horizontal hydraulic conductivity
i = horizontal hydraulic gradient
n = estimated effective porosity

Using the median hydraulic conductivity of 108 ft/day in the shallow aquifer, an effective porosity of 0.30, and the average horizontal gradient of 0.0038 feet/foot, the seepage velocity for the aquifer is estimated at 1.4 feet per year (ft/yr). Substituting an effective porosity of 0.20 to account for sediment variations, the seepage velocity for the aquifer is estimated at 2.1 ft/yr.

Using the median hydraulic conductivity of 3.7 ft/day of weathered basalt, an effective porosity of 0.20, and the average horizontal gradient of 0.0037 feet/foot, the seepage velocity for the weathered basalt aquifer is estimated at 0.1 ft/yr.

3.1.5 Surface Water Hydrology

3.1.5.1 *Regional Surface Water Hydrology*

Fairchild AFB is located within the Deep Creek Watershed, which flows to the east-northeast and discharges to the Spokane River approximately 12 miles northeast of the base. Relatively little surface water exits within the installation boundary due to a series of collection ponds located on the installation and the high permeability of the surface soils. A majority of the stormwater that does discharge from Fairchild AFB exits through an outfall located at the southeast corner of the installation. This outfall (located at ERP site WP003) is typically the only one with water present on a regular basis. The outfall consists of a reservoir that collects stormwater from the installation and then discharges into a large open field via an unnamed ditch where the water eventually infiltrates into the ground (Weston, 2010).

3.1.5.2 *Site Surface Water Hydrogeology*

There are no surface water features at OW056, and the site is paved. Rainwater is anticipated to infiltrate and/or runoff toward the southeast. The closest surface water body is located more than 0.75 miles downgradient of OW056.

3.2 Ecological Setting

3.2.1 Regional Habitats

Fairchild AFB is located in the Columbia Basin Province where grassland and shrub-steppe vegetation grades into ponderosa pine forest. Vegetation agro-communities in this region show a wide range of diversity depending on soil conditions, hydrology, topographic aspect, and microclimate. Perennial grassland community associations dominated by Idaho fescue or

bluebunch wheatgrass are found in drier sites, while ponderosa pine, aspen, and wetland associations exist in moist sites. Fairchild AFB covers approximately 4,500 acres, of which 3,500 acres are classified as improved or semi-improved. Approximately 700 acres in the northeast corner and southern portion of the installation are primarily unimproved areas, open grass fields, and stands of ponderosa pine, along with areas of mixed native and nonnative grasses, weeds, and shrubs (Weston, 2010).

Over 220 acres of wetlands of various levels of quality and vernal pools are located in the southern portion of the base. The vernal pools in the southern portion of the base are significant because they contain rare vernal pool species and diverse vernal pool obligates (Air Mobility Command, 2014).

3.2.2 Site Habitats

OW056 is less than 1/4 acre in size, is paved, and currently functions as an operational area. There are no surface water features at the site. Terrestrial wildlife potentially present at the site may include various species of birds, mammals, reptiles, and amphibians observed at Fairchild AFB and reported in historical documents. However, given the absence of habitat, terrestrial wildlife potentially present at the site is limited.

3.2.3 Threatened and Endangered Species

There are no resident endangered species or critical habitats in the region of the base. The peregrine falcon, a federally-listed endangered species, may pass through Fairchild AFB during the migration in the fall and spring months. In addition, two federal candidate species (ferruginous hawk and Swainson's hawk) and four state-sensitive species (burrowing owl, grasshopper sparrow, great blue heron, and prairie falcon) may visit the base during migration months (EA, Inc., 1996).

There is one federally-listed threatened species found at Fairchild AFB: Spalding's catchfly (*Silene spaldingii*). Spalding's catchfly habitat is located in both the wetland and vernal pool areas on the south side of the base, southeast of the Survival, Evasion, Resistance, and Escape School. Fourteen of the wetland areas have been identified as having Spalding's catchfly. There are also state-listed sensitive species and state-listed species of concern found in vernal pools in the same area of the base (Air Mobility Command, 2014). Habitat for these threatened and endangered species is not present at the site.

3.3 Human Environment

3.3.1 Basewide Land Use and Demography

Fairchild AFB is roughly split in half by the northeast/southwest trending runway. Building development is largely concentrated in the northern half of the base in proximity to the Main Gate off Highway 2. The developed core of the base is organized with an irregular, though largely rectilinear, street grid. This grid also runs along a north-northeast to west-southwest axis. Primary roads from south to north are Arnold Street, Bong Street, Castle Street, and Fairchild Highway.

In total, the base has approximately 1,250 buildings. Approximately 1,060 buildings are single-family and duplex housing, which have been transferred to private ownership by quitclaim deed. The base retains direct management responsibility for the remaining buildings and structures. They range in size from an 82-square-foot shed to an 11-acre airplane hangar (Building 2050). In use, they vary from specific mission-driven, to base support, to community and retail.

The Fairchild AFB community comprises approximately 14,300 military and civilian personnel and their families living on and off base. Fairchild AFB employs more than 6,020 people: 4,710 military personnel and 1,310 civilians (Air Mobility Command, 2014).

3.3.2 Historical, Current, and Future Site Land Use

According to the Fairchild AFB Installation Development Plan, the long-term use plan for this site is industrial (Air Mobility Command, 2014).

3.3.3 Human Access and Use

Access to OW056 is restricted by a secured fence.

4.0 INITIAL INVESTIGATION / SITE HAZARD ASSESSMENT APPROACH

This section describes the field activities, methods used, and data validation activities during the II/SHA conducted at OW056 in 2015. These activities were performed in conformance with the UFP-QAPP (Bay West, 2015a) and the standard operating procedures (SOPs) in the Consolidated UFP-QAPP (Bay West, 2015b), by reference. The II/SHA approach and data quality objectives were developed to determine if a release occurred, to evaluate the threat to human health and the environment, and to determine whether or not OW056 should be placed on WDOE's HSL and undergo further action. A discussion of each investigation activity is presented in the following subsections.

4.1 Activities Completed Prior to Field Work

A ticket was initiated with Washington One Call before initiating intrusive field work to identify utilities. Utilities at OW056 were located prior to starting work. Boring locations OW056-DP503, OW056-DP504, and OW056-DP505 were moved inside the fence to avoid a utility, and locations OW056-DP501 and OW056-DP502 were eliminated due to safety issues related to drilling in proximity to the operating OWS.

4.2 Direct Push Investigation

A direct push investigation was completed to determine whether or not contamination is present at OW056. A total of three direct push probe borings were completed at OW056. Soil samples were visually examined and screened with a PID to guide sample selection for laboratory analysis. Samples were collected on 9 and 10 November 2015. Direct push activities met the requirements of Washington Administrative Code (WAC) 173-160 and WDOE guidance (WDOE, 2011).

Two direct push borings (OW056-DP503 and OW056-DP504) were advanced for soil sampling and 1 direct push boring (OW056-DP505) was advanced for soil sampling and as a temporary well for groundwater sampling. The relocation and elimination of sample locations was coordinated with the Base Remedial Project Manager prior to sampling. Since the sampled locations were within the excavation, the data is considered sufficient for decision making purposes.

All sampling was completed in accordance with field SOPs listed in the Consolidated UFP-QAPP (Bay West, 2015b). A summary of soil borings is included in **Table 4-1**. Sample locations are shown on **Figure 4-1**. Prior to initiating field sampling activities, the PID was calibrated and a safety meeting was performed. Documentation of these activities, including boring logs, Daily Quality Control Reports, sample collection field sheets, and global positioning system (GPS) survey data are included in **Appendix A**.

4.2.1 Soil Sampling

Continuous soil cores were collected from direct push borings for logging soil lithology. The soil borings were advanced to between 8 and 24 feet bgs. Soil logging information was recorded on boring logs (**Appendix A**). The soil cores were field screened to identify potential depth(s) of impacted soil using a PID approximately every 2 feet and visually observed for contamination. Results of the field screening were recorded on the boring logs by a geologist. The field screening results were used to select soil sample intervals for laboratory analysis. No elevated PID readings or visual signs of contamination were noted; therefore, the depth of the excavation

was selected for sampling. No analytes were detected above MTCA Method A cleanup levels (CULs); therefore, no step-out borings were performed.

Samples were submitted for analysis for VOCs, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), TPH-diesel range organics (DRO)/TPH-oil range organics (ORO), TPH-gasoline range organics (GRO), and metals, as summarized in **Table 4-2**. All samples were shipped to TestAmerica Laboratories, Inc. (TestAmerica) in Arvada, Colorado, for analysis. Copies of the laboratory chain of custodies are included in the lab reports in **Appendix B**.

Soil borings were decommissioned in accordance with SOP 12 of the Consolidated UFP-QAPP (Bay West, 2015b), WAC 173-160-221 and WDOE Guidance (WDOE, 2011). Boreholes were decommissioned using unhydrated bentonite chips to 4 feet bgs, pea gravel to the surface, and 8-inch thick cold patch asphalt to grade.

4.2.2 Groundwater Sampling

One groundwater sample was collected from OW056-DP505. The actual OWS location is unknown, therefore the well was installed within the OWS excavation. A downgradient sample was not possible due to the presence of utilities. The sample was collected by pulling the direct push rods back and using a peristaltic pump at the maximum rate sustained by the well or pump in accordance with SOP 9 of the Consolidated UFP-QAPP (Bay West, 2015b).

The sample was submitted for analysis for VOCs, PAHs, PCBs, TPH-DRO/TPH-ORO, TPH-GRO, and metals, as summarized in **Table 4-2.** The water sample was shipped to TestAmerica in Arvada, Colorado, for analysis. A copy of the laboratory chain of custody is included in the lab reports in **Appendix B**.

The boring was decommissioned in accordance with SOP 12 of the Consolidated UFP-QAPP (Bay West, 2015b), WAC 173-160-221, and WDOE Guidance (WDOE, 2011). The boring was decommissioned using unhydrated bentonite chips to 4 feet bgs, pea gravel to the surface, and 8-inch thick cold patch asphalt to grade.

4.3 Sample Quality Assurance/Quality Control Measures

Quality assurance (QA)/quality control (QC) samples were collected as part of the soil and groundwater investigations, including matrix spike/matrix spike duplicates (MS/MSD), field duplicates, trip blanks, temperature blanks, and field blanks. **Table 4-2** presents the location, media, and analytical parameter for each QA/QC sample collected. All samples were shipped to TestAmerica in Arvada, Colorado, for analysis. Copies of the laboratory chain of custodies are included in the lab reports in **Appendix B**. The results of the QA/QC sampling and data evaluation are presented in **Section 6.0**.

4.3.1 Field Quality Assurance/Quality Control

Field QA/QC samples included field duplicates and trip blanks (VOCs only). Field duplicates were collected at a frequency of 10 percent per method and matrix during work at multiple OWS sites. Equipment rinsate blanks were not collected as only disposable sampling equipment was used. One trip blank was included in each cooler with aqueous VOC samples and temperature blanks were included in all sample coolers.

QA/QC procedures for PID screening during soil sampling included calibrating the instruments, as specified in the UFP-QAPP, and checking the reproducibility of the measurements by taking multiple readings on a single sample or reference standard.

4.3.2 Laboratory Quality Assurance/Quality Control

MS/MSDs were analyzed at a frequency of 5 percent per method and matrix during work at multiple OWS sites. A triple volume of groundwater samples was collected to ensure adequate sample for MS/MSD analysis. In addition, the laboratory analyzed method blanks and laboratory control samples (LCSs) at a frequency of 5 percent per method and matrix. If a MS/MSD was not included in an analytical batch, a LCS duplicate was analyzed in order to measure precision. Surrogates were also spiked into all organic field and QA/QC samples. Equipment blanks were not necessary because sampling equipment used was disposable.

4.4 Decontamination

All drilling equipment utilized during the initial field investigation was decontaminated in accordance with the Consolidated UFP-QAPP (Bay West, 2015b). Sampling equipment consisted of disposable liners and tubing; therefore, decontamination was not needed. Drilling equipment, including the GeoProbe™ direct push technology equipment, was decontaminated prior to its initial use and between borings via steam cleaning.

4.5 Investigation Derived Waste

Investigation derived waste (IDW) generated during the direct push investigation consisted of soil cores/cuttings, equipment decontamination water, sampling purge water, and personal protective equipment (PPE). All IDW was handled in accordance with the Waste Management Plan (Appendix E of the Consolidated UFP-QAPP [Bay West, 2015b]). Documentation is provided in **Appendix D**.

4.5.1 Solid Waste

PPE was the only solid waste generated during investigation activities. PPE used during field activities (e.g., latex or nitrile gloves) and sampling supplies (paper towels, plastic bags, etc.) were expected to have minimal contamination and were placed in plastic trash bags and disposed of at the Craig Road Landfill (LF002) groundwater treatment facility, for subsequent disposal as solid waste. The PPE did not exhibit gross signs of contamination prior to disposal.

4.5.2 Soil Waste

During sampling, the IDW from the direct push soil cores was containerized in 55-gallon drums. The drums were moved from OW056 and stored in the secured IDW storage area near the flightline as approved by Fairchild AFB. The IDW soil was sampled on 4 March 2016 and submitted for waste characterization analysis for toxicity characteristic leaching procedure (TCLP) VOCs (8260B), TCLP SVOCs (8270D), TCLP DRO and ORO (Northwest TPH – Diesel), and TCLP Metals (6010C, 7470A). The sample was shipped to the TestAmerica in Arvada, Colorado. All results were less than the regulatory action levels; therefore, waste was considered non-hazardous waste. Waste characterization results were submitted to Waste Management, Inc. (owner/operator of Graham Road Facility) as part of the disposal approval process. Approvals were obtained and arrangements made for transfer and disposal of the soil as Special Waste at the Graham Road Facility. Copies of the waste profile and waste characterization are included in **Appendix D**.

4.5.3 Liquid Waste

Aqueous IDW generated from drilling decontamination and sampling activities was containerized in 5-gallon buckets, drums, and small plastic tanks. The containers were

transported daily to the Craig Road Landfill (LF002) groundwater treatment facility for subsequent treatment using an existing air stripping system. The treated water is re-infiltrated downgradient of landfill cells on site. Samples of treated effluent are collected quarterly from the treated water and reported in quarterly LF002 Remedial Action Operations reports.

During the course of work completed at multiple OWS sites, an estimated 100 gallons of water were treated at the LF002 groundwater treatment plant.

4.6 Location and Elevation Survey

Locations and ground elevations for soil borings were estimated based on measured distances from landmarks and using a hand held sub-meter GPS unit. Location coordinates and ground surface elevations were referenced to Universal Transverse Mercator North American Datum 1984 Zone 11 (North Zone) Coordinate System. Survey data is included in **Appendix A.**

5.0 INVESTIGATION RESULTS

The results obtained during the II/SHA for each of the tasks described in **Section 4.0** are summarized in the following sections. Analytical results from soil samples are included in **Table 5-1** and results from groundwater samples are included in **Table 5-2**. Analytical results were compared to MTCA Method A CULs listed in Worksheet #15 of the UFP-QAPP (Bay West, 2015a). If no CUL exists, then results were compared to USEPA regional screening levels or maximum contaminant levels.

5.1 Physical Results

Boring logs were completed for three direct push borings at the site. Subsurface materials generally consisted of brown silty sand and tan sand. Boring depths were between 8 and 24 feet bgs. Boring logs are included in **Appendix A**. Water was encountered at 21 feet bgs, but only at the deepest boring: OW056-DP505.

5.2 Chemical Results

5.2.1 Soil Sampling Results

Three soil samples were collected, one from each of the three soil borings. Several PAHs, TPH-DRO, TPH-ORO, TPH-GRO, cadmium, chromium, lead, nickel, and zinc were detected, but all concentrations were below the MTCA Method A CULs. A summary of the soil analytical results for detected analytes is presented in **Table 5-1**. VOCs and PCBs were not detected.

5.2.2 Groundwater Sampling Results

One groundwater sample was collected at boring OW056-DP505. Several PAHs, TPH-DRO, TPH-ORO, cadmium, chromium, lead, nickel, and zinc were detected, but all concentrations were below the MTCA Method A CULs. Groundwater analytical results for detected analytes are presented in **Table 5-2**. TPH-GRO, VOCs, and PCBs were not detected.

6.0 LABORATORY DATA QUALITY REVIEW

6.1 Data Review and Verification

During sampling activities that took place in November 2015, a total of four investigative soil/groundwater samples, one MS/MSD sample, and one field duplicate sample were submitted to TestAmerica in Arvada, Colorado. Preparation and analysis methods for each analyte are summarized below.

- VOC groundwater samples were prepared by USEPA SW-846 Method 5030B and analyzed by USEPA SW-846 Method 8260B. VOC soil samples were prepared by USEPA SW-846 Method 5035A and analyzed by USEPA SW-846 Method 8260B.
- PAH groundwater samples were prepared by USEPA SW-846 Method 3510C and analyzed by USEPA SW-846 Method 8270D-SIM. PAH soil samples were prepared by USEPA SW-846 Method 3546 and analyzed by USEPA SW-846 Method 8270D-SIM.
- PCB groundwater samples were prepared by USEPA SW-846 Method 3510C and analyzed by USEPA SW-846 Method 8082A. PCB soil samples were prepared by USEPA SW-846 Method 3546 and analyzed by USEPA SW-846 Method 8082A.
- TPH-GRO groundwater samples were prepared by USEPA SW-846 Method 5030B and analyzed by Method NWTPH-Gx. TPH-GRO soil samples were prepared by USEPA SW-846 Method 5035A and analyzed by Method NWTPH-Gx.
- TPH-DRO/ORO groundwater samples were prepared by USEPA SW-846 Method 3510C and analyzed by USEPA SW-846 Method NWTPH-Dx. TPH-DRO/ORO soil samples were prepared by USEPA SW-846 Method 3546 and analyzed by Method NWTPH-Dx.
- Metals groundwater samples were prepared by USEPA SW-846 Method 3010A and analyzed by USEPA SW-846 Method 6010C. Metals soil samples were prepared by USEPA SW-846 Method 3050B and analyzed by USEPA SW-846 Method 6010C.

Detected analytical results are provided in **Tables 5-1** and **5-2**. Complete laboratory data reports are provided in **Appendix B**.

Analytical results were reviewed and validated in accordance with the DoD Quality Systems Manual for Environmental Laboratories, Final Version 5.0 (DoD, 2013), applicable to USEPA and State of Washington Methods, Consolidated UFP-QAPP Fairchild AFB (Bay West, 2015b) and OWS Multi-Site UFP-QAPP (Bay West, 2015a). A summary of qualifications from the data verification process from the sampling event is provided in **Table 6-1**. Complete verification summary reports are provided in **Appendix C**.

6.2 Data Verification Process

Analytical data were verified by URS following the criteria listed in **Section 6.1**. The QC parameters that were verified include the following (where applicable):

- sample documentation
- laboratory case narrative and cooler receipt form
- sample preservation and holding times
- blank contamination
- LCS recoveries
- surrogate compound recoveries

- MS/MSD recoveries
- post digestion spike recoveries
- dilution test
- laboratory duplicate results
- field duplicate results
- instrument performance check (tuning)
- initial calibration
- initial calibration verification
- calibration verification
- internal standards
- sensitivity
- additional qualifications using professional judgment
- completeness

6.3 Analytical Results Qualifications

Qualifications applied to the analytical results based on the data verification findings are presented in **Table 6-1** and summarized below:

- The TPH-GRO results for three samples, the chrysene results for one sample, and the TPH-DRO results for two samples were qualified as nondetect due to method blank contamination.
- The metals and VOC results for one sample were qualified as estimated/estimated nondetect (**J/UJ**) due to low MSD recovery.
- The TPH-DRO/ORO results for one sample were qualified **J/UJ** due to low surrogate recoveries.

No additional qualification of the chemical data for sampling completed at OW056 was required.

6.4 Review Conclusions

The analytical data were found to be acceptable for their intended use based on the data review and verification results. Completeness, defined to be the percentage of analytical results judged to be valid, including **J/UJ** data, was 100 percent for the sampling event at OW056.

6.5 Environmental Resources Program Information Management System

URS prepared the results for submittal to the Environmental Resources Program Information Management System (ERPIMS). Laboratory and analytical data generated during the sample event will be loaded into ERPTools X 6.0.0.0 and submitted as an ERPIMS data file to the USAF.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The purpose of this II/SHA was to evaluate the nature and extent of potential petroleum-related contamination at OW056 and determine whether or not contaminants are present above MTCA Method A CULs, the unlimited use level. According to WAC 173-340-320(6), WDOE determines whether a site warrants NFA or is placed on the State of Washington's HSL. The information obtained during the II/SHA indicates all detected compounds were below MTCA Method A CULs in soil and groundwater and there is no threat to human health or the environment, thus meeting the requirements stated in WAC 173-340-310(5)(d)(i); therefore, OW056 should not be placed on the HSL and should be closed with unlimited use/unrestricted exposure. A letter concurring that this site warrants no further action per WAC 173-340-310 (5)(d)(i), and has achieved SC with unlimited use/unrestricted exposure, is requested from WDOE.

8.0 CERTIFICATION STATEMENT

The conditions in soil and groundwater at OW056 are currently protective of human health and the environment and are expected to remain protective of human health and the environment in perpetuity. OW056 has achieved SC with unlimited use/unrestricted exposure.

Approved By:

Suzanne W. Bilbrey, P.E., GS-15, DAF **Date**
Director
Air Force Civil Engineer Center/Environmental Directorate

9.0 REFERENCES

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TABLES

Table 2-1
Analytical Detections in Soil in Previous Investigations
Fairchild Air Force Base, Washington

Site Name / Sample Date	2016 Method A CUL	OW056	
		1995 Old OWS Removal	1995 New OWS Installation
VOCs (µg/kg)			
Acetone	NA	2,200	<
Benzene	30	<	<
Ethylbenzene	6,000	<	<
Ethylene dibromide	5	<	<
Methyl ethyl ketone (MEK)	NA	<	<
4-Methyl 2-pentanone	NA	<	<
Methylene chloride	20	13	200
Naphthalene	5,000	4,400	2,800
Tetrachloroethene	50	<	<
Toluene	7,000	18	<
1,1,1 Trichloroethane	2,000	<	<
Trichloroethene	30	<	<
Xylene	9,000	55	1,130
SVOCs (µg/kg)			
Anthracene	NA	<	<
Benzo(a)anthracene	100[1]	<	<
Benzo(a)pyrene	100[1]	<	<
Benzo(b)fluoranthene	100[1]	<	<
Benzo(k)fluoranthene	100[1]	<	<
Bis(2)ethylhexyl phalate	NA	1,000	1,300
Chrysene	NA	<	<
Dibenzofuran	NA	320	280
Fluoranthene	NA	66	<
Fluorene	NA	410	360
Indeno(1,2,3-cd)pyrene	100[1]	<	<
2-Methylnaphthlene	NA	9,700	6,900
Phenanthrene	NA	120	110
Pyrene	NA	84	<
Metals (mg/kg)			
Aluminum	NA	9,800	11,000
Arsenic	20	11	8.7
Barium	NA	82	100
Beryllium	NA	0.45	0.56
Cadmium	2	1.9	2.1
Calcium	NA	5,000	6,000
Chromium (total)	19	10[2]	15[2]
Cobalt	NA	8.2	9.2
Copper	NA	21	66
Iron	NA	21,000	27,000
Lead	250	39	50
Magnesium	NA	6,100	5,800
Manganese	NA	280	390
Nickel	NA	12	13
Potassium	NA	1,700	1,700
Sodium	NA	120	190
Vanadium	NA	26	36
Zinc	NA	60	98
Petroleum Hydrocarbons (mg/kg)			
GRO (detected without benzene)	100	12,000	100
DRO	2,000	5,600	1,800

Notes:

Data source is Final Technical Evaluation Report (URS, 2011).

Shaded values exceed current (2016) WDOE Method A CULs

[1] The CUL for carcinogenic PAHs is a cumulative value based on benzo(a)pyrene and the carcinogenic factor for each compound, and calculated using WDOE Equation 740-2.

[2] Total Chromium value

< = nondetect at the limit of detection

µg/kg = micrograms per kilogram

CUL = cleanup level

DRO = diesel range organics

GRO = gasoline range organics

mg/kg = milligrams per kilogram

NA = no value promulgated

PAH = polycyclic aromatic hydrocarbon

SVOC = semivolatile organic compound

VOC = volatile organic compound

WDOE = Washington Department of Ecology

Table 3-1
Measured Groundwater Elevations - December 2015
Fairchild Air Force Base, Washington

Well ID	Top of Casing Elevation (NAVD 88) (feet amsl)	Measured Depth to Groundwater (feet btoc)	Groundwater Elevation (feet amsl)
MP-09	2442.98	11.52	2431.46
MP-31	2441.23	12.42	2428.81
MP-38	2441.93	NM	NM
MW-065	2445.60	18.39	2427.21
MW-091	2446.61	8.75	2437.86
MW-109	2444.64	NM	NM
MW-198	2445.64	14.01	2431.63
MW-199	2444.44	13.41	2431.03
MW-200	2443.21	12.35	2430.86
MW-263	2434.03	11.82	2422.21
MW-264	2435.20	13.59	2421.61
MW-265	2435.40	12.24	2423.16
MW-289	2446.52	14.80	2431.72
MW-290	2445.44	14.32	2431.12
MW-292	2444.49	10.70	2433.79
MW-293	2445.42	11.04	2434.38
MW-295	2439.96	15.30	2424.66
MW-297	2436.64	16.82	2419.82
MW-332	2443.26	11.00	2432.26
MW-333	2442.27	9.96	2432.31
MW-334	2443.01	NM	NM
MW-335	2443.04	11.11	2431.93
MW-336	2445.80	NM	NM
MW-337	2445.32	10.81	2434.51
MW-338	2443.93	9.31	2434.62
MW-370	2440.00	7.97	2432.03
MW-380	2443.54	15.19	2428.35
MW-382	2446.18	17.51	2428.67
MW-384	2442.98	11.15	2431.83
MW-387	2433.41	13.25	2420.16
MW-390	2435.58	19.56	2416.02
MW-392	2431.80	10.70	2421.10
MW-394	2447.07	18.71	2428.36
MW-399	2438.79	9.60	2429.19
MW-401	2447.33	18.87	2428.46
MW-404	2433.47	13.35	2420.12
MW-406	2436.45	16.19	2420.26
MW-408	2441.26	9.61	2431.65
MW-411	2444.34	10.35	2433.99
MW-420	2437.98	11.31	2426.67
MW-429	2435.65	8.82	2426.83
MW-432	2438.06	11.40	2426.66
MW-438	2434.83	8.15	2426.68
MW-439	2438.10	11.50	2426.60
MW-440	2436.52	9.82	2426.70

Notes:
amsl = above mean sea level
btoc = below top of casing
ID = identification
NAVD 88 = North American Vertical Datum, 1988
NM = not measured

Table 4-1
Soil Boring Summary
Fairchild Air Force Base, Washington

Boring Location[1]	Date Installed	Total Depth Drilled (feet bgs)	Depth Water Encountered (feet bgs)	Water-Bearing Zone Lithology	Northing	Easting	Ground Surface Elevation (feet amsl)
OW056-DP503	10-Nov-15	8	NE	NE	5275268.8	451720.4	2432.0
OW056-DP504	9-Nov-15	16	NE	NE	5275264.1	451723.8	2432.0
OW056-DP505	9-Nov-15	24	21	Alluvium	5275271.6	451716.5	2432.0

Notes:

[1] Locations of borings are shown on **Figure 4-1**.

amsl = above mean sea level

bgs = below ground surface

NE = not encountered

Table 4-2
Soil and Groundwater Sample Summary
Fairchild Air Force Base, Washington

Boring Location[1]	Sample Identification	Media	Date Collected	Sample Depth (feet bgs)	Analysis[2]						Notes
					GRO	DRO/ORO	VOCs	PAHs	Metals	PCBs	
OW056-DP503	OW056-DPS503-6	Soil	10-Nov-15	6	X	X	X	X	X	X	MS/MSD
OW056-DP504	OW056-DPS504-6	Soil	9-Nov-15	6	X	X	X	X	X	X	
OW056-DP505	OW056-DPS505-6	Soil	9-Nov-15	6	X	X	X	X	X	X	Dup OW056-DPS5505-06
	OW056-DPW505-24	Water	10-Nov-15	24	X	X	X	X	X	X	

Notes:

[1] Locations of borings are shown on Figure 4-1.

[2] Preparation and Analysis Methods for soil and groundwater samples are as follows:

GRO	Water: USEPA 5030B/NWTPH-Gx	Soil: USEPA 5035A/NWTPH-Gx
DRO/ORO	Water: USEPA 3510C/NWTPH-Dx	Soil: USEPA 3546/NWTPH-Dx
VOCs	Water: USEPA 5030B/8260B	Soil: USEPA 5035/8260B
PAHs	Water: USEPA 3510C/8270D-SIM	Soil: USEPA 3546/8270D-SIM
Metals	Water: USEPA 3010A/6010C	Soil: USEPA 3050B/6010C
PCBs	Water: USEPA 3510C/8082A	Soil: USEPA 3546/8082A

bgs = below ground surface
DRO = diesel range organics
Dup = duplicate
GRO = gasoline range organics
MS/MSD = matrix spike / matrix spike duplicate
NWTPH-Dx = Northwest Total Petroleum Hydrocarbon-Diesel Range Organics
NWTPH-Gx = Northwest Total Petroleum Hydrocarbon-Gasoline Range Organics
ORO = oil range organics
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
SIM = select ion monitoring
USEPA = United States Environmental Protection Agency
VOCs = volatile organic compounds

Table 5-1
Summary of Detected Analytes in Soil at OW056
Fairchild Air Force Base, Washington

FIELD IDENTIFICATION				OW056-DPS503-6				OW056-DPS504-6				OW056-DPS505-6			
DATE COLLECTED				November 10, 2015				November 9, 2015				November 9, 2015			
	Maximum	Frequency	PAL	Result	DL/LOD	LOQ	Qual	Result	DL/LOD	LOQ	Qual	Result	DL/LOD	LOQ	Qual
POLYNUCLEAR AROMATIC HYDROCARBONS (µg/kg)															
1-Methylnaphthalene	6.9	2 / 3	5,000*	0.53	0.26	4.9	J	6.9	2.6	50	J	<	0.52	5.2	U
2-Methylnaphthalene	9.8	2 / 3	5,000*	0.79	0.31	4.9	J	9.8	3.1	50	J	<	0.69	5.2	U
Benzo(a)anthracene	1.2	1 / 3	100**	1.2	0.89	4.9	J	<	25	50	U	<	2.6	5.2	U
Benzo(a)pyrene	13	2 / 3	100**	1.8	0.73	4.9	J	13	7.4	50	J	<	2.6	5.2	U
Benzo(b)fluoranthene	20	2 / 3	100**	2.7	1.2	4.9	J	20	12	50	J	<	2.6	5.2	U
Benzo(k)fluoranthene	1.2	1 / 3	100**	1.2	0.99	4.9	J	<	25	50	U	<	2.6	5.2	U
Chrysene	28	2 / 3	NA	2.4	0.99	4.9	J	28	10	50	J	<	2.6	5.2	U
Indeno(1,2,3-cd)pyrene	14	2 / 3	100**	1.9	1.1	4.9	J	14	11	50	J	<	2.6	5.2	U
cPAH TEQ	17	2 / 3	100	3				17				0			
PETROLEUM HYDROCARBONS (mg/kg)															
Diesel Range Organics	18	1 / 3	2,000	18	3.6	25	J	<	3.6	25	U	<	3.8	26	UJ
Oil Range Organics	99	3 / 3	2,000	13	9.1	50	J	29	9.1	50	J	99	9.5	52	J
Gasoline Range Organics	7.3	1 / 3	30/100[#]	7.3	0.52	4.2		<	0.48	3.8	U	<	0.45	3.6	U
METALS (mg/kg)															
Cadmium	0.2	3 / 3	2	0.2	0.033	0.4	J	0.11	0.041	0.5	J	0.089	0.039	0.47	J
Chromium	10	3 / 3	2,000	8.3	0.047	2.8		10	0.058	3.5		9.2	0.055	3.3	
Lead	8.5	3 / 3	250	8.5	0.22	0.73	J	8.2	0.27	0.91		6.8	0.26	0.85	
Nickel	9.8	3 / 3	1,500	9.8	0.099	3.2	J	9.6	0.12	4		9.5	0.12	3.8	
Zinc	48	3 / 3	23,000	41	0.32	6.4		48	0.4	8		41	0.38	7.6	

Notes:
Analytes below the LOQ were not included.
DL value shown if a detection is less than the LOD.
*Total of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene
** The PAL for carcinogenic PAHs is a cumulative value based on benzo(a)pyrene and the carcinogenic factor for each compound, and calculated using WDOE Equation 740-2.

[#]30 mg/kg if benzene present, 100 mg/kg if no detectable benzene
< = Nondetect at the DL/LOD
µg/kg = micrograms per kilogram
cPAH TEQ = carcinogenic Polycyclic Aromatic Hydrocarbons Toxic Equivalence Quotient
DL/LOD = Detection Limit/Limit of Detection
J = Estimated
LOQ = Limit of Quantitation
mg/kg = milligrams per kilogram
NA = no value promulgated
PAL = Project Action Level (Washington Department of Ecology Method A Cleanup Level or if none, then USEPA residential soil Regional Screening Level)
Qual = Qualifier
U = Nondetect
UJ = Estimated Nondetect

Table 5-2
Summary of Detected Analytes in Groundwater at OW056
Fairchild Air Force Base, Washington

FIELD IDENTIFICATION				OW056-DPW505-24			
DATE COLLECTED				November 10, 2015			
	Maximum	Frequency	PAL	Result	DL/LOD	LOQ	Qual
POLYNUCLEAR AROMATIC HYDROCARBONS (µg/L)							
1-Methylnaphthalene	0.0082	1 / 1	160*	0.008	0.0062	0.11	J
2-Methylnaphthalene	0.01	1 / 1	160*	0.01	0.0063	0.11	J
Benzo(b)fluoranthene	0.01	1 / 1	0.1**	0.01	0.0033	0.11	J
Naphthalene	0.013	1 / 1	160*	0.013	0.0084	0.11	J
cPAH TEQ	0.001	1 / 1	0.1**	0.001			
PETROLEUM HYDROCARBONS (mg/L)							
Diesel Range Organics	0.025	1 / 1	0.5	0.025	0.014	0.11	J
Oil Range Organics	0.034	1 / 1	0.5	0.034	0.0097	0.25	J
METALS (µg/L)							
Cadmium	0.49	1 / 1	5	0.49	0.45	5	J
Chromium	17	1 / 1	50	17	0.66	15	
Lead	10	1 / 1	15	10	2.6	15	J
Nickel	10	1 / 1	390	10	1.3	40	J
Zinc	38	1 / 1	6,000	38	4.5	150	J

Notes:
Analytes below the LOQ were not included.
DL value shown if a detection is less than the LOD.
*Total of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene
**Toxicity equivalency based on factors from Table 708-2 in Washington Administrative Code 173-340-900
µg/L = micrograms per liter
cPAH TEQ = carcinogenic Polycyclic Aromatic Hydrocarbons Toxic Equivalence Quotient
DL/LOD = Detection Limit/Limit of Detection
J = Estimated
LOQ = Limit of Quantitation
mg/L = milligrams per liter
PAL = Project Action Level (Washington Department of Ecology Method A Cleanup Level or if none, then USEPA Maximum Contaminant Level)
Qual = Qualifier

Table 6-1
Summary of Data Qualifications
Fairchild Air Force Base, Washington

Sample Delivery Group	Field Identification	Matrix	Analysis	Analyte	New LOQ	URS Qual	Comments
280-76678	OW056-DPS503-6	Soil	VOCs	Benzene	--	**UJ**	Low matrix spike recovery
280-76678	OW056-DPS503-6	Soil	VOCs	Ethylbenzene	--	**UJ**	Low matrix spike recovery
280-76678	OW056-DPS503-6	Soil	Metals	Lead	--	**J**	Low matrix spike recovery
280-76678	OW056-DPS503-6	Soil	Metals	Nickel	--	**J**	Low matrix spike recovery
280-76678	OW056-DPS503-6	Soil	VOCs	Toluene	--	**UJ**	Low matrix spike recovery
280-76678	OW056-DPS503-6	Soil	VOCs	Xylenes, Total	--	**UJ**	Low matrix spike recovery
280-76600	OW056-DPS505-6	Soil	NWTPH-Dx	DRO	--	**UJ**	Low surrogate recovery
280-76600	OW056-DPS505-6	Soil	NWTPH-Dx	ORO	--	**J**	Low surrogate recovery
280-76600	OW056-DPS504-6	Soil	NWTPH-Dx	DRO	--	**U**	Method blank contamination
280-76600	OW056-DPS504-6	Soil	NWTPH-Gx	GRO	--	**U**	Method blank contamination
280-76600	OW056-DPS505-6	Soil	NWTPH-Dx	DRO	--	**U**	Method blank contamination
280-76600	OW056-DPS505-6	Soil	NWTPH-Gx	GRO	--	**U**	Method blank contamination
280-76600	OW056-DPS5505-6	Soil	NWTPH-Gx	GRO	--	**U**	Method blank contamination
280-76678	OW056-DPW505-24	Water	PAHs	Chrysene	--	**U**	Method blank contamination

Notes:

-- = New LOQ not necessary

DPS = Direct push soil

DPW = Direct push water

DRO = diesel range organics

GRO = gasoline range organics

J = Estimated

LOQ = Limit of Quantitation

NWTPH-Dx = Northwest Total Petroleum Hydrocarbon-Diesel Range Organics including heavy oil

NWTPH-Gx = Northwest Total Petroleum Hydrocarbon-Gasoline Range Organics

ORO = oil range organics

PAHs = Polynuclear aromatic hydrocarbons

Qual = Qualifier

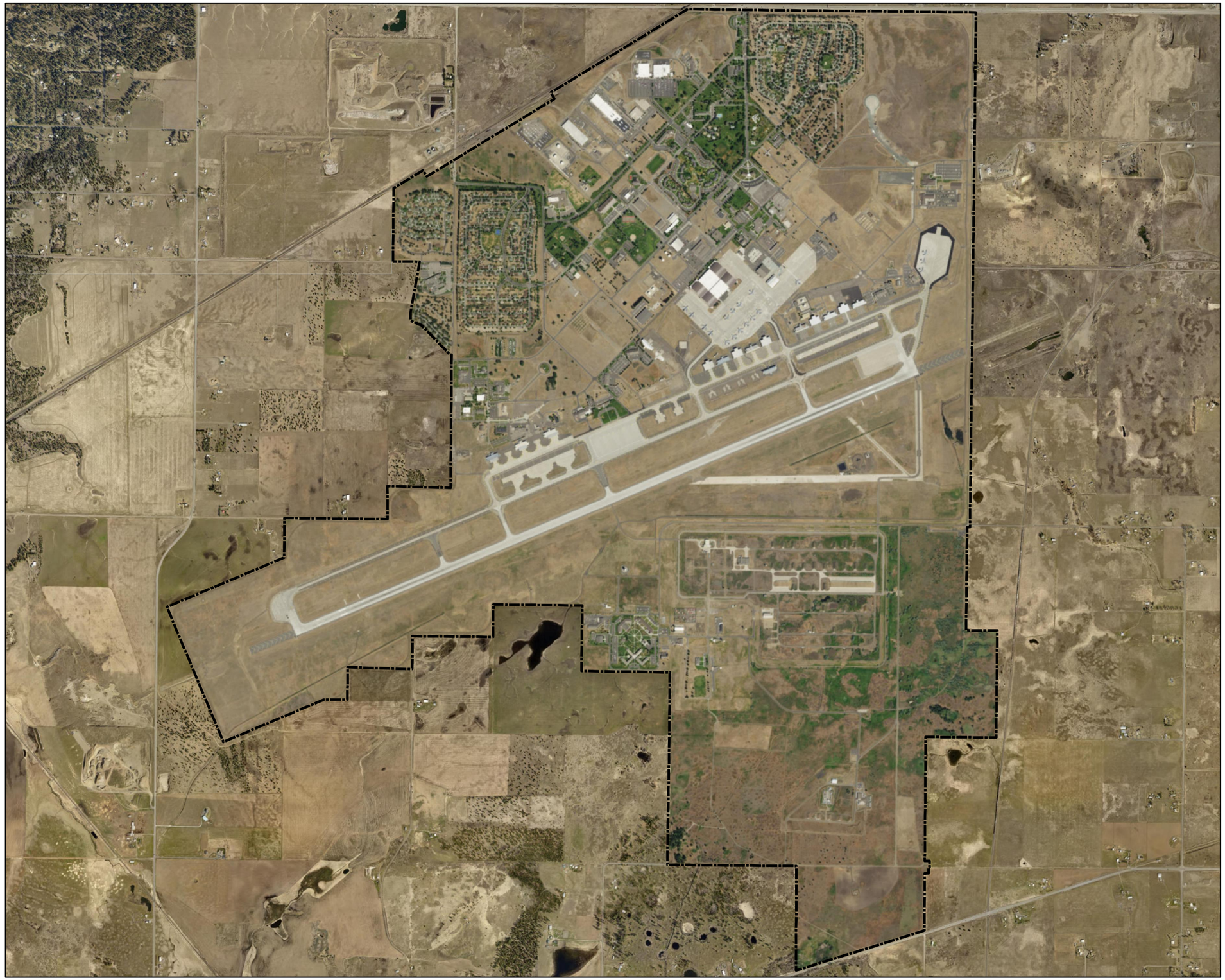
U = Nondetect

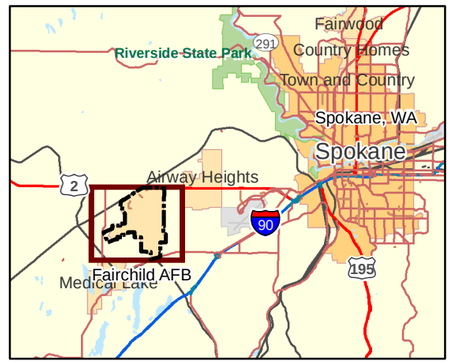
UJ = Estimated nondetect

URS =URS Group, Inc.

VOCs = Volatile organic compounds

FIGURES





Legend

Installation Boundary

N

0 1,000 2,000 4,000

Feet

Installation Location Map
Fairchild AFB, WA

Drawn By: LLS	Date: 3/23/2017	Project No: 16170886	Figure 1-1
Checked By: DS	Revision: 0		

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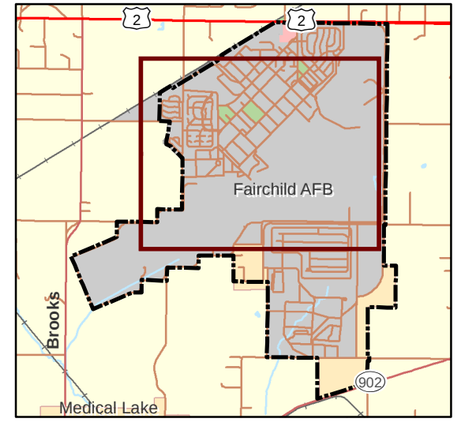

Legend

- OW056
- Installation Boundary

N

0 500 1,000 2,000

Feet

OW056 Site Map
Fairchild AFB, WA

Drawn By: LLS	Date: 3/27/2017	Project No: 16170886	Figure 1-2
Checked By: DS	Revision: 0		

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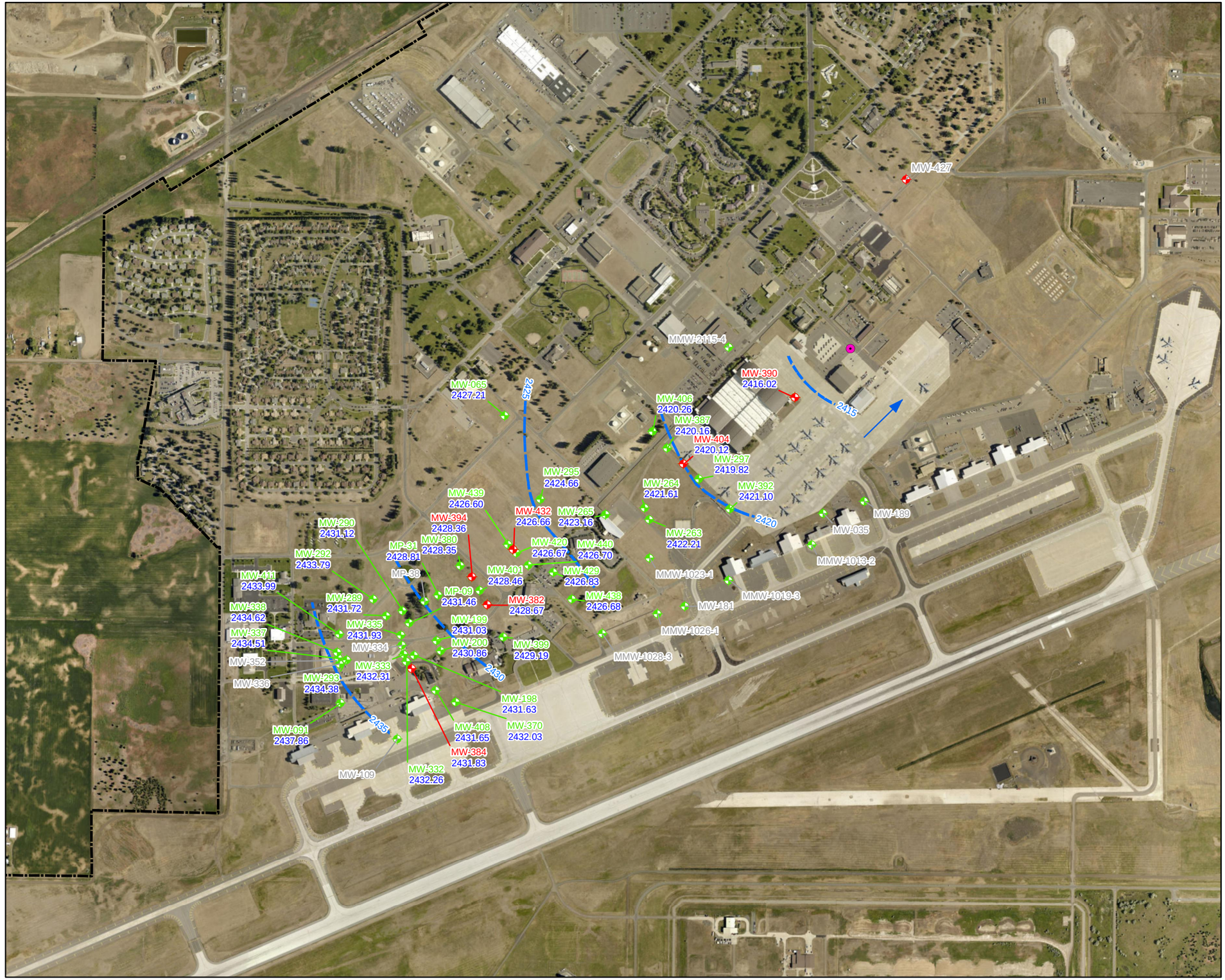

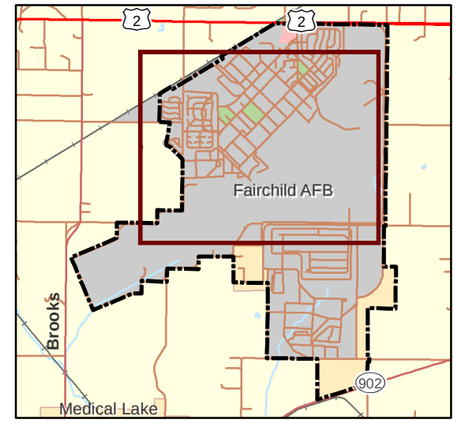

Legend

- OW056
- Shallow Alluvial Well with Slug Test Data
- Shallow Alluvial Well
- Groundwater Elevation Contour (feet above msl)
- Groundwater Flow Direction
- Installation Boundary

Notes:

1. Water level was not measured at shallow alluvial monitoring wells with a gray label.
2. msl = mean sea level

N

0 500 1,000 2,000 Feet

December 2015 Shallow Alluvium Groundwater Elevations and Contours

Fairchild AFB, WA

Drawn By:	Date:	Project No:	Figure 3-1
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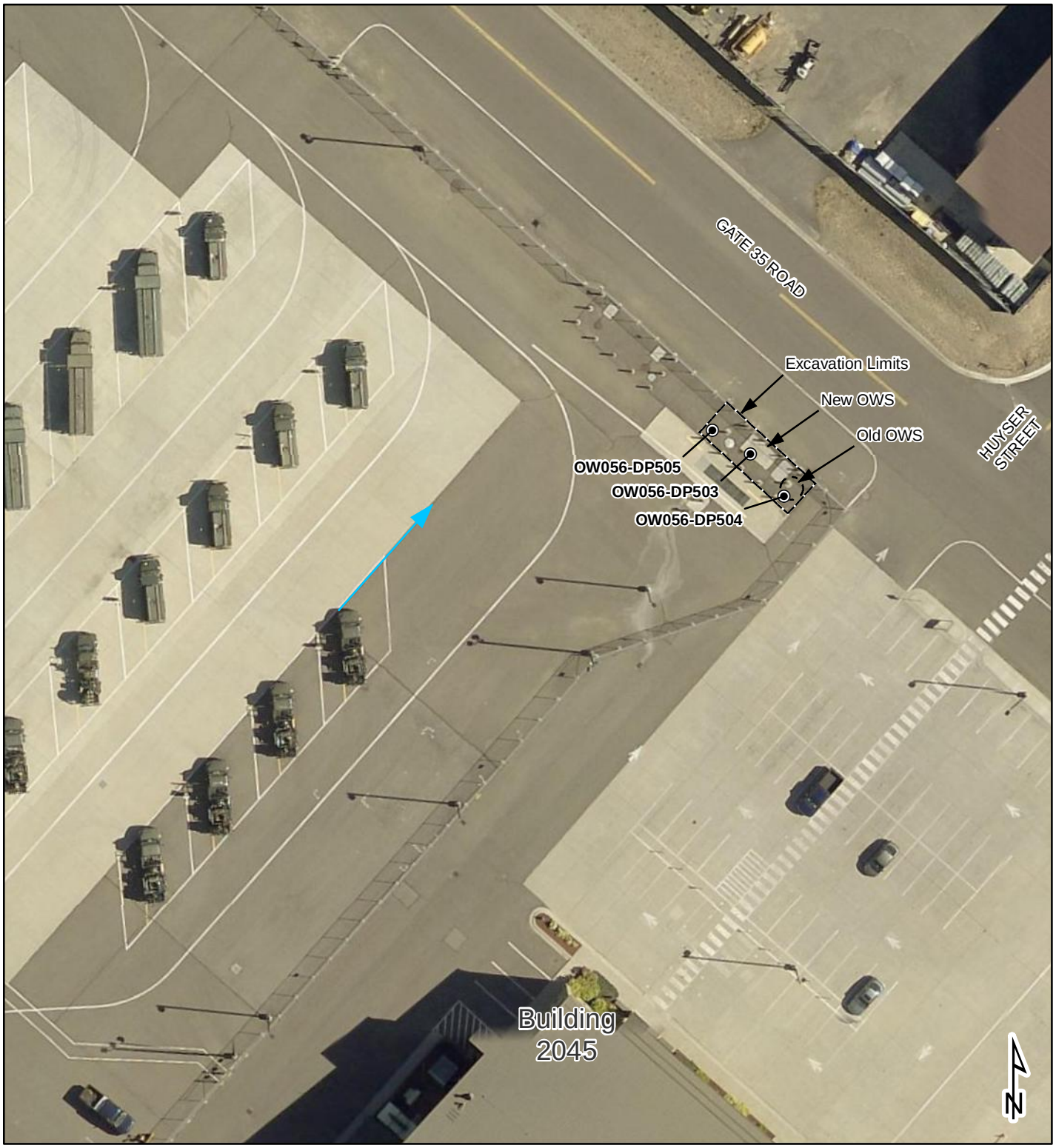
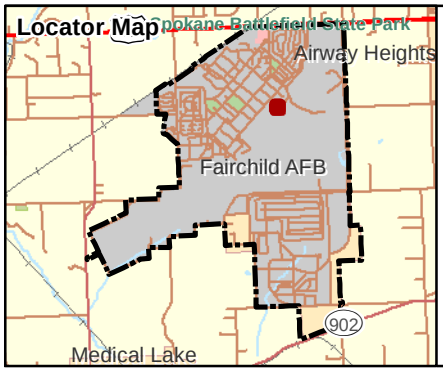
Checked By: DS	Revision: 0		





Legend

- Installation
- Approximate Location of Removed Oil Water Separator
- Approximate Direct Push Location
- Site Location
- Groundwater Flow Direction

Note: Groundwater Was Not Encountered Prior to Refusal

0 25 50 100 Feet

OW056 II/SHA Sample Locations
Fairchild AFB, WA

Drawn By:	Date:	Project No.	Figure 4-1
LLS	11/3/2017	16170886	
Checked By:	Revision:		
DS	0		

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APPENDIX A

FIELD DOCUMENTATION

Appendix A-1

Daily Quality Control Reports

DAILY QUALITY CONTROL REPORT

Date	9-Nov-15

Day	S	M	T	W	TH	F	S
		X					

On Site Hours	10
Travel Time	0.5
Office Time	0.5

Site Name and Location	FAFB, Spokane, WA
AFCEC Project Manager	Marc Connally
Project	OWS Investigation
Project No.	60419236.16170886.OWAA3

Weather	Bright Sun	Clear	Overcast	Rain	Snow
			X		

Temp	To 32	32-50	50-70	70-85	85 up
		X	X		

Wind	Still	Moderate	High	Report No.
		X		

Humidity	Dry		Humid	1
			X	

Subcontractors on Site: Environmental West

Equipment on Site:

Drilling equipment includes: GeoProbe 5400 Truck Mounted Rig utilizing a 2" diameter/4' long macro core sampler and disposable liners, Support truck and trailer. Decontamination equipment includes: electric washer, brushes, containment, and phosphate free wash. Air monitoring equipment includes a RAE - MiniRAE 3000 PID 11.7eV Lamp. Soil sampling equipment includes: pocket penetrometer, zip lock bags, terra cores, and sample jars. Direct push water sampling equipment includes a stainless steel 3' and 4' long retractable screens, disposable tubing, peristaltic pump, and sample jars.

Visitors on Site: Marc Connally (AFCEC)

URS Personnel on Site: Jenn Allen, Aubrey Naylor

Field Work Performed:

Utilizing the truck mounted GeoProbe 5400, boreholes were advanced in 4 foot intervals with recovery collected in disposable 4 foot liners. Location OW063-501 was drilled to 20 ft. bgs and soil sample OW063-DPS501-12 was collected. Location OW063-503 was drilled to 15.3 ft. bgs and soil sample OW063-DPS503-13 was collected. Location OW063-502 was drilled to 16 ft. bgs and soil sample OW063-DPS502-13 was collected. Location OW063-504 was drilled to 24 ft. bgs and soil sample OW063-DPS504-13 was collected. Location OW063-505 was drilled to 16 ft. bgs and soil sample OW063-DPS505-13 was collected. Location OW056-504 was drilled to 16 ft. bgs and soil sample OW056-DPS504-6 was collected. Location OW056-505 was drilled to 24 ft. bgs and soil sample OW056-DPS505-6 was collected.

All soil and groundwater samples collected for VOCs, PAH, PCB, Metal, TPH-GRO and TPH-DRO analysis,

Quality Control Activities (including field calibration): Bump checked the PID with 100 ppm Isobutylene Duplicates were collected for soil samples OW063-DPS502-13 labeled OW063-DPS5502-13 and OW056-DPS505-6 labeled OW056-DPS5505-6.

Health and Safety and Activities:

A tail-gate safety meeting took place prior to work activities. PPE is Level D.

Observations/Problems Encountered/Corrective Action Taken:

The incorrect tubing was brought to site and there were no groundwater samples collected today. Proper tubing will be onsite 11-10-15 and sites OW063 and OW056 will be sampled.

By *Jennifer Allen* Title *Geological Engineer*

DAILY QUALITY CONTROL REPORT

Date	10-Nov-15

Day	S	M	T	W	TH	F	S
			X				

On Site Hours	10
Travel Time	0.5
Office Time	0.5

Site Name and Location	FAFB, Spokane, WA
AFCEC Project Manager	Marc Connally
Project	OWS Investigation
Project No.	60419236.16170886.OWAA3

Weather	Bright Sun	Clear	Overcast	Rain	Snow
			X		

Temp	To 32	32-50	50-70	70-85	85 up
		X			

Wind	Still	Moderate	High	Report No.
		X		

Humidity	Dry		Humid	2
			X	

Subcontractors on Site: Environmental West

Equipment on Site:

Drilling equipment includes: GeoProbe 5400 Truck Mounted Rig utilizing a 2" diameter/4' long macro core sampler and disposable liners, Support truck and trailer. Decontamination equipment includes: electric washer, brushes, containment, and phosphate free wash. Air monitoring equipment includes a RAE - MiniRAE 3000 PID 11.7eV Lamp. Soil sampling equipment includes: pocket penetrometer, zip lock bags, terra cores, and sample jars. Direct push water sampling equipment includes a stainless steel 3' and 4' long retractable screens, disposable tubing, peristaltic pump, and sample jars.

Visitors on Site: Marc Connally (AFCEC)

URS Personnel on Site: Jenn Allen, Aubrey Naylor

Field Work Performed:

Utilizing the truck mounted GeoProbe 5400, boreholes were advanced in 4 foot intervals with recovery collected in disposable 4 foot liners. At location OW056-505 (drilled to 24 ft. bgs on 11-9-15) groundwater sample OW056-DPW505-24 was collected. Location OW056-503 was drilled to 8 ft. bgs and soil sample OW056-DPS503-6 was collected. Location OW063-505 was redrilled to 24 ft. bgs and groundwater sample OW063-DPW505-24 was collected.

All soil and groundwater samples collected for VOCs, PAH, PCB, Metal, TPH-GRO and TPH-DRO analysis,

Quality Control Activities (including field calibration): Bump checked the PID with 100 ppm Isobutylene
Extra volume was collected at OW056-DPS503-6 for MS/MSD.

Health and Safety and Activities:

A tail-gate safety meeting took place prior to work activities. PPE is Level D.

Observations/Problems Encountered/Corrective Action Taken:

While working at OW063 around noon, a new utility line appeared at the OW056 location on the road side of the fence close to marked borehole locations 501, 502, and 503. The issue was reported to Marc Connally. We will not be able to conduct any drilling operations where the borehole locations currently sit. Borehole locations will be moved inside the fence, however, due to the close proximity to the operating OWS, only 3 borehole locations can be safely drilled at OW056 (503, 504, 505).

A site inspection of all abandoned borehole locations on asphalt was conducted. Upon inspection it was evident that the bentonite chips had hydrated pushing out the asphalt plug. The issue was discussed between AFCEC and AECOM. The resolution is to drill out each borehole to 4 ft. bgs, fill with pea gravel to 0.8 ft. bgs, then add asphalt

By *Jennifer Allen* Title *Geological Engineer*

Appendix A-2

Soil Boring Logs

HTRW DRILLING LOG

	DISTRICT: AFCEC	HOLE NUMBER: OWØ56-503
1. COMPANY NAME: URS	2. DRILLING SUBCONTRACTOR: Environmental West	SHEET 1 OF 2 SHEETS
3. PROJECT: OWS Multi-Site Remedial Investigation	4. LOCATION: Fairchild AFB, Spokane, WA	
5. NAME OF DRILLER: Ron Sink	6. MANUFACTURER'S DESIGNATION OF DRILL: GeoProbe 5400 Truck Mounted	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" diameter/4' long Macro Core Sampler Using disposable	8. HOLE LOCATION: OWØ56	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 11-10-15@0910	11. DATE COMPLETED: 11-10-15 @ 0920
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: Groundwater Not Encountered	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING: N/A	
14. TOTAL DEPTH OF HOLE: 8 feet below ground Surface	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
Ø			N/A

20. SAMPLES FOR CHEMICAL	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1	X	X	TPH-GRO/DRO	PAHs	PCBs	N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Abandoned	Bentonite			

LOCATION SKETCH/COMMENTS — SCALE: Not to Scale

PROJECT	HOLE
OWS Multi-Site Remedial Investigation	OWØ56-503

HOLE OWØ56-503

PROJECT: OWS Multi-Site Remedial Investigation

Inspector: Jennifer Allen

SHEET ___ OF SHEETS

ELEV. a.	DEPTH	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0	Silty SAND with GRAVEL (SM) - medium dense, moist, brown, fine to coarse grain, fine gravel	Field Screening (FS) Parts Per Million (ppm) Head Space (HS) Pocket Pen (PP)			START TIME @ 0910
	1		FS=0ppm			T=0912 R=3.0'/4.0'
	2		FS=0ppm			
	3				NO Recovery	
	4					4'-8' Run drilled with a closed system
	5		FS=0ppm HS=0ppm	OWØ56-DP503-6 @ 0920 Extra volume for MS/MSD		T=0920 R=3.0'/4.0'
	6	SAND (SP) - loose, dry, dark grey/tan, fine to medium with trace coarse				
	7			x x x	NO Recovery	
	8	Bottom of Boring @ 8 ft bgs				
	9					
	10					

Project: OWS Multi-Site Remedial Investigation

HOLE NO. OWØ56-503

HTRW DRILLING LOG

DISTRICT: AFCEC	HOLE NUMBER: OWØ56-504	
1. COMPANY NAME: URS	2. DRILLING SUBCONTRACTOR: Environmental West	SHEET 1 OF SHEETS 3
3. PROJECT: OWS Multi-Site Remedial Investigation	4. LOCATION: Fairchild AFB, Spokane, WA	
5. NAME OF DRILLER: Ron Sink	6. MANUFACTURER'S DESIGNATION OF DRILL: Cipo Probe 5400 Truck Mounted	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" diameter / 4' long macro Core Sampler using disposable liners	8. HOLE LOCATION: OWØ56	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 11-9-15 @ 1413	11. DATE COMPLETED: 11-9-15 @ 1443
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: No Groundwater Encountered	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING: N/A	
14. TOTAL DEPTH OF HOLE: 16 feet below ground surface	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
Ø			N/A

20. SAMPLES FOR CHEMICAL	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1	X	X	TPH-GRO/DRO	PCBs	PAHs	N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Abandoned	Bentonite			

LOCATION SKETCH/COMMENTS — SCALE: Not to Scale

PROJECT	HOLE
OWS Multi-Site Remedial Investigation	OWØ56-504

HOLE OWØ56-504

PROJECT OWS Multi-Site Remedial Investigation

Inspector Jennifer Allen

SHEET 2 OF 3 SHEETS

ELEV. a.	DEPTH	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0	Silty SAND with GRAVEL (SM) - Medium dense, moist, brown, fine to coarse sand fine gravel	Field Screening (FS) Parts Per Million (ppm) Head Space (HS) Pocket Pen (PP)			START TIME = 1413
	1		FS=0ppm			
	2		FS=0ppm			Time (T) = 1416 Recovery (R) = 3.0'/4.0'
	3				NO Recovery	
	4	Decreased Silt				
	5		FS=0ppm			T= 1420 R= 3.0'/4.0'
	6	SAND (SP) - loose, Slight moisture, tan, ~~very~~ fine sand	HS=0ppm FS=0ppm	OWØ56-DP5504-6 @ 1420		
	7				NO Recovery	8'-12'; 12'-16' Runs made using a closed system
	8	Becomes dark grey and tan, fine to medium grain				T= 1430 R= 3.0'/4.0'
	9		FS=0ppm			
	10					

Project OWS Multi-Site Remedial Investigation

HOLE NO. OWØ56-504

HOLE OWØ56-504

PROJECT OWS Multi-Site Remedial Investigation

Inspector Jennifer Allen

SHEET 3 OF 3 SHEETS

ELEV. a.	DEPTH	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	10	SAME AS ABOVE Becomes gravelly with coarse basalt gravel	Field Screening (FS) Parts Per Million (ppm) Head Space (HS) Pocket Pen (PP) FS=0ppm			
	11				NO Recovery	
	12					
	13		FS=0ppm			T=1443 R=2.5'/4.0'
	14		FS=0ppm			
	15				NO Recovery	
	16	Bottom of Boring @ 16 ft bgs				

Project OWS Multi-Site Remedial Investigation

HOLE NO. OWØ56-504

HTRW DRILLING LOG

DISTRICT: AFCEC		HOLE NUMBER: OWØ56-505
1. COMPANY NAME: URS	2. DRILLING SUBCONTRACTOR: Environmental West	SHEET 1 OF SHEETS 4
3. PROJECT: OWS Multi-Site Remedial Investigation	4. LOCATION: Fairchild AFB, Spokane, WA	
5. NAME OF DRILLER: Ron Sink	6. MANUFACTURER'S DESIGNATION OF DRILL: GeoProbe 5400 Truck Mounted	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" diameter / 4' long Macro Core Sampler using disposable liners, 4' long Stainless steel retractable screen	8. HOLE LOCATION: OWØ56	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 11-9-15@1455	11. DATE COMPLETED: 11-9-15 @ 1600
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: 21 feet below ground surface	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING: N/A	
14. TOTAL DEPTH OF HOLE: 24 ft bgs	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
Ø			N/A

20. SAMPLES FOR CHEMICAL	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
1GW/1Soil	X	X	TPH-GRO/DRO	DAHs	PCBs	N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Abandoned	Bentonite			

LOCATION SKETCH/COMMENTS — SCALE: Not to Scale

PROJECT	HOLE
OWS Multi-Site Remedial Investigation	OWØ56-505

HOLE OW056-505

PROJECT: OWS Multi-Site Remedial Investigation

Inspector: Jennifer Allen

SHEET 2 OF SHEETS 4

ELEV. a.	DEPTH	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	0	Silty SAND with Gravel (SM)- Medium dense, moist, brown, fine to coarse sand, fine gravel	Field Screening (FS) Parts Per Million (ppm) Head Space (HS) Pocket Pen (PP)			START TIME = 1455
	1		FS=0ppm			Time (T) = 1458
	2		FS=0ppm			Recovery (R) = 4.0'/4.0'
	3		FS=0ppm			
	4			OW056-DPS505-6 @ 1502, Dup: OW056-DPS505-6 @ false time 0815		
	5		FS=0ppm			T=1502 R=3.0'/4.0'
	6	Decreasing Silt	FS=0ppm			
	7				NO Recovery	
	8	Trace Coarse basalt gravel				T=1512 R=1.8'/4.0'
	9		FS=0ppm			
	10				No Recovery	

Project: OWS Multi-Site Remedial Investigation

HOLE NO. OW056-505

HOLE OWS56-505

PROJECT OWS Multi-Site Remedial Investigation

Inspector Jennifer Allen

SHEET 3 OF 4 SHEETS

ELEV. a.	DEPTH	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	10	Same As Above	Field Screening (FS) Parts Per Million (ppm) Head Space (HS) Pocket Pen (PP)		NO Recovery	
	11					
	12	SAND (SW) - loose, Slight moisture, grey/tan, fine to coarse grain with fine to coarse gravel	FS=0ppm			T=1520 R=2.5'/4.0'
	13					
	14		FS=0ppm			
	15				NO Recovery	
	16					
	17		FS=0ppm			T=1531 R=3.6'/4.0'
	18		FS=0ppm			
	19					
	20				NO Recovery	

Project OWS Multi-Site Remedial Investigation

HOLE NO. OWS56-505

HOLE OWØ56-505

PROJECT OWS Multi-Site Remedial Investigation

Inspector Jennifer Allen

SHEET 4 OF 4 SHEETS

ELEV. a.	DEPTH	DESCRIPTION OF MATERIALS c.	FIELD SCREENING RESULTS d.	ANALYTICAL SAMPLE NO. f.	BLOW COUNTS g.	REMARKS h.
	20	Same As Above	Field Screening (FS) Parts Per Million (ppm) Head Space (HS) Pocket Pen (PP)			T=1600
	21 ▽	Becomes Wet, some silt				R= 3.0'/4.0 GW @ 21'
	22					
	23					
	24	Bottom of Boring @ 24.0 ft bgs Set Screen 20-24' 11-10-15 @ 0830 Collect OWØ56-DPW505-24				END TIME =1600
	25					
	26					
	27					
	28					
	29					
	30					

Project OWS Multi-Site Remedial Investigation

HOLE NO. OWØ56-505

Appendix A-3

Soil and Groundwater Sample Collection Field Sheets

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: **Fairchild AFB OWS Multi-Site Investigation** PROJECT NO. **60419236.16170886.OWAA1**

SAMPLE NO. OW056-DPS503-6 BORING NO. OW056-503

DATE/TIME COLLECTED: 11-10-15 @ 0920 PERSONNEL: JA AN

SAMPLE METHOD / DEPTH: Direct Push / 6'

SAMPLE MEDIA: [SOIL] SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. —

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. —

MS/MSD REQUESTED: (YES) NO

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
9 (3) 40 mL VOA vials	2 H_2O & 1 MeOH	VOCs (8260B)
9 (3) 40 mL VOA vials	3 MeOH	TPH-GRO
2 (1) 4 oz Jar	None	TPH-DRO
2 (1) 8 oz Jar	None	SIM PAHs (8270D), PCBs (8082A
		Metals (6010C)

OVA MEASUREMENTS

Background	0ppm
Breathing zone	↓
Boring	
Headspace	

SAMPLE DESCRIPTION

DEPTH: 4'-6' DESCRIPTION: Silty SAND and GRAVEL (SM) - medium dense, moist, brown, fine to coarse, fine gravel

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: **Fairchild AFB OWS Multi-Site Investigation** PROJECT NO. **60419236.16170886.OWAA1**

SAMPLE NO. OWØ56-DP504-6 BORING NO. OWØ56-504

DATE/TIME COLLECTED: 11-9-15 @ 1420 PERSONNEL: JA AN

SAMPLE METHOD / DEPTH: Direct Push / 6'

SAMPLE MEDIA: [SOIL] SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. —

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. —

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
(3) 40 mL VOA vials	2 H_2O & 1 MeOH	VOCs (8260B)
(3) 40 mL VOA vials	3 MeOH	TPH-GRO
(1) 4 oz Jar	None	TPH-DRO
(1) 8 oz Jar	None	SIM PAHs (8270D), PCBs (8082A
		Metals (6010C)

OVA MEASUREMENTS

Background (0) 0ppm

Breathing zone ↓

Boring

Headspace

SAMPLE DESCRIPTION

DEPTH: 5.5'-6.3' DESCRIPTION: SAND (SP) - loose, slight moisture, tan, fine grain

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: **Fairchild AFB OWS Multi-Site Investigation** PROJECT NO. **60419236.16170886.OWAA1**

SAMPLE NO. OW056-DPS5506-6 (5 ORS) BORING NO. OW056-506 (5 ORS)

DATE/TIME COLLECTED: 11-10-15 @ 1502 PERSONNEL: JA AN

SAMPLE METHOD / DEPTH: Direct Push / 6'

SAMPLE MEDIA: [SOIL] SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. —

SAMPLE QC DUPLICATE: (YES) NO DUPLICATE SAMPLE NO. OW056-DPS5505-6 @ 0815

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
6 (3) 40 mL VOA vials	2 H_2O & 1 MeOH	VOCs (8260B)
6 (3) 40 mL VOA vials	3 MeOH	TPH-GRO
2 (1) 4 oz Jar	None	TPH-DRO
2 (1) 8 oz Jar	None	SIM PAHs (8270D), PCBs (8082A
		Metals (6010C)

OVA MEASUREMENTS

Background	0ppm
Breathing zone	
Boring	
Headspace	

SAMPLE DESCRIPTION

DEPTH: 4'-6' DESCRIPTION: Silty SAND with GRAVEL (SM) - medium dense, moist, brown, fine to coarse sand, fine gravel

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME **Fairchild AFB OWS Multi-Site Investigation**

PROJECT NO. **60419236.16170886.OWAA1**

SAMPLE NO. OW056-DPW505-24

~~WELL~~ NO. OW056-505

DATE/TIME COLLECTED 11-10-15 @ 0830

Boring

SAMPLE METHOD Direct Push

PERSONNEL JA AN

SAMPLE MEDIA: (Groundwater) Surface Water

SAMPLE QA SPLIT: YES (NO)

SAMPLE QC DUPLICATE: YES (NO)

MS/MSD REQUESTED YES (NO)

SPLIT SAMPLE NO.

DUPLICATE SAMPLE NO.

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
(3) 40 mL VOA vials	HCl	VOCs (8260B)
(3) 40 mL VOA vials	HCL	TPH-GRO
(1) 1 L Amber	HCL	TPH-DRO
(2) 250 mL Amber	None	SIM-PAHs (8270D)
(2) 250 mL Amber	None	PCBs (8082A)
(1) 500 mL Poly	HNO3	Total Metals (6010C)

WELL PURGING DATA

Date 11-10-15

Time Started 0815

Time Completed 0830

PID Measurements

Background 0ppm

Breathing Zone

Well Head

Well Depth (ft. BTOC) 24'

Depth to Water (ft BTOC) 21'

Water Column Length 3'

Volume of Water in Well (liters) —

Stabilized Purge Rate (liters/min) Apx 500 mL

Stabilized Level of Drawdown (ft. BTOC) —

Total Amount Purged (liters) 4

FIELD MEASUREMENTS

Time	Amount Purged (liters)	pH	Temperature (°C)	Conductivity (mS/cm)	DO (mg/L)	Turbidity (NTU's)	ORP	Water Level (ft)

NO PARAMETERS COLLECTED FOR DIRECT PUSH GROUNDWATER SAMPLING
SAMPLES COLLECTED USING A RETRACTABLE SCREEN AND DISPOSABLE TUBING

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe		
Water Quality Meter		

GENERAL COMMENTS

Appendix A-4

GPS Location Survey Data

SAMPLE LOCATION SURVEY DATA
FAIRCHILD AFB, SPOKANE, WA

Location Identification	Northing	Easting	Ground Elevation
OW056-DP503	5275268.814	451720.4312	2432.00
OW056-DP504	5275264.122	451723.7658	2432.00
OW056-DP505	5275271.589	451716.5022	2432.00

Note:

Survey data was collected with a GPS and is in datum WGS84 UTM 11N

APPENDIX B

LABORATORY ANALYTICAL DATA REPORTS

Due to the large file size, Laboratory Reports have been included as a separate file.

APPENDIX C

DATA VERIFICATION AND QUALIFICATION SUMMARIES

(enclosed on CD/DVD)

Table C-1
Summary of Data Qualifications
Fairchild Air Force Base, Washington

Sample Delivery Group	Field Identification	Matrix	Analysis	Analyte	New LOQ	URS Qual	Comments
280-76678	OW056-DPS503-6	Soil	VOCs	Benzene	--	**UJ**	Low matrix spike recovery
280-76678	OW056-DPS503-6	Soil	VOCs	Ethylbenzene	--	**UJ**	Low matrix spike recovery
280-76678	OW056-DPS503-6	Soil	Metals	Lead	--	**J**	Low matrix spike recovery
280-76678	OW056-DPS503-6	Soil	Metals	Nickel	--	**J**	Low matrix spike recovery
280-76678	OW056-DPS503-6	Soil	VOCs	Toluene	--	**UJ**	Low matrix spike recovery
280-76678	OW056-DPS503-6	Soil	VOCs	Xylenes, Total	--	**UJ**	Low matrix spike recovery
280-76600	OW056-DPS505-6	Soil	NWTPH-Dx	DRO	--	**UJ**	Low surrogate recovery
280-76600	OW056-DPS505-6	Soil	NWTPH-Dx	ORO	--	**J**	Low surrogate recovery
280-76600	OW056-DPS504-6	Soil	NWTPH-Dx	DRO	--	**U**	Method blank contamination
280-76600	OW056-DPS504-6	Soil	NWTPH-Gx	GRO	--	**U**	Method blank contamination
280-76600	OW056-DPS505-6	Soil	NWTPH-Dx	DRO	--	**U**	Method blank contamination
280-76600	OW056-DPS505-6	Soil	NWTPH-Gx	GRO	--	**U**	Method blank contamination
280-76600	OW056-DPS5505-6	Soil	NWTPH-Gx	GRO	--	**U**	Method blank contamination
280-76678	OW056-DPW505-24	Water	PAHs	Chrysene	--	**U**	Method blank contamination

Notes:

-- = New LOQ not necessary

DPS = Direct push soil

DPW = Direct push water

DRO = diesel range organics

GRO = gasoline range organics

J = Estimated

LOQ = Limit of Quantitation

NWTPH-Dx = Northwest Total Petroleum Hydrocarbons - Diesel Range Organics including heavy oil

NWTPH-Gx = Northwest Total Petroleum Hydrocarbons - Gasoline Range Organics

ORO = oil range organics

PAHs = Polynuclear aromatic hydrocarbons

Qual = Qualifier

U = Nondetect

UJ = Estimated nondetect

URS =URS Group, Inc.

VOCs = Volatile organic compounds

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

Sample Identification #	Date Collected	Date Received	Matrix	Analysis
OW063-DPS501-12	11/9/2015	11/10/2015	Soil	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx) and DRO/ORO (NWTPH-Dx)
OW063-DPS503-13	11/9/2015	11/10/2015	Soil	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx) and DRO/ORO (NWTPH-Dx)
OW063-DPS502-13	11/9/2015	11/10/2015	Soil	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx) and DRO/ORO (NWTPH-Dx)
OW063-DPS5502-13	11/9/2015	11/10/2015	Soil	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx) and DRO/ORO (NWTPH-Dx)
OW063-DPS504-13	11/9/2015	11/10/2015	Soil	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx) and DRO/ORO (NWTPH-Dx)
OW063-DPS505-13	11/9/2015	11/10/2015	Soil	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx), DRO/ORO (NWTPH-Dx) and NWTPH-HCID.
OW056-DPS504-6	11/9/2015	11/10/2015	Soil	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx) and DRO/ORO (NWTPH-Dx)
OW056-DPS505-6	11/9/2015	11/10/2015	Soil	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx), DRO/ORO (NWTPH-Dx) and NWTPH-HCID.
OW056-DPS5505-6	11/9/2015	11/10/2015	Soil	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx) and DRO/ORO (NWTPH-Dx)

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

1.0 Laboratory Case Narrative \ Cooler Receipt Form

Verification Criteria	Yes	No	N/A
Were any DoD QSM deviations noted in the laboratory case narrative?	X		
Were DoD QSM corrective actions followed if deviations were noted?	X		
Were any issues noted in the cooler receipt form?		X	

The laboratory case narrative indicated gasoline and DRO were detected in method blanks at levels less than ½ the LOQ. Some DRO surrogate recoveries were outside evaluation criteria. Some VOC and metals MS/MSD recoveries were outside evaluation criteria. The DRO matrix duplicate RPD was outside evaluation criteria. These issues are discussed further in the appropriate sections below. No other issues were noted in the laboratory case narrative or cooler receipt form.

2.0 Sample Documentation

Verification Criteria	Yes	No
Were all samples documented correctly on the chain-of-custody (COC) and samples labels?	X	
Were all sample identifications (IDs) documented correctly on sample labels?	X	
Did samples listed on COCs match the sample labels?	X	
Were sample relinquished properly on the COC?	X	

3.0 Holding Time

Verification Criteria	Yes	No	N/A
Were all samples extracted/analyzed within holding time?	X		
Were samples outside holding time extracted/analyzed < 2x holding time?			X
Were samples outside holding time extracted/analyzed > 2x holding time?			X

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

4.0 Instrument Performance Check (Tuning)

Method 8260B Instrument Tuning Criteria (Filename)	BFB 280-303240/1		
Instrument:	VMS_G		
Date of Tuning:	11/10/2015		
	Yes	No	N/A
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundances for each target mass within the required intensities limits listed in Table 4 of SW-846 Method 8260B?	X		

Method 8260B Instrument Tuning Criteria (Filename)	BFB 280-303666/1		
Instrument:	VMS_G		
Date of Tuning:	11/11/2015		
	Yes	No	N/A
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundances for each target mass within the required intensities limits listed in Table 4 of SW-846 Method 8260B?	X		

Method 8270D-SIM Instrument Tuning Criteria (Filename)	DFTPP 280-304874/1		
Instrument:	SMS_G5		
Date of Tuning:	11/19/2015		
	Yes	No	N/A
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundance for each target mass within the required intensity limits listed in Table 3 of SW-846 Method 8270D?	X		

Method 8270D-SIM Instrument Tuning Criteria (Filename)	DFTPP 280-305282/1		
Instrument:	SMS_G5		
Date of Tuning:	11/23/2015		
	Yes	No	N/A
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundance for each target mass within the required intensity limits listed in Table 3 of SW-846 Method 8270D?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

5.0 Initial Calibration

Method 8260B Initial Calibration Criteria			
Instrument:	**VMS_G**		
Date of Calibration:	**11/10/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 15%?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 8270D-SIM Initial Calibration Criteria			
Instrument:	**SMS_G5**		
Date of Calibration:	**11/19/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 15%?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 8082A Initial Calibration Criteria			
Instrument:	**SGC_P3**		
Date of Calibration:	**10/28/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 20%?			X
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?	X		
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

Method 8082A Initial Calibration Criteria			
Instrument:	**SGC_W**		
Date of Calibration:	**11/22/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 20%?			X
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?	X		
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method NWTPH-Gx Initial Calibration Criteria			
Instrument:	**SEA047**		
Date of Calibration:	**11/5/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 20%?			X
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?	X		
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method NWTPH-Dx Initial Calibration Criteria			
Instrument:	**TAC020**		
Date of Calibration:	**11/3/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 20%?			X
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?	X		
If non-linear regression was used were 6 points used for second order and 7 points for third order?	X		

Method 6010C Initial Calibration Criteria			
Instrument:	**MT_025**		
Date of Calibration:	**11/21/2015**		
	Yes	**No**	**N/A**
Was a minimum of two standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$ for all target metals?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

6.0 Initial Calibration Verification [(ICV) Second Source]

Method 8260B ICV Criteria (Filename)	ICV 280-303240/12		
Instrument:	VMS_G		
Date of Initial Calibration Verification:	11/10/2015		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8270D-SIM ICV Criteria (Filename)	ICV 280-304874/10		
Instrument:	SMS_G5		
Date of Initial Calibration Verification:	11/19/2015		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8082A ICV Criteria (Filename)	ICV 280-301477/36-40		
Instrument:	SGC_P3		
Date of Initial Calibration Verification:	10/29/2015		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8082A ICV Criteria (Filename)	ICV 280-305184/36-40		
Instrument:	SGC_W		
Date of Initial Calibration Verification:	11/22/2015		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Gx ICV Criteria (Filename)	ICV 580-204941/15		
Instrument:	SEA047		
Date of Initial Calibration Verification:	11/6/2015		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

Method NWTPH-Dx ICV Criteria (Filename)	ICV 580-204723/11		
Instrument:	TAC020		
Date of Initial Calibration Verification:	11/3/2015		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 6010C ICV Criteria (Filename)	ICV 280-305246/7		
Instrument:	MT_025		
Date of Initial Calibration Verification:	11/21/2015		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Were all reported analytes within ± 10% of true value?	X		

7.0 Continuing Calibration Verification (CCV)

8260B Verification Criteria for instrument VMS_G					
Beginning CCV Lab File ID:	CCV 280-303666/2	11/11/2015	19:08		
Ending CCV Lab File ID:	CCVC 280-303666/29	11/12/2015	04:17	Yes	No
Was a CCV analyzed daily before sample analysis?				X	
Was a CCV analyzed every 12 hours of analysis time?				X	
Was a CCV analyzed at the end of the analytical batch run?				X	
Were all reported analytes and surrogates within ± 20% of true value?				X	
Were all reported analytes and surrogates within ± 50% of true value for the end of analytical batch CCV?				X	

8270D-SIM Verification Criteria for instrument SMS_G5					
Beginning CCV Lab File ID:	CCV 280-305282/2	11/23/2015	12:09		
Ending CCV Lab File ID:	CCVC 280-305282/21	11/23/2015	20:47	Yes	No
Was a CCV analyzed daily before sample analysis?				X	
Was a CCV analyzed every 12 hours of analysis time?				X	
Was a CCV analyzed at the end of the analytical batch run?				X	
Were all reported analytes and surrogates within ± 20% of true value?				X	
Were all reported analytes and surrogates within ± 50% of true value for the end of analytical batch CCV?				X	

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

Method 8082A CCV Criteria (Filename)	**CCV 280-304453/29**		
Instrument:	**SGC_P3**		
Date of Calibration Verification:	**11/17/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8082A CCV Criteria (Filename)	**CCV 280-304453/56**		
Instrument:	**SGC_P3**		
Date of Calibration Verification:	**11/18/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8082A CCV Criteria (Filename)	**CCV 280-305577/31**		
Instrument:	**SGC_W**		
Date of Calibration Verification:	**11/25/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8082A CCV Criteria (Filename)	**CCV 280-305577/51**		
Instrument:	**SGC_W**		
Date of Calibration Verification:	**11/26/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

Method NWTPH-Gx CCV Criteria (Filename)	**CCVRT 580-206041/4**		
Instrument:	**SEA047**		
Date of Calibration Verification:	**11/19/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Gx CCV Criteria (Filename)	**CCV 580-206041/15**		
Instrument:	**SEA047**		
Date of Calibration Verification:	**11/19/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Gx CCV Criteria (Filename)	**CCV 580-206041/26**		
Instrument:	**SEA047**		
Date of Calibration Verification:	**11/20/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Dx CCV Criteria (Filename)	**CCV 580-205572/67**		
Instrument:	**TAC020**		
Date of Calibration Verification:	**11/14/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

Method NWTPH-Dx CCV Criteria (Filename)	**CCV 580-205572/78**		
Instrument:	**TAC020**		
Date of Calibration Verification:	**11/14/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Dx CCV Criteria (Filename)	**CCV 580-205572/85**		
Instrument:	**TAC020**		
Date of Calibration Verification:	**11/14/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 6010C CCV Criteria (Filename)	**CCV 280-305246/36**		
Instrument:	**MT_025**		
Date of Calibration Verification:	**11/22/2015**		
	Yes	**No**	**N/A**
Were the CCVs analyzed after every 10 samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 10% of true value?	X		

Method 6010C CCV Criteria (Filename)	**CCV 280-305246/47**		
Instrument:	**MT_025**		
Date of Calibration Verification:	**11/22/2015**		
	Yes	**No**	**N/A**
Were the CCVs analyzed after every 10 samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 10% of true value?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

Method 6010C CCV Criteria (Filename)	**CCV 280-305246/59**		
Instrument:	**MT_025**		
Date of Calibration Verification:	**11/22/2015**		
	Yes	**No**	**N/A**
Were the CCVs analyzed after every 10 samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 10% of true value?	X		

8.0 Method Blank Samples

Blank Criteria	**Yes**	**No**	**N/A**
Was a method blank analyzed with every preparatory batch?	X		
Were analytes detected > ½ the LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit?		X	
Were target analytes detected in method, trip or calibration blanks?	X		

Blank ID	**Parameter**	**Analyte**	**Concentration**	**LOQ**	**Units**
MB 580-206074/1-A	NWTPH-Gx	Gasoline	1.41	4	mg/kg
MB 580-205486/1-A	NWTPH-Dx	DRO	7.17	25	mg/kg

Qualifications due to blank contamination are included in the table below. Analytical data that were reported nondetect or at concentrations greater than five times (5X) the associated blank concentration did not require qualification.

Field ID	**Parameter**	**Analyte**	**New LOQ**	**Qualification**
OW063-DPS501-12	NWTPH-Gx	Gasoline	--	**U**
OW063-DPS503-13	NWTPH-Gx	Gasoline	--	**U**
OW063-DPS502-13	NWTPH-Gx	Gasoline	--	**U**
OW063-DPS5502-13	NWTPH-Gx	Gasoline	--	**U**
OW063-DPS504-13	NWTPH-Gx	Gasoline	--	**U**
OW063-DPS505-13	NWTPH-Gx	Gasoline	--	**U**
OW056-DPS504-6	NWTPH-Gx	Gasoline	--	**U**
OW056-DPS505-6	NWTPH-Gx	Gasoline	--	**U**
OW056-DPS5505-6	NWTPH-Gx	Gasoline	--	**U**
OW063-DPS501-12	NWTPH-Dx	DRO	--	**U**
OW063-DPS503-13	NWTPH-Dx	DRO	--	**U**
OW056-DPS504-6	NWTPH-Dx	DRO	--	**U**
OW056-DPS505-6	NWTPH-Dx	DRO	--	**U**

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

9.0 Laboratory Control Sample (LCS)

LCS Criteria	Yes	No	N/A
Was an LCS analyzed with every preparatory batch?	X		
Were LCS recoveries within acceptance criteria listed in the UFP-QAPP?	X		

10.0 Surrogate Recoveries

Surrogate Criteria	Yes	No	N/A
Were surrogate spikes added to all field and QC samples?	X		
Were surrogate recoveries within acceptance criteria listed in the UFP-QAPP?		X	

Field ID	Parameter	Surrogate	Recovery	Criteria
OW056-DPS505-6	NWTPH-Dx	*o*-Terphenyl	**9**	50-150

Qualification of data based on surrogate recoveries is listed in the following table.

Field ID	Parameter	Analyte	Qualification
OW056-DPS505-6	NWTPH-Dx	DRO	**UJ**
OW056-DPS505-6	NWTPH-Dx	Motor Oil	**J**

11.0 Internal Standard (IS) Recoveries

Method 8260B and 8270D-SIM IS Criteria	Yes	No	N/A
Were internal standards spiked for all samples and standards?	X		
Were internal standard areas within -50% to + 100% of the ICAL midpoint standard area?	X		
Were retention time ± 30 seconds from the retention time of the midpoint standard of the ICAL?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

12.0 Matrix Spike/Matrix Spike Duplicate Recoveries/RPDs

MS/MSD Criteria	Yes	No	N/A
Were MS/MSD samples analyzed with every preparatory batch?	X		
Were MS/MSD samples collected from this SDG?	X		
Were MS/MSD recoveries/RPDs within acceptance criteria listed in the UFP-QAPP?		X	

Sample OW063-DPS501-12 was spiked and analyzed for VOCs, PAHs, gasoline, DRO, motor oil, PCBs, and metals. Sample OW063-DPS502-13 was spiked and analyzed for PCBs.

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/RPD Criteria
OW063-DPS501-12	VOCs	Ethylbenzene	**75/71**	7	76-122/20
OW063-DPS501-12	VOCs	Toluene	79/**75**	7	77-121/20
OW063-DPS501-12	VOCs	Xylenes, total	**74/70**	9	78-124/20
OW063-DPS501-12	Metals	Chromium	**80/84**	11	85-113/20
OW063-DPS501-12	Metals	Nickel	**79/81**	12	83-113/20
OW063-DPS501-12	Metals	Zinc	**74/76**	7	82-113/20

Analytical data that required qualification based on MS/MSD data are included in the table below.

Field ID	Parameter	Analyte	Qualification
OW063-DPS501-12	VOCs	Ethylbenzene	**UJ**
OW063-DPS501-12	VOCs	Toluene	**UJ**
OW063-DPS501-12	VOCs	Xylenes, total	**UJ**
OW063-DPS501-12	Metals	Chromium	**J**
OW063-DPS501-12	Metals	Nickel	**J**
OW063-DPS501-12	Metals	Zinc	**J**

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

14.0 Matrix Duplicate

Matrix Duplicate (MD) Criteria	Yes	No	N/A
Were MD samples analyzed with every preparatory batch?	X		
Were MD samples collected for this SDG?	X		
Were MDs within acceptance criteria listed in the UFP-QAPP?	X		

Sample OW056-DPS5505-6 was duplicated and analyzed for DRO and motor oil. The MD RPD was not used to evaluate precision since the concentrations of DRO and motor oil were below the LOQ. The differences between the parent sample / matrix duplicate were < 2x the LOQ and therefore within evaluation criteria.

15.0 Dilution Test

Method 6010C Dilution Test Criteria	Yes	No	N/A
Was a dilution test sample analyzed with every preparatory batch?	X		
Was a dilution test sample analyzed from this SDG	X		
Were metals concentrations > 50x the LOQ?		X	
Did the five-fold dilution agree within ± 10% of the original measurement?	X		
If the five-fold dilution did not agree within ± 10% of the original measurement, was a post digestion spike sample analyzed?			X

Sample OW063-DPS501-12 was diluted and analyzed for metals.

16.0 Post Digestion Spike (PDS) Recoveries

Method 6010C PDS Criteria	Yes	No	N/A
Was a PDS sample analyzed from this SDG	X		
Was a PDS sample analyzed if the dilution test failed or metals concentrations were > 50 x the LOD?	X		
Were the PDS recoveries within 80-120%?	X		

Sample OW063-DPS501-12 was spiked and analyzed for metals.

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76600 **URS ITR: Jennifer Zorinsky**
Date Verified: 12/2/2015
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx and NWTPH-HCID

17.0 Field Duplicate Samples

Field Duplicate Criteria	Yes	No	N/A
Were field duplicate samples collected for this SDG? (if yes, list below)	X		
Were parent sample / field duplicate RPDs ≤ 30% for water samples and ≤ 50% for soils for analytes that had concentrations > 5x the LOQ.	X		
Were the differences between the parent sample / field duplicate < 2x the LOQ for analytes that had concentrations < 5x the LOQ	X		

Parent Sample ID	Field Duplicate Sample ID
OW063-DPS502-13	OW063-DPS5502-13
OW056-DPS505-6	OW056-DPS5505-6

18.0 Sensitivity

Sensitivity Criteria	Yes	No	N/A
Was the laboratory sensitivity consistent with project (QAPP) requirements?		X	
Did all analytes meet sensitivity requirements?	X		

The PAHs for sample OW056-DPS504-6 were analyzed at an initial dilution factor of 10 due to matrix interference. The sensitivity achieved still met data quality objectives.

19.0 Additional Qualifications

Additional Qualification Criteria	Yes	No	N/A
Were common laboratory contaminants detected?		X	
Were common laboratory contaminant concentrations < 2x the LOQ			X
Was professional judgment used to qualify data (if yes, list below)			X

20.0 Completeness

Completeness Criteria	Yes	No	N/A
Were any data rejected during the verification process?		X	
Were any samples lost, broken, or in any other manner in not verified?		X	
Were sample analyses requested performed, the correct analyte lists used and correct sample preparation and analyses methods and units utilized?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Sample Identification #	Date Collected	Date Received	Matrix	Analysis
OW056-DPW505-24	11/10/2015	11/11/2015	Water	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx) and DRO/ORO (NWTPH-Dx)
OW056-DPS503-6	11/10/2015	11/11/2015	Soil	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx) and DRO/ORO (NWTPH-Dx)
OW063-DPW505-24	11/10/2015	11/11/2015	Water	VOCs (8260B), PAHs (8270D-SIM), PCBs (8082A), Metals (6010C), GRO (NWTPH-Gx) and DRO/ORO (NWTPH-Dx)
TB-11015	11/10/2015	11/11/2015	Water	VOCs (8260B)

1.0 Laboratory Case Narrative \ Cooler Receipt Form

Verification Criteria	Yes	No	N/A
Were any DoD QSM deviations noted in the laboratory case narrative?	X		
Were DoD QSM corrective actions followed if deviations were noted?	X		
Were any issues noted in the cooler receipt form?		X	

The laboratory case narrative indicated gasoline, PAHs, and chromium were detected in method blanks at levels less than ½ the LOQ. Some VOC and metals MS/MSD recoveries and RPDs were outside evaluation criteria. A PDS recovery for zinc was below evaluation criteria. These issues are discussed further in the appropriate sections below. No other issues were noted in the laboratory case narrative or cooler receipt form.

2.0 Sample Documentation

Verification Criteria	Yes	No
Were all samples documented correctly on the chain-of-custody (COC) and samples labels?	X	
Were all sample identifications (IDs) documented correctly on sample labels?	X	
Did samples listed on COCs match the sample labels?	X	
Were sample relinquished properly on the COC?	X	

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

3.0 Holding Time

Verification Criteria	Yes	No	N/A
Were all samples extracted/analyzed within holding time?	X		
Were samples outside holding time extracted/analyzed < 2x holding time?			X
Were samples outside holding time extracted/analyzed > 2x holding time?			X

4.0 Instrument Performance Check (Tuning)

Method 8260B Instrument Tuning Criteria (Filename)	BFB 280-303004/1		
Instrument:	VMS_J		
Date of Tuning:	11/6/2015		
	Yes	No	N/A
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundances for each target mass within the required intensities limits listed in Table 4 of SW-846 Method 8260B?	X		

Method 8260B Instrument Tuning Criteria (Filename)	BFB 280-303861/1		
Instrument:	VMS_J		
Date of Tuning:	11/12/2015		
	Yes	No	N/A
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundances for each target mass within the required intensities limits listed in Table 4 of SW-846 Method 8260B?	X		

Method 8260B Instrument Tuning Criteria (Filename)	BFB 280-303705/1		
Instrument:	VMS_MS1		
Date of Tuning:	11/12/2015		
	Yes	No	N/A
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundances for each target mass within the required intensities limits listed in Table 4 of SW-846 Method 8260B?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Method 8260B Instrument Tuning Criteria (Filename)	**BFB 280-304192/1**		
Instrument:	**VMS_MS1**		
Date of Tuning:	**11/16/2015**		
	Yes	**No**	**N/A**
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundances for each target mass within the required intensities limits listed in Table 4 of SW-846 Method 8260B?	X		

Method 8270D-SIM Instrument Tuning Criteria (Filename)	**DFTPP 280-304874/1**		
Instrument:	**SMS_G5**		
Date of Tuning:	**11/19/2015**		
	Yes	**No**	**N/A**
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundance for each target mass within the required intensity limits listed in Table 3 of SW-846 Method 8270D?	X		

Method 8270D-SIM Instrument Tuning Criteria (Filename)	**DFTPP 280-305282/1**		
Instrument:	**SMS_G5**		
Date of Tuning:	**11/23/2015**		
	Yes	**No**	**N/A**
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundance for each target mass within the required intensity limits listed in Table 3 of SW-846 Method 8270D?	X		

Method 8270D-SIM Instrument Tuning Criteria (Filename)	**DFTPP 280-304743/1**		
Instrument:	**SMS_X4**		
Date of Tuning:	**11/18/2015**		
	Yes	**No**	**N/A**
Was instrument tuning completed prior to calibration?	X		
Were all samples analyzed under an acceptable 12 hour clock tune?	X		
Were ion relative abundance for each target mass within the required intensity limits listed in Table 3 of SW-846 Method 8270D?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

5.0 Initial Calibration

Method 8260B Initial Calibration Criteria			
Instrument:	**VMS_J**		
Date of Calibration:	**11/6/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 15%?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?	X		
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 8260B Initial Calibration Criteria			
Instrument:	**VMS_MS1**		
Date of Calibration:	**11/12/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 15%?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 8270D-SIM Initial Calibration Criteria			
Instrument:	**SMS_G5**		
Date of Calibration:	**11/19/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 15%?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Method 8270D-SIM Initial Calibration Criteria			
Instrument:	**SMS_X4**		
Date of Calibration:	**11/18/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 15%?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 8082A Initial Calibration Criteria			
Instrument:	**SGC_P3**		
Date of Calibration:	**10/28/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 20%?			X
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?	X		
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 8082A Initial Calibration Criteria			
Instrument:	**SGC_W**		
Date of Calibration:	**11/2/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 20%?			X
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?	X		
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Method NWTPH-Gx Initial Calibration Criteria			
Instrument:	**SEA006**		
Date of Calibration:	**11/5/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 20%?			X
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?	X		
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method NWTPH-Gx Initial Calibration Criteria			
Instrument:	**SEA047**		
Date of Calibration:	**11/5/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 20%?			X
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?	X		
If non-linear regression was used were 6 points used for second order and 7 points for third order?	X		

Method NWTPH-Dx Initial Calibration Criteria			
Instrument:	**TAC020**		
Date of Calibration:	**11/3/2015**		
	Yes	**No**	**N/A**
Option 1: RSD for each analyte ≤ 20%?			X
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?	X		
If non-linear regression was used were 6 points used for second order and 7 points for third order?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Method 6010C Initial Calibration Criteria			
Instrument:	**MT_025**		
Date of Calibration:	**12/2/2015**		
	Yes	**No**	**N/A**
Was a minimum of two standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$ for all target metals?	X		

6.0 Initial Calibration Verification [(ICV) Second Source]

Method 8260B ICV Criteria (Filename)	**ICV 280-303004/11**		
Instrument:	**VMS_J**		
Date of Initial Calibration Verification:	**11/6/2015**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8260B ICV Criteria (Filename)	**ICV 280-303705/19**		
Instrument:	**VMS_MS1**		
Date of Initial Calibration Verification:	**11/12/2015**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8270D-SIM ICV Criteria (Filename)	**ICV 280-304874/10**		
Instrument:	**SMS_G5**		
Date of Initial Calibration Verification:	**11/19/2015**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8270D-SIM ICV Criteria (Filename)	**ICV 280-304743/9**		
Instrument:	**SMS_X4**		
Date of Initial Calibration Verification:	**11/18/2015**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Method 8082A ICV Criteria (Filename)	**ICV 280-301477/36-40**		
Instrument:	**SGC_P3**		
Date of Initial Calibration Verification:	**10/29/2015**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8082A ICV Criteria (Filename)	**ICV 280-302012/64-68**		
Instrument:	**SGC_W**		
Date of Initial Calibration Verification:	**11/2/2015**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Gx ICV Criteria (Filename)	**ICV 580-205007/12**		
Instrument:	**SEA006**		
Date of Initial Calibration Verification:	**11/5/2015**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Gx ICV Criteria (Filename)	**ICV 580-204941/12**		
Instrument:	**SEA047**		
Date of Initial Calibration Verification:	**11/5/2015**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Dx ICV Criteria (Filename)	**ICV 580-204723/11**		
Instrument:	**TAC020**		
Date of Initial Calibration Verification:	**11/3/2015**		
	Yes	**No**	**N/A**
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within ± 20% of the true value?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Method 6010C ICV Criteria (Filename)	ICV 280-306403/7		
Instrument:	MT_025		
Date of Initial Calibration Verification:	12/2/2015		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Were all reported analytes within ± 10% of true value?	X		

7.0 Continuing Calibration Verification (CCV)

8260B Verification Criteria for instrument VMS_J					
Beginning CCV Lab File ID:	CCV 280-303861/2	11/12/2015	17:04		
Ending CCV Lab File ID:	CCVC 280-303861/33	11/13/2015	02:12	Yes	No
Was a CCV analyzed daily before sample analysis?				X	
Was a CCV analyzed every 12 hours of analysis time?				X	
Was a CCV analyzed at the end of the analytical batch run?				X	
Were all reported analytes and surrogates within ± 20% of true value?				X	
Were all reported analytes and surrogates within ± 50% of true value for the end of analytical batch CCV?				X	

8260B Verification Criteria for instrument VMS_MS1					
Beginning CCV Lab File ID:	CCV 280-304192/2	11/16/2015	07:42		
Ending CCV Lab File ID:	CCVC 280-304192/32	11/16/2015	18:14	Yes	No
Was a CCV analyzed daily before sample analysis?				X	
Was a CCV analyzed every 12 hours of analysis time?				X	
Was a CCV analyzed at the end of the analytical batch run?				X	
Were all reported analytes and surrogates within ± 20% of true value?				X	
Were all reported analytes and surrogates within ± 50% of true value for the end of analytical batch CCV?				X	

8270D-SIM Verification Criteria for instrument SMS_G5					
Beginning CCV Lab File ID:	CCV 280-305282/2	11/23/2015	12:09		
Ending CCV Lab File ID:	CCVC 280-305282/21	11/23/2015	20:47	Yes	No
Was a CCV analyzed daily before sample analysis?				X	
Was a CCV analyzed every 12 hours of analysis time?				X	
Was a CCV analyzed at the end of the analytical batch run?				X	
Were all reported analytes and surrogates within ± 20% of true value?				X	

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

8270D-SIM Verification Criteria for instrument SMS_G5					
Beginning CCV Lab File ID:	**CCV 280-305282/2**	**11/23/2015**	**12:09**		
Ending CCV Lab File ID:	**CCVC 280-305282/21**	**11/23/2015**	**20:47**	**Yes**	**No**
Were all reported analytes and surrogates within ± 50% of true value for the end of analytical batch CCV?				X	

8270D-SIM Verification Criteria for instrument SMS_X4					
Beginning CCV Lab File ID:	**ICV 280-304743/9**	**11/18/2015**	**19:49**		
Ending CCV Lab File ID:	**CCVC 280-304743/26**	**11/19/2015**	**03:16**	**Yes**	**No**
Was a CCV analyzed daily before sample analysis?				X	
Was a CCV analyzed every 12 hours of analysis time?				X	
Was a CCV analyzed at the end of the analytical batch run?				X	
Were all reported analytes and surrogates within ± 20% of true value?				X	
Were all reported analytes and surrogates within ± 50% of true value for the end of analytical batch CCV?				X	

Method 8082A CCV Criteria (Filename)	**CCVIS 280-304868/3**		
Instrument:	**SGC_P3**		
Date of Calibration Verification:	**11/19/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8082A CCV Criteria (Filename)	**CCV 280-304868/30**		
Instrument:	**SGC_P3**		
Date of Calibration Verification:	**11/19/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method 8082A CCV Criteria (Filename)	**CCV 280-304926/4**		
Instrument:	**SGC_W**		
Date of Calibration Verification:	**11/19/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Method 8082A CCV Criteria (Filename)	**CCV 280-304926/4**		
Instrument:	**SGC_W**		
Date of Calibration Verification:	**11/19/2015**		
	Yes	**No**	**N/A**
Were all reported analytes within ± 20% of the true value?	X		

Method 8082A CCV Criteria (Filename)	**CCV 280-304926/17**		
Instrument:	**SGC_W**		
Date of Calibration Verification:	**11/19/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Gx CCV Criteria (Filename)	**CCVRT 580-205903/19**		
Instrument:	**SEA006**		
Date of Calibration Verification:	**11/17/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Gx CCV Criteria (Filename)	**CCV 580-205903/29**		
Instrument:	**SEA006**		
Date of Calibration Verification:	**11/18/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Gx CCV Criteria (Filename)	**CCV 580-206041/15**		
Instrument:	**SEA047**		
Date of Calibration Verification:	**11/19/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Method NWTPH-Gx CCV Criteria (Filename)	**CCV 580-206041/26**		
Instrument:	**SEA047**		
Date of Calibration Verification:	**11/20/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Dx CCV Criteria (Filename)	**CCV 580-205469/43**		
Instrument:	**TAC020**		
Date of Calibration Verification:	**11/13/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Dx CCV Criteria (Filename)	**CCV 580-205469/60**		
Instrument:	**TAC020**		
Date of Calibration Verification:	**11/13/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Dx CCV Criteria (Filename)	**CCV 580-205767/3**		
Instrument:	**TAC020**		
Date of Calibration Verification:	**11/16/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 20% of the true value?	X		

Method NWTPH-Dx CCV Criteria (Filename)	**CCV 580-205767/14**		
Instrument:	**TAC020**		
Date of Calibration Verification:	**11/16/2015**		
	Yes	**No**	**N/A**
Was the CCV analyzed before sample analysis, after every 10 field samples and at the end of the analysis sequence?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Method NWTPH-Dx CCV Criteria (Filename)	**CCV 580-205767/14**		
Instrument:	**TAC020**		
Date of Calibration Verification:	**11/16/2015**		
	Yes	**No**	**N/A**
Were all reported analytes within ± 20% of the true value?	X		

Method 6010C CCV Criteria (Filename)	**CCV 280-306403/34**		
Instrument:	**MT_025**		
Date of Calibration Verification:	**12/2/2015**		
	Yes	**No**	**N/A**
Were the CCVs analyzed after every 10 samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 10% of true value?	X		

Method 6010C CCV Criteria (Filename)	**CCV 280-306403/45**		
Instrument:	**MT_025**		
Date of Calibration Verification:	**12/2/2015**		
	Yes	**No**	**N/A**
Were the CCVs analyzed after every 10 samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 10% of true value?	X		

Method 6010C CCV Criteria (Filename)	**CCV 280-306403/56**		
Instrument:	**MT_025**		
Date of Calibration Verification:	**12/2/2015**		
	Yes	**No**	**N/A**
Were the CCVs analyzed after every 10 samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 10% of true value?	X		

Method 6010C CCV Criteria (Filename)	**CCV 280-306403/68**		
Instrument:	**MT_025**		
Date of Calibration Verification:	**12/2/2015**		
	Yes	**No**	**N/A**
Were the CCVs analyzed after every 10 samples and at the end of the analysis sequence?	X		
Were all reported analytes within ± 10% of true value?	X		

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

8.0 Method Blank Samples

Blank Criteria	Yes	No	N/A
Was a method blank analyzed with every preparatory batch?	X		
Were analytes detected > ½ the LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit?		X	
Were target analytes detected in method, trip or calibration blanks?	X		

Blank ID	Parameter	Analyte	Concentration	LOQ	Units
MB 580-206074/1-A	NWTPH-Gx	Gasoline	1.41	4	mg/kg
MB 280-303893/1-A	PAHs	Benzo[a]anthracene	0.00625	0.1	µg/L
MB 280-303893/1-A	PAHs	Chrysene	0.00348	0.1	µg/L
MB 280-304282/1-A	Metals	Chromium	0.09	3.5	mg/kg

Qualifications due to blank contamination are included in the table below. Analytical data that were reported nondetect or at concentrations greater than five times (5X) the associated blank concentration did not require qualification.

Field ID	Parameter	Analyte	New LOQ	Qualification
OW056-DPW505-24	PAHs	Chrysene	--	**U**
OW063-DPW505-24	PAHs	Benzo[a]anthracene	--	**U**

9.0 Laboratory Control Sample (LCS)

LCS Criteria	Yes	No	N/A
Was an LCS analyzed with every preparatory batch?	X		
Were LCS recoveries within acceptance criteria listed in the UFP-QAPP?	X		

10.0 Surrogate Recoveries

Surrogate Criteria	Yes	No	N/A
Were surrogate spikes added to all field and QC samples?	X		
Were surrogate recoveries within acceptance criteria listed in the UFP-QAPP?	X		

11.0 Internal Standard (IS) Recoveries

Method 8260B and 8270D-SIM IS Criteria	Yes	No	N/A

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Method 8260B and 8270D-SIM IS Criteria	Yes	No	N/A
Were internal standards spiked for all samples and standards?	X		
Were internal standard areas within -50% to + 100% of the ICAL midpoint standard area?	X		
Were retention time ± 30 seconds from the retention time of the midpoint standard of the ICAL?	X		

12.0 Matrix Spike/Matrix Spike Duplicate Recoveries/RPDs

MS/MSD Criteria	Yes	No	N/A
Were MS/MSD samples analyzed with every preparatory batch?	X		
Were MS/MSD samples collected from this SDG?	X		
Were MS/MSD recoveries/RPDs within acceptance criteria listed in the UFP-QAPP?		X	

Sample OW056-DPS503-6 was spiked and analyzed for VOCs, PAHs, gasoline, PCBs, DRO, motor oil, and metals. Sample OW056-DPW505-24 was spiked and analyzed for metals.

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/RPD Criteria
OW056-DPS503-6	VOCs	Benzene	**71/66**	19	77-121/20
OW056-DPS503-6	VOCs	Ethylbenzene	**62/67**	4	76-122/20
OW056-DPS503-6	VOCs	n-Hexane	64/57	**24**	45-142/20
OW056-DPS503-6	VOCs	Toluene	**67/65**	13	77-121/20
OW056-DPS503-6	VOCs	Xylenes, Total	**61/63**	8	78-124/20
OW056-DPS503-6	Metals	Lead	90/**78**	18	81-112/20
OW056-DPS503-6	Metals	Nickel	85/**78**	13	83-113/20

Analytical data that required qualification based on MS/MSD data are included in the table below. Data was not qualified if the MS/MSD recoveries were within evaluation criteria.

Field ID	Parameter	Analyte	Qualification
OW056-DPS503-6	VOCs	Benzene	**UJ**
OW056-DPS503-6	VOCs	Ethylbenzene	**UJ**
OW056-DPS503-6	VOCs	Toluene	**UJ**
OW056-DPS503-6	VOCs	Xylenes, Total	**UJ**

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

Field ID	Parameter	Analyte	Qualification
OW056-DPS503-6	Metals	Lead	**J**
OW056-DPS503-6	Metals	Nickel	**J**

13.0 Matrix Duplicate

Matrix Duplicate (MD) Criteria	Yes	No	N/A
Were MD samples analyzed with every preparatory batch?	X		
Were MD samples collected for this SDG?		X	
Were MDs within acceptance criteria listed in the UFP-QAPP?			X

14.0 Dilution Test

Method 6010C Dilution Test Criteria	Yes	No	N/A
Was a dilution test sample analyzed with every preparatory batch?	X		
Was a dilution test sample analyzed from this SDG	X		
Were metals concentrations > 50x the LOQ?		X	
Did the five-fold dilution agree within ± 10% of the original measurement?			X
If the five-fold dilution did not agree within ± 10% of the original measurement, was a post digestion spike sample analyzed?			X

Samples OW056-DPS503-6 and OW056-DPW505-24 were diluted and analyzed for metals.

15.0 Post Digestion Spike (PDS) Recoveries

Method 6010C PDS Criteria	Yes	No	N/A
Was a PDS sample analyzed from this SDG	X		
Was a PDS sample analyzed if the dilution test failed or metals concentrations were > 50 x the LOD?	X		
Were the PDS recoveries within 80-120%?		X	

Samples OW056-DPS503-6 and OW056-DPW505-24 were spiked and analyzed for metals. The recovery for zinc (75%) in sample OW056-DPS503-6 was below evaluation criteria. The MS/MSD recoveries for zinc were within evaluation criteria and no qualification of data was required.

Fairchild AFB Data Verification

Laboratory: Test America, Arvada, CO **URS Chemist: Jeff Aust**
Laboratory and SDG#: 280-76678 **URS ITR: Jennifer Zorinsky**
Date Verified: 1/7/2016
Guidance: DoD QSM, Version 5.0, Appendix B Tables (DoD, 2013)
Applicable QAPP: Consolidated UFP QAPP Fairchild AFB (Bay West, 2015), UFP-QAPP Oil Water Separator Multi-site Remedial Investigation (URS, 2015)
Applicable Analytical Methods: 8260B, 8270D-SIM, 8082A, 6010C, NWTPH-Gx, NWTPH-Dx

16.0 Field Duplicate Samples

Field Duplicate Criteria	Yes	No	N/A
Were field duplicate samples collected for this SDG? (if yes, list below)		X	
Were parent sample / field duplicate RPDs ≤ 30% for water samples and ≤ 50% for soils for analytes that had concentrations > 5x the LOQ.			X
Were the differences between the parent sample / field duplicate < 2x the LOQ for analytes that had concentrations < 5x the LOQ			X

17.0 Sensitivity

Sensitivity Criteria	Yes	No	N/A
Was the laboratory sensitivity consistent with project (QAPP) requirements?	X		
Did all analytes meet sensitivity requirements?	X		

18.0 Additional Qualifications

Additional Qualification Criteria	Yes	No	N/A
Were common laboratory contaminants detected?		X	
Were common laboratory contaminant concentrations < 2x the LOQ			X
Was professional judgment used to qualify data (if yes, list below)			X

19.0 Completeness

Completeness Criteria	Yes	No	N/A
Were any data rejected during the verification process?		X	
Were any samples lost, broken, or in any other manner in not verified?		X	
Were sample analyses requested performed, the correct analyte lists used and correct sample preparation and analyses methods and units utilized?	X		

APPENDIX D

INVESTIGATION DERIVED WASTE DOCUMENTATION

WASTE MANAGEMENT

EZ Profile™

Requested Facility: Graham Road Landfill ☐ Unsure Profile Number: 111509WA

☐ Multiple Generator Locations (Attach Locations) ☑ Request Certificate of Disposal ☐ Renewal? Original Profile Number: _____

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Fairchild AFB, OWS Sites
2. Site Address: 92nd CES/CEV, 100 W Ent St
   (City, State, ZIP) Fairchild AFB WA 99011
3. County: Spokane
4. Contact Name: Marc Connally, RPM
5. Email: marc.connally@us.af.mil
6. Phone: (509) 247-8148 7. Fax: _____
8. Generator EPA ID: WA9571924647 ☐ N/A
9. State ID: _____ ☑ N/A

B. BILLING INFORMATION ☐ SAME AS GENERATOR

1. Billing Name: AECOM
2. Billing Address: P.O. Box 5604
   (City, State, ZIP) Glenn Allen VA 23058
3. Contact Name: Sean Bayer
4. Email: sean.bayer@aecom.com
5. Phone: (402) 952-2669 6. Fax: _____
7. WM Hauled? ☑ Yes ☐ No
8. P.O. Number: 60419236.16170886.OWAA3
9. Payment Method: ☑ Credit Account ☐ Cash ☐ Credit Card

C. MATERIAL INFORMATION

1. Common Name: Soil IDW

   Describe Process Generating Material: ☐ See Attached

   Generated Soil during direct push investigation and installation of monitoring wells at Fairchild AFB to investigate former oil water separator sites.

2. Material Composition and Contaminants: ☐ See Attached

1. Soil (sand, silt, gravels)	100 %
2.	
3.	
4.	
Total comp. must be equal to or greater than 100%	≥100%

3. State Waste Codes: _____ ☑ N/A
4. Color: brown
5. Physical State at 70˚F: ☑ Solid ☐ Liquid ☐ Other: _____
6. Free Liquid Range Percentage: _____ to _____ ☑ N/A
7. pH: _____ to _____ ☑ N/A
8. Strong Odor: ☐ Yes ☑ No Describe: _____
9. Flash Point: ☐ <140˚F ☐ 140˚–199˚F ☐ ≥200˚ ☑ N/A

D. REGULATORY INFORMATION

1. EPA Hazardous Waste? ☐ Yes* ☑ No
   Code: _____
2. State Hazardous Waste? ☐ Yes ☑ No
   Code: _____
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? ☐ Yes* ☑ No
4. Contains Underlying Hazardous Constituents? ☐ Yes* ☑ No
5. From an industry regulated under Benzene NESHAP? ☐ Yes* ☑ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ☐ Yes* ☑ No
7. CERCLA or State-mandated clean-up? ☐ Yes* ☑ No
8. NRC or State-regulated radioactive or NORM waste? ☐ Yes* ☑ No

***If Yes, see Addendum (page 2) for additional questions and space.**

9. Contains PCBs? → If Yes, answer a, b and c. ☐ Yes ☑ No
   a. Regulated by 40 CFR 761? ☐ Yes ☐ No
   b. Remediation under 40 CFR 761.61 (a)? ☐ Yes ☐ No
   c. Were PCB imported into the US? ☐ Yes ☐ No
10. Regulated and/or Untreated Medical/Infectious Waste? ☐ Yes ☑ No
11. Contains Asbestos? ☐ Yes ☑ No
    → If Yes: ☐ Non-Friable ☐ Non-Friable – Regulated ☐ Friable

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☑ Yes

   Please identify applicable samples and/or lab reports:

   The client sample ID# OWS-IDW-030416 and the lab ID# 280-80468-9. This sample is a composite sample of IDW drums.

2. Other information attached (such as MSDS)? ☐ Yes

F. SHIPPING AND DOT INFORMATION

1. ☐ One-Time Event ☑ Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: 16
   ☐ Tons ☐ Yards ☑ Drums ☐ Gallons ☐ Other: _____
3. Container Type and Size: 55-gallon
4. USDOT Proper Shipping Name: ☑ N/A

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

If I am an agent signing on behalf of the Generator, I have confirmed with the Generator that information contained in this Profile is accurate and complete.

Name (Print): Sean Bayer Date: 06/21/2016

Title: Civil Engineer

Company: AECOM

Certification Signature

Sean Bayer

cd1d6a0245...

Client: URS Corporation Job Number: 280-80468-1

Client Sample ID: **OWS-IDW-030416**

Lab Sample ID: 280-80468-9 Date Sampled: 03/04/2016 1500
Client Matrix: Solid % Moisture: 7.6 Date Received: 03/05/2016 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-316538	Instrument ID:	VMS_G
Prep Method:	5035	Prep Batch:	280-316537	Lab File ID:	G3413.D
Dilution:	1.0			Initial Weight/Volume:	5.283 g
Analysis Date:	03/11/2016 0432			Final Weight/Volume:	5 mL
Prep Date:	03/04/2016 1500				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ
Benzene		1.6	U	0.48	5.1
Ethylbenzene		1.6	U Q	0.69	5.1
n-Hexane		1.6	U	0.70	5.1
Toluene		1.6	U	0.71	5.1
Xylenes, Total		1.0	U	0.62	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Toluene-d8 (Surr)	112		85 - 116
1,2-Dichloroethane-d4 (Surr)	99		71 - 136
4-Bromofluorobenzene (Surr)	140	M Q	79 - 119
Dibromofluoromethane (Surr)	103		78 - 119

Client: URS Corporation Job Number: 280-80468-1

Client Sample ID: **OWS-IDW-030416**

Lab Sample ID: 280-80468-9 Date Sampled: 03/04/2016 1500
Client Matrix: Solid % Moisture: 7.6 Date Received: 03/05/2016 0830

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	280-316892	Instrument ID:	SMS_F
Prep Method:	3546	Prep Batch:	280-316650	Lab File ID:	F4705.D
Dilution:	10			Initial Weight/Volume:	31.3 g
Analysis Date:	03/15/2016 1255			Final Weight/Volume:	1 mL
Prep Date:	03/11/2016 1913			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ
Benzo[a]anthracene		26	U	9.3	52
Benzo[b]fluoranthene		26	U M	12	52
Benzo[k]fluoranthene		26	U M	10	52
Benzo[a]pyrene		26	U M	7.7	52
Chrysene		26	U	10	52
Dibenz(a,h)anthracene		26	U	13	52
Indeno[1,2,3-cd]pyrene		26	U M	11	52
1-Methylnaphthalene		5.2	U Q	2.7	52
2-Methylnaphthalene		6.9	U Q	3.2	52
Naphthalene		6.9	U Q	3.4	52

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorobiphenyl	82	D	46 - 115
Terphenyl-d14	78	D	58 - 133
Nitrobenzene-d5	0	Q D	44 - 125

Client: URS Corporation Job Number: 280-80468-1

Client Sample ID: **OWS-IDW-030416**

Lab Sample ID: 280-80468-9 Date Sampled: 03/04/2016 1500
Client Matrix: Solid % Moisture: 7.6 Date Received: 03/05/2016 0830

NWTPH-Gx Northwest - Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Gx	Analysis Batch:	580-212753	Instrument ID:	SEA047
Prep Method:	5035	Prep Batch:	580-212715	Initial Weight/Volume:	5.808 g
Dilution:	1.0			Final Weight/Volume:	10 mL
Analysis Date:	03/10/2016 2315			Injection Volume:	5 mL
Prep Date:	03/10/2016 1728			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Gasoline		15		0.97	7.8

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	106		50 - 150

Client: URS Corporation Job Number: 280-80468-1

Client Sample ID: OWS-IDW-030416

Lab Sample ID: 280-80468-9 Date Sampled: 03/04/2016 1500
Client Matrix: Solid % Moisture: 7.6 Date Received: 03/05/2016 0830

8082A Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082A	Analysis Batch:	280-316721	Instrument ID:	SGC_P3
Prep Method:	3546	Prep Batch:	280-316611	Initial Weight/Volume:	31.3 g
Dilution:	1.0			Final Weight/Volume:	10 mL
Analysis Date:	03/15/2016 2349			Injection Volume:	1 uL
Prep Date:	03/11/2016 1330			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ
PCB-1016		16	U	5.3	34
PCB-1221		18	U	16	49
PCB-1232		16	U	5.3	34
PCB-1242		34	U	9.5	34
PCB-1248		21	U	5.8	34
PCB-1254		18	U	5.7	34
PCB-1260		8.0	U	2.7	34
PCB-1262		34	U	12	34
PCB-1268		12	U	4.1	34
Total PCBs		8.0	U	2.7	34

Surrogate	%Rec	Qualifier	Acceptance Limits
Tetrachloro-m-xylene	81		44 - 130
DCB Decachlorobiphenyl	74		59 - 130

Client: URS Corporation Job Number: 280-80468-1

Client Sample ID: **OWS-IDW-030416**

Lab Sample ID: 280-80468-9 Date Sampled: 03/04/2016 1500
Client Matrix: Solid % Moisture: 7.6 Date Received: 03/05/2016 0830

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	580-212694	Instrument ID:	TAC020
Prep Method:	3546	Prep Batch:	580-212636	Lab File ID:	10C16025.D
Dilution:	1.0			Initial Weight/Volume:	10.195 g
Analysis Date:	03/10/2016 2026			Final Weight/Volume:	10 mL
Prep Date:	03/09/2016 1230			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
DRO (C10-C24)		49		3.8	27
Motor Oil (>C24-C36)		120		9.7	53

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	92		50 - 150

Client: URS Corporation Job Number: 280-80468-1

Client Sample ID: OWS-IDW-030416

Lab Sample ID: 280-80468-9 Date Sampled: 03/04/2016 1500
Client Matrix: Solid Date Received: 03/05/2016 0830

6010C Metals (ICP)-TCLP

Analysis Method:	6010C	Analysis Batch:	280-317174	Instrument ID:	MT_025
Prep Method:	3010A	Prep Batch:	280-316926	Lab File ID:	25D031616.asc
Dilution:	1.0	Leach Batch:	280-316777	Initial Weight/Volume:	10 mL
Analysis Date:	03/17/2016 0027			Final Weight/Volume:	50 mL
Prep Date:	03/15/2016 1515				
Leach Date:	03/14/2016 1535				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	DL	LOQ
Barium		640	J	2.0	1000
Cadmium		9.0	U	2.0	100
Chromium		3.9	J	3.0	500
Lead		50	U	13	500
Selenium		95	U	24	100
Silver		18	U	4.0	500

Analysis Method:	6010C	Analysis Batch:	280-317237	Instrument ID:	MT_025
Prep Method:	3010A	Prep Batch:	280-316926	Lab File ID:	25Z031716.asc
Dilution:	1.0	Leach Batch:	280-316777	Initial Weight/Volume:	10 mL
Analysis Date:	03/17/2016 1203			Final Weight/Volume:	50 mL
Prep Date:	03/15/2016 1515				
Leach Date:	03/14/2016 1535				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	DL	LOQ
Arsenic		75	U	22	500

7470A Mercury (CVAA)-TCLP

Analysis Method:	7470A	Analysis Batch:	280-317343	Instrument ID:	MT_034
Prep Method:	7470A	Prep Batch:	280-317185	Lab File ID:	160317bc.txt
Dilution:	1.0	Leach Batch:	280-316777	Initial Weight/Volume:	30 mL
Analysis Date:	03/17/2016 1835			Final Weight/Volume:	50 mL
Prep Date:	03/17/2016 1055				
Leach Date:	03/14/2016 1535				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	DL	LOQ
Hg		0.12	J	0.030	2.0